

FCC Part 15.407

TEST REPORT

For

ANSER-NET CO.,LTD

3F., No.108, Shanghai Rd., Taoyuan Dist., Taoyuan City 330, Taiwan (R.O.C.)

FCC ID: 2ASNE221014ACN

Report Type: Original Report	Product Name: Wireless Solution
Report Producer : <u>Coco Lin</u>	
Report Number : <u>RXZ220803003RF02</u>	
Report Date : <u>2022-11-25</u>	
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Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Applicant	ANSER-NET CO.,LTD
	3F., No.108, Shanghai Rd., Taoyuan Dist., Taoyuan City 330, Taiwan (R.O.C.)
Manufacturer	ANSER-NET CO.,LTD
	3F., No.108, Shanghai Rd., Taoyuan Dist., Taoyuan City 330, Taiwan (R.O.C.)
Brand(Trade) Name	RF-iLink
Product (Equipment)	Wireless Solution
Main Model Name	AS-AP515915ACN-S
Series Model Name	AS-AP515919ACN-S, AS-AP515919ACNO-S, AS-AP24590819ACN-S, AS-AP515920ACN-S, AS-AP515920ACNO-S, AS-AP24590820ACN-S, AS-AP515923ACN-S, AS-AP515923ACNO-S, AS-AP24590823ACN-S, AS-AP5159X51ACN-S, AS-AP2459X51ACN-S, AS-AP5159X52ACN-S, AS-AP2459X52ACN-S, AS-AP515904ACNO-S.
Model Discrepancy	Please refer to the difference declaration letter provided by the manufacturer.
Frequency Range	5150 MHz ~ 5250 MHz
Modulation Technique	IEEE 802.11a Mode: OFDM IEEE 802.11n HT20/ ac VHT20 Mode: OFDM IEEE 802.11n HT40/ ac VHT40 Mode: OFDM IEEE 802.11ac VHT80 Mode: OFDM
Power Operation	24Vdc from POE
Received Date	2022/8/22
Date of Test	2022/9/22 ~ 2022/10/26

*All measurement and test data in this report was gathered from production sample serial number:

RXZ220803003-03/-07/-08/-09/-10/-11 (Assigned by BAACL, New Taipei Laboratory).

1.2 Objective

This report is prepared on behalf of ANSER-NET CO.,LTD in accordance with Part 2, Subpart J, Part 15, Subparts A, C and E of the Federal Communication Commission's rules.

1.3 Related Submittal(s)/Grant(s)

N/A

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

1.5 Statement

Decision Rule: No, (The test results do not include MU judgment)

It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (New Taipei Laboratory).

Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

The determination of the test results does not require consideration of the uncertainty of the measurement, unless the assessment is required by customer agreement, regulation or standard document specification.

Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) is not responsible for the authenticity of the information provided by the applicant that affects the test results.

1.6 Measurement Uncertainty

Parameter		Uncertainty
AC Mains		+/- 2.36 dB
RF output power, conducted		+/- 0.93 dB
Power Spectral Density, conducted		+/- 0.93 dBm
Occupied Bandwidth		+/- 0.35 MHz
Unwanted Emissions, conducted		+/- 1.69 dBm
Emissions, radiated	30 MHz~1GHz	+/- 5.22 dB
	1 GHz~18 GHz	+/- 6.12 dB
	18 GHz~40 GHz	+/- 4.99 dB
Temperature		+/- 1.27 °C
Humidity		+/- 3 %

1.7 Environmental Conditions

Test Site	Test Date	Temperature (°C)	Relative Humidity (%)	ATM Pressure (hPa)	Test Engineer
AC Line Conducted Emissions	2022/10/20~2022/10/26	24	65	1010	Jim
Radiation Spurious Emissions	2022/9/22~2022/10/21	21.6~24.1	60~71	1010	Aaron Pan
Emission Bandwidth And Occupied Bandwidth	2022/10/7~2022/10/19	24.3~25.5	51~52	1010	Andy Cheng
Maximum Output Power	2022/10/7~2022/10/19	24.3~25.5	51~52	1010	Andy Cheng
Power Spectral Density	2022/10/7~2022/10/19	24.3~25.5	51~52	1010	Andy Cheng

1.8 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) to collect test data is located on

☒70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3732) and the FCC designation No.TW3732 under the Mutual Recognition Agreement (MRA) in FCC Test.

2 System Test Configuration

2.1 Description of Test Configuration

The system was configured for testing in an engineering mode, which is provided by manufacturer.

The system support 802.11a/n ht20/n ht40/ac vht20/ac vht40/ac vht80, the 802.11n ht20/n ht40 were reduced since the identical parameters with 802.11ac vht20 and vht40.

SISO mode and MIMO mode have the same power level setting and base on output power testing, MIMO mode power than SISO mode large, MIMO mode was selected for full testing.

The device supports MIMO (CDD) at all modes.

For 5150 ~ 5250MHz

4 channels are provided for 802.11a, 802.11n HT20, 802.11ac VHT20:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
40	5200	48	5240

2 channels are provided for 802.11n HT40, 802.11ac VHT40:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230

1 channel is provided for 802.11ac VHT80:

Channel	Frequency (MHz)
42	5210

802.11a/n HT20 mode Channel 36, 40, 48 were tested.

802.11n HT40 mode Channel 38, 46 were tested.

802.11ac VHT80 mode Channel 42 were tested.

2.2 Equipment Modifications

No modification was made to the EUT.

2.3 EUT Exercise Software

The EUT was programmed to be in continuously transmitting mode.

The software was used “Atheors Radio Test 2 (ART2-GUI) v2.3”.

MIMO(CDD)

Model: AS-AP515915ACN-S, AS-AP515919ACN-S, AS-AP515919ACNO-S, AS-AP24590819ACN-S, AS-AP515920ACN-S, AS-AP515920ACNO-S, AS-AP24590820ACN-S, AS-AP515923ACN-S, AS-AP515923ACNO-S, AS-AP24590823ACN-S :

UNII Band	Mode	Channel	Frequency (MHz)	Power setting	
				Chain 0	Chain 1
UNII-1	802.11a	36	5180	14	14
		40	5200	14	14
		48	5240	14	14
	802.11n HT20	36	5180	13.5	13.5
		40	5200	13.5	13.5
		48	5240	13.5	13.5
	802.11n HT40	38	5190	7.5	7.5
		46	5230	7.5	7.5
	802.11ac VHT20	36	5180	13.5	13.5
		40	5200	13.5	13.5
		48	5240	13.5	13.5
	802.11ac VHT40	38	5190	7.5	7.5
		46	5230	7.5	7.5
	802.11ac VHT80	42	5210	3	3

Model: AS-AP5159X51ACN-S, AS-AP2459X51ACN-S, AS-AP5159X52ACN-S, AS-AP2459X52ACN-S :

UNII Band	Mode	Channel	Frequency (MHz)	Power setting	
				Chain 0	Chain 1
UNII-1	802.11a	36	5180	22	22
		40	5200	22	22
		48	5240	20	20
	802.11n HT20	36	5180	21.5	21.5
		40	5200	21.5	21.5
		48	5240	19.5	19.5
	802.11n HT40	38	5190	17.5	17.5
		46	5230	24.5	24.5
	802.11ac VHT20	36	5180	21.5	21.5
		40	5200	21.5	21.5
		48	5240	19.5	19.5
	802.11ac VHT40	38	5190	17.5	17.5
		46	5230	24.5	24.5
	802.11ac VHT80	42	5210	16	16

Model: AS-AP515904ACNO-S :

UNII Band	Mode	Channel	Frequency (MHz)	Power setting	
				Chain 0	Chain 1
UNII-1	802.11a	36	5180	23	23
		40	5200	25	25
		48	5240	25	25
	802.11n HT20	36	5180	24	24
		40	5200	25	25
		48	5240	25	25
	802.11n HT40	38	5190	20.5	20.5
		46	5230	26	26
	802.11ac VHT20	36	5180	24	24
		40	5200	25	25
		48	5240	25	25
	802.11ac VHT40	38	5190	20.5	20.5
		46	5230	26	26
	802.11ac VHT80	42	5210	16	16

SISO mode and MIMO mode have the same power level setting and base on output power testing, MIMO mode power than SISO mode large, MIMO mode was selected for full testing.

The device supports MIMO (CDD) at all modes.

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

802.11a: MIMO(CDD) Mode :6Mbps

802.11ac VHT20 MIMO(CDD) Mode: MCS0

802.11ac VHT40 MIMO(CDD) Mode: MCS0

802.11ac VHT80 MIMO(CDD) Mode: MCS0

2.4 Test Mode

Pre-scan

AC Line Conducted Emissions and Radiated Spurious Emissions

Mode 1: AS-AP515915ACN-S, Panel Antenna, Antenna Gain: 15dBi (Sample serial number: RXZ220803003-03).

Mode 2: AS-AP515919ACN-S, Panel Antenna, Antenna Gain: 15dBi (Sample serial number: RXZ220803003-08).

Mode 3: AS-AP515920ACN-S, Panel Antenna, Antenna Gain: 15dBi (Sample serial number: RXZ220803003-07).

Mode 4: AS-AP515923ACN-S, Panel Antenna, Antenna Gain: 15dBi (Sample serial number: RXZ220803003-10).

Mode 5: AS-AP5159X51ACN-S, Rubber Antenna, Antenna Gain: 8.16dBi (Sample serial number: RXZ220803003-07).

Mode 6: AS-AP5159X52ACN-S, Rubber Antenna, Antenna Gain: 8.16dBi (Sample serial number: RXZ220803003-09).

Mode 7: AS-AP515904ACNO-S, Rubber Antenna, Antenna Gain: 2dBi (Sample serial number: RXZ220803003-11).

Worst case is the Mode 1, Mode 5, Mode 7

Model 1 , Mode 5 , Mode 7 for all test item.

Other series model test Radiated Spurious Emissions below 1GHz and AC Line Conducted Emissions.

2.5 Support Equipment List and Details

Description	Manufacturer	Model Number	S/N
NB	DELL	E6410	8N7PXXN1
POE POWER SUPPLY	ANSER-NET	GRT-POE20-240100A	2005290154

2.6 External Cable List and Details

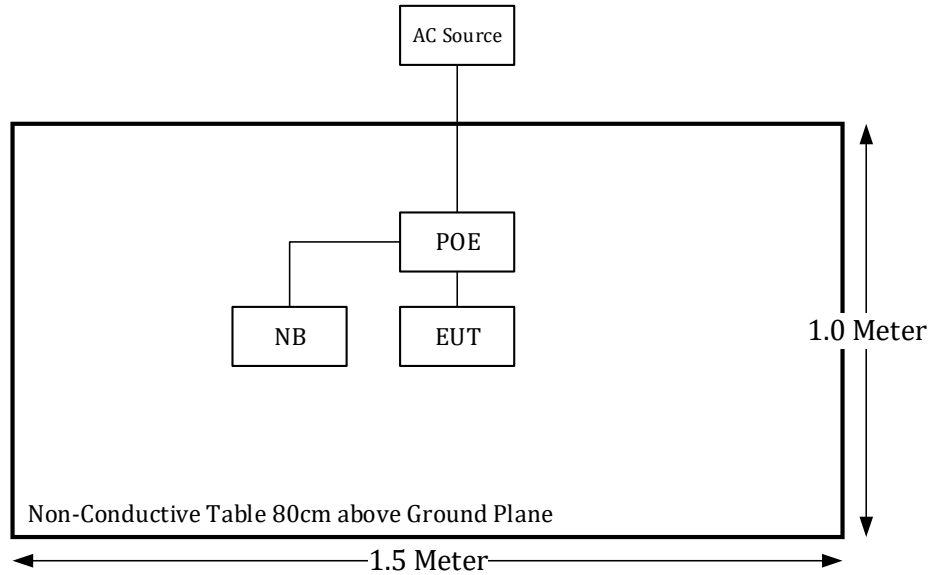
Cable Description	Length (m)	From	To
RJ-45 Cable	1	EUT	POE
RJ-45 Cable	1	NB	POE

2.7 Block Diagram of Test Setup

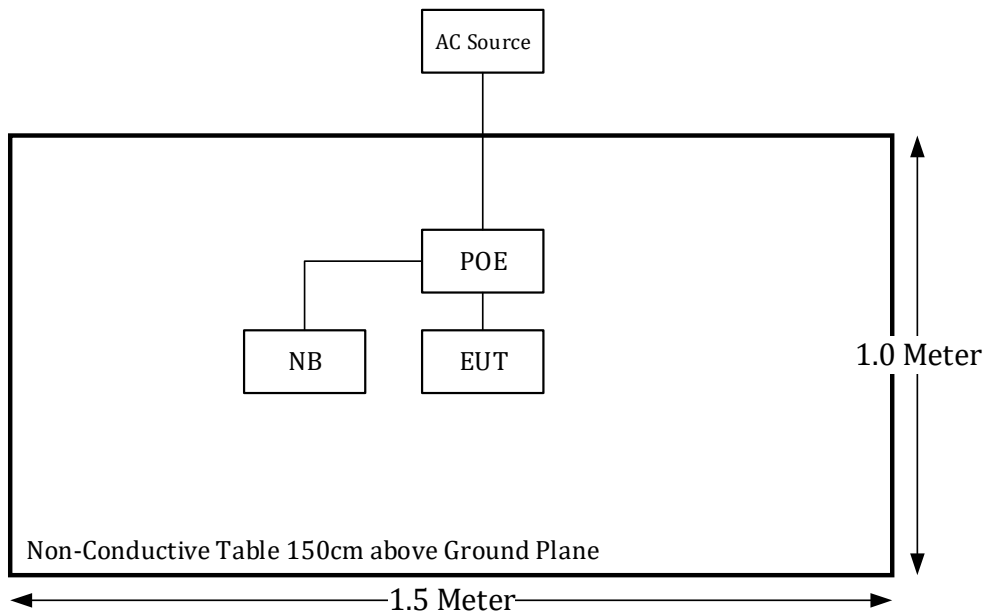
See test photographs attached in setup photos for the actual connections between EUT and support equipment.

Radiation:

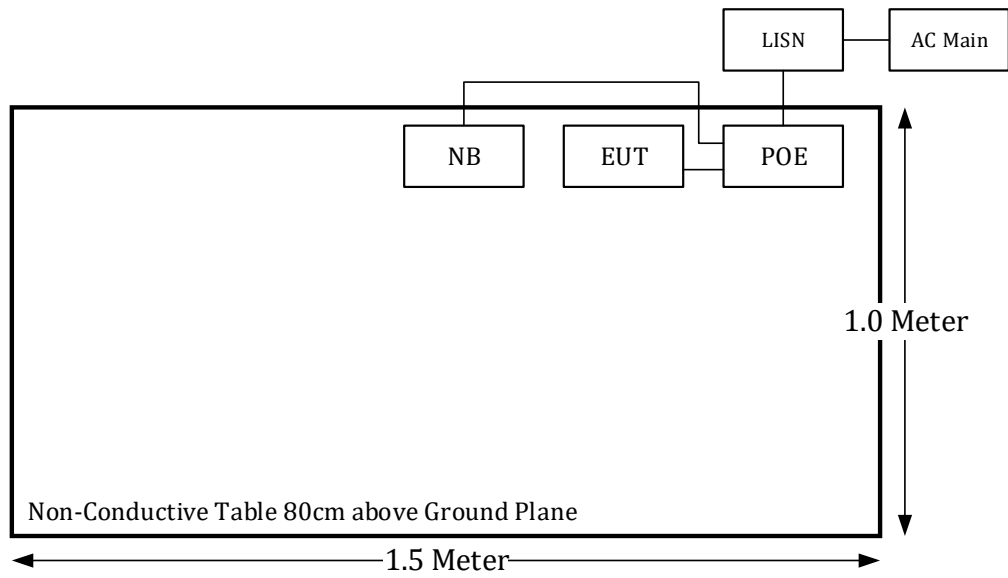
Below 1GHz:



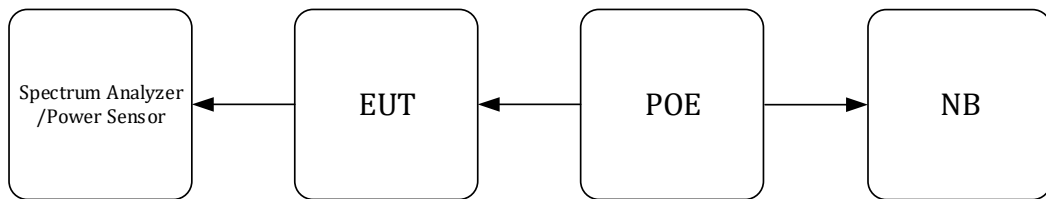
Above 1GHz:



Conduction:



Conducted:



2.8 Duty Cycle

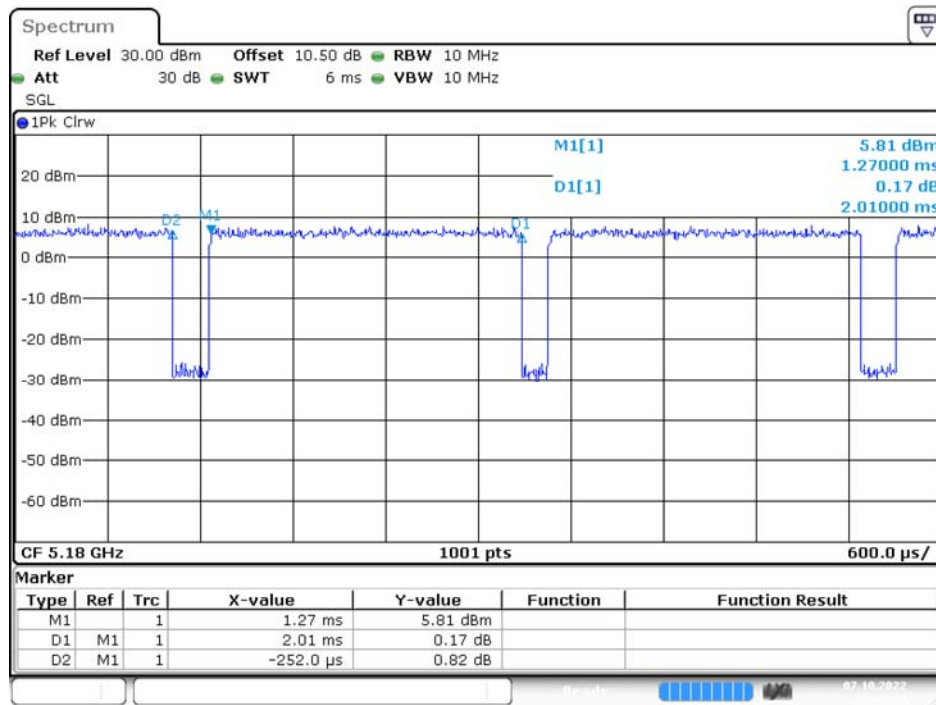
The duty cycle as below:

Radio Mode	T _{on} (ms)	T _{on} +T _{off} (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11a	2.01	2.262	89	0.51
802.11n20	1.87	2.01	93	0.32
802.11n40	0.927	0.999	93	0.32
802.11ac20	1.902	1.98	96	0.18
802.11ac40	0.936	1.008	93	0.32
802.11ac80	0.456	0.534	85	0.71

Note: Duty Cycle Correction Factor = 10*log(1/duty cycle)

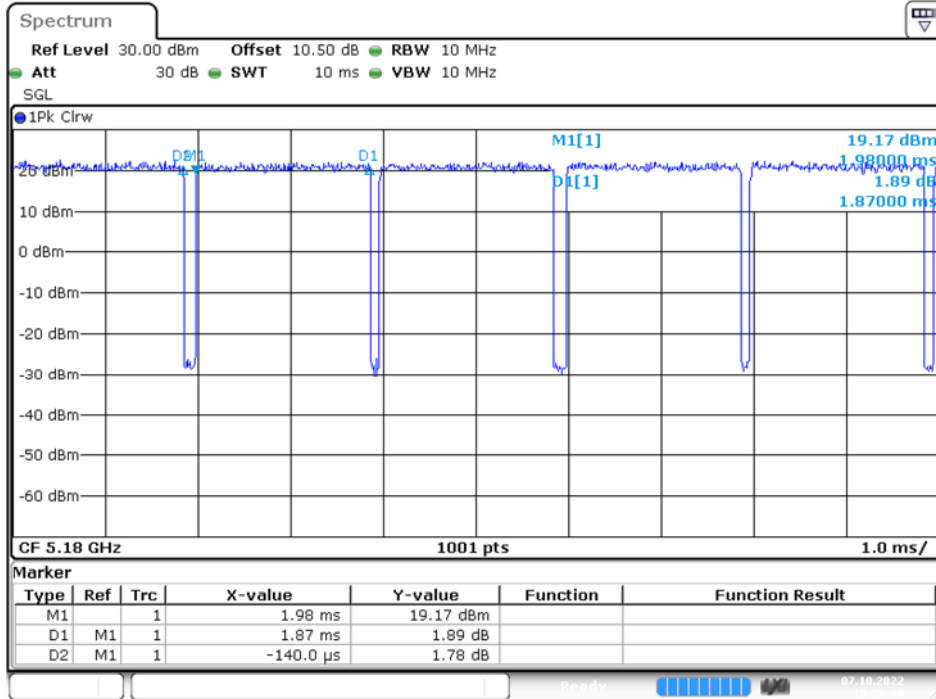
Please refer to the following plots.

802.11a Mode

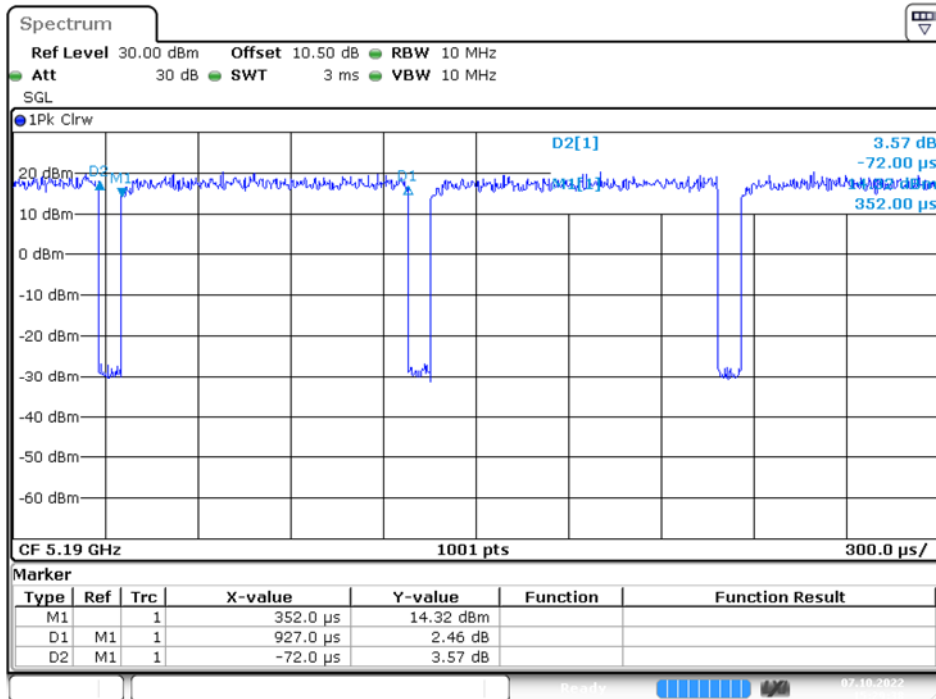


Date: 7.OCT.2022 17:03:12

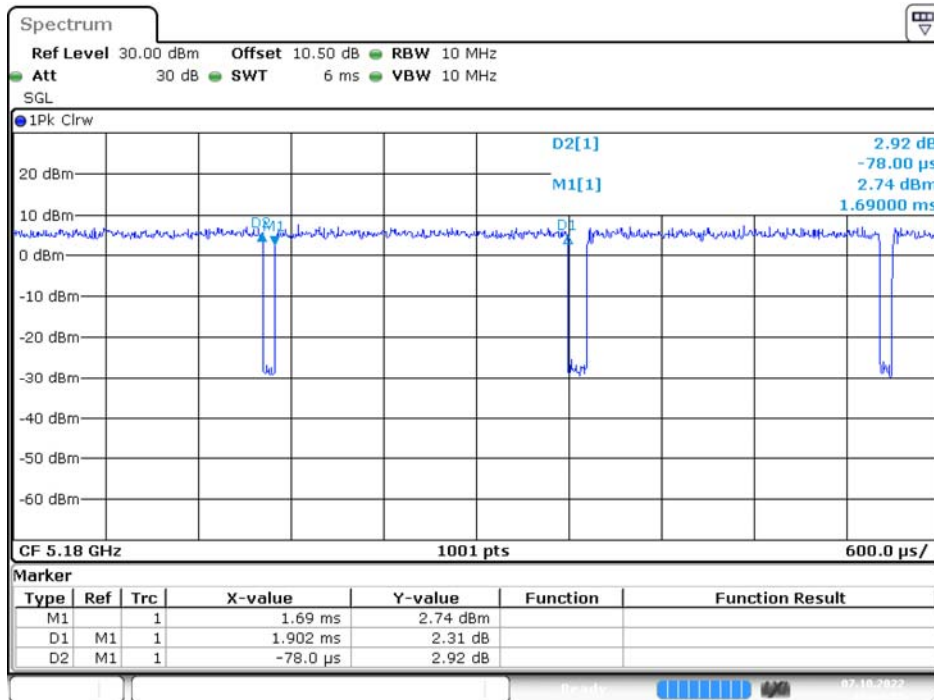
802.11n HT20 Mode



802.11n HT40 Mode

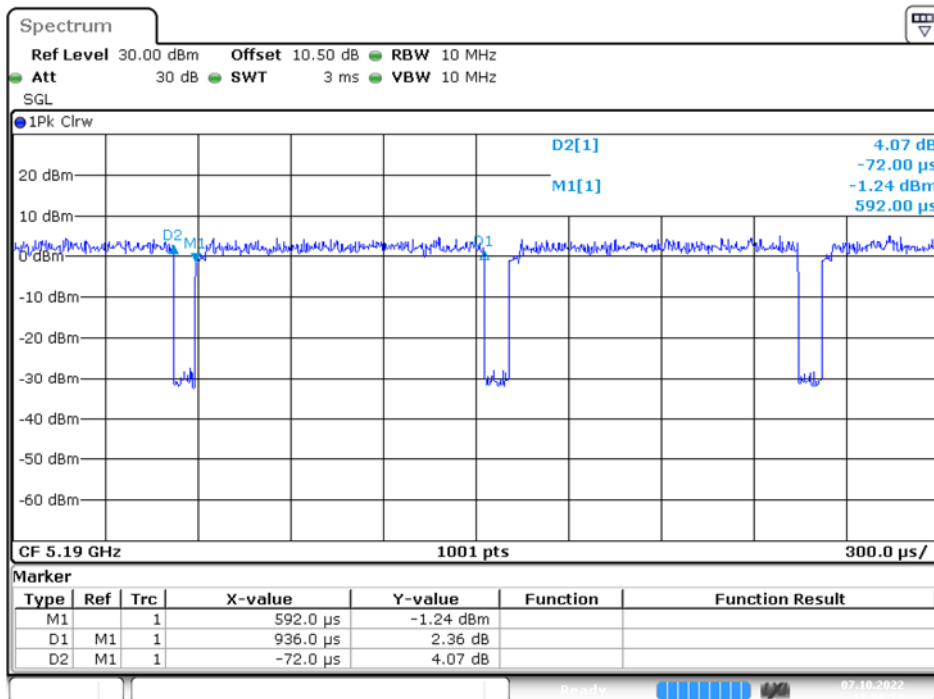


802.11ac VHT20 Mode



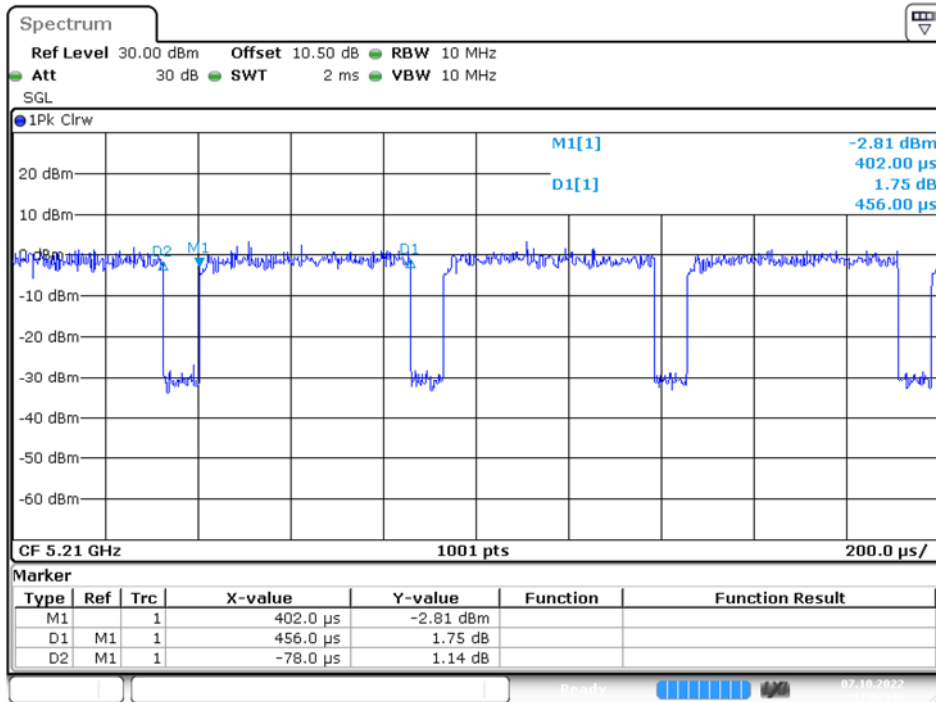
Date: 7.OCT.2022 17:04:25

802.11ac VHT40 Mode



Date: 7.OCT.2022 17:06:24

802.11ac VHT80 Mode



Date: 7.OCT.2022 17:07:49

3 Summary of Test Results

FCC Rules	Description of Test	Results
§15.407(f), §1.1307(b)(3)(i)	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(9) & §15.207(a)	AC Line Conducted Emissions	Compliance
§15.205 & §15.209 & §15.407(b)	Unwanted Emission	Compliance
§15.407(a)	Emission Bandwidth	Compliance
§15.407(a)(1)	Conducted Transmitter Output Power	Compliance
§15.407(a)(1)	Power Spectral Density	Compliance

4 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conduction Room (CON-A)					
LISN	Rohde & Schwarz	ENV216	101612	2022/1/14	2023/1/13
LISN	Rohde & Schwarz	ENV216	101248	2022/6/22	2023/6/21
EMI Test Receiver	Rohde & Schwarz	ESW8	100947	2022/7/27	2023/7/26
Pulse Limiter	Rohde & Schwarz	ESH3Z2	TXZEM104	2022/7/19	2023/7/18
RF Cable	EMEC	EM-CB5D	1	2022/6/7	2023/6/6
Software	AUDIX	E3	V9.150826k	N.C.R	N.C.R
Radiated Room (966-A)					
Bilog Antenna with 6 dB Attenuator	SUNOL SCIENCES & MINI-CIRCUITS	JB6/UNAT-6+	A050115/15542_01	2022/2/14	2023/2/13
Horn Antenna	EMCO	SAS-571	1020	2022/5/25	2023/5/24
Horn Antenna	ETS-Lindgren	3116	62638	2022/8/18	2023/8/17
Preamplifier	Sonoma	310N	130602	2022/6/16	2023/6/15
Preamplifier	A.H. system Inc.	PAM-0118P	466	2021/11/4	2022/11/3
Microwave Preamplifier	EM Electronics Corporation	EM18G40G	60656	2021/12/27	2022/12/26
Spectrum Analyzer	Rohde & Schwarz	FSV40	101435	2022/1/13	2023/1/12
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2021/11/9	2022/11/8
Micro flex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2022/1/24	2023/1/23
Coaxial Cable	COMMATE	PEWC	8Dr	2021/12/24	2022/12/23
Coaxial Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2022/1/24	2023/1/23
Coaxial Cable	JUNFLON	J12J102248-00-B-5	AUG-07-15-044	2021/12/24	2022/12/23
Cable	EMC	EMC105-SM-SM-10000	201003	2022/1/24	2023/1/23
Coaxial Cable	ROSNOL	K1K50-UP0264-K1K50-450CM	160309-1	2022/1/24	2023/1/23

Coaxial Cable	ROSNOL	K1K50-UP0264- K1K50-50CM	15120-1	2022/1/18	2023/1/17
Software	AUDIX	E3	18621a	N.C.R	N.C.R
Conducted Room					
Spectrum Analyzer	Rohde & Schwarz	FSV40	101140	2022/2/18	2023/2/17
Cable	UTIFLEX	UFA210A	9435	2022/10/3	2023/10/2
Power Sensor	KEYSIGHT	U2021XA	MY54080018	2022/1/24	2023/1/23
Attenuator	MINI-CIRCUITS	BW-S10W5+	1419	2022/2/11	2023/2/10

***Statement of Traceability:** BACL Corp. attests that all of the calibrations on the equipment items listed above were traceable to the SI System of Units via the R.O.C. Center for Measurement Standards of the Electronics Testing Center, Taiwan (ETC) or to another internationally recognized National Metrology Institute (NMI), and were compliant with the current Taiwan Accreditation Foundation (TAF) requirements

5 FCC §15.407(f), §1.1307(b)(3)(i) - RF Exposure

5.1 Applicable Standard

According to subpart 15.407(f) and subpart §1.1307(b)(3)(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission’s guidelines.

For single RF sources (*i.e.*, any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).

P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R ² .
1.34-30	3,450 R ² /f ² .
30-300	3.83 R ² .
300-1,500	0.0128 R ² f.
1,500-100,000	19.2R ² .

The sequence to apply for single portable RF sources includes the following steps:

- 1) determination of 1 mW blanket exemption under § 1.1307(b)(3)(i)(A)
- 2) determination of exemption under the MPE-based § 1.1307(b)(3)(i)(C) if 1) is not met
- 3) determination of exemption under the SAR-based § 1.1307(b)(3)(i)(B) if both 1) and 2) are not met

5.2 RF Exposure Evaluation Result

Worst case:

Mode 1:

Band	Freq (MHz)	Tune-up (dBm)	Ant Gain (dBi)	Distances (mm)	Tune-up (mW)	ERP (dBm)	ERP (mW)
WIFI 5G	5180	12.5	15	200	17.78	25.35	342.77

§ 1.1307(b)(3)(i)(A) method is not applicable.

§ 1.1307(b)(3)(i)(C)

Band	Freq (MHz)	$\lambda/2\pi$ (mm)	Distances applies	ERP Limit (mW)	Result Option C
WIFI 5G	5180	9.22	apply	768.00	exempt

The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates

ERP (watts) is no more than the calculated value prescribed for that frequency

R must be at least $\lambda/2\pi$

λ is the free-space operating wavelength in meters

Mode 5:

RF cable loss: 0.5dB

Output Power: 22.88+0.5=23.38dBm

Tune-up power: 23.5dBm

Band	Freq (MHz)	Tune-up (dBm)	Ant Gain (dBi)	Distances (mm)	Tune-up (mW)	ERP (dBm)	ERP (mW)
WIFI 5G	5180	23.5	8.16	200	223.87	29.51	893.31

§ 1.1307(b)(3)(i)(A) and (C) method is not applicable.

§ 1.1307(b)(3)(i)(B)

Band	Freq (MHz)	Pth (mW)	X	ERP 20cm (mW)	Result Option B
WIFI 5G	5180	3060.00	2.065	3060	exempt

The available maximum time-averaged power or effective radiated power (ERP), whichever is greater.

This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).

Mode 7:

RF cable loss: 0.5dB

Output Power: 24.13+0.5=24.63dBm

Tune-up power: 25dBm

Band	Freq (MHz)	Tune-up (dBm)	Ant Gain (dBi)	Distances (mm)	Tune-up (mW)	ERP (dBm)	ERP (mW)
WIFI 5G	5180	25	2	200	316.23	24.85	305.49

§ 1.1307(b)(3)(i)(A) method os not applicable.

§ 1.1307(b)(3)(i)(C)

Band	Freq (MHz)	$\lambda/2\pi$ (mm)	Distances applies	ERP Limit (mW)	Result Option C
WIFI 5G	5180	9.22	apply	768.00	exempt

The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates

ERP (watts) is no more than the calculated value prescribed for that frequency

R must be at least $\lambda/2\pi$

λ is the free-space operating wavelength in meters

Result: The EUT meets exemption requirement- RF exposure evaluation greater than **20cm** distance.

6 FCC §15.203 – Antenna Requirements

6.1 Applicable Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna does not exceed 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.2 Antenna List and Details

Manufacturer	Model	Antenna Type	Antenna ports type	RF cable loss	Antenna Gain
ANSER-NET	AS-PA515915DU-S	Panel Antenna	N/A	N/A	15 dBi
ANSER-NET	AS-FG245908NM-M	Dipole antenna	N Type	0.5dB	8.16 dBi
ANSER-NET	AS-SW245802SM-G	Dipole antenna	SMA Type	0.5dB	2 dBi

Result: Compliance

7 FCC §15.407(b)(9) & § 15.207(a) – AC Line Conducted Emissions

7.1 Applicable Standard

As per FCC §15.407(b) (9)

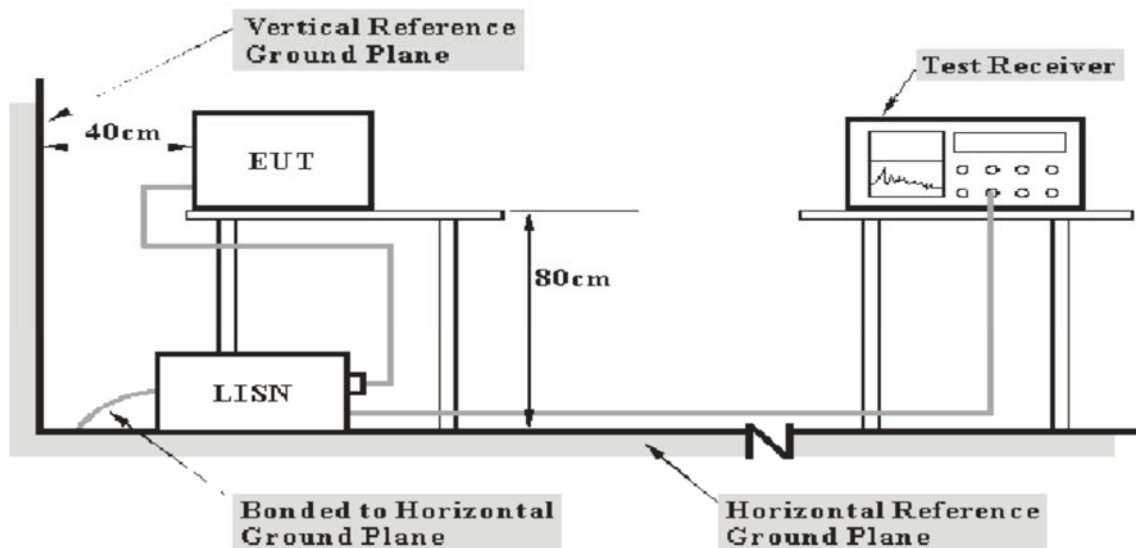
Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207

The lower limit applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 ^{Note 1}	56 to 46 ^{Note 1}
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency.

7.2 EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2020 measurement procedure. The specification used was with the FCC Part 15.207 limits.

7.3 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations

Frequency Range	IF B/W
150kHz – 30MHz	9kHz

7.4 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

7.5 Corrected Factor & Margin Calculation

The factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

The “Over Limit” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of -7 dB means the emission is 7 dB below the limit. The equation for Over Limit calculation is as follows:

$$\text{Over Limit} = \text{Level} - \text{Limit Line}$$

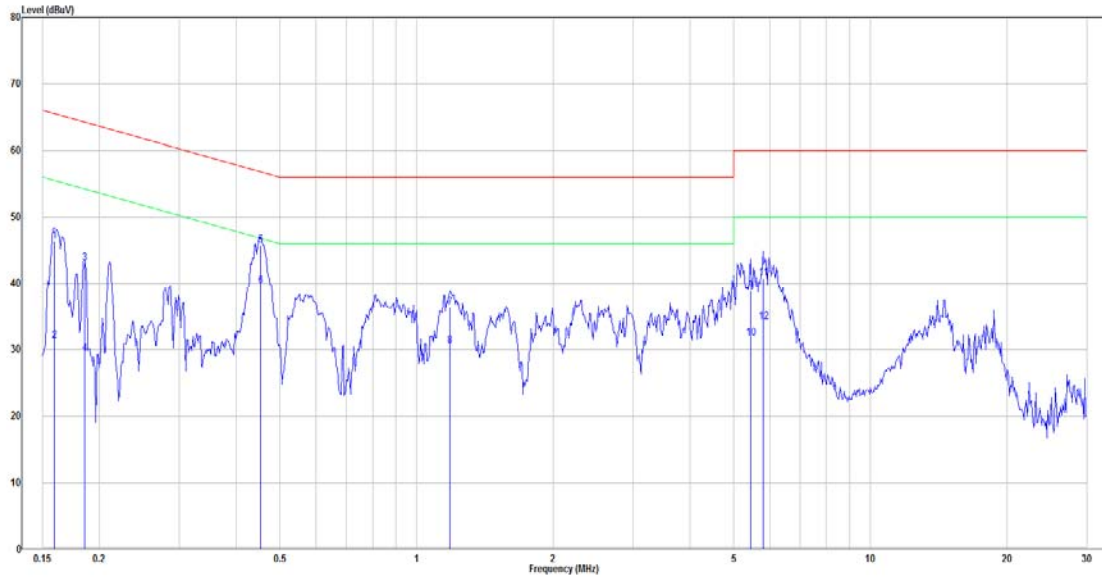
7.6 Test Results

Test Mode: Transmitting

802.11a mode, 5240MHz of 5150~5250MHz (worst case)

Mode 1:

Main: AC120 V, 60 Hz, Line



No.	Frequency (MHz)	Reading (dBμV)	Correct Factor(dB)	Result (dBμV)	Limit (dBμV)	Over limit (dB)	Remark
1	0.159	26.96	19.50	46.46	65.52	-19.06	QP
2	0.159	11.74	19.50	31.24	55.52	-24.28	Average
3	0.185	23.57	19.50	43.07	64.24	-21.17	QP
4	0.185	9.84	19.50	29.34	54.24	-24.90	Average
5	0.454	26.26	19.52	45.78	56.80	-11.02	QP
6	0.454	20.10	19.52	39.62	46.80	-7.18	Average
7	1.184	16.76	19.55	36.31	56.00	-19.69	QP
8	1.184	11.02	19.55	30.57	46.00	-15.43	Average
9	5.447	19.23	19.67	38.90	60.00	-21.10	QP
10	5.447	12.06	19.67	31.73	50.00	-18.27	Average
11	5.805	21.10	19.67	40.77	60.00	-19.23	QP
12	5.805	14.48	19.67	34.15	50.00	-15.85	Average

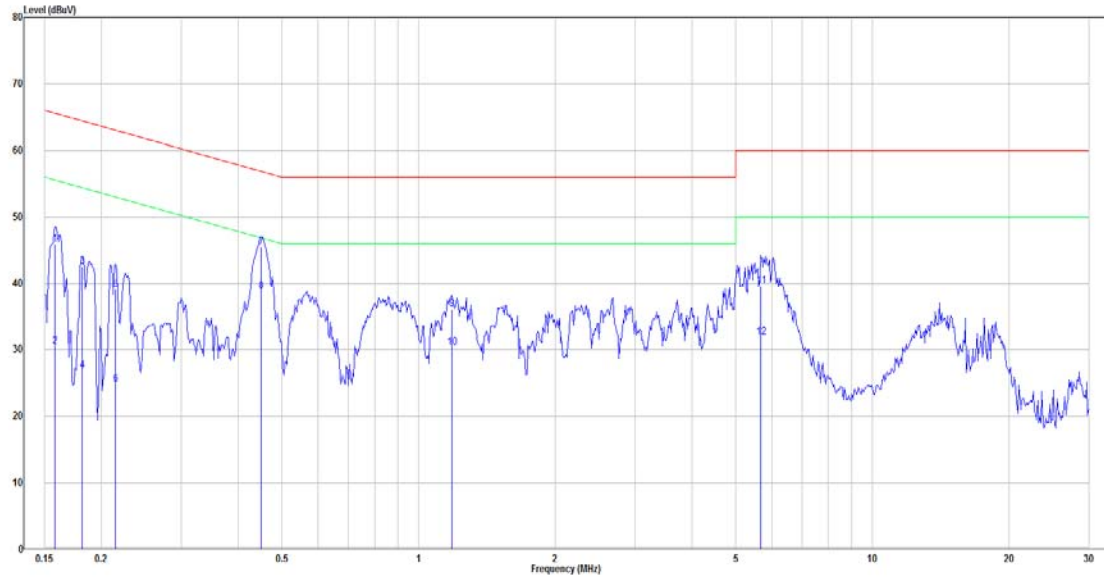
Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Main: AC120 V, 60 Hz, Neutral



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.158	26.41	19.50	45.91	65.56	-19.65	QP
2	0.158	10.82	19.50	30.32	55.56	-25.24	Average
3	0.182	23.05	19.50	42.55	64.42	-21.87	QP
4	0.182	7.35	19.50	26.85	54.42	-27.57	Average
5	0.215	19.49	19.49	38.98	63.01	-24.03	QP
6	0.215	5.21	19.49	24.70	53.01	-28.31	Average
7	0.449	26.05	19.52	45.57	56.89	-11.32	QP
8	0.449	19.20	19.52	38.72	46.89	-8.17	Average
9	1.184	16.54	19.54	36.08	56.00	-19.92	QP
10	1.184	10.69	19.54	30.23	46.00	-15.77	Average
11	5.683	19.94	19.68	39.62	60.00	-20.38	QP
12	5.683	12.12	19.68	31.80	50.00	-18.20	Average

Note:

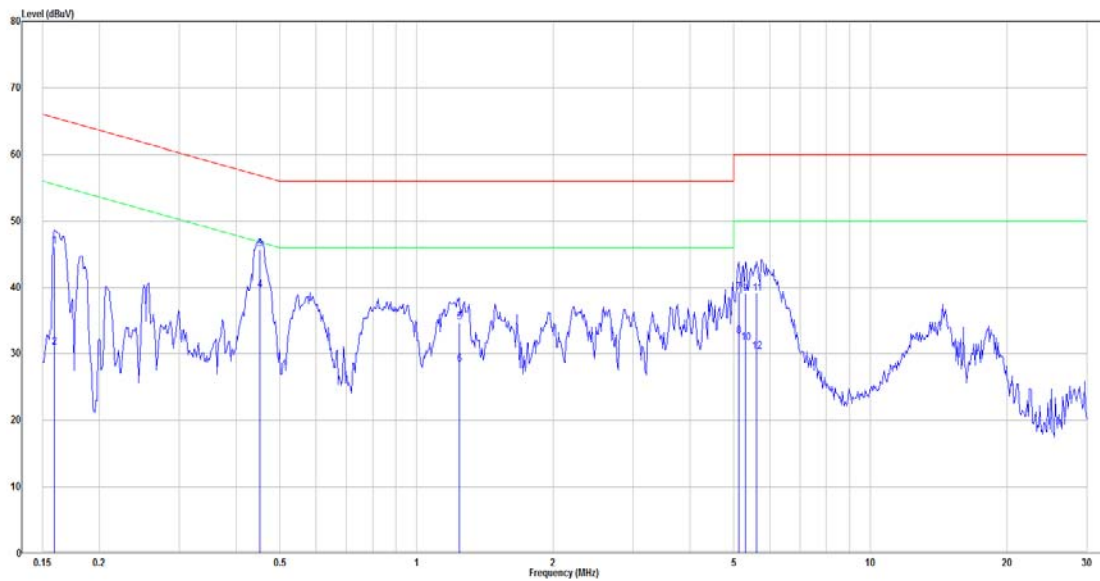
Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Mode 2:

Main: AC120 V, 60 Hz, Line



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.159	26.67	19.50	46.17	65.52	-19.35	QP
2	0.159	11.36	19.50	30.86	55.52	-24.66	Average
3	0.452	26.30	19.52	45.82	56.85	-11.03	QP
4	0.452	20.05	19.52	39.57	46.85	-7.28	Average
5	1.242	15.11	19.55	34.66	56.00	-21.34	QP
6	1.242	8.79	19.55	28.34	46.00	-17.66	Average
7	5.139	19.51	19.66	39.17	60.00	-20.83	QP
8	5.139	12.89	19.66	32.55	50.00	-17.45	Average
9	5.305	19.27	19.66	38.93	60.00	-21.07	QP
10	5.305	11.91	19.66	31.57	50.00	-18.43	Average
11	5.623	19.41	19.67	39.08	60.00	-20.92	QP
12	5.623	10.62	19.67	30.29	50.00	-19.71	Average

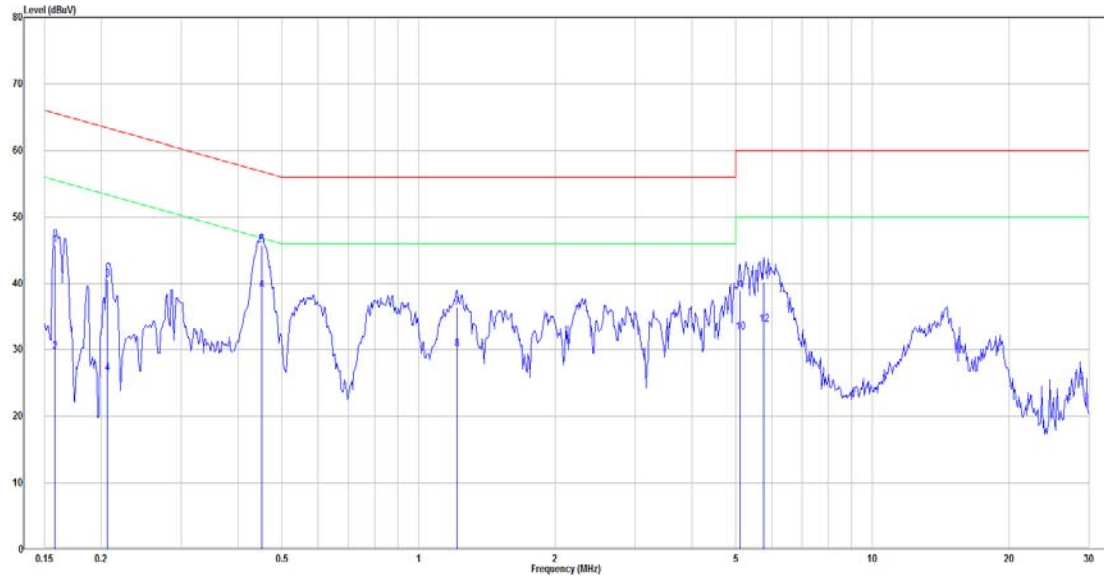
Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Main: AC120 V, 60 Hz, Neutral



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.158	26.21	19.50	45.71	65.56	-19.85	QP
2	0.158	10.15	19.50	29.65	55.56	-25.91	Average
3	0.206	21.15	19.49	40.64	63.36	-22.72	QP
4	0.206	6.90	19.49	26.39	53.36	-26.97	Average
5	0.452	26.23	19.52	45.75	56.85	-11.10	QP
6	0.452	19.33	19.52	38.85	46.85	-8.00	Average
7	1.216	16.73	19.54	36.27	56.00	-19.73	QP
8	1.216	10.48	19.54	30.02	46.00	-15.98	Average
9	5.112	19.23	19.66	38.89	60.00	-21.11	QP
10	5.112	12.94	19.66	32.60	50.00	-17.40	Average
11	5.774	20.52	19.68	40.20	60.00	-19.80	QP
12	5.774	14.04	19.68	33.72	50.00	-16.28	Average

Note:

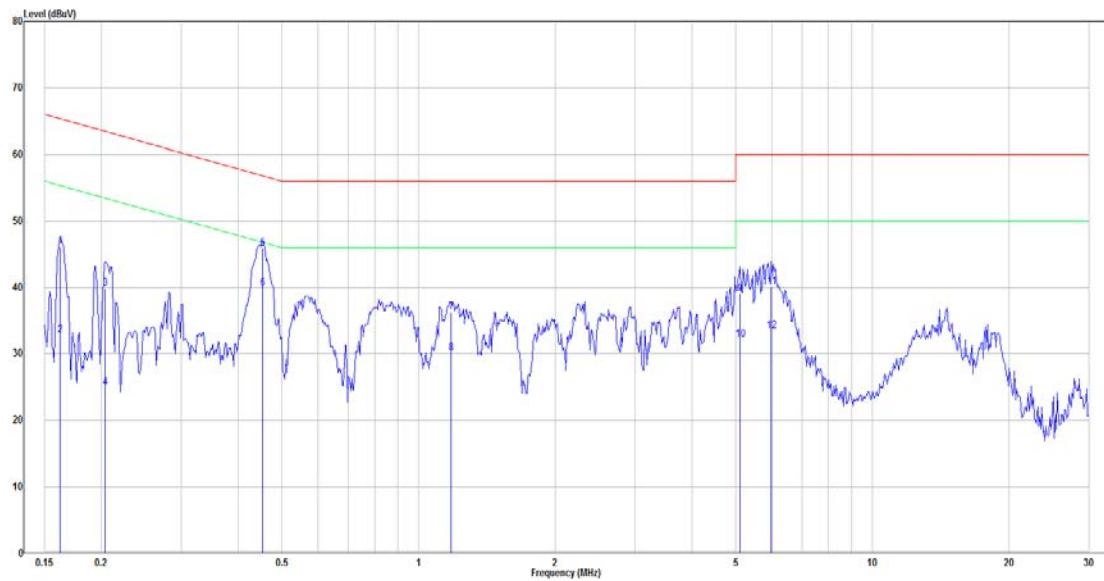
Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Mode 3:

Main: AC120 V, 60 Hz, Line



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.162	26.64	19.50	46.14	65.34	-19.20	QP
2	0.162	13.22	19.50	32.72	55.34	-22.62	Average
3	0.204	20.33	19.50	39.83	63.45	-23.62	QP
4	0.204	5.34	19.50	24.84	53.45	-28.61	Average
5	0.454	26.36	19.52	45.88	56.80	-10.92	QP
6	0.454	20.29	19.52	39.81	46.80	-6.99	Average
7	1.178	16.56	19.55	36.11	56.00	-19.89	QP
8	1.178	10.51	19.55	30.06	46.00	-15.94	Average
9	5.112	19.36	19.66	39.02	60.00	-20.98	QP
10	5.112	12.45	19.66	32.11	50.00	-17.89	Average
11	5.993	20.45	19.68	40.13	60.00	-19.87	QP
12	5.993	13.71	19.68	33.39	50.00	-16.61	Average

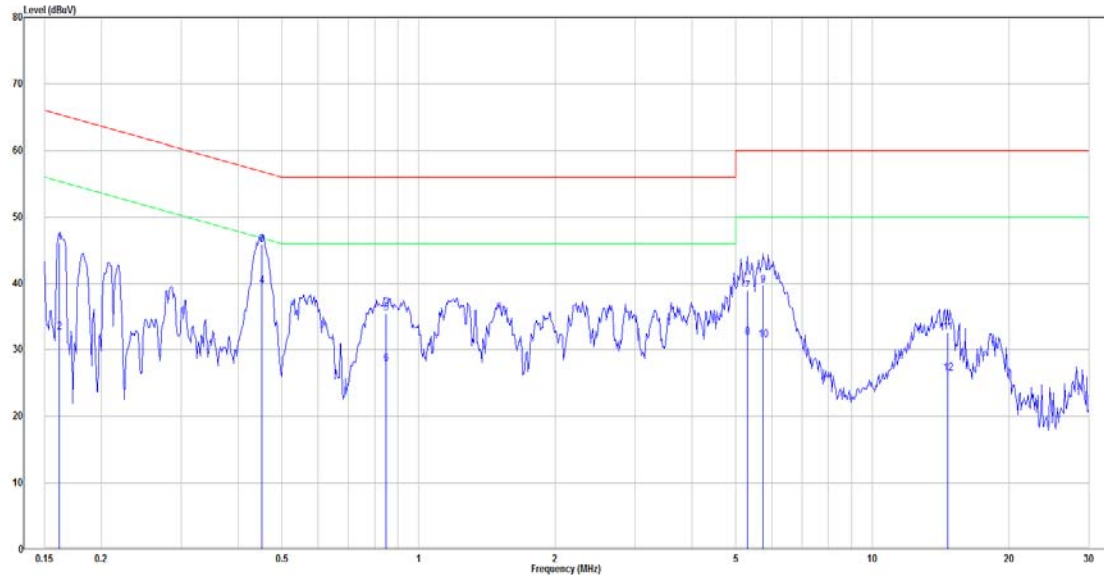
Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Main: AC120 V, 60 Hz, Neutral



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.162	26.69	19.50	46.19	65.38	-19.19	QP
2	0.162	13.05	19.50	32.55	55.38	-22.83	Average
3	0.452	26.33	19.52	45.85	56.85	-11.00	QP
4	0.452	20.12	19.52	39.64	46.85	-7.21	Average
5	0.848	15.82	19.53	35.35	56.00	-20.65	QP
6	0.848	8.28	19.53	27.81	46.00	-18.19	Average
7	5.305	19.18	19.67	38.85	60.00	-21.15	QP
8	5.305	12.12	19.67	31.79	50.00	-18.21	Average
9	5.744	20.08	19.68	39.76	60.00	-20.24	QP
10	5.744	11.79	19.68	31.47	50.00	-18.53	Average
11	14.672	12.70	19.83	32.53	60.00	-27.47	QP
12	14.672	6.52	19.83	26.35	50.00	-23.65	Average

Note:

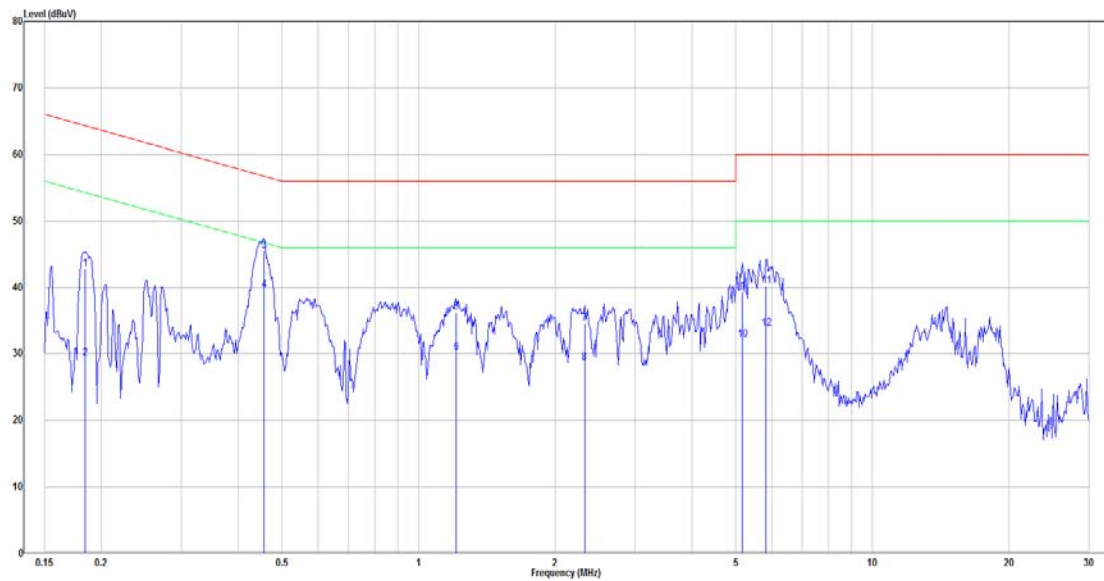
Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Mode 4:

Main: AC120 V, 60 Hz, Line



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.184	23.26	19.50	42.76	64.28	-21.52	QP
2	0.184	9.67	19.50	29.17	54.28	-25.11	Average
3	0.456	25.95	19.52	45.47	56.76	-11.29	QP
4	0.456	20.13	19.52	39.65	46.76	-7.11	Average
5	1.210	16.64	19.55	36.19	56.00	-19.81	QP
6	1.210	10.57	19.55	30.12	46.00	-15.88	Average
7	2.321	14.85	19.59	34.44	56.00	-21.56	QP
8	2.321	8.98	19.59	28.57	46.00	-17.43	Average
9	5.166	19.60	19.66	39.26	60.00	-20.74	QP
10	5.166	12.39	19.66	32.05	50.00	-17.95	Average
11	5.836	20.55	19.67	40.22	60.00	-19.78	QP
12	5.836	14.03	19.67	33.70	50.00	-16.30	Average

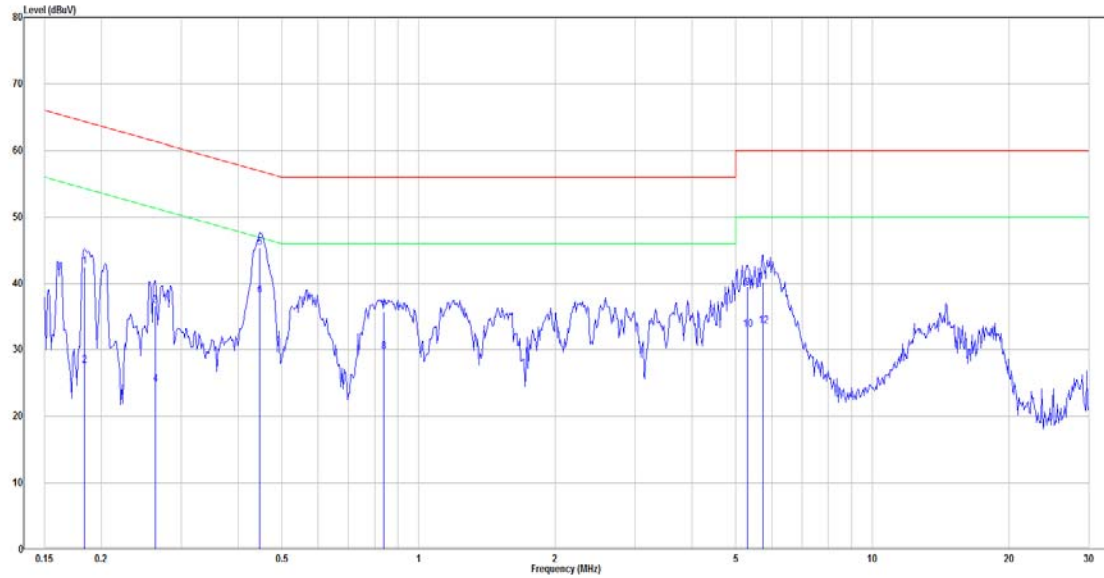
Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Main: AC120 V, 60 Hz, Neutral



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.183	23.03	19.49	42.52	64.33	-21.81	QP
2	0.183	8.10	19.49	27.59	54.33	-26.74	Average
3	0.263	17.03	19.50	36.53	61.34	-24.81	QP
4	0.263	5.30	19.50	24.80	51.34	-26.54	Average
5	0.447	25.91	19.52	45.43	56.93	-11.50	QP
6	0.447	18.58	19.52	38.10	46.93	-8.83	Average
7	0.839	16.15	19.53	35.68	56.00	-20.32	QP
8	0.839	10.06	19.53	29.59	46.00	-16.41	Average
9	5.305	19.72	19.67	39.39	60.00	-20.61	QP
10	5.305	13.29	19.67	32.96	50.00	-17.04	Average
11	5.744	20.54	19.68	40.22	60.00	-19.78	QP
12	5.744	13.80	19.68	33.48	50.00	-16.52	Average

Note:

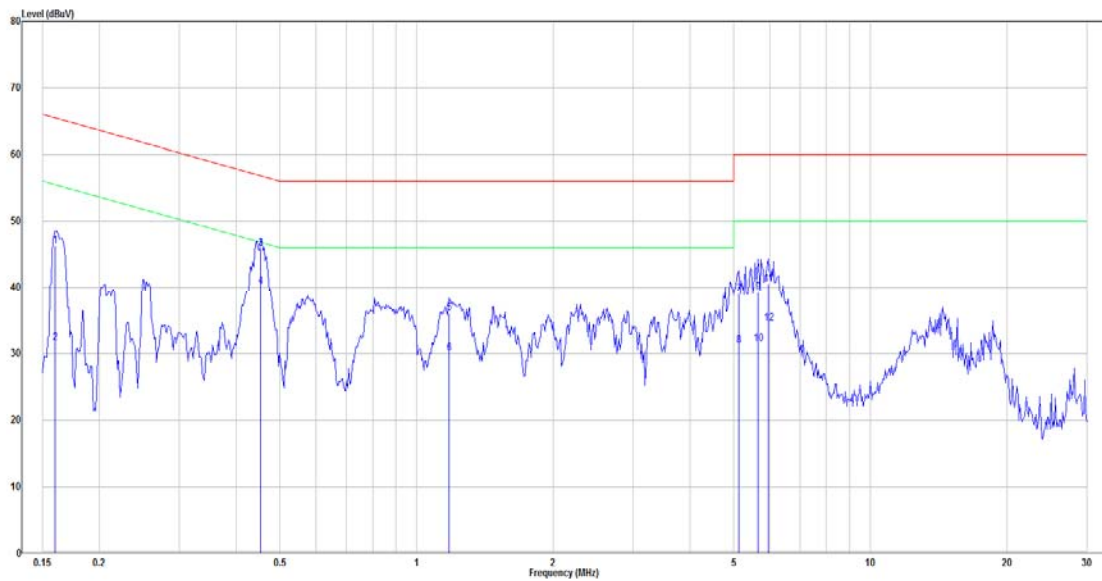
Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Mode 5:

Main: AC120 V, 60 Hz, Line



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.160	26.81	19.50	46.31	65.47	-19.16	QP
2	0.160	11.98	19.50	31.48	55.47	-23.99	Average
3	0.454	26.44	19.52	45.96	56.80	-10.84	QP
4	0.454	20.61	19.52	40.13	46.80	-6.67	Average
5	1.178	16.42	19.55	35.97	56.00	-20.03	QP
6	1.178	10.49	19.55	30.04	46.00	-15.96	Average
7	5.139	19.29	19.66	38.95	60.00	-21.05	QP
8	5.139	11.51	19.66	31.17	50.00	-18.83	Average
9	5.653	19.51	19.67	39.18	60.00	-20.82	QP
10	5.653	11.70	19.67	31.37	50.00	-18.63	Average
11	5.961	20.83	19.68	40.51	60.00	-19.49	QP
12	5.961	14.79	19.68	34.47	50.00	-15.53	Average

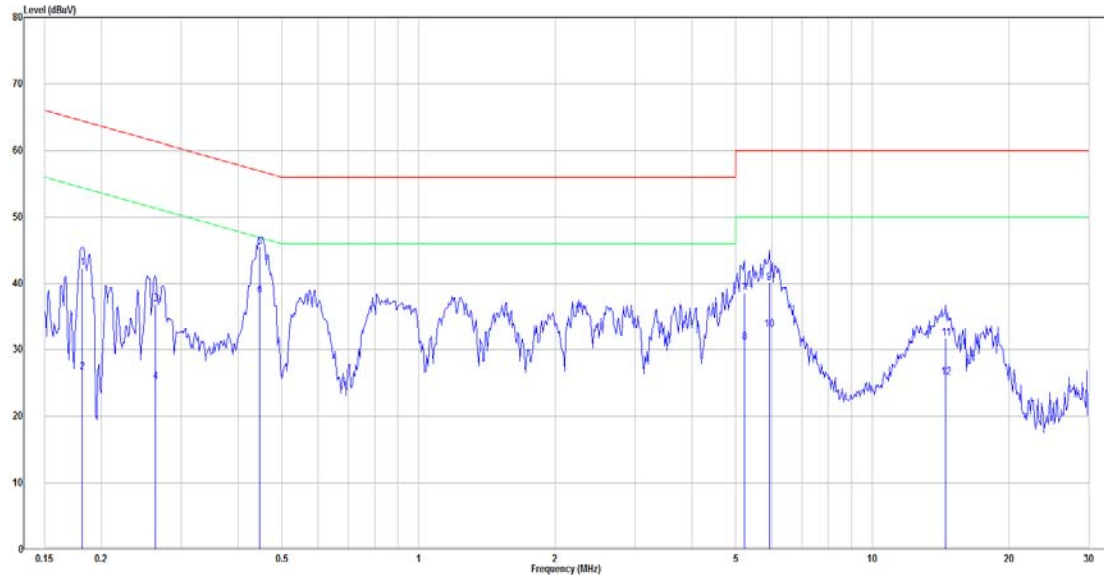
Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Main: AC120 V, 60 Hz, Neutral



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.182	22.81	19.50	42.31	64.42	-22.11	QP
2	0.182	7.07	19.50	26.57	54.42	-27.85	Average
3	0.263	17.30	19.50	36.80	61.34	-24.54	QP
4	0.263	5.68	19.50	25.18	51.34	-26.16	Average
5	0.447	25.96	19.52	45.48	56.93	-11.45	QP
6	0.447	18.54	19.52	38.06	46.93	-8.87	Average
7	5.221	18.73	19.67	38.40	60.00	-21.60	QP
8	5.221	11.36	19.67	31.03	50.00	-18.97	Average
9	5.929	20.43	19.68	40.11	60.00	-19.89	QP
10	5.929	13.29	19.68	32.97	50.00	-17.03	Average
11	14.517	11.77	19.83	31.60	60.00	-28.40	QP
12	14.517	5.94	19.83	25.77	50.00	-24.23	Average

Note:

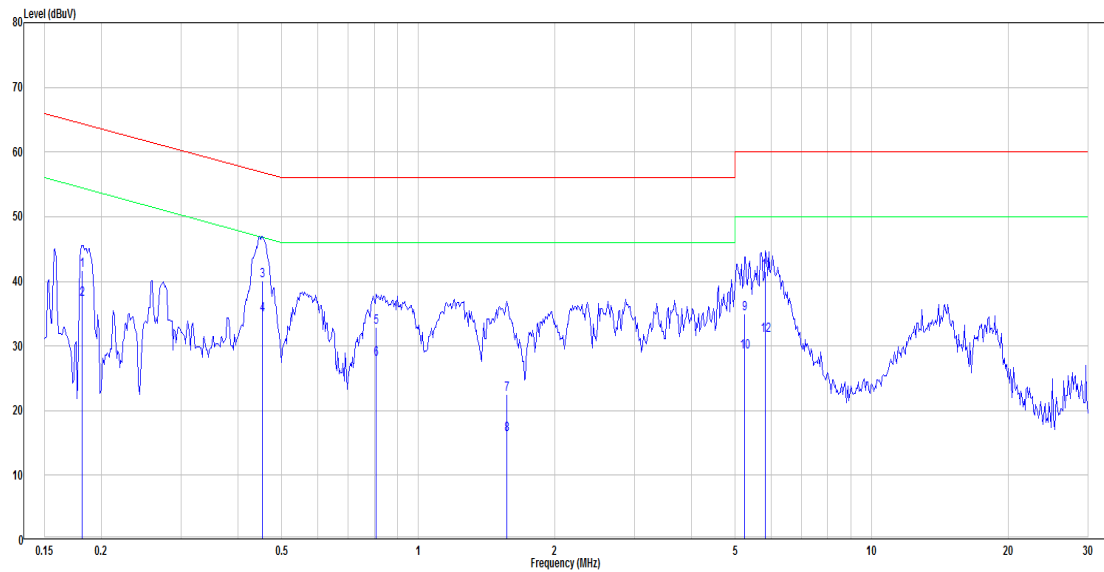
Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Mode 6:

Main: AC120 V, 60 Hz, Line



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.182	22.18	19.50	41.68	64.42	-22.74	QP
2	0.182	17.72	19.50	37.22	54.42	-17.20	Average
3	0.454	20.50	19.52	40.02	56.80	-16.78	QP
4	0.454	15.33	19.52	34.85	46.80	-11.95	Average
5	0.809	13.41	19.53	32.94	56.00	-23.06	QP
6	0.809	8.41	19.53	27.94	46.00	-18.06	Average
7	1.568	2.97	19.56	22.53	56.00	-33.47	QP
8	1.568	-3.26	19.56	16.30	46.00	-29.70	Average
9	5.249	15.26	19.66	34.92	60.00	-25.08	QP
10	5.249	9.33	19.66	28.99	50.00	-21.01	Average
11	5.836	21.77	19.67	41.44	60.00	-18.56	QP
12	5.836	11.88	19.67	31.55	50.00	-18.45	Average

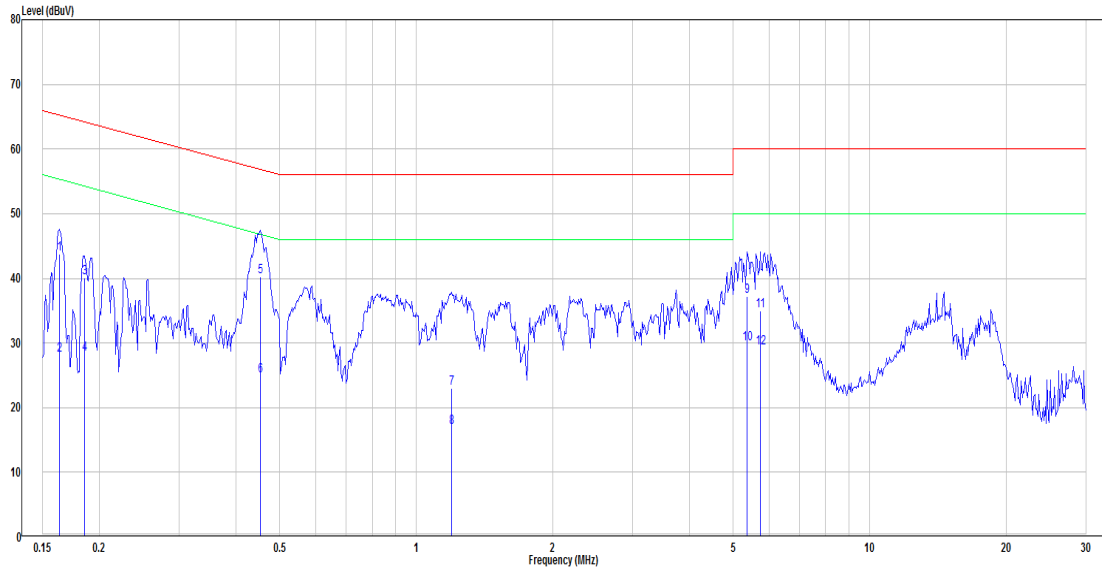
Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Main: AC120 V, 60 Hz, Neutral



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.163	24.29	19.50	43.79	65.30	-21.51	QP
2	0.163	8.68	19.50	28.18	55.30	-27.12	Average
3	0.185	20.61	19.49	40.10	64.24	-24.14	QP
4	0.185	8.81	19.49	28.30	54.24	-25.94	Average
5	0.454	20.70	19.52	40.22	56.80	-16.58	QP
6	0.454	5.39	19.52	24.91	46.80	-21.89	Average
7	1.197	3.39	19.54	22.93	56.00	-33.07	QP
8	1.197	-2.65	19.54	16.89	46.00	-29.11	Average
9	5.362	17.55	19.67	37.22	60.00	-22.78	QP
10	5.362	10.22	19.67	29.89	50.00	-20.11	Average
11	5.744	15.28	19.68	34.96	60.00	-25.04	QP
12	5.744	9.54	19.68	29.22	50.00	-20.78	Average

Note:

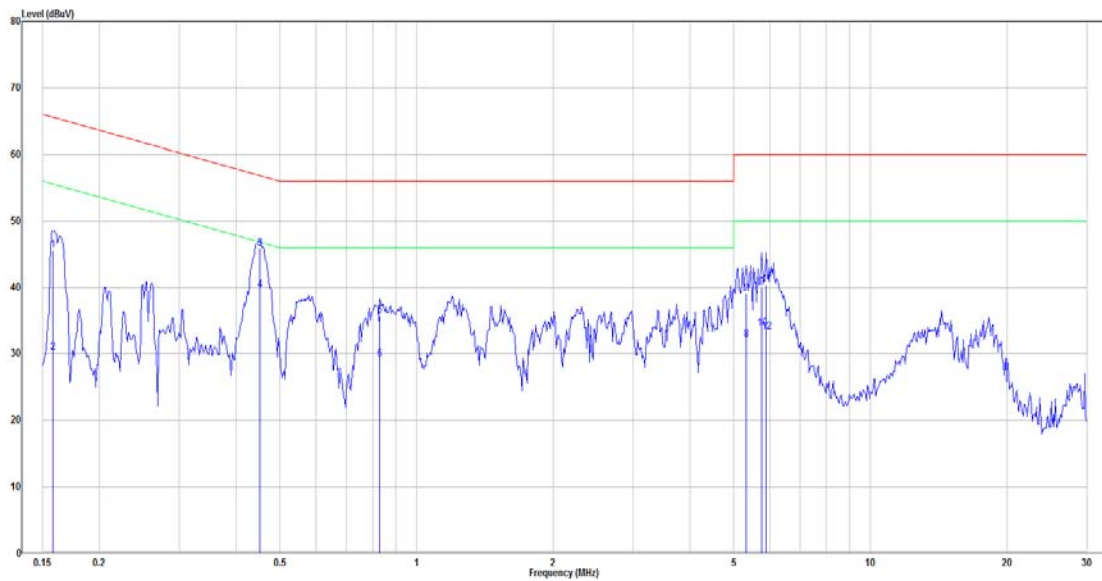
Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Mode 7:

Main: AC120 V, 60 Hz, Line



No.	Frequency (MHz)	Reading (dBµV)	Correct Factor(dB)	Result (dBµV)	Limit (dBµV)	Over limit (dB)	Remark
1	0.158	26.08	19.50	45.58	65.56	-19.98	QP
2	0.158	10.61	19.50	30.11	55.56	-25.45	Average
3	0.452	26.34	19.52	45.86	56.85	-10.99	QP
4	0.452	20.13	19.52	39.65	46.85	-7.20	Average
5	0.830	16.11	19.53	35.64	56.00	-20.36	QP
6	0.830	9.57	19.53	29.10	46.00	-16.90	Average
7	5.333	19.34	19.66	39.00	60.00	-21.00	QP
8	5.333	12.33	19.66	31.99	50.00	-18.01	Average
9	5.774	20.39	19.67	40.06	60.00	-19.94	QP
10	5.774	14.09	19.67	33.76	50.00	-16.24	Average
11	5.898	20.75	19.67	40.42	60.00	-19.58	QP
12	5.898	13.48	19.67	33.15	50.00	-16.85	Average

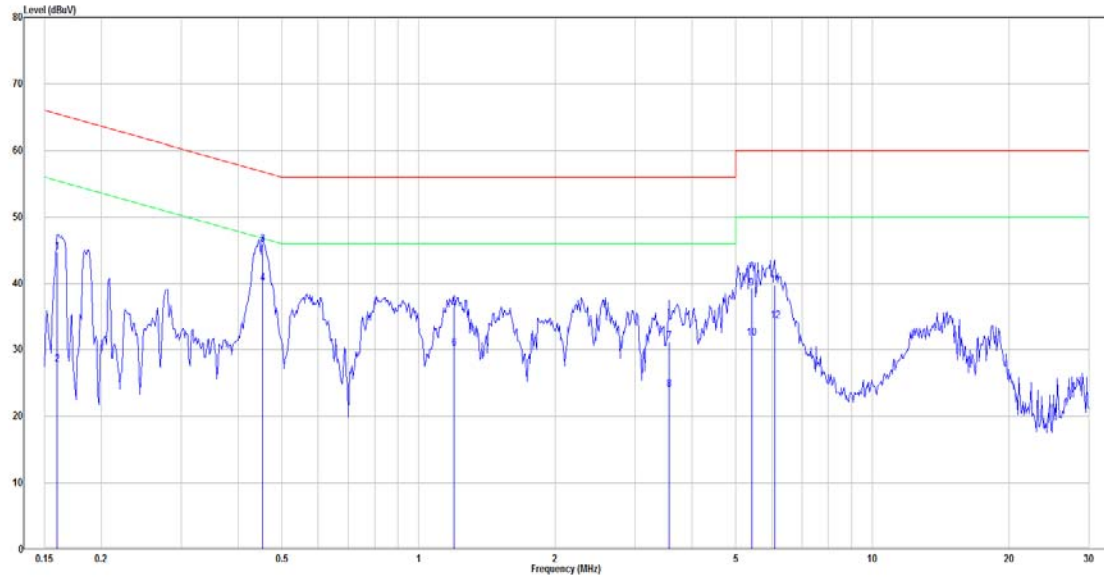
Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Main: AC120 V, 60 Hz, Neutral



No.	Frequency (MHz)	Reading (dBμV)	Correct Factor(dB)	Result (dBμV)	Limit (dBμV)	Over limit (dB)	Remark
1	0.160	25.30	19.50	44.80	65.47	-20.67	QP
2	0.160	8.13	19.50	27.63	55.47	-27.84	Average
3	0.454	26.34	19.52	45.86	56.80	-10.94	QP
4	0.454	20.53	19.52	40.05	46.80	-6.75	Average
5	1.197	16.71	19.54	36.25	56.00	-19.75	QP
6	1.197	10.61	19.54	30.15	46.00	-15.85	Average
7	3.565	11.59	19.62	31.21	56.00	-24.79	QP
8	3.565	4.31	19.62	23.93	46.00	-22.07	Average
9	5.419	19.50	19.67	39.17	60.00	-20.83	QP
10	5.419	11.99	19.67	31.66	50.00	-18.34	Average
11	6.089	20.03	19.68	39.71	60.00	-20.29	QP
12	6.089	14.58	19.68	34.26	50.00	-15.74	Average

Note:

Result = Read Level + Factor

Over Limit = Result – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

7 FCC §15.209, §15.205 , §15.407(b) – Spurious Emissions

8.1 Applicable Standard

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	608 – 614	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	960 – 1240	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	1300 – 1427	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1435 – 1626.5	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1645.5 – 1646.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1660 – 1710	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1718.8 – 1722.2	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	2200 – 2300	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2310 – 2390	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2483.5 – 2500	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2690 – 2900	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	3260 – 3267	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3.332 – 3.339	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3 3458 – 3 358	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3.600 – 4.400	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4		Above 38.6
13.36 – 13.41	399.9 – 410		

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (micro volts/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: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per FCC Part 15.407 (b)

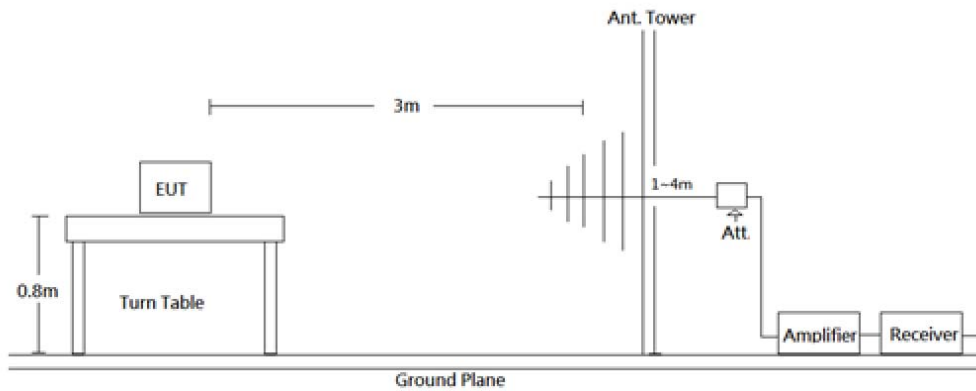
- For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note: It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (New Taipei Laboratory)

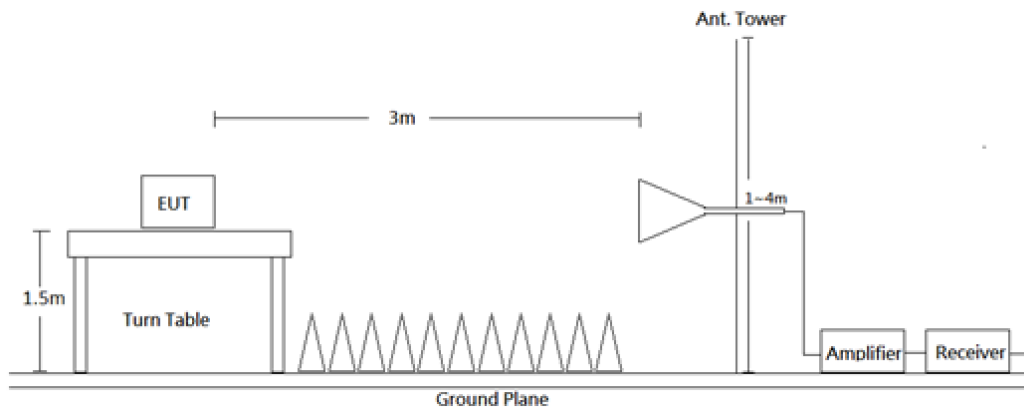
- The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

8.2 EUT Setup

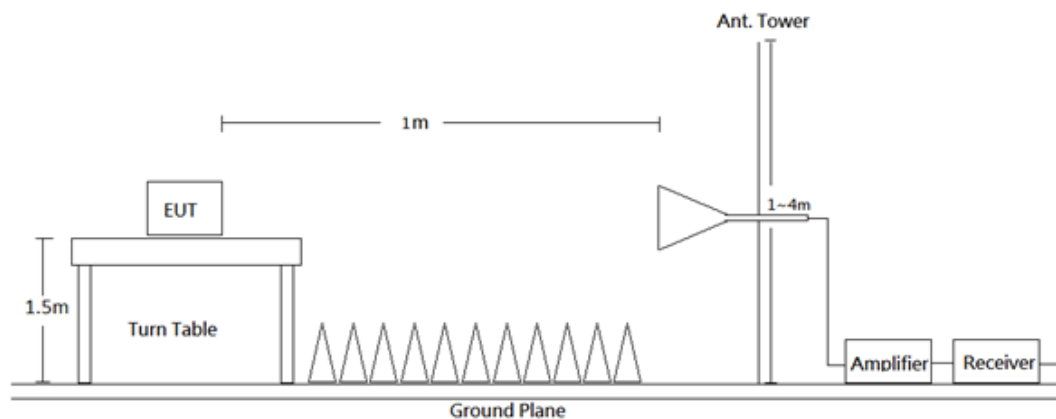
Below 1 GHz:



1GHz -18GHz:



18GHz -40GHz:



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 and FCC 15.407 Limits.

8.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

Frequency Range	RBW	VBW	Duty cycle	Measurement method
30-1000 MHz	120 kHz	/	/	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	>98%	Ave
	1 MHz	1/T	<98%	Ave

Note: T is minimum transmission duration

8.4 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

According to C63.10, emission shall be computed as: $E [dB\mu V/m] = EIRP[dBm] + 95.2$, for $d = 3$ meters.

All emissions under the average limit and under the noise floor have not recorded in the report

8.5 Corrected Factor & Margin Calculation

The Correct Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Correct Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Result} - \text{Limit}$$

8.6 Test Results

Test Mode: Transmitting

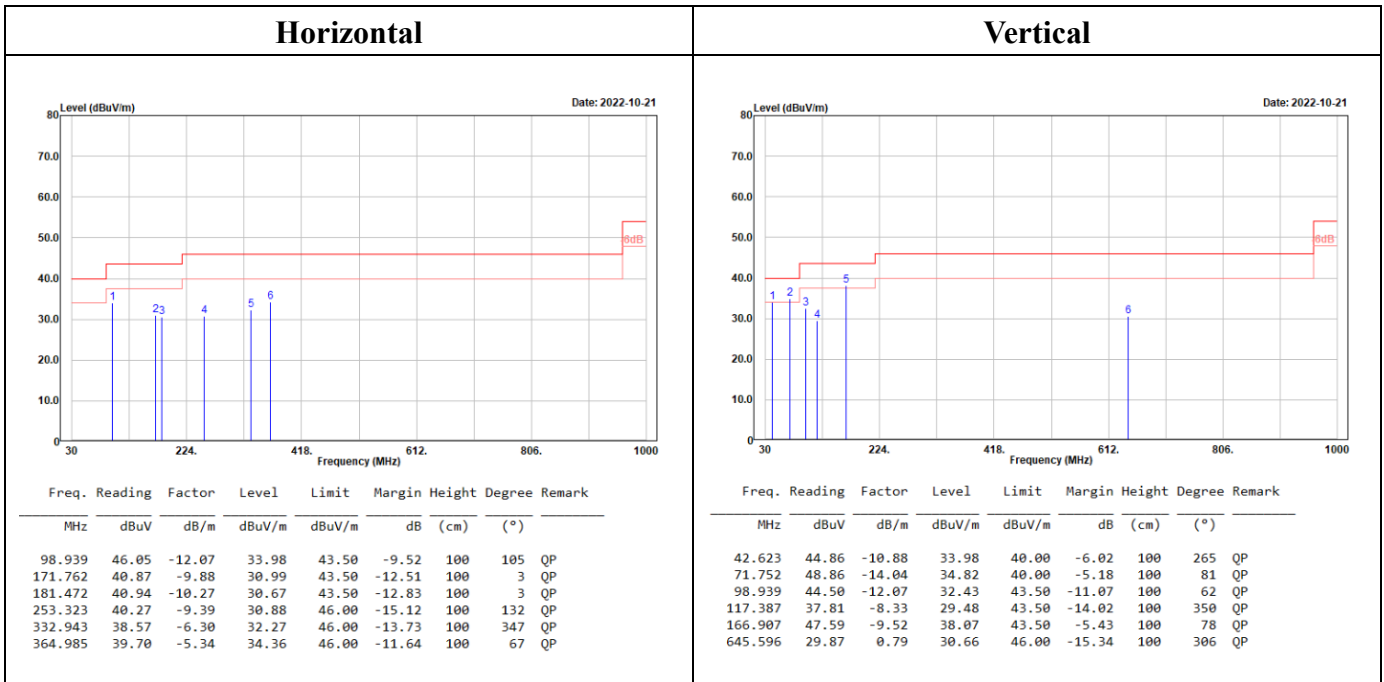
(Pre-scan with three orthogonal axis, and worse case as Y axis.)

For UNII-1 Band I:

Mode 1:

(worst case is 802.11ac20 mode 5240MHz)

30MHz-1GHz:



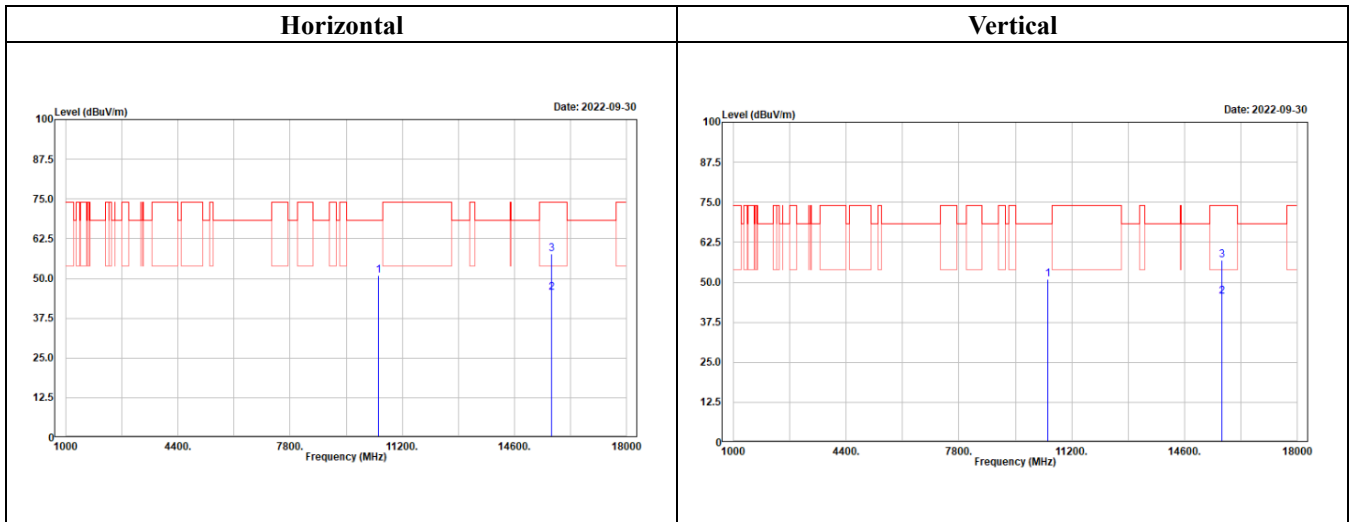
Level (Result) = Reading + Factor.

Margin = Level – Limit.

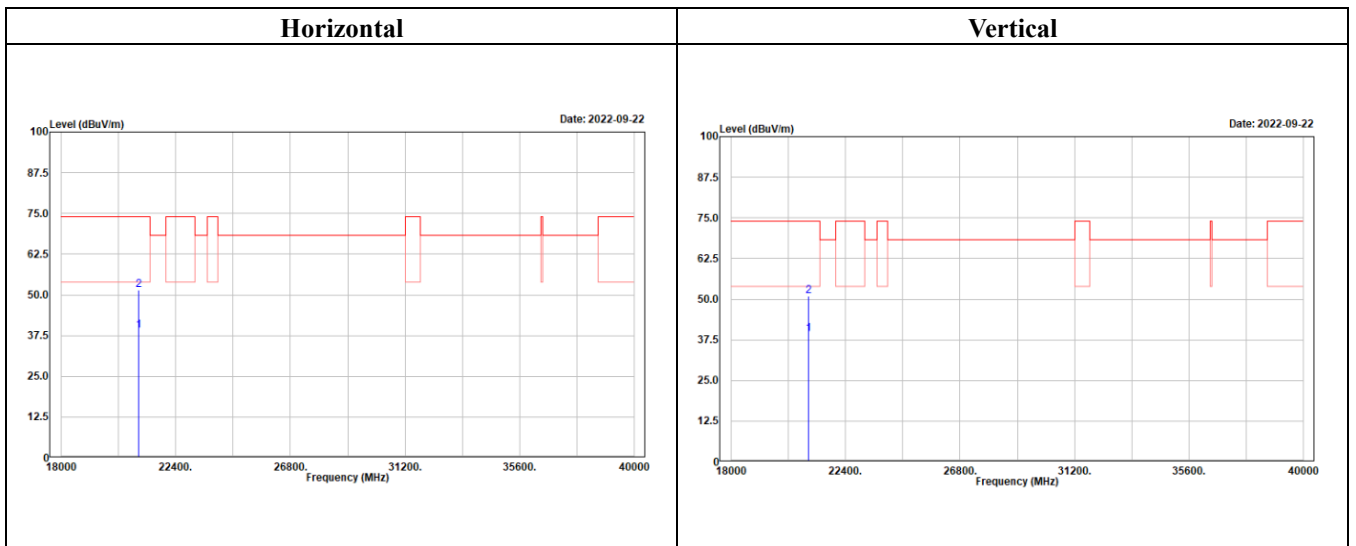
Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

1GHz-18GHz:



18GHz-40GHz:



Above 1GHz:

802.11a Mode:

5180 MHz									
Horizontal					Vertical				
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
5149.099	45.45	4.92	50.37	54.00	-3.63	196	270	Average	
5149.099	61.07	4.92	65.99	74.00	-8.01	196	270	Peak	
5180.000	101.94	4.99	106.93			196	270	Average	
5180.000	112.93	4.99	117.92			196	270	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10360.000	40.02	10.87	50.89	68.20	-17.31	149	328	Peak	
15540.000	31.40	14.04	45.44	54.00	-8.56	152	328	Average	
15540.000	41.23	14.04	55.27	74.00	-18.73	152	328	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10360.000	39.30	10.87	50.17	68.20	-18.03	153	162	Peak	
15540.000	31.13	14.04	45.17	54.00	-8.83	149	228	Average	
15540.000	40.73	14.04	54.77	74.00	-19.23	149	228	Peak	

5200 MHz									
Horizontal					Vertical				
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
5200.000	102.18	5.03	107.21			203	270	Average	
5200.000	113.15	5.03	118.18			203	270	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10400.000	39.66	11.01	50.67	68.20	-17.53	151	174	Peak	
15600.000	31.48	14.08	45.56	54.00	-8.44	147	201	Average	
15600.000	42.79	14.08	56.87	74.00	-17.13	147	201	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10400.000	40.23	11.01	51.24	68.20	-16.96	146	146	Peak	
15600.000	31.51	14.08	45.59	54.00	-8.41	152	0	Average	
15600.000	43.65	14.08	57.73	74.00	-16.27	152	0	Peak	

5240 MHz									
Horizontal					Vertical				
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
5240.000	102.31	4.75	107.06			201	272	Average	
5240.000	113.57	4.75	118.32			201	272	Peak	
5403.363	47.85	4.73	52.58	54.00	-1.42	201	272	Average	
5403.363	60.07	4.73	64.80	74.00	-9.20	201	272	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10480.000	39.98	10.96	50.94	68.20	-17.26	154	111	Peak	
15720.000	31.65	14.13	45.78	54.00	-8.22	149	96	Average	
15720.000	43.62	14.13	57.75	74.00	-16.25	149	96	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10480.000	39.86	10.96	50.82	68.20	-17.38	147	227	Peak	
15720.000	31.48	14.13	45.61	54.00	-8.39	152	131	Average	
15720.000	42.80	14.13	56.93	74.00	-17.07	152	131	Peak	

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

802.11ac VHT20 Mode:

5180 MHz									
Horizontal					Vertical				
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
5147.498	45.08	4.93	50.01	54.00	-3.99	201	271	Average	
5147.498	63.56	4.93	68.49	74.00	-5.51	201	271	Peak	
5180.000	100.89	4.99	105.88			201	271	Average	
5180.000	111.40	4.99	116.39				271	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10360.000	40.18	10.87	51.05	68.20	-17.15	149	2	Peak	
15540.000	31.12	14.04	45.16	54.00	-8.84	153	158	Average	
15540.000	42.17	14.04	56.21	74.00	-17.79	153	158	Peak	

5200 MHz									
Horizontal					Vertical				
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
5200.000	101.36	5.03	106.39			200	270	Average	
5200.000	111.65	5.03	116.68				270	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10400.000	39.87	11.01	50.88	68.20	-17.32	147	173	Peak	
15600.000	31.57	14.08	45.65	54.00	-8.35	154	105	Average	
15600.000	43.65	14.08	57.73	74.00	-16.27	154	105	Peak	

5240 MHz									
Horizontal					Vertical				
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
5240.000	101.56	4.75	106.31			194	270	Average	
5240.000	111.68	4.75	116.43				270	Peak	
5453.434	47.54	4.52	52.06	54.00	-1.94	194	270	Average	
5453.434	60.82	4.52	65.34	74.00	-8.66	194	270	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10480.000	40.09	10.96	51.05	68.20	-17.15	149	167	Peak	
15720.000	31.45	14.13	45.58	54.00	-8.42	153	182	Average	
15720.000	43.48	14.13	57.61	74.00	-16.39	153	182	Peak	

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

802.11ac VHT40 Mode:

5190 MHz																	
Horizontal							Vertical										
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5149.299	44.01	4.92	48.93	54.00	-5.07	195	273	Average	5149.500	42.11	4.92	47.03	54.00	-6.97	174	273	Average
5149.299	57.75	4.92	62.67	74.00	-11.33	195	273	Peak	5149.500	54.47	4.92	59.39	74.00	-14.61	174	273	Peak
5190.000	92.25	5.01	97.26			195	273	Average	5190.000	91.45	5.01	96.46			174	273	Average
5190.000	103.30	5.01	108.31			195	273	Peak	5190.000	100.90	5.01	105.91			174	273	Peak
10380.000	39.78	10.94	50.72	68.20	-17.48	152	2	Peak	10380.000	39.96	10.94	50.90	68.20	-17.30	145	97	Peak
15570.000	32.22	14.05	46.27	54.00	-7.73	147	236	Average	15570.000	31.70	14.05	45.75	54.00	-8.25	151	360	Average
15570.000	41.61	14.05	55.66	74.00	-18.34	147	236	Peak	15570.000	42.47	14.05	56.52	74.00	-17.48	151	360	Peak

5230 MHz																	
Horizontal							Vertical										
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5230.000	92.47	4.82	97.29			200	269	Average	5230.000	92.81	4.75	97.56			171	272	Average
5230.000	102.43	4.82	107.25			200	269	Peak	5230.000	102.45	4.75	107.20			171	272	Peak
5398.849	45.38	4.75	50.13	54.00	-3.87	200	269	Average	5420.190	47.49	4.65	52.14	54.00	-1.86	171	272	Average
5398.849	58.13	4.75	62.88	74.00	-11.12	200	269	Peak	5420.190	59.24	4.65	63.89	74.00	-10.11	171	272	Peak
10460.000	41.66	10.97	52.63	68.20	-15.57	152	259	Peak	10460.000	40.48	10.97	51.45	68.20	-16.75	149	289	Peak
15690.000	31.75	14.14	45.89	54.00	-8.11	145	208	Average	15690.000	31.98	14.14	46.12	54.00	-7.88	152	99	Average
15690.000	42.44	14.14	56.58	74.00	-17.42	145	208	Peak	15690.000	42.26	14.14	56.40	74.00	-17.60	152	99	Peak

802.11ac VHT80 Mode:

5210 MHz																	
Horizontal							Vertical										
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5148.298	45.77	4.92	50.69	54.00	-3.31	196	271	Average	5149.099	44.02	4.92	48.94	54.00	-5.06	173	273	Average
5148.298	58.65	4.92	63.57	74.00	-10.43	196	271	Peak	5149.099	56.26	4.92	61.18	74.00	-12.82	173	273	Peak
5210.000	85.40	4.95	90.35			196	271	Average	5210.000	85.97	4.95	90.92			173	273	Average
5210.000	96.80	4.95	101.75			196	271	Peak	5210.000	95.31	4.95	100.26			173	273	Peak
10420.000	40.30	11.00	51.30	68.20	-16.90	149	253	Peak	10420.000	39.80	11.00	50.80	68.20	-17.40	152	320	Peak
15630.000	32.91	14.10	47.01	54.00	-6.99	152	316	Average	15630.000	32.74	14.10	46.84	54.00	-7.16	147	0	Average
15630.000	41.64	14.10	55.74	74.00	-18.26	152	316	Peak	15630.000	42.78	14.10	56.88	74.00	-17.12	147	0	Peak

Level (Result) = Reading + Factor.

Margin = Level - Limit.

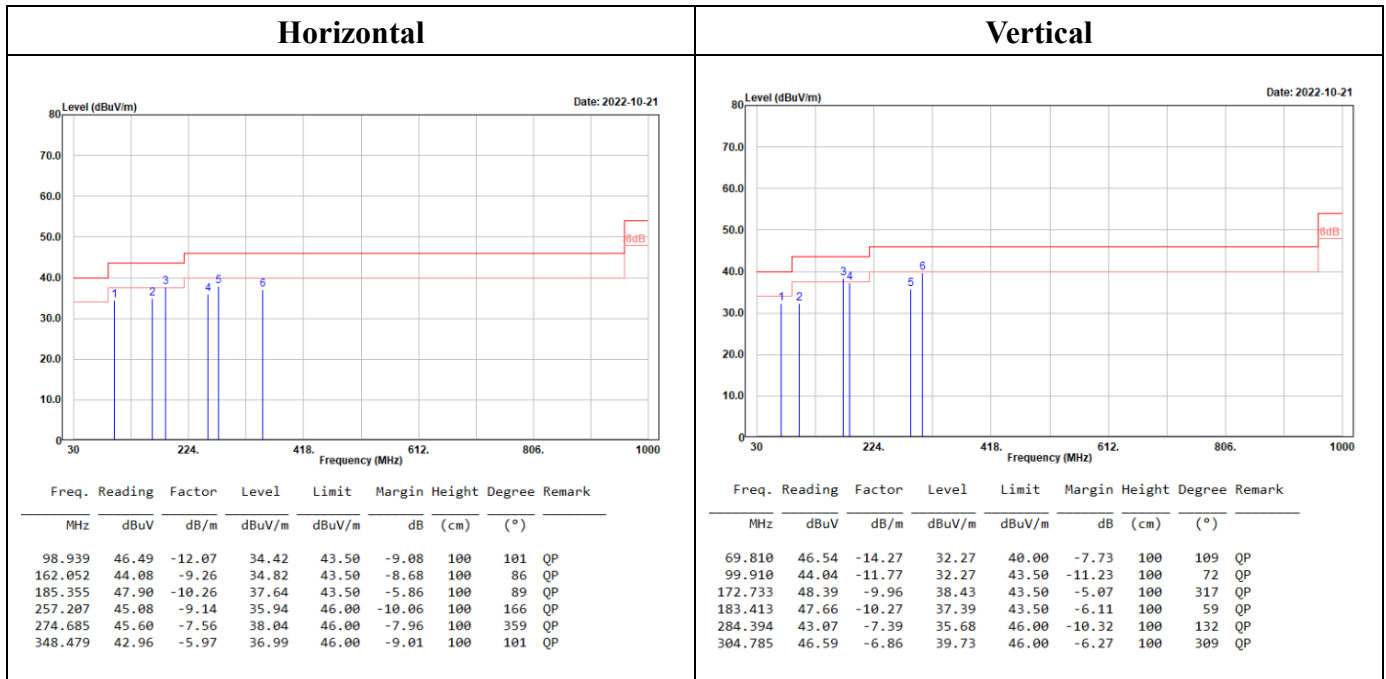
Factor = Antenna Factor + Cable Loss - Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Mode 5:

(worst case is 802.11ac20 mode 5240MHz)

30MHz-1GHz:



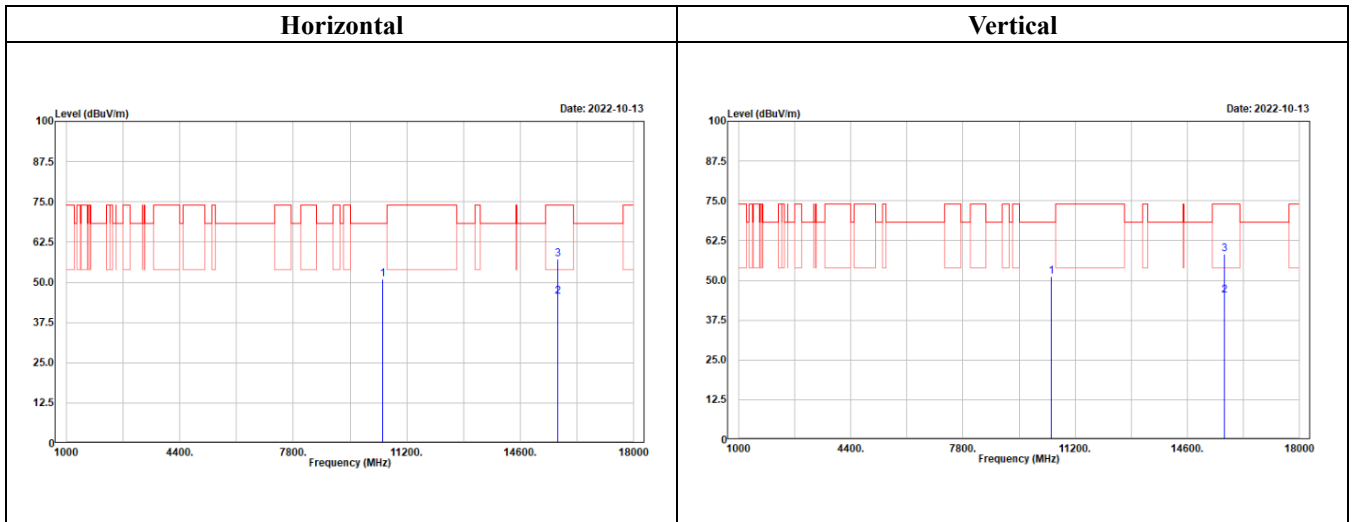
Level (Result) = Reading + Factor.

Margin = Level – Limit.

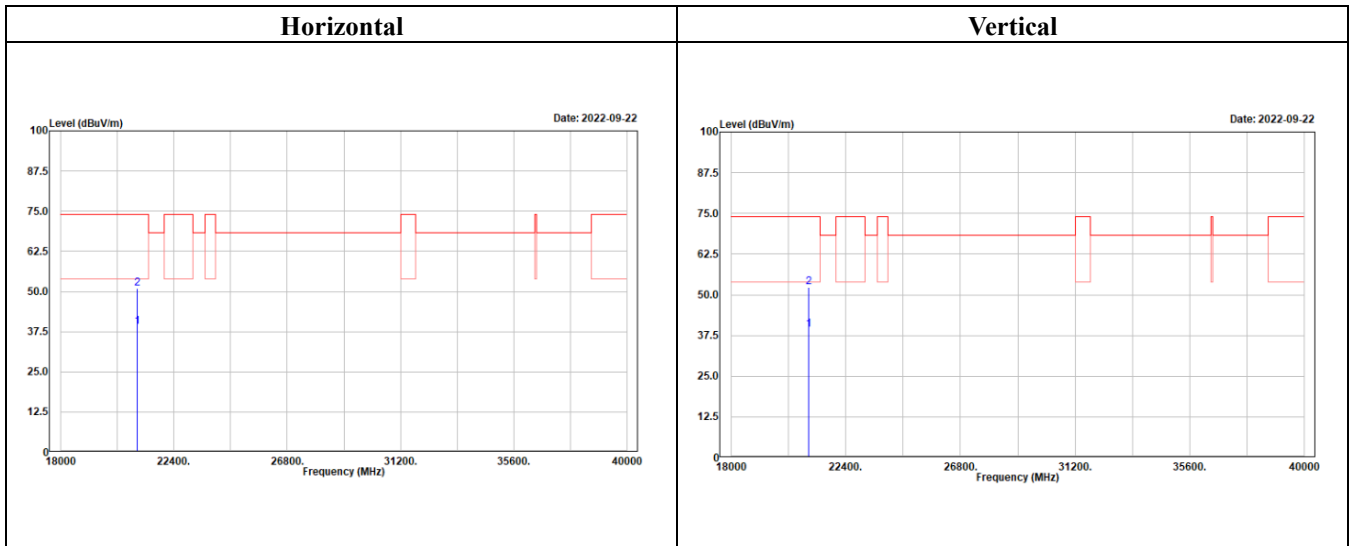
Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

1GHz-18GHz:



18GHz-40GHz:



Above 1GHz:

802.11a Mode:

5180 MHz									
Horizontal					Vertical				
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
5148.699	39.94	4.92	44.86	54.00	-9.14	156	37	Average	
5148.699	52.68	4.92	57.60	74.00	-16.40	156	37	Peak	
5180.000	91.81	4.99	96.80			156	37	Average	
5180.000	101.82	4.99	106.81			156	37	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10360.000	39.45	10.87	50.32	68.20	-17.88	154	131	Peak	
15540.000	31.33	14.04	45.37	54.00	-8.63	148	150	Average	
15540.000	41.05	14.04	55.09	74.00	-18.91	148	150	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10360.000	40.00	10.87	50.87	68.20	-17.33	149	229	Peak	
15540.000	31.63	14.04	45.67	54.00	-8.33	152	241	Average	
15540.000	41.65	14.04	55.69	74.00	-18.31	152	241	Peak	

5200 MHz									
Horizontal					Vertical				
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
5200.000	92.89	5.03	97.92			163	40	Average	
5200.000	102.48	5.03	107.51			163	40	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10400.000	39.76	11.01	50.77	68.20	-17.43	151	66	Peak	
15600.000	31.85	14.08	45.93	54.00	-8.07	146	108	Average	
15600.000	42.75	14.08	56.83	74.00	-17.17	146	108	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10400.000	39.57	11.01	50.58	68.20	-17.62	148	236	Peak	
15600.000	31.68	14.08	45.76	54.00	-8.24	156	13	Average	
15600.000	43.40	14.08	57.48	74.00	-16.52	156	13	Peak	

5240 MHz									
Horizontal					Vertical				
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
5240.000	91.22	4.75	95.97			166	41	Average	
5240.000	101.29	4.75	106.04			166	41	Peak	
5378.328	40.22	4.71	44.93	54.00	-9.07	166	41	Average	
5378.328	52.88	4.71	57.59	74.00	-16.41	166	41	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10480.000	39.48	10.96	50.44	68.20	-17.76	149	33	Peak	
15720.000	31.39	14.13	45.52	54.00	-8.48	153	76	Average	
15720.000	43.02	14.13	57.15	74.00	-16.85	153	76	Peak	
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		
10480.000	39.95	10.96	50.91	68.20	-17.29	152	289	Peak	
15720.000	31.28	14.13	45.41	54.00	-8.59	149	166	Average	
15720.000	42.30	14.13	56.43	74.00	-17.57	149	166	Peak	

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

802.11ac VHT20 Mode:

5180 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5149.700	40.04	4.92	44.96	54.00	-9.04	162	36	Average	5148.098	46.84	4.92	51.76	54.00	-2.24	159	303	Average
5149.700	52.80	4.92	57.72	74.00	-16.28	162	36	Peak	5148.098	64.41	4.92	69.33	74.00	-4.67	159	303	Peak
5180.000	90.10	4.99	95.09			162	36	Average	5180.000	105.09	4.99	110.08			159	303	Average
5180.000	99.74	4.99	104.73			162	36	Peak	5180.000	114.91	4.99	119.90			159	303	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10360.000	40.28	10.87	51.15	68.20	-17.05	153	212	Peak	10360.000	39.61	10.87	50.48	68.20	-17.72	149	351	Peak
15540.000	31.33	14.04	45.37	54.00	-8.63	147	96	Average	15540.000	31.30	14.04	45.34	54.00	-8.66	151	28	Average
15540.000	41.10	14.04	55.14	74.00	-18.86	147	96	Peak	15540.000	42.21	14.04	56.25	74.00	-17.75	151	28	Peak

5200 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5200.000	91.26	5.03	96.29			161	41	Average	5200.000	105.87	5.03	110.90			153	303	Average
5200.000	100.76	5.03	105.79			161	41	Peak	5200.000	115.03	5.03	120.06			153	303	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10400.000	39.57	11.01	50.58	68.20	-17.62	147	70	Peak	10400.000	40.14	11.01	51.15	68.20	-17.05	152	153	Peak
15600.000	31.54	14.08	45.62	54.00	-8.38	152	0	Average	15600.000	31.61	14.08	45.69	54.00	-8.31	145	1	Average
15600.000	42.49	14.08	56.57	74.00	-17.43	152	0	Peak	15600.000	42.99	14.08	57.07	74.00	-16.93	145	1	Peak

5240 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5240.000	90.53	4.75	95.28			170	42	Average	5240.000	103.56	4.75	108.31			151	304	Average
5240.000	100.34	4.75	105.09			170	42	Peak	5240.000	113.04	4.75	117.79			151	304	Peak
5395.565	40.34	4.74	45.08	54.00	-8.92	170	42	Average	5358.218	47.38	4.66	52.04	54.00	-1.96	151	304	Average
5395.565	53.18	4.74	57.92	74.00	-16.08	170	42	Peak	5358.218	60.13	4.66	64.79	74.00	-9.21	151	304	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10480.000	40.00	10.96	50.96	68.20	-17.24	150	359	Peak	10480.000	40.30	10.96	51.26	68.20	-16.94	149	121	Peak
15720.000	31.37	14.13	45.50	54.00	-8.50	151	297	Average	15720.000	31.25	14.13	45.38	54.00	-8.62	155	275	Average
15720.000	43.00	14.13	57.13	74.00	-16.87	151	297	Peak	15720.000	44.19	14.13	58.32	74.00	-15.68	155	275	Peak

Level (Result) = Reading + Factor.

Margin = Level - Limit.

Factor = Antenna Factor + Cable Loss - Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

802.11ac VHT40 Mode:

5190 MHz																	
Horizontal							Vertical										
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5093.644	40.52	4.78	45.30	54.00	-8.70	166	42	Average	5148.899	46.79	4.92	51.71	54.00	-2.29	157	304	Average
5093.644	52.37	4.78	57.15	74.00	-16.85	166	42	Peak	5148.899	59.73	4.92	64.65	74.00	-9.35	157	304	Peak
5190.000	84.74	5.01	89.75			166	42	Average	5190.000	97.92	5.01	102.93			157	304	Average
5190.000	94.55	5.01	99.56			166	42	Peak	5190.000	107.77	5.01	112.78			157	304	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10380.000	39.82	10.94	50.76	68.20	-17.44	147	44	Peak	10380.000	39.83	10.94	50.77	68.20	-17.43	152	107	Peak
15570.000	31.25	14.05	45.30	54.00	-8.70	151	235	Average	15570.000	31.37	14.05	45.42	54.00	-8.58	147	331	Average
15570.000	41.15	14.05	55.20	74.00	-18.80	151	235	Peak	15570.000	41.79	14.05	55.84	74.00	-18.16	147	331	Peak

5230 MHz																	
Horizontal							Vertical										
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5230.000	93.60	4.82	98.42			161	40	Average	5230.000	105.66	4.82	110.48			155	303	Average
5230.000	103.19	4.82	108.01			161	40	Peak	5230.000	115.45	4.82	120.27			155	303	Peak
5372.993	40.51	4.69	45.20	54.00	-8.80	161	40	Average	5351.652	46.16	4.65	50.81	54.00	-3.19	155	303	Average
5372.993	53.26	4.69	57.95	74.00	-16.05	161	40	Peak	5351.652	57.75	4.65	62.40	74.00	-11.60	155	303	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10460.000	40.00	10.97	50.97	68.20	-17.23	147	226	Peak	10460.000	40.73	10.97	51.70	68.20	-16.50	153	277	Peak
15690.000	31.11	14.14	45.25	54.00	-8.75	154	53	Average	15690.000	31.31	14.14	45.45	54.00	-8.55	148	123	Average
15690.000	42.22	14.14	56.36	74.00	-17.64	154	53	Peak	15690.000	42.89	14.14	57.03	74.00	-16.97	148	123	Peak

802.11ac VHT80 Mode:

5210 MHz																	
Horizontal							Vertical										
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5113.463	40.77	4.85	45.62	54.00	-8.38	160	40	Average	5148.098	46.99	4.92	51.91	54.00	-2.09	152	303	Average
5113.463	52.64	4.85	57.49	74.00	-16.51	160	40	Peak	5148.098	59.50	4.92	64.42	74.00	-9.58	152	303	Peak
5210.000	81.30	4.95	86.25			160	40	Average	5210.000	94.49	4.95	99.44			152	303	Average
5210.000	90.82	4.95	95.77			160	40	Peak	5210.000	103.83	4.95	108.78			152	303	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10420.000	40.79	11.00	51.79	68.20	-16.41	151	207	Peak	10420.000	39.75	11.00	50.75	68.20	-17.45	149	68	Peak
15630.000	32.33	14.10	46.43	54.00	-7.57	147	146	Average	15630.000	32.54	14.10	46.64	54.00	-7.36	153	181	Average
15630.000	41.83	14.10	55.93	74.00	-18.07	147	146	Peak	15630.000	42.14	14.10	56.24	74.00	-17.76	153	181	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

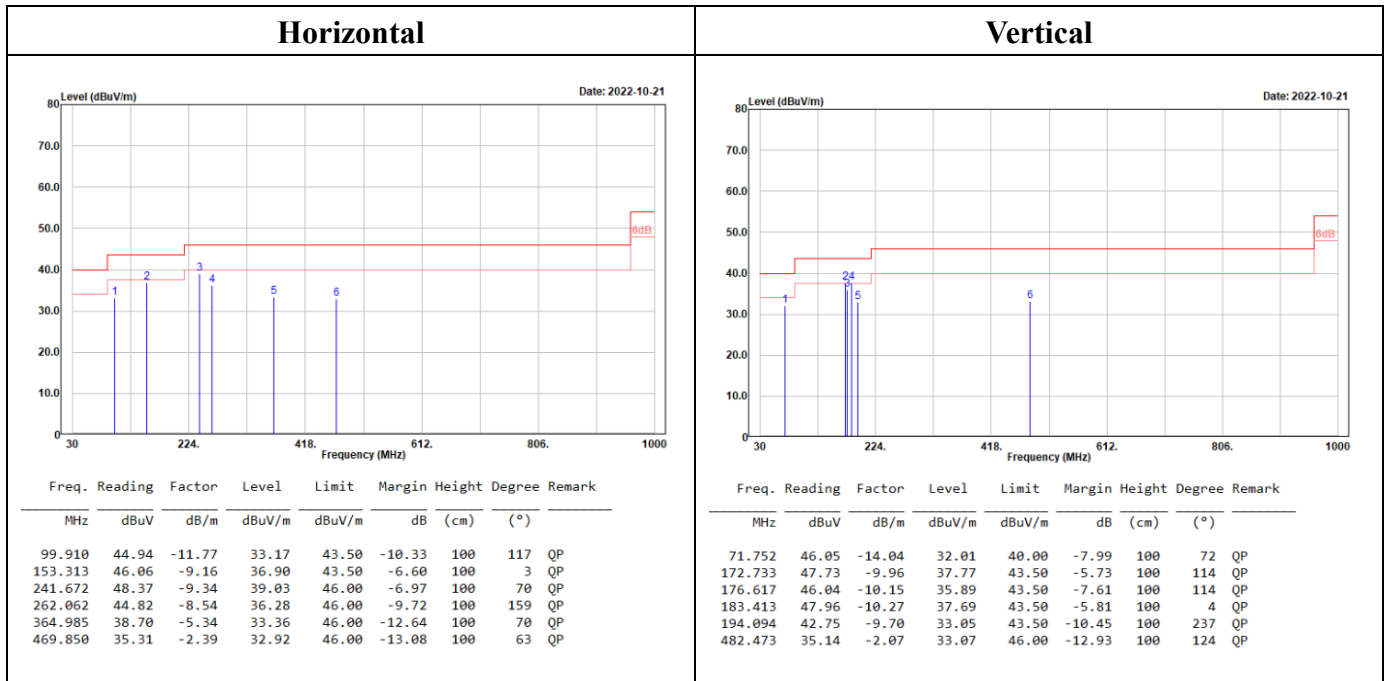
Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Mode 7:

(worst case is 802.11ac20 mode 5180MHz)

30MHz-1GHz:



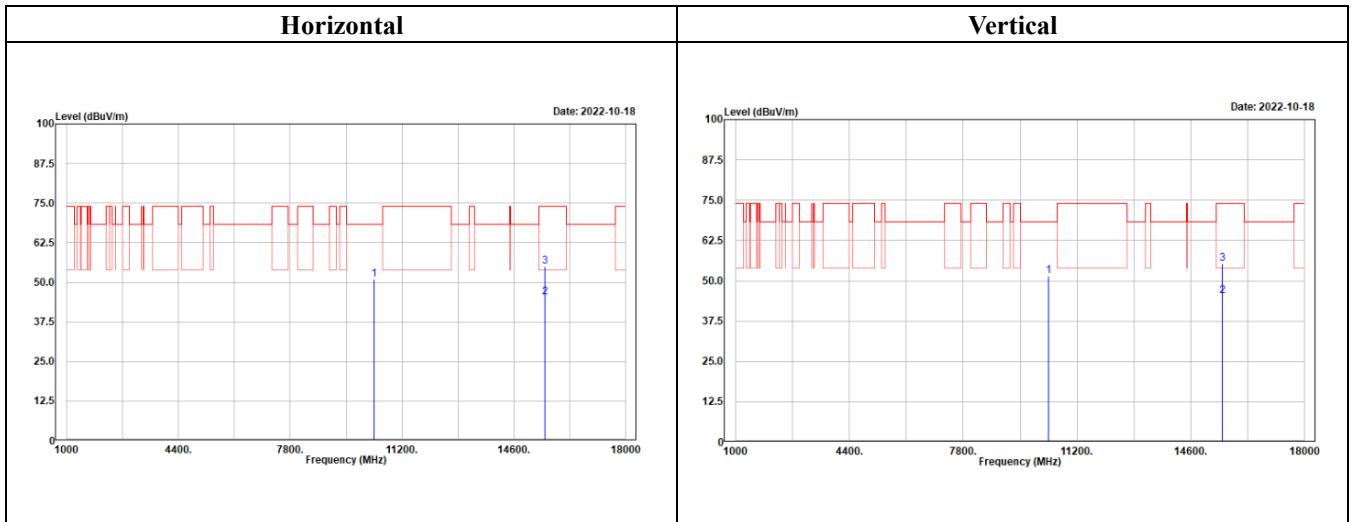
Level (Result) = Reading + Factor.

Margin = Level – Limit.

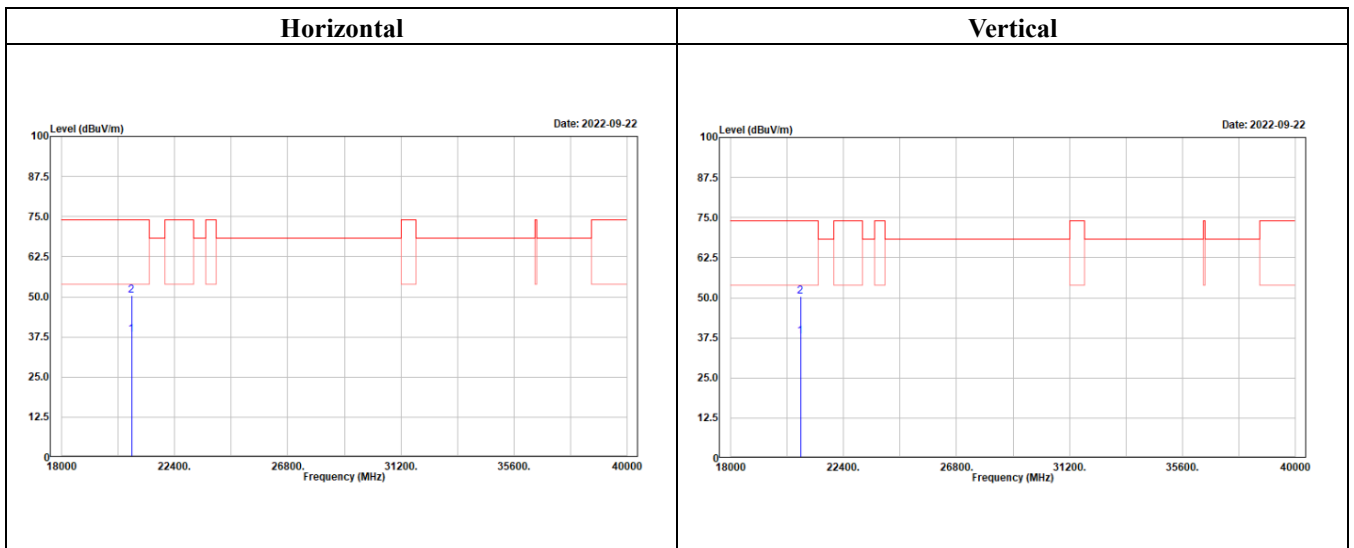
Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

1GHz-18GHz:



18GHz-40GHz:



Above 1GHz:

802.11a Mode:

5180 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5148.899	46.95	4.92	51.87	54.00	-2.13	105	101	Average	5133.684	40.12	4.89	45.01	54.00	-8.99	106	354	Average
5148.899	61.31	4.92	66.23	74.00	-7.77	105	101	Peak	5133.684	52.76	4.89	57.65	74.00	-16.35	106	354	Peak
5180.000	104.30	4.99	109.29			105	101	Average	5180.000	91.82	4.99	96.81			106	354	Average
5180.000	114.01	4.99	119.00			105	101	Peak	5180.000	101.57	4.99	106.56			106	354	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10360.000	39.26	10.87	50.13	68.20	-18.07	149	221	Peak	10360.000	39.14	10.87	50.01	68.20	-18.19	152	119	Peak
15540.000	31.35	14.04	45.39	54.00	-8.61	151	64	Average	15540.000	31.46	14.04	45.50	54.00	-8.50	147	224	Average
15540.000	41.44	14.04	55.48	74.00	-18.52	151	64	Peak	15540.000	41.07	14.04	55.11	74.00	-18.89	147	224	Peak

5200 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5200.000	105.81	5.03	110.84			111	103	Average	5200.000	94.45	5.03	99.48			106	354	Average
5200.000	115.80	5.03	120.83			111	103	Peak	5200.000	104.29	5.03	109.32			106	354	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10400.000	39.81	11.01	50.82	68.20	-17.38	153	2	Peak	10400.000	40.59	11.01	51.60	68.20	-16.60	147	304	Peak
15600.000	31.55	14.08	45.63	54.00	-8.37	149	155	Average	15600.000	31.93	14.08	46.01	54.00	-7.99	152	182	Average
15600.000	44.01	14.08	58.09	74.00	-15.91	149	155	Peak	15600.000	42.85	14.08	56.93	74.00	-17.07	152	182	Peak

5240 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5240.000	106.12	4.75	110.87			103	101	Average	5240.000	94.97	4.75	99.72			100	352	Average
5240.000	115.64	4.75	120.39			103	101	Peak	5240.000	104.70	4.75	109.45			100	352	Peak
5359.860	45.18	4.67	49.85	54.00	-4.15	103	101	Average	5354.935	39.95	4.66	44.61	54.00	-9.39	100	352	Average
5359.860	58.03	4.67	62.70	74.00	-11.30	103	101	Peak	5354.935	52.17	4.66	56.83	74.00	-17.17	100	352	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10480.000	40.74	10.96	51.70	68.20	-16.50	152	72	Peak	10480.000	40.96	10.96	51.92	68.20	-16.28	147	321	Peak
15720.000	31.23	14.13	45.36	54.00	-8.64	146	164	Average	15720.000	31.43	14.13	45.56	54.00	-8.44	151	158	Average
15720.000	42.28	14.13	56.41	74.00	-17.59	146	164	Peak	15720.000	42.52	14.13	56.65	74.00	-17.35	151	158	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

802.11ac VHT20 Mode:

5180 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5146.096	47.13	4.92	52.05	54.00	-1.95	112	102	Average	5149.700	39.91	4.92	44.83	54.00	-9.17	108	344	Average
5146.096	62.69	4.92	67.61	74.00	-6.39	112	102	Peak	5149.700	52.92	4.92	57.84	74.00	-16.16	108	344	Peak
5180.000	104.95	4.99	109.94			112	102	Average	5180.000	91.80	4.99	96.79			108	344	Average
5180.000	114.84	4.99	119.83			112	102	Peak	5180.000	101.42	4.99	106.41			108	344	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10360.000	40.20	10.87	51.07	68.20	-17.13	153	196	Peak	10360.000	40.73	10.87	51.60	68.20	-16.60	147	92	Peak
15540.000	31.34	14.04	45.38	54.00	-8.62	148	288	Average	15540.000	31.32	14.04	45.36	54.00	-8.64	151	296	Average
15540.000	41.08	14.04	55.12	74.00	-18.88	148	288	Peak	15540.000	41.23	14.04	55.27	74.00	-18.73	151	296	Peak

5200 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5200.000	105.94	5.03	110.97			102	99	Average	5200.000	94.59	5.03	99.62			105	354	Average
5200.000	115.55	5.03	120.58			102	99	Peak	5200.000	103.80	5.03	108.83			105	354	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10400.000	40.30	11.01	51.31	68.20	-16.89	152	214	Peak	10400.000	40.21	11.01	51.22	68.20	-16.98	147	325	Peak
15600.000	31.69	14.08	45.77	54.00	-8.23	147	176	Average	15600.000	31.49	14.08	45.57	54.00	-8.43	153	37	Average
15600.000	42.33	14.08	56.41	74.00	-17.59	147	176	Peak	15600.000	42.83	14.08	56.91	74.00	-17.09	153	37	Peak

5240 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5240.000	105.96	4.75	110.71			102	100	Average	5240.000	95.36	4.75	100.11			101	353	Average
5240.000	115.66	4.75	120.41			102	100	Peak	5240.000	105.11	4.75	109.86			101	353	Peak
5372.583	44.47	4.69	49.16	54.00	-4.84	102	100	Average	5405.826	39.80	4.72	44.52	54.00	-9.48	101	353	Average
5372.583	56.99	4.69	61.68	74.00	-12.32	102	100	Peak	5405.826	52.70	4.72	57.42	74.00	-16.58	101	353	Peak
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
10480.000	40.51	10.96	51.47	68.20	-16.73	153	232	Peak	10480.000	40.53	10.96	51.49	68.20	-16.71	148	151	Peak
15720.000	31.38	14.13	45.51	54.00	-8.49	148	0	Average	15720.000	31.20	14.13	45.33	54.00	-8.67	151	46	Average
15720.000	42.64	14.13	56.77	74.00	-17.23	148	0	Peak	15720.000	41.98	14.13	56.11	74.00	-17.89	151	46	Peak

Level (Result) = Reading + Factor.

Margin = Level - Limit.

Factor = Antenna Factor + Cable Loss - Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

802.11ac VHT40 Mode:

5190 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5147.297	47.12	4.93	52.05	54.00	-1.95	104	101	Average	5100.050	40.56	4.83	45.39	54.00	-8.61	102	356	Average
5147.297	61.49	4.93	66.42	74.00	-7.58	104	101	Peak	5100.050	53.14	4.83	57.97	74.00	-16.03	102	356	Peak
5190.000	97.97	5.01	102.98			104	101	Average	5190.000	85.92	5.01	90.93			102	356	Average
5190.000	107.52	5.01	112.53			104	101	Peak	5190.000	95.57	5.01	100.58			102	356	Peak
Freq. Reading Factor Level Limit Margin Height Degree Remark								Freq. Reading Factor Level Limit Margin Height Degree Remark									
MHz dBuV dB/m dBuV/m dBuV/m dB (cm) (°)								MHz dBuV dB/m dBuV/m dBuV/m dB (cm) (°)									
10380.000	39.99	10.94	50.93	68.20	-17.27	151	128	Peak	10380.000	40.15	10.94	51.09	68.20	-17.11	147	129	Peak
15570.000	31.41	14.05	45.46	54.00	-8.54	148	9	Average	15570.000	31.55	14.05	45.60	54.00	-8.40	155	289	Average
15570.000	42.36	14.05	56.41	74.00	-17.59	148	9	Peak	15570.000	43.02	14.05	57.07	74.00	-16.93	155	289	Peak

5230 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5230.000	103.48	4.82	108.30			105	103	Average	5230.000	92.18	4.82	97.00			106	353	Average
5230.000	112.95	4.82	117.77			105	103	Peak	5230.000	101.41	4.82	106.23			106	353	Peak
5350.010	45.44	4.65	50.09	54.00	-3.91	105	103	Average	5397.618	40.51	4.75	45.26	54.00	-8.74	106	353	Average
5350.010	57.21	4.65	61.86	74.00	-12.14	105	103	Peak	5397.618	52.66	4.75	57.41	74.00	-16.59	106	353	Peak
Freq. Reading Factor Level Limit Margin Height Degree Remark								Freq. Reading Factor Level Limit Margin Height Degree Remark									
MHz dBuV dB/m dBuV/m dBuV/m dB (cm) (°)								MHz dBuV dB/m dBuV/m dBuV/m dB (cm) (°)									
10460.000	42.09	10.97	53.06	68.20	-15.14	151	315	Peak	10460.000	40.50	10.97	51.47	68.20	-16.73	149	102	Peak
15690.000	31.39	14.14	45.53	54.00	-8.47	145	42	Average	15690.000	31.34	14.14	45.48	54.00	-8.52	152	249	Average
15690.000	42.43	14.14	56.57	74.00	-17.43	145	42	Peak	15690.000	42.14	14.14	56.28	74.00	-17.72	152	249	Peak

802.11ac VHT80 Mode:

5210 MHz																	
Horizontal								Vertical									
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark	Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
5149.500	46.13	4.92	51.05	54.00	-2.95	109	101	Average	5149.900	40.91	4.92	45.83	54.00	-8.17	105	355	Average
5149.500	60.26	4.92	65.18	74.00	-8.82	109	101	Peak	5149.900	52.72	4.92	57.64	74.00	-16.36	105	355	Peak
5210.000	91.01	4.82	95.83			109	101	Average	5210.000	79.71	4.95	84.66			105	355	Average
5210.000	101.69	4.82	106.51			109	101	Peak	5210.000	89.32	4.95	94.27			105	355	Peak
Freq. Reading Factor Level Limit Margin Height Degree Remark								Freq. Reading Factor Level Limit Margin Height Degree Remark									
MHz dBuV dB/m dBuV/m dBuV/m dB (cm) (°)								MHz dBuV dB/m dBuV/m dBuV/m dB (cm) (°)									
10420.000	40.36	11.00	51.36	68.20	-16.84	147	210	Peak	10420.000	40.33	11.00	51.33	68.20	-16.87	153	200	Peak
15630.000	32.40	14.10	46.50	54.00	-7.50	152	218	Average	15630.000	32.11	14.10	46.21	54.00	-7.79	149	299	Average
15630.000	42.55	14.10	56.65	74.00	-17.35	152	218	Peak	15630.000	42.84	14.10	56.94	74.00	-17.06	149	299	Peak

Level (Result) = Reading + Factor.

Margin = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.