



FCC PART 15.247

TEST REPORT

For

Chengdu Vantron Technology, Ltd.

No.5 GaoPeng Road, Hi-Tech Zone, Chengdu,
SiChuan, P.R. China 610045

FCC ID: 2AAGEVTM2M-LV

Report Type: Class II Permissive Change	Product Name: M2M Gateway
Report Number: RSC171209001-0BA1	
Report Date: 2018-01-16 Sula Huang	
Reviewed By: Lab Director 	
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Chengdu) No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China Tel: +86-28-65525123 Fax: +86-28-65525125 www.baclcorp.com

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Chengdu).

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY	3
GENERAL INFORMATION.....	5
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
OBJECTIVE.....	5
RELATED SUBMITTAL(S)/GRANT(S)	5
MEASUREMENT UNCERTAINTY	6
TEST METHODOLOGY.....	6
TEST FACILITY	6
SYSTEM TEST CONFIGURATION	7
DESCRIPTION OF TEST CONFIGURATION.....	7
EUT EXERCISE SOFTWARE	8
EQUIPMENT MODIFICATIONS.....	8
SUPPORT EQUIPMENT LIST AND DETAILS	9
EXTERNAL I/O CABLE.....	9
BLOCK DIAGRAM OF TEST SETUP	9
TEST EQUIPMENTS LIST.....	10
SUMMARY OF TEST RESULTS	11
FCC §15.247 (I), §2.1091 & §1.1307(B)(1) - MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	12
APPLICABLE STANDARD	12
FCC §15.203 - ANTENNA REQUIREMENT	15
APPLICABLE STANDARD	15
ANTENNA CONNECTOR CONSTRUCTION	15
FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS.....	16
APPLICABLE STANDARD	16
EUT SETUP	16
EMI TEST RECEIVER SETUP.....	16
TEST PROCEDURE.....	17
CORRECTED AMPLITUDE & MARGIN CALCULATION	17
TEST DATA	17
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS	42
APPLICABLE STANDARD	42
EUT SETUP	42
EMI TEST RECEIVER SETUP.....	43
TEST PROCEDURE.....	43
CORRECTED AMPLITUDE & MARGIN CALCULATION	43
TEST DATA	44

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RSC150128002	Original Report	2015-02-09
1	RSC171209001-0BA1	CIIPC Report	2018-01-16

Note: This report was the CIIPC report, which was identical to the previously certified except for the changes as below for details.

1. Changing 3G module, change 3G module HE910 (FCC ID: RI7HE910) to 4G module LE910-SV1 (FCC ID: RI7LE910SVV2) or LE910-NA1(FCC ID: RI7LE910NAV2) .
2. Adding one adapter, model: WT48-1203000-T.
3. Updating EUT external picture,

Original:



Current:



4. Updating LTE antenna

Original:



Current:



The above changes will affect “*part of tests*”, all test data were presented in this report, and other data were referred to the report number RSC150128002.

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The **Chengdu Vantron Technology, Ltd.**'s product, model number: **VT-M2M-LV (FCC ID: 2AAGEVTM2M-LV)** (the "EUT") in this report was the **M2M Gateway**, which was measured approximately: 172 mm(L) x 93.5 mm (W) x 47 mm (H), rated input voltage:DC12V from adapter.

Adapter 1:

Manufacturer: Anthin

Model: API315-1212

Input: AC 100-240V, 50/60Hz, 0.3A

Output: DC 12V, 1.25A

Adapter 2:

Model: ZF120A-1203000

Input: AC 100-240V, 50/60Hz, 1.2A MAX

Output: DC 12V, 3.0A

Adapter 3:

Model: WT48-1203000-T

Input: AC 100-240V, 50/60Hz, 1.6A MAX

Output: DC 12V, 3.0A

**All measurement and test data in this report were gathered from final production sample, serial number: 171209001/01(Provided by BACL). It may have deviation from any other sample. The EUT supplied by the applicant was received on 2017-12-09, and EUT complied with test requirement.*

Objective

This report is prepared on behalf of *Chengdu Vantron Technology, Ltd.* accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: 2AAGEVTM2M-LV.

Measurement Uncertainty

Item			Uncertainty
AC power line conducted emission			2.71 dB
Radiated Emission(Field Strength)	30MHz-200MHz	H	4.57dB
		V	4.81dB
	200MHz-1GHz	H	5.69dB
		V	6.07dB
	1GHz-6GHz		5.49dB
	6GHz-18GHz		5.57dB
	18GHz-40GHz		5.48dB

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.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Chengdu). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Chengdu) to collect test data is located No.5040, Huilongwan Plaza, No. 1, Shawan Road, Jinniu District, Chengdu, Sichuan, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 910975, the FCC Designation No. : CN1186.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062C-1.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

WIFI Module:

The system was configured for test in testing mode, which was provided by manufacturer. 11 channels are provided to testing:

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

For 802.11b, 802.11g, and 802.11n HT20 modes were tested with Channel 1, 6 and 11.
For 802.11n HT40 mode were tested with Channel 3, 6 and 9.

Zigbee Module:

The system was configured for testing in testing mode, which was provided by manufacturer. For Zigbee mode were tested with Channel 2405MHz, 2440MHz, 2475MHz and 2480MHz.

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

EUT Exercise Software

The software “putty_V0.63.0.0.43510830.exe” was used for testing, which was provided by manufacturer.

WIFI Module:

Test Mode	Test Software Version	putty_V0.63.0.0.43510830.exe		
802.11b	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	CCK 1M	CCK 1M	CCK 1M
	Power Level Setting Antenna	17	17	17
802.11g	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	OFDM 6M	OFDM 6M	OFDM 6M
	Power Level Setting Antenna	15	15	15
802.11n HT20	Test Frequency	2412MHz	2437MHz	2462MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting Antenna	9	9	9
802.11n HT40	Test Frequency	2422MHz	2437MHz	2452MHz
	Data Rate	MCS0	MCS0	MCS0
	Power Level Setting Antenna	9	9	9

Zigbee Module:

The test was performed under “putty_V0.63.0.0.43510830.exe” which was provided by the manufacturer.

Test Software Version	putty_V0.63.0.0.43510830.exe			
Test Frequency	2405 MHz	2440 MHz	2475 MHz	2480 MHz
Power Level Setting	Maximum output power level			

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

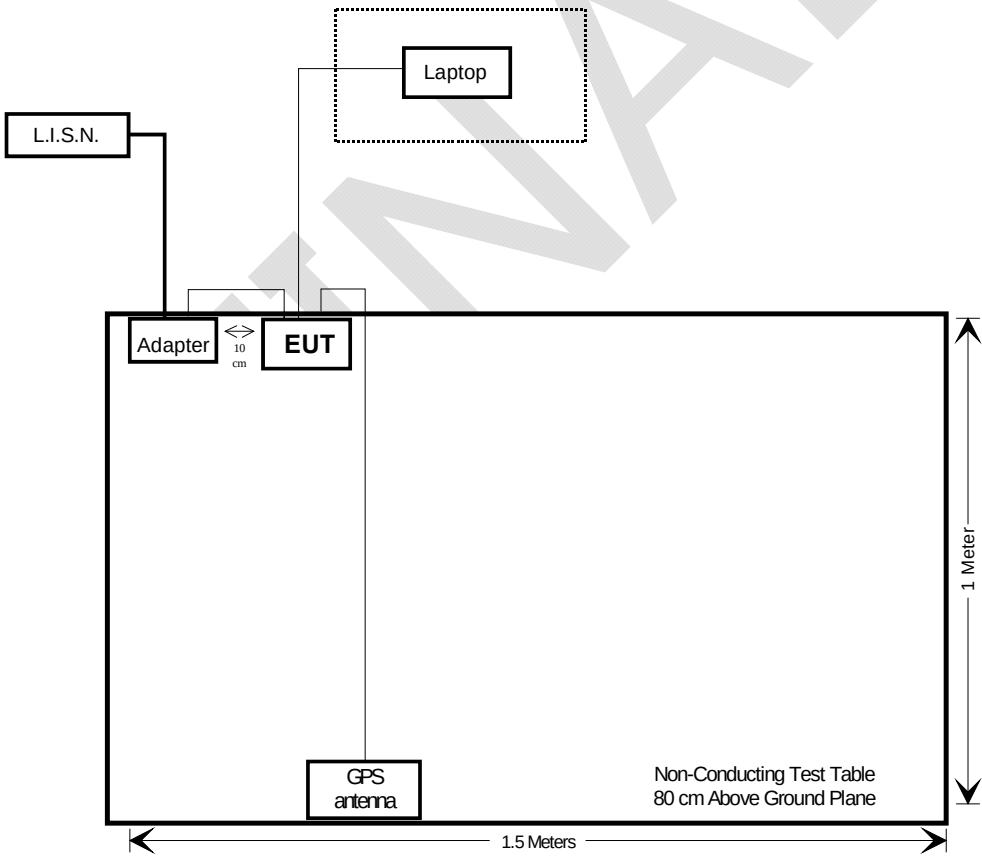
Manufacturer	Description	Model Number	Serial Number
DELL	Laptop	C640	5P804A00

External I/O Cable

Cable Description	Length (m)	From	To
Unshielded RJ45 Cable	10	Laptop	EUT

Block Diagram of Test Setup

Conducted emissions test:



Test Equipments List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCS 30	836858/0016	2017-12-02	2018-12-01
Rohde & Schwarz	L.I.S.N.	ENV216	100018	2017-05-20	2018-05-19
Rohde & Schwarz	RF Limiter	ESH3Z2	DE14781	2017-11-10	2018-11-09
N/A	Conducted Cable	NO.5	N/A	2017-11-10	2018-11-09
Rohde & Schwarz	EMC32	N/A	V 8.52.0	N/A	N/A
Radiated Emissions Test					
Sonoma	Pre-Amplifier	310N	186684	2017-08-18	2018-08-17
Rohde & Schwarz	EMI Test Receiver	ESIB 40	100215	2017-09-12	2018-09-11
Rohde & Schwarz	EMI Test Receiver	ESCI	100028	2017-05-20	2018-05-19
Sunol Sciences	Broadband Antenna	JB3	A121808	2017-05-18	2020-05-17
ETS	Horn Antenna	3115	003-6076	2017-05-19	2020-05-18
A.H.Systems,inc	Horn Antenna	SAS-574	505	2017-12-02	2018-12-01
Mini-circuits	Pre-Amplifier	ZVA-183-S+	771001215	2017-05-20	2018-05-19
Quinstar	Pre-Amplifier	QLW-18405536-JO	15964004001	2017-05-20	2018-05-19
Sinoscite.,Co Ltd	Reject Band Filter	BSF 2402-2480MN	0898-005	2017-11-10	2018-11-09
INMET	Attenuator	N-6dB	/	2017-11-10	2018-11-09
EMCT	Semi-Anechoic Chamber	966	N/A	2015-04-24	2018-04-23
N/A	RF Cable (below 1GHz)	NO.1	N/A	2017-11-10	2018-11-09
N/A	RF Cable (below 1GHz)	NO.4	N/A	2017-11-10	2018-11-09
N/A	RF Cable (above 1GHz)	NO.2	N/A	2017-11-10	2018-11-09
Rohde & Schwarz	EMC32	N/A	V 8.52.0	N/A	N/A

* **Statement of Traceability:** BA CL (Chengdu) attested that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

SUMMARY OF TEST RESULTS

WIFI Module:

FCC Rules	Description of Test	Result
§15.247(i), §2.1091 & §1.1307(b)(1)	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.247(d)	Conducted Spurious Emissions at Antenna Port	Compliance*
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance*
§15.247(b)(3)	Maximum Peak Output Power	Compliance*
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance*
§15.247(e)	Power Spectral Density	Compliance*

Zigbee Module:

FCC Rules	Description of Test	Result
§15.247(i), §2.1091 & §1.1307(b)(1)	Maximum Permissible exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.247(d)	Conducted Spurious Emissions at Antenna Port	Compliance*
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Emission Bandwidth	Compliance*
§15.247(b)(3)	Maximum Peak Output Power	Compliance*
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance*
§15.247(e)	Power Spectral Density	Compliance*

Compliance*: Refer to the certified product with FCC ID: 2AAGEVTM2M-LV, Report No.: RSC150128002.

FCC §15.247 (I), §2.1091 & §1.1307(B)(1) - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247(i) and subpart §1.1310, 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.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	-	-	f/1500	30
1500–100,000	-	-	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = PG/4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

WiFi+Zigbee+LTE (FCC ID: RI7LE910SVV2)

Mode	Frequency Range	Antenna Gain		Tune-up Conducted Power		Evaluation Distance	Power Density	Limit
	MHz	dBi	numeric	dBm	mW	cm	mW/cm ²	mW/cm ²
WiFi	2412-2462	2.00	1.58	17.26	53.21	20	0.017	1.00
	2422-2452	2.00	1.58	14.03	25.29	20	0.008	1.00
Zigbee	2405-2480	2.00	1.58	10.08	10.19	20	0.003	1.00
LTE band 2	1850.7-1909.3	5.00	3.16	24.00	251.19	20	0.158	1.00
LTE band 4	1710.7-1754.3	5.00	3.16	24.00	251.19	20	0.158	1.00
LTE band 13	777-787	3.00	2.00	24.00	251.19	20	0.100	0.52

MPE evaluation for simultaneous transmission:

Wi-Fi&Zigbee<E can transmit at the same time, MPE evaluation is as below formula:

$PD1/Limit1+PD2/Limit2+..... < 1$, PD (Power Density)

The worst case is as below:

Max MPE of Wi-Fi+ Max MPE of Zigbee + Max MPE of LTE = $0.017/1+0.003/1+0.100/0.52$
 $=0.212 < 1.0$

Result: MPE evaluation of single and simultaneous transmission meet the requirement of standard.

WiFi+Zigbee+WCDMA/LTE (FCC ID: RI7LE910NAV2)

Mode	Frequency Range	Antenna Gain		Tune-up Conducted Power		Evaluation Distance	Power Density	Limit
	MHz	dBi	numeric	dBm	mW	cm	mW/cm ²	mW/cm ²
WiFi	2412-2462	2.00	1.58	17.26	53.21	20	0.017	1.00
	2422-2452	2.00	1.58	14.03	25.29	20	0.008	1.00
Zigbee	2405-2480	2.00	1.58	10.08	10.19	20	0.003	1.00
WCDMA Band 2	1852.4-1907.6	5.00	3.16	24.50	281.84	20	0.177	1.00
WCDMA Band 5	826.4-846.6	3.00	2.00	24.50	281.84	20	0.112	0.55
LTE band 2	1850.7-1909.3	5.00	3.16	24.00	251.19	20	0.158	1.00
LTE band 4	1710.7-1754.3	5.00	3.16	24.00	251.19	20	0.158	1.00
LTE band 5	824.7-848.3	3.00	2.00	24.00	251.19	20	0.100	1.00
LTE band 13	777-787	3.00	2.00	24.00	251.19	20	0.100	0.52
LTE band 17	704-715.9	3.00	2.00	24.00	251.19	20	0.100	0.47
LTE band 12	699-716	3.00	2.00	24.00	251.19	20	0.100	0.47

MPE evaluation for simultaneous transmission:

Wi-Fi&Zigbee&WCDMA/LTE can transmit at the same time, MPE evaluation is as below formula:

$PD1/Limit1 + PD2/Limit2 + \dots < 1$, PD (Power Density)

The worst case is as below:

Max MPE of Wi-Fi + Max MPE of Zigbee + Max MPE of LTE = $0.017/1 + 0.003/1 + 0.100/0.47$
 $= 0.233 < 1.0$

Result: MPE evaluation of single and simultaneous transmission meet the requirement of standard.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to FCC §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- Antenna must be permanently attached to the unit.
 - Antenna must use a unique type of connector to attach to the EUT.
- Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Connector Construction

The EUT has five external antennas, which used a unique type of connector to attach to the EUT. Please refer to EUT photos and the following table for details:

Mode	Manufacturer	Model Name	Connector Type	Max. Antenna Gain
WIFI	Dongguan Guoxu Electronics Communication Co.,Ltd.	GX042S.100001.S01	SMA Female	2400-2483MHz 2dBi
Zigbee	Dongguan Guoxu Electronics Communication Co.,Ltd.	GX042S.100001.S01	SMA Female	2.4GHz-2.4835GHz: 2dBi
GPS	Shenzhen Norminson Technology CO.,LTD.	NP002	SMA Male	1575.42MHz+/-3MHz: 28dBi+/-3dBi(LNA)
LTE Main Antenna	Asian Creation Communication Co.,Ltd	AC-Q7027-YZW	SMA Male	WCDMA Band 2 LTE FDD Band 2, 4 5 dBi;
LTE Diversity Antenna				WCDMA Band 5 LTE FDD Band 12,13,17 3 dBi

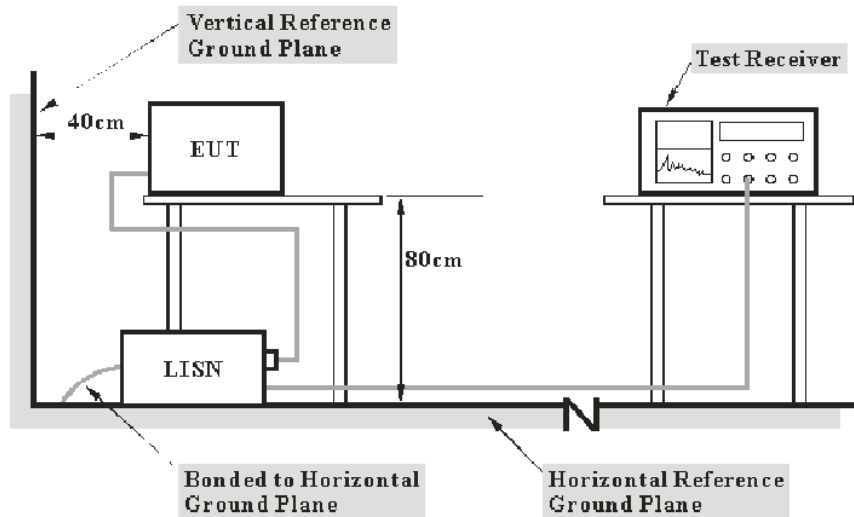
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

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 C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to AC 120V/60Hz power source.

EMI Test Receiver Setup

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

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

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

Test Procedure

During the conducted emission test, the adapter was connected to the first L.I.S.N.

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.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

V_C (cord. Reading): corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN

C_f : Correction Factor

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Data

Environmental Conditions

Temperature:	19 °C
Relative Humidity:	42 %
ATM Pressure:	96.2 kPa

The testing was performed by Tom Tang on 2018-01-03.

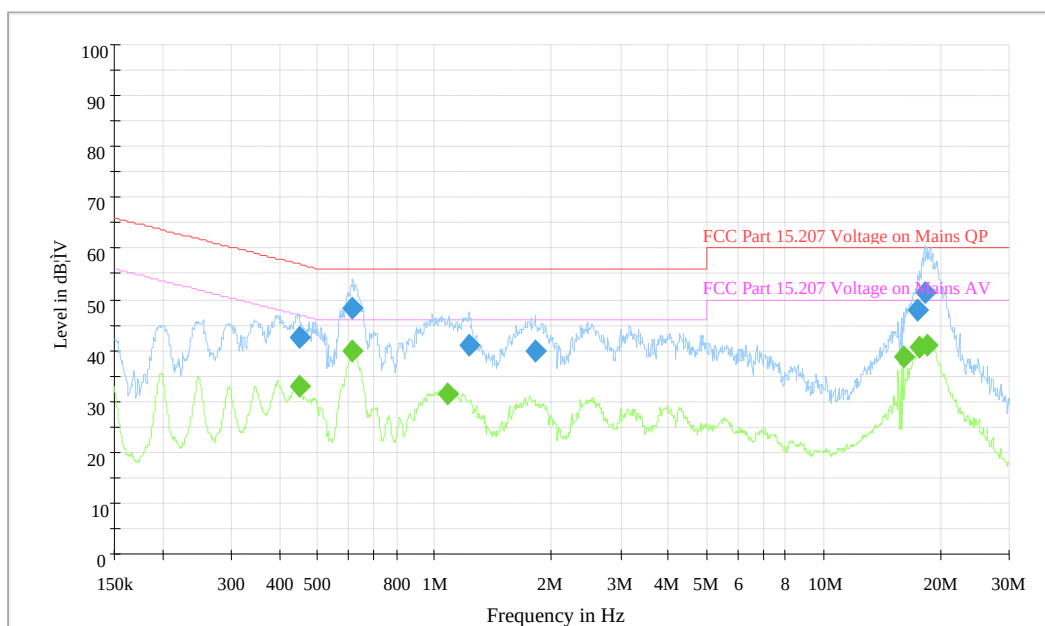
Test Mode: Transmitting

1. Multi-listing 4G Module , Model: LE910-SV1

Adapter 1: API315-1212

Wi-Fi mode

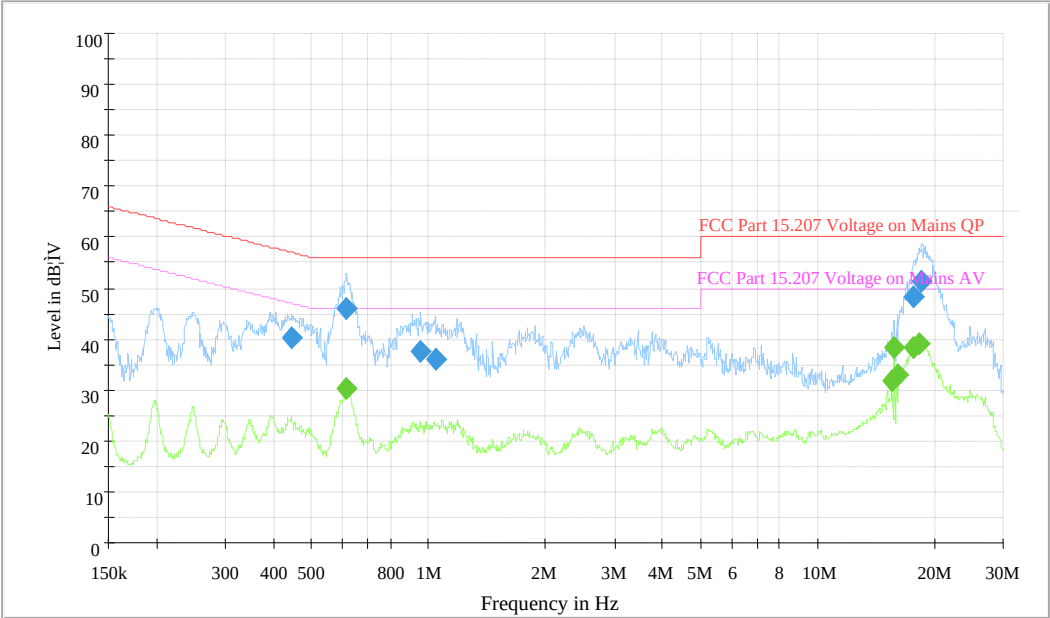
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.447846	42.3	9.000	L1	19.8	14.6	56.9
0.616348	48.4	9.000	L1	19.8	7.6	56.0
1.224685	41.1	9.000	L1	19.7	14.9	56.0
1.818285	39.7	9.000	L1	19.8	16.3	56.0
17.485466	47.7	9.000	L1	20.1	12.3	60.0
18.197610	51.3	9.000	L1	20.1	8.7	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.447846	32.9	9.000	L1	19.8	14.0	46.9
0.613892	39.8	9.000	L1	19.8	6.2	46.0
1.082130	31.3	9.000	L1	19.7	14.7	46.0
16.015317	38.8	9.000	L1	20.1	11.2	50.0
17.625630	40.6	9.000	L1	20.1	9.4	50.0
18.416856	40.9	9.000	L1	20.1	9.1	50.0

AC120 V, 60 Hz, Neutral:

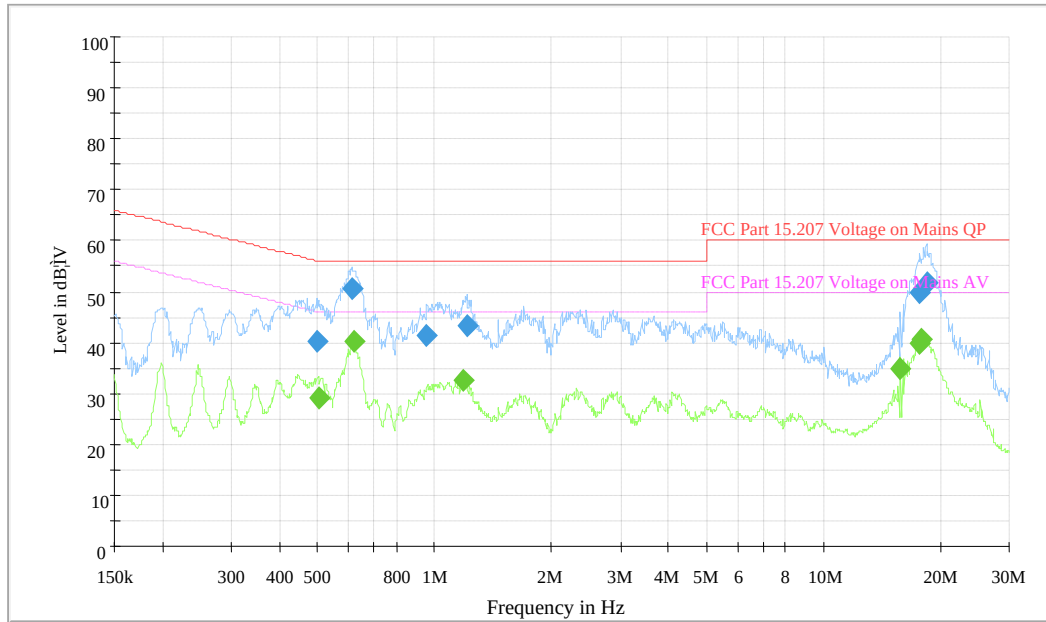


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.446062	40.2	9.000	N	19.5	16.7	56.9
0.616348	45.9	9.000	N	19.5	10.1	56.0
0.956168	37.6	9.000	N	19.5	18.4	56.0
1.039782	36.1	9.000	N	19.5	19.9	56.0
17.625630	48.4	9.000	N	19.9	11.6	60.0
18.564485	51.5	9.000	N	20.0	8.5	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.616348	30.3	9.000	N	19.5	15.7	46.0
15.511930	31.9	9.000	N	19.9	18.1	50.0
15.761614	38.5	9.000	N	19.9	11.5	50.0
16.015317	33.1	9.000	N	19.9	16.9	50.0
17.625630	38.4	9.000	N	19.9	11.6	50.0
18.343482	39.3	9.000	N	19.9	10.7	50.0

Zigbee mode

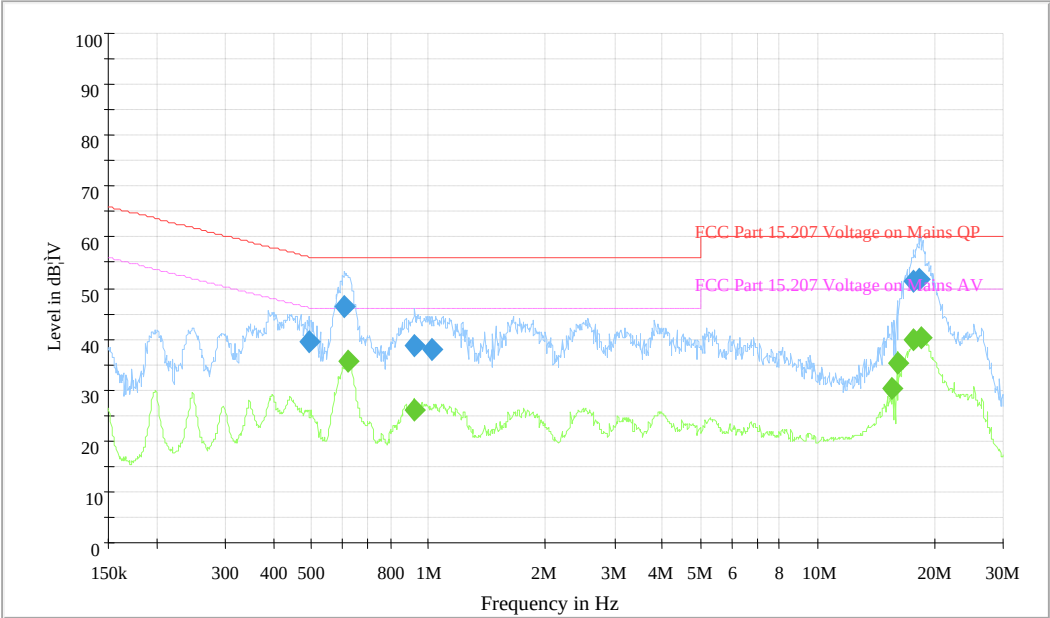
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.498815	40.4	9.000	L1	19.8	15.6	56.0
0.613892	50.4	9.000	L1	19.8	5.6	56.0
0.956168	41.5	9.000	L1	19.8	14.5	56.0
1.210106	43.4	9.000	L1	19.7	12.6	56.0
17.555408	49.9	9.000	L1	20.1	10.1	60.0
18.416856	51.8	9.000	L1	20.1	8.2	60.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.502813	29.0	9.000	L1	19.8	17.0	46.0
0.618813	40.2	9.000	L1	19.8	5.8	46.0
1.186191	32.8	9.000	L1	19.7	13.2	46.0
15.761614	35.0	9.000	L1	20.1	15.0	50.0
17.625630	39.8	9.000	L1	20.1	10.2	50.0
17.837984	40.6	9.000	L1	20.1	9.4	50.0

AC120 V, 60 Hz, Neutral:



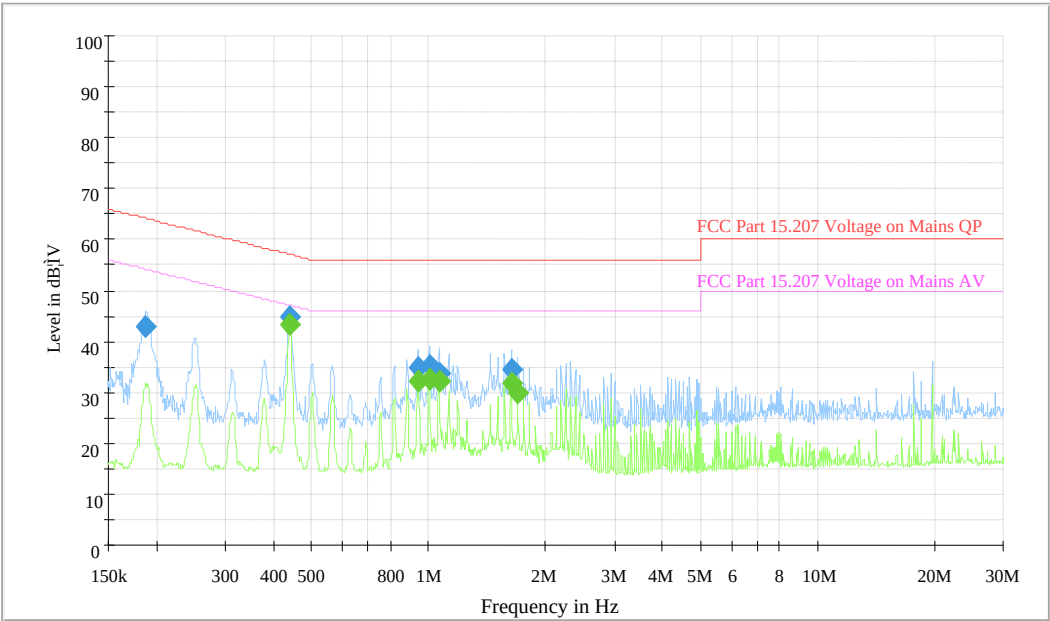
Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.492876	39.4	9.000	N	19.5	16.7	56.1
0.609010	46.3	9.000	N	19.5	9.7	56.0
0.922425	38.9	9.000	N	19.5	17.1	56.0
1.023310	38.0	9.000	N	19.5	18.0	56.0
17.625630	51.2	9.000	N	19.9	8.8	60.0
18.270400	51.8	9.000	N	19.9	8.2	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.618813	35.7	9.000	N	19.5	10.3	46.0
0.915089	26.1	9.000	N	19.5	19.9	46.0
15.573978	30.4	9.000	N	19.9	19.6	50.0
16.015317	35.3	9.000	N	19.9	14.7	50.0
17.625630	39.7	9.000	N	19.9	10.3	50.0
18.416856	40.1	9.000	N	19.9	9.9	50.0

Adapter 2: ZF120A-1203000

Wi-Fi mode

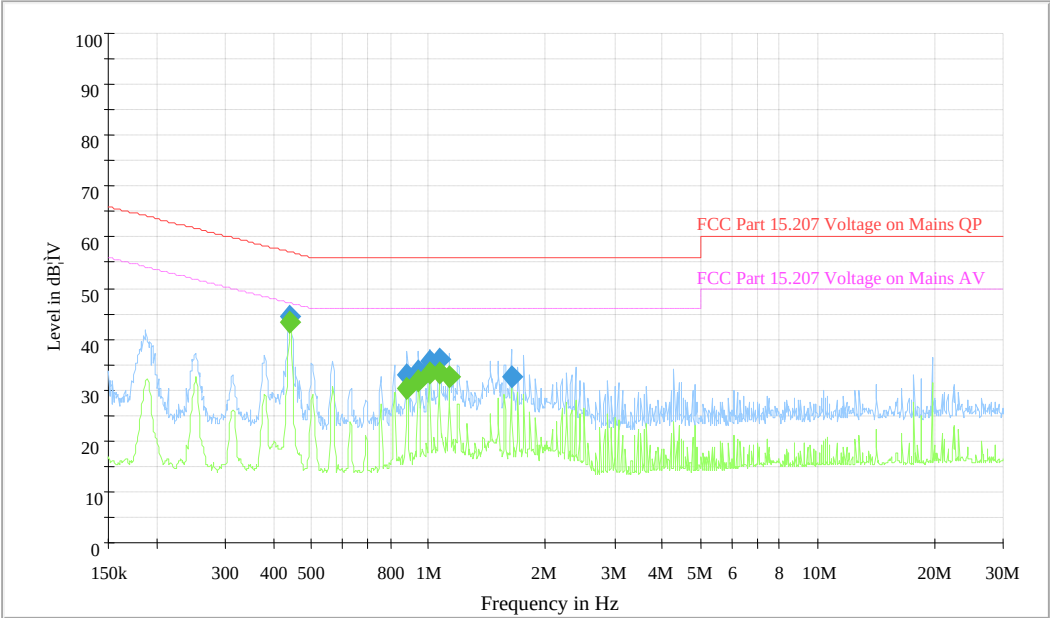
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.187577	42.8	9.000	L1	19.6	21.3	64.1
0.440752	44.9	9.000	L1	19.8	12.1	57.0
0.941021	35.0	9.000	L1	19.8	21.0	56.0
1.003088	35.1	9.000	L1	19.8	20.9	56.0
1.064988	33.9	9.000	L1	19.7	22.1	56.0
1.632495	34.3	9.000	L1	19.8	21.7	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.440752	43.2	9.000	L1	19.8	3.8	47.0
0.941021	32.0	9.000	L1	19.8	14.0	46.0
1.003088	32.4	9.000	L1	19.8	13.6	46.0
1.064988	32.3	9.000	L1	19.7	13.7	46.0
1.632495	31.8	9.000	L1	19.8	14.2	46.0
1.692214	29.7	9.000	L1	19.8	16.3	46.0

AC120 V, 60 Hz, Neutral:

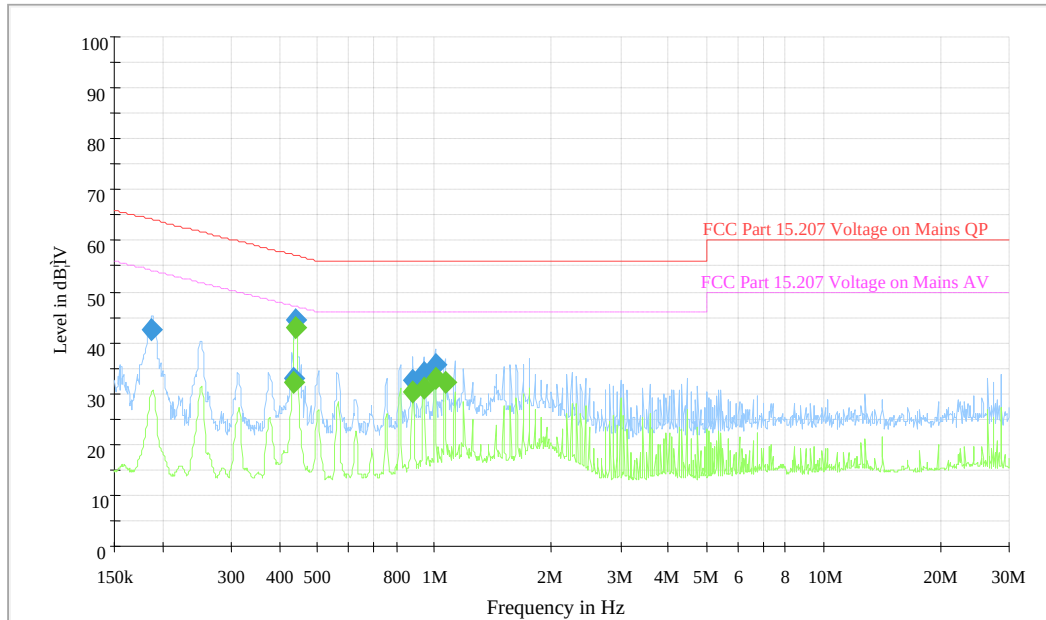


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.440752	44.6	9.000	N	19.5	12.4	57.0
0.879278	33.1	9.000	N	19.5	22.9	56.0
0.941021	33.9	9.000	N	19.5	22.1	56.0
1.007100	35.6	9.000	N	19.5	20.4	56.0
1.069248	35.9	9.000	N	19.5	20.1	56.0
1.632495	32.5	9.000	N	19.5	23.5	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.440752	43.5	9.000	N	19.5	3.6	47.0
0.879278	30.3	9.000	N	19.5	15.7	46.0
0.941021	31.7	9.000	N	19.5	14.3	46.0
1.003088	33.2	9.000	N	19.5	12.8	46.0
1.069248	33.5	9.000	N	19.5	12.5	46.0
1.130707	32.7	9.000	N	19.5	13.3	46.0

Zigbee mode

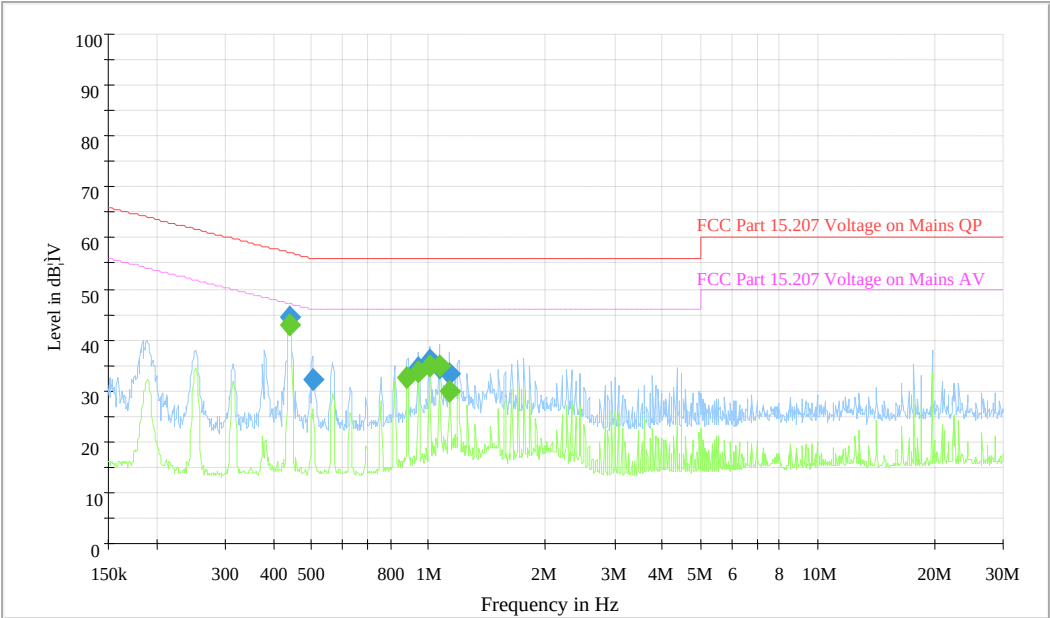
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.187577	42.7	9.000	L1	19.6	21.4	64.1
0.432041	33.1	9.000	L1	19.8	24.1	57.2
0.438996	44.3	9.000	L1	19.8	12.8	57.1
0.875775	32.7	9.000	L1	19.8	23.3	56.0
0.941021	34.0	9.000	L1	19.8	22.0	56.0
1.003088	35.5	9.000	L1	19.8	20.5	56.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.432041	32.0	9.000	L1	19.8	15.2	47.2
0.438996	43.1	9.000	L1	19.8	4.0	47.1
0.875775	30.1	9.000	L1	19.8	15.9	46.0
0.937272	31.1	9.000	L1	19.8	14.9	46.0
1.003088	32.8	9.000	L1	19.8	13.2	46.0
1.064988	32.1	9.000	L1	19.7	13.9	46.0

AC120 V, 60 Hz, Neutral:



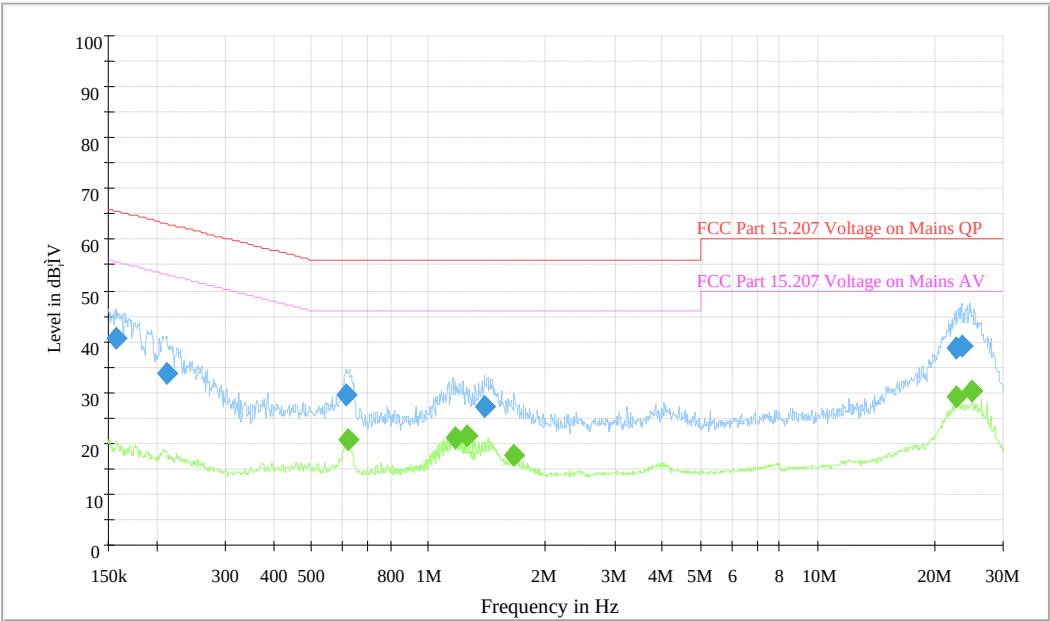
Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.440752	44.5	9.000	N	19.5	12.5	57.0
0.502813	32.1	9.000	N	19.5	23.9	56.0
0.944785	34.5	9.000	N	19.5	21.5	56.0
1.007100	36.0	9.000	N	19.5	20.0	56.0
1.069248	34.7	9.000	N	19.5	21.3	56.0
1.130707	33.2	9.000	N	19.5	22.8	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.440752	42.9	9.000	N	19.5	4.1	47.0
0.879278	32.7	9.000	N	19.5	13.3	46.0
0.944785	33.6	9.000	N	19.5	12.4	46.0
1.007100	34.9	9.000	N	19.5	11.1	46.0
1.069248	35.0	9.000	N	19.5	11.0	46.0
1.130707	29.8	9.000	N	19.5	16.2	46.0

Adapter 3: WT48-1203000-T

Wi-Fi mode

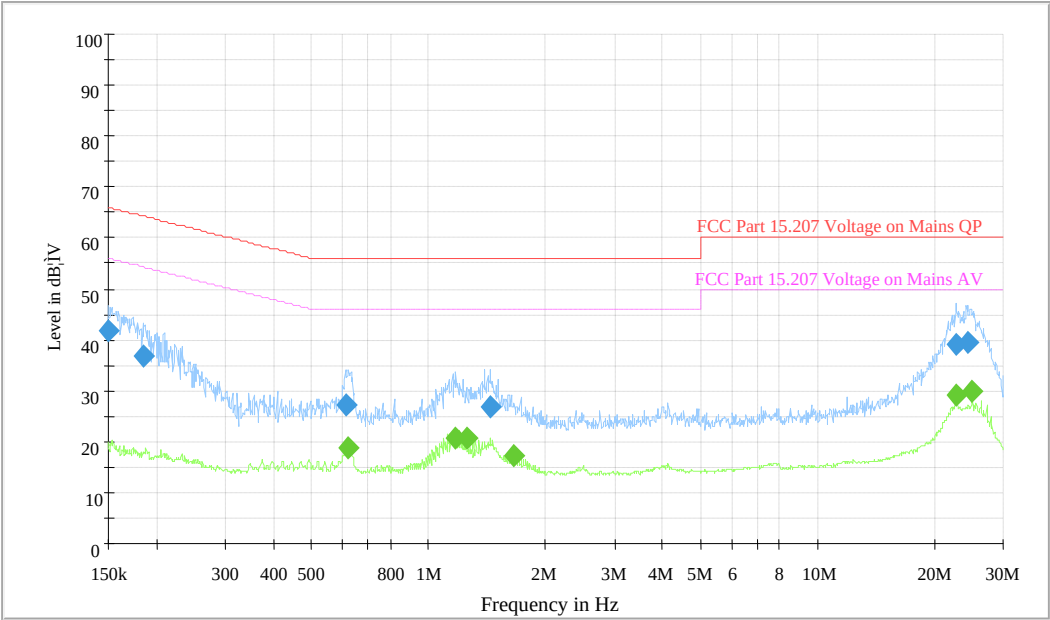
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.156734	40.5	9.000	L1	19.6	25.1	65.6
0.212288	33.7	9.000	L1	19.7	29.4	63.1
0.613892	29.5	9.000	L1	19.8	26.5	56.0
1.391564	27.2	9.000	L1	19.8	28.8	56.0
22.756332	38.8	9.000	L1	20.3	21.2	60.0
23.494811	39.2	9.000	L1	20.3	20.8	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.623774	20.5	9.000	L1	19.8	25.5	46.0
1.176759	21.1	9.000	L1	19.7	24.9	46.0
1.249376	21.4	9.000	L1	19.7	24.6	46.0
1.658772	17.7	9.000	L1	19.8	28.3	46.0
22.756332	29.3	9.000	L1	20.3	20.7	50.0
25.044443	30.2	9.000	L1	20.3	19.8	50.0

AC120 V, 60 Hz, Neutral:

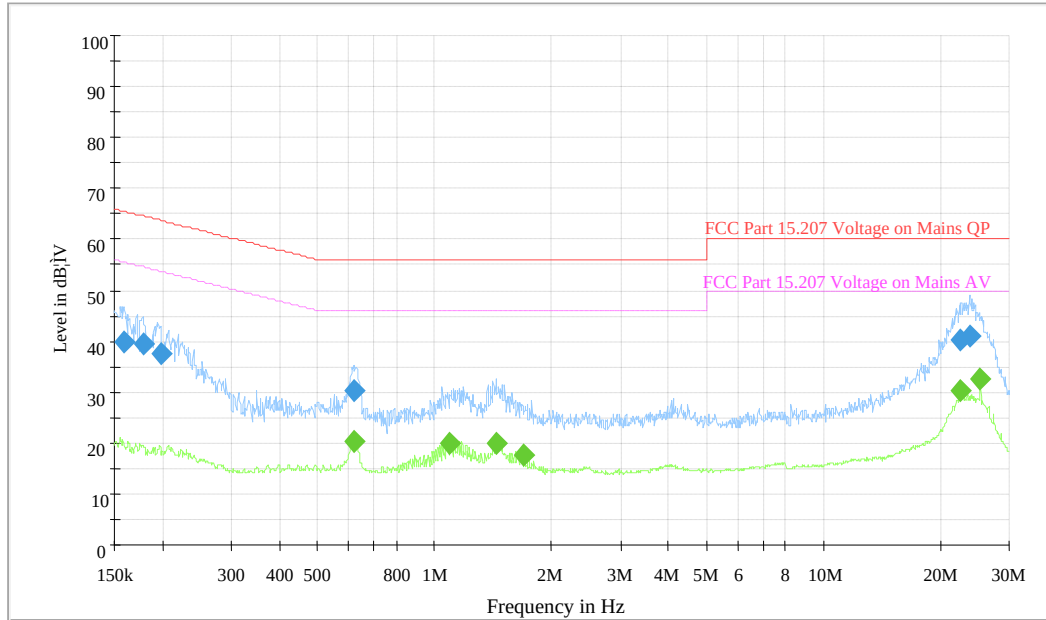


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.150000	41.7	9.000	N	19.5	24.3	66.0
0.183870	36.6	9.000	N	19.5	27.7	64.3
0.611446	27.4	9.000	N	19.5	28.6	56.0
1.442470	26.9	9.000	N	19.5	29.1	56.0
22.756332	38.9	9.000	N	20.1	21.1	60.0
24.354285	39.6	9.000	N	20.1	20.4	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.618813	18.9	9.000	N	19.5	27.1	46.0
1.176759	20.7	9.000	N	19.5	25.3	46.0
1.249376	20.7	9.000	N	19.5	25.3	46.0
1.658772	17.2	9.000	N	19.5	28.8	46.0
22.756332	29.2	9.000	N	20.1	20.8	50.0
24.944664	29.7	9.000	N	20.1	20.3	50.0

Zigbee mode

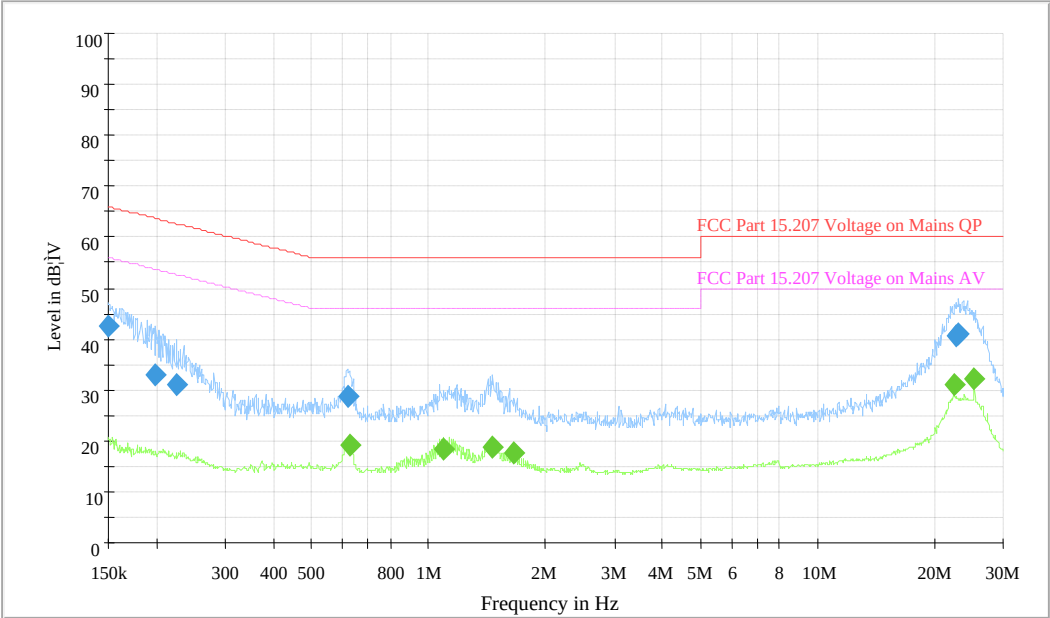
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.158622	39.8	9.000	L1	19.6	25.7	65.5
0.177381	39.6	9.000	L1	19.6	25.0	64.6
0.196781	37.7	9.000	L1	19.6	26.0	63.7
0.621288	30.4	9.000	L1	19.8	25.6	56.0
22.575368	40.1	9.000	L1	20.3	19.9	60.0
23.683146	41.1	9.000	L1	20.3	18.9	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.623774	20.3	9.000	L1	19.8	25.7	46.0
1.095167	20.0	9.000	L1	19.7	26.0	46.0
1.442470	19.8	9.000	L1	19.8	26.2	46.0
1.685472	17.6	9.000	L1	19.8	28.4	46.0
22.485426	30.3	9.000	L1	20.2	19.7	50.0
25.346180	32.4	9.000	L1	20.3	17.6	50.0

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.150000	42.5	9.000	N	19.5	23.5	66.0
0.198359	33.1	9.000	N	19.5	30.6	63.7
0.224490	31.1	9.000	N	19.5	31.6	62.7
0.618813	28.8	9.000	N	19.5	27.2	56.0
22.756332	40.7	9.000	N	20.1	19.3	60.0
23.122624	41.0	9.000	N	20.1	19.0	60.0

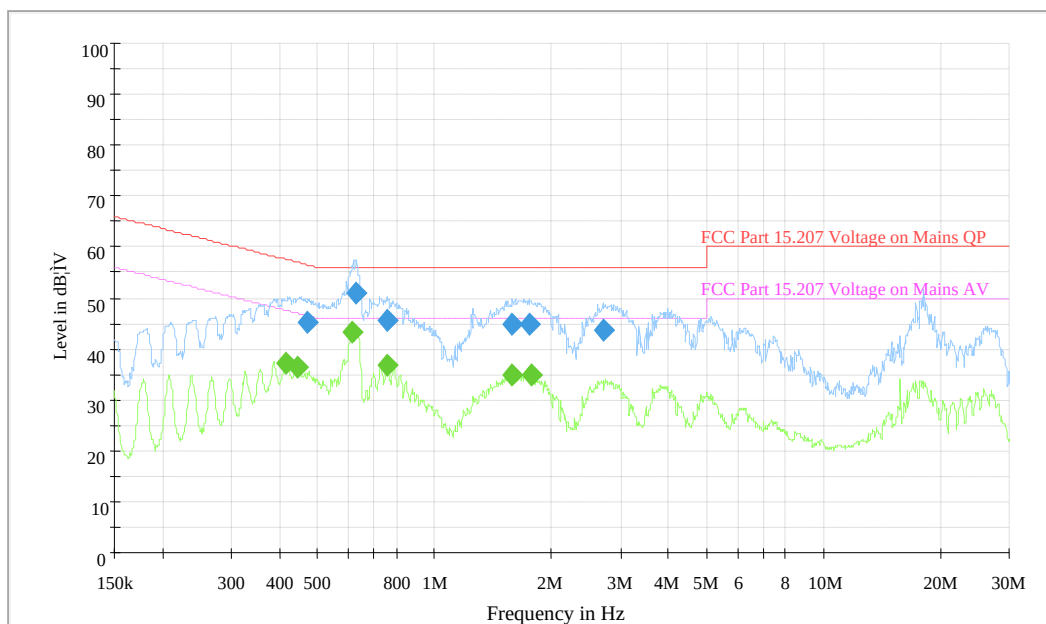
Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.626269	19.1	9.000	N	19.5	26.9	46.0
1.095167	18.5	9.000	N	19.5	27.5	46.0
1.465688	19.0	9.000	N	19.5	27.0	46.0
1.658772	17.7	9.000	N	19.5	28.3	46.0
22.485426	31.0	9.000	N	20.0	19.0	50.0
25.346180	32.0	9.000	N	20.1	18.0	50.0

2. Multi-listing 4G Module , Model: LE910-NA1

Adapter 1: API315-1212

Wi-Fi mode

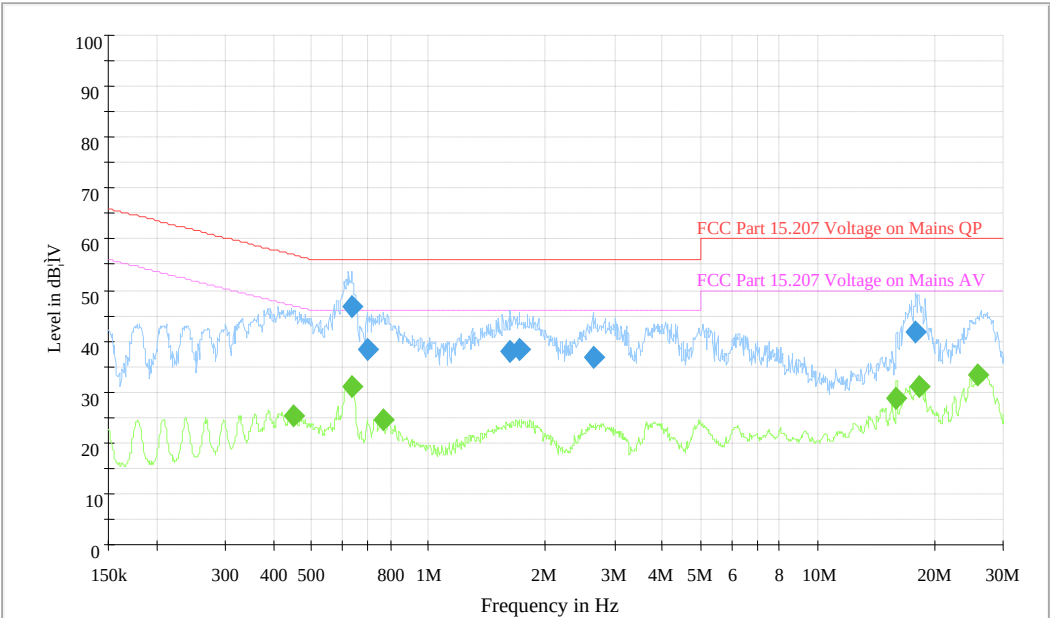
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.471701	45.2	9.000	L1	19.8	11.3	56.5
0.628774	51.1	9.000	L1	19.8	4.9	56.0
0.755519	45.8	9.000	L1	19.7	10.2	56.0
1.587508	44.9	9.000	L1	19.8	11.1	56.0
1.747129	44.8	9.000	L1	19.8	11.2	56.0
2.710400	43.5	9.000	L1	19.9	12.5	56.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.415134	37.0	9.000	L1	19.8	10.5	47.5
0.446062	36.4	9.000	L1	19.8	10.5	46.9
0.613892	43.4	9.000	L1	19.8	2.6	46.0
0.755519	36.8	9.000	L1	19.7	9.2	46.0
1.587508	34.7	9.000	L1	19.8	11.3	46.0
1.768178	34.8	9.000	L1	19.8	11.2	46.0

AC120 V, 60 Hz, Neutral:

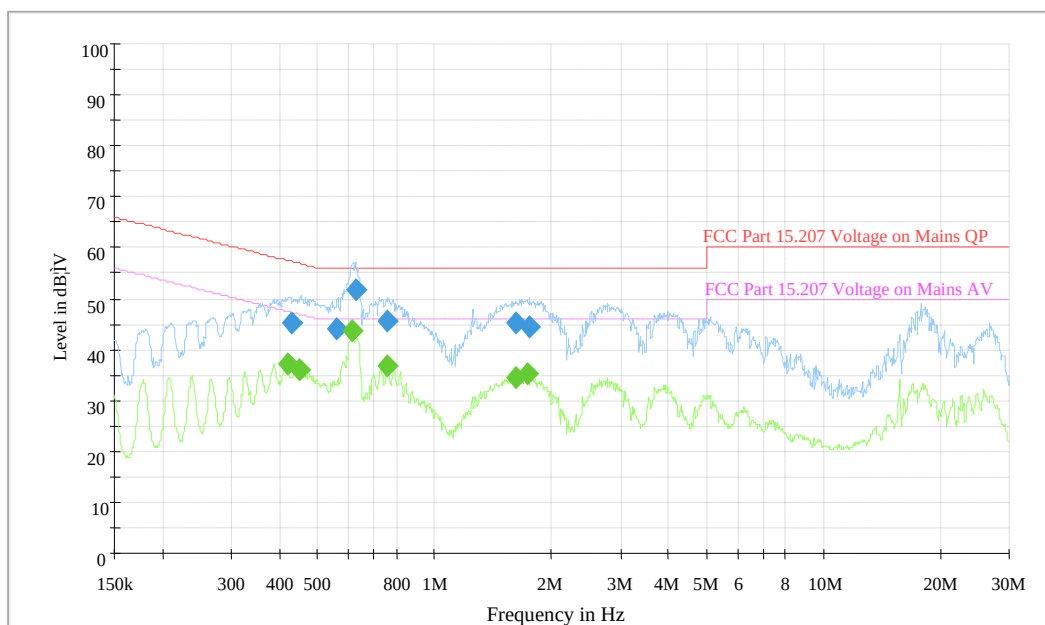


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.633814	46.9	9.000	N	19.5	9.1	56.0
0.694764	38.4	9.000	N	19.5	17.6	56.0
1.625991	37.9	9.000	N	19.5	18.1	56.0
1.712602	38.3	9.000	N	19.5	17.7	56.0
2.646251	36.6	9.000	N	19.6	19.4	56.0
17.909336	41.6	9.000	N	19.9	18.4	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.447846	25.4	9.000	N	19.5	21.5	46.9
0.633814	30.9	9.000	N	19.5	15.1	46.0
0.761575	24.5	9.000	N	19.5	21.5	46.0
15.951511	28.6	9.000	N	19.9	21.4	50.0
18.197610	31.2	9.000	N	19.9	18.8	50.0
25.960604	33.2	9.000	N	20.1	16.8	50.0

Zigbee mode

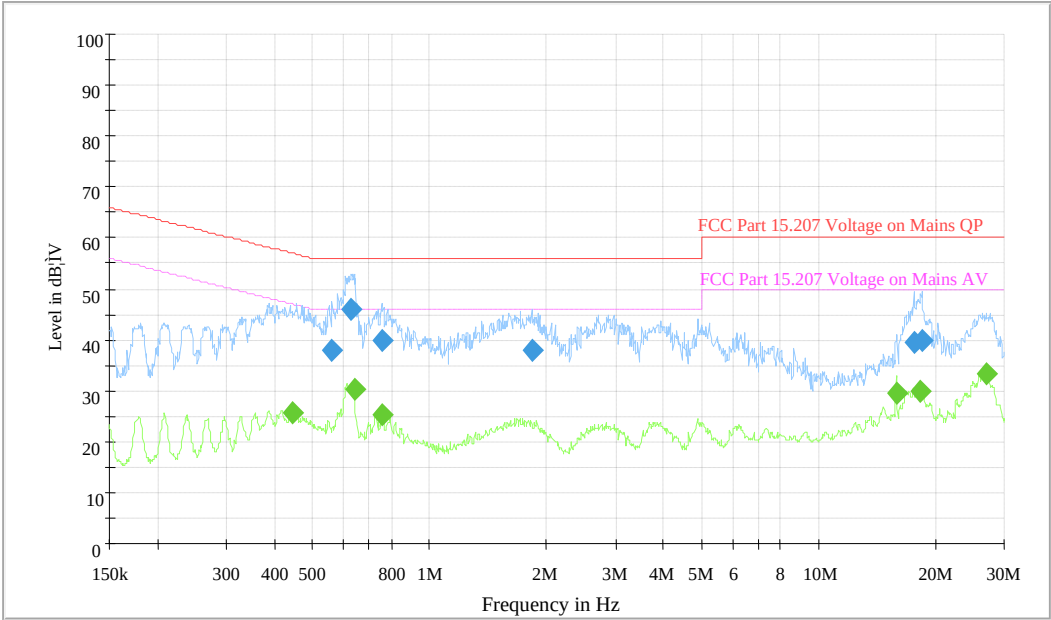
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.426898	45.0	9.000	L1	19.8	12.3	57.3
0.562277	44.0	9.000	L1	19.8	12.0	56.0
0.626269	51.8	9.000	L1	19.8	4.2	56.0
0.758541	45.6	9.000	L1	19.7	10.4	56.0
1.619513	45.0	9.000	L1	19.8	11.0	56.0
1.754117	44.6	9.000	L1	19.8	11.4	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.416795	37.0	9.000	L1	19.8	10.5	47.5
0.447846	36.1	9.000	L1	19.8	10.8	46.9
0.613892	43.5	9.000	L1	19.8	2.5	46.0
0.758541	36.7	9.000	L1	19.7	9.3	46.0
1.613061	34.6	9.000	L1	19.8	11.4	46.0
1.733235	35.1	9.000	L1	19.8	10.9	46.0

AC120 V, 60 Hz, Neutral:



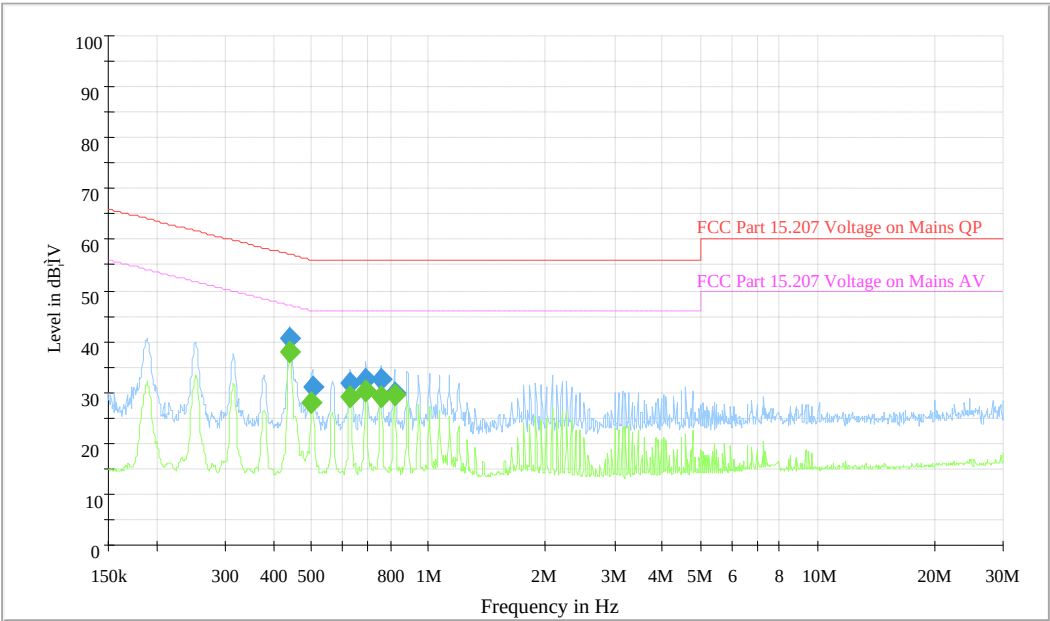
Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.562277	37.9	9.000	N	19.5	18.1	56.0
0.628774	46.1	9.000	N	19.5	9.9	56.0
0.752509	40.0	9.000	N	19.5	16.0	56.0
1.832861	37.9	9.000	N	19.5	18.1	56.0
17.555408	39.5	9.000	N	19.9	20.5	60.0
18.490523	40.0	9.000	N	20.0	20.0	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.442515	25.7	9.000	N	19.5	21.3	47.0
0.638895	30.3	9.000	N	19.5	15.7	46.0
0.758541	25.1	9.000	N	19.5	20.9	46.0
15.824660	29.7	9.000	N	19.9	20.3	50.0
18.343482	30.1	9.000	N	19.9	19.9	50.0
26.910279	33.2	9.000	N	20.1	16.8	50.0

Adapter 2: ZF120A-1203000

Wi-Fi mode

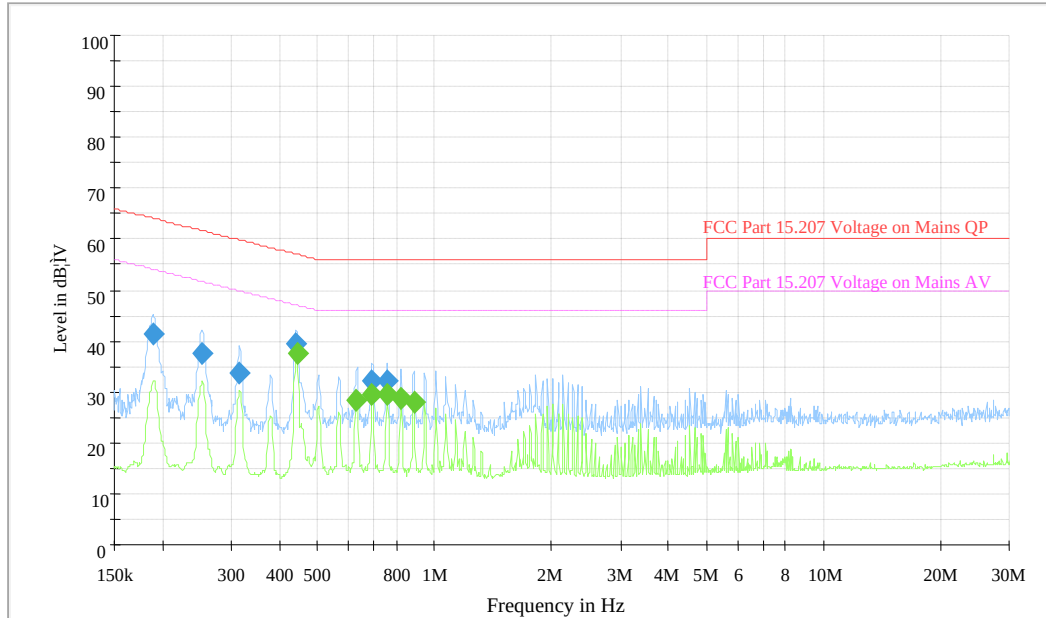
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.440752	40.7	9.000	L1	19.8	16.3	57.0
0.502813	30.9	9.000	L1	19.8	25.1	56.0
0.628774	31.8	9.000	L1	19.8	24.2	56.0
0.691996	32.6	9.000	L1	19.8	23.4	56.0
0.755519	32.5	9.000	L1	19.7	23.5	56.0
0.815053	29.9	9.000	L1	19.7	26.1	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.440752	37.8	9.000	L1	19.8	9.2	47.0
0.500810	28.1	9.000	L1	19.8	17.9	46.0
0.628774	29.0	9.000	L1	19.8	17.0	46.0
0.691996	30.2	9.000	L1	19.8	15.8	46.0
0.752509	29.0	9.000	L1	19.7	17.0	46.0
0.818313	29.4	9.000	L1	19.7	16.6	46.0

AC120 V, 60 Hz, Neutral:

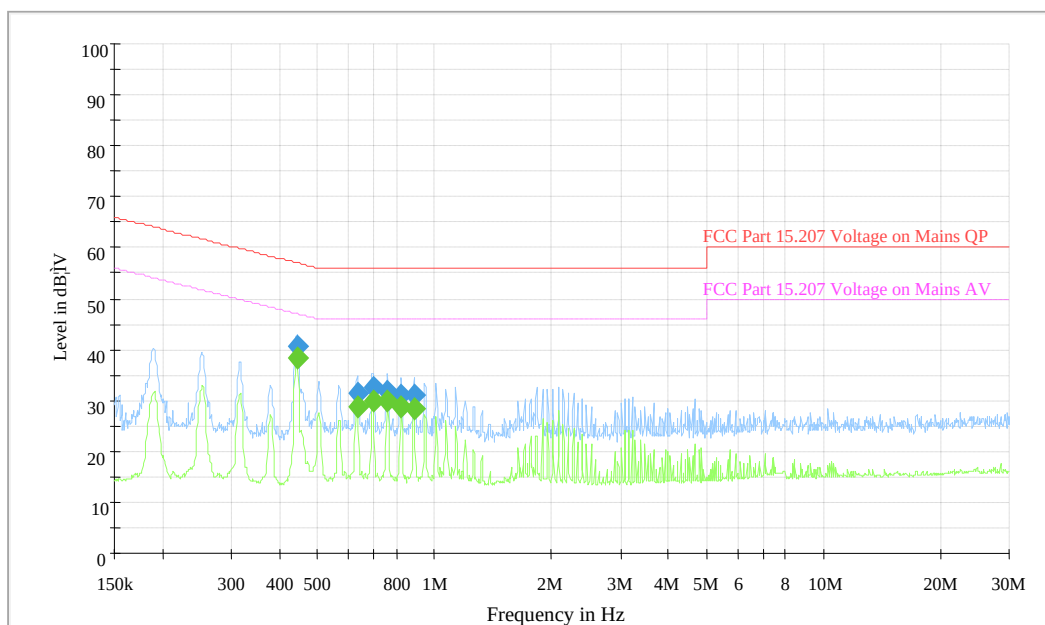


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.189081	41.2	9.000	N	19.5	22.9	64.1
0.251039	37.7	9.000	N	19.5	24.0	61.7
0.315183	33.7	9.000	N	19.5	26.1	59.8
0.440752	39.6	9.000	N	19.5	17.4	57.0
0.691996	32.1	9.000	N	19.5	23.9	56.0
0.755519	32.3	9.000	N	19.5	23.7	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.442515	37.6	9.000	N	19.5	9.4	47.0
0.628774	28.2	9.000	N	19.5	17.8	46.0
0.691996	29.4	9.000	N	19.5	16.6	46.0
0.755519	29.5	9.000	N	19.5	16.5	46.0
0.818313	28.6	9.000	N	19.5	17.4	46.0
0.882795	27.9	9.000	N	19.5	18.1	46.0

Zigbee mode

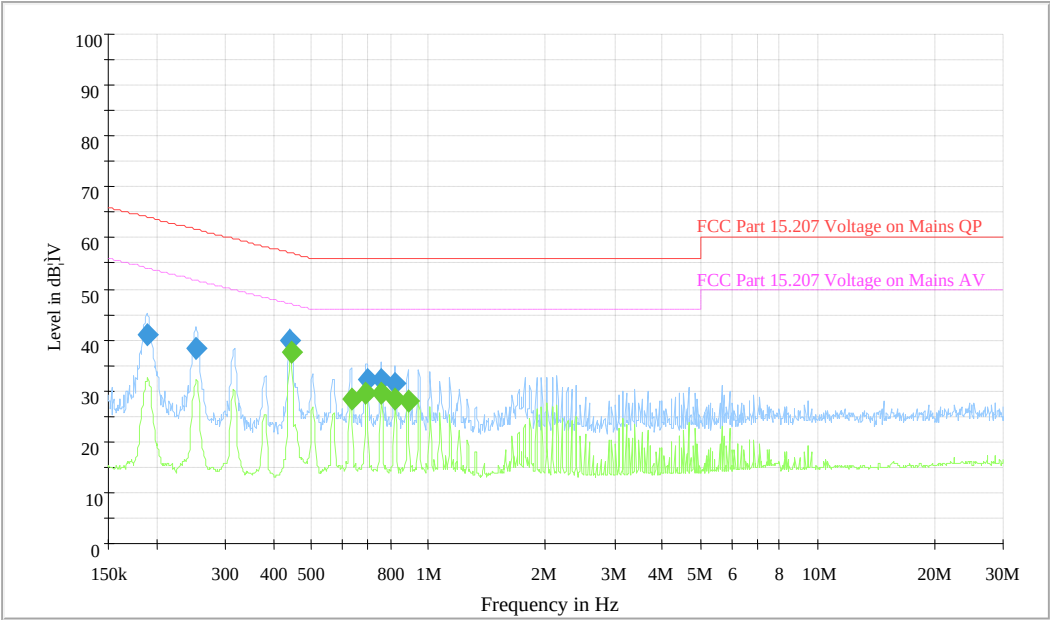
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.442515	40.7	9.000	L1	19.8	16.3	57.0
0.631289	31.6	9.000	L1	19.8	24.4	56.0
0.694764	32.5	9.000	L1	19.8	23.5	56.0
0.758541	31.9	9.000	L1	19.7	24.1	56.0
0.821586	31.2	9.000	L1	19.7	24.8	56.0
0.882795	30.9	9.000	L1	19.8	25.1	56.0

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBμV)
0.442515	38.4	9.000	L1	19.8	8.6	47.0
0.631289	28.7	9.000	L1	19.8	17.3	46.0
0.694764	29.7	9.000	L1	19.8	16.3	46.0
0.755519	29.9	9.000	L1	19.7	16.1	46.0
0.818313	28.6	9.000	L1	19.7	17.4	46.0
0.882795	28.2	9.000	L1	19.8	17.8	46.0

AC120 V, 60 Hz, Neutral:



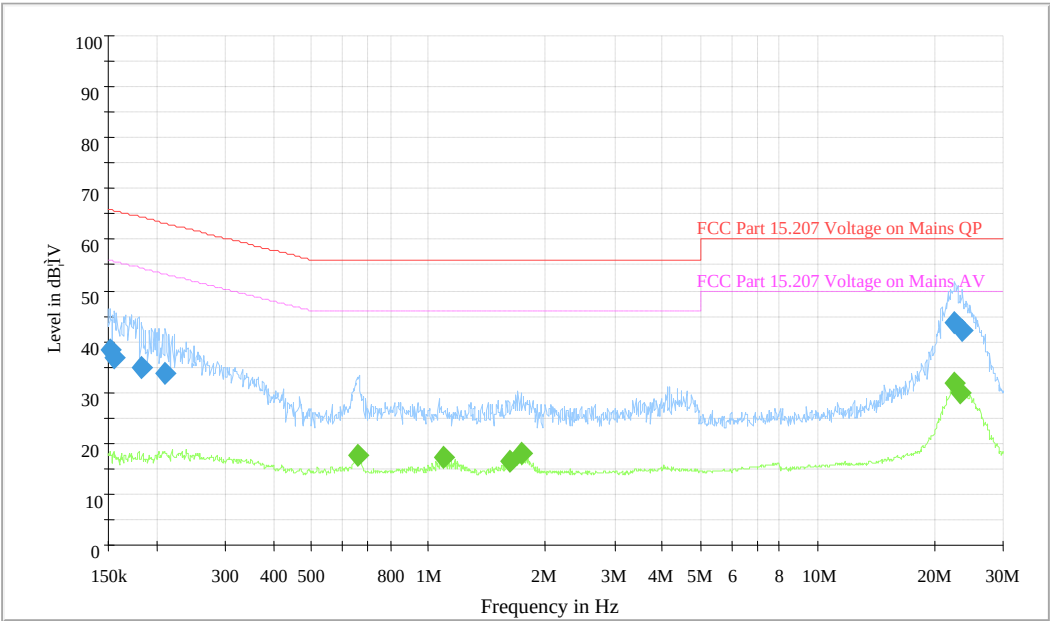
Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.189081	41.1	9.000	N	19.5	23.0	64.1
0.252043	38.2	9.000	N	19.5	23.5	61.7
0.440752	39.7	9.000	N	19.5	17.3	57.0
0.694764	32.2	9.000	N	19.5	23.8	56.0
0.755519	32.2	9.000	N	19.5	23.8	56.0
0.818313	31.3	9.000	N	19.5	24.7	56.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.442515	37.5	9.000	N	19.5	9.5	47.0
0.631289	28.4	9.000	N	19.5	17.6	46.0
0.691996	29.5	9.000	N	19.5	16.5	46.0
0.755519	29.6	9.000	N	19.5	16.4	46.0
0.818313	28.4	9.000	N	19.5	17.6	46.0
0.882795	28.0	9.000	N	19.5	18.0	46.0

Adapter 3: WT48-1203000-T

Wi-Fi mode

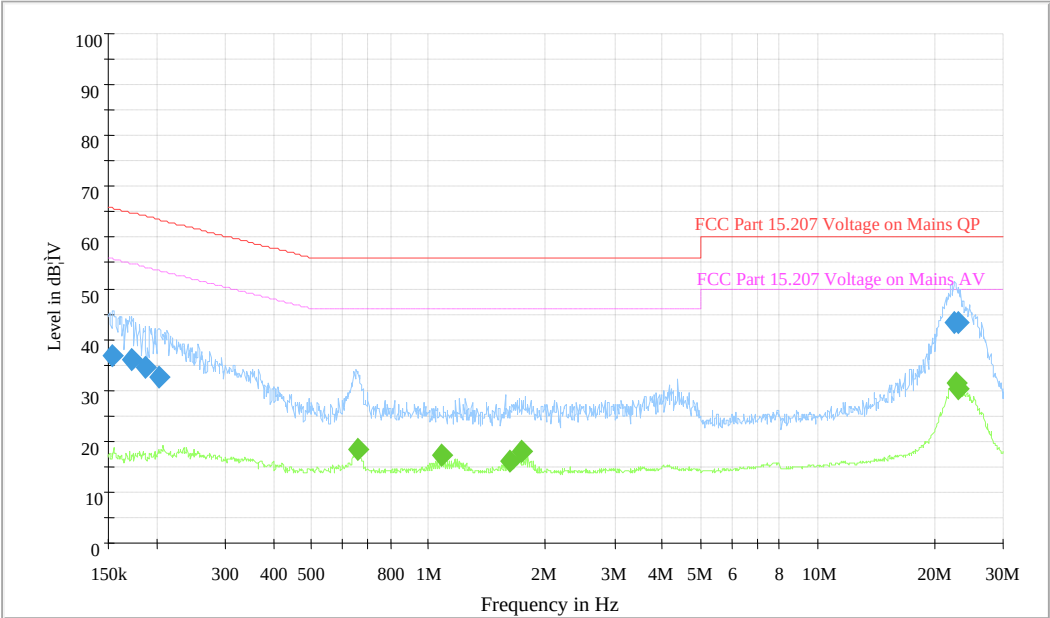
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.151807	38.3	9.000	L1	19.6	27.6	65.9
0.156109	36.6	9.000	L1	19.6	29.1	65.7
0.182408	34.8	9.000	L1	19.6	29.6	64.4
0.210599	33.8	9.000	L1	19.7	29.4	63.2
22.575368	43.6	9.000	L1	20.3	16.4	60.0
23.588791	42.0	9.000	L1	20.3	18.0	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.657000	17.5	9.000	L1	19.8	28.5	46.0
1.095167	17.1	9.000	L1	19.7	28.9	46.0
1.613061	16.5	9.000	L1	19.8	29.5	46.0
1.733235	17.9	9.000	L1	19.8	28.1	46.0
22.575368	31.6	9.000	L1	20.3	18.4	50.0
23.215114	29.9	9.000	L1	20.3	20.1	50.0

AC120 V, 60 Hz, Neutral:

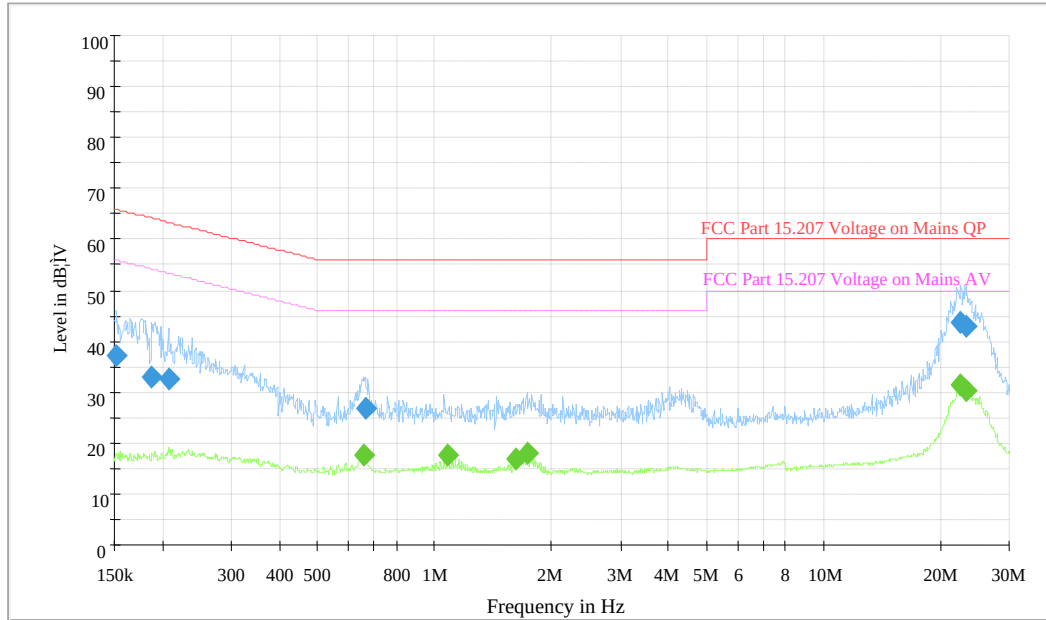


Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.154251	36.9	9.000	N	19.5	28.9	65.8
0.172493	35.9	9.000	N	19.5	28.9	64.8
0.186830	34.4	9.000	N	19.5	29.8	64.2
0.201552	32.5	9.000	N	19.5	31.0	63.5
22.575368	43.4	9.000	N	20.0	16.6	60.0
23.122624	43.2	9.000	N	20.1	16.8	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.657000	18.2	9.000	N	19.5	27.8	46.0
1.082130	17.2	9.000	N	19.5	28.8	46.0
1.613061	16.2	9.000	N	19.5	29.8	46.0
1.733235	17.9	9.000	N	19.5	28.1	46.0
22.665669	31.3	9.000	N	20.0	18.7	50.0
23.030502	30.4	9.000	N	20.1	19.6	50.0

Zigbee mode

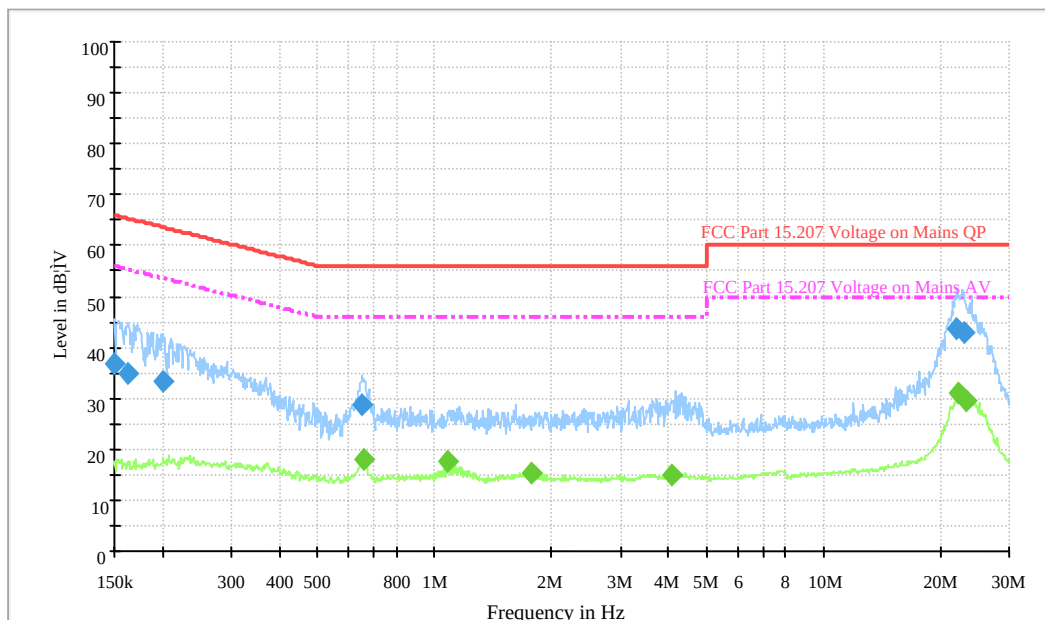
AC120 V, 60 Hz, Line:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.152415	37.2	9.000	L1	19.6	28.7	65.9
0.187577	33.1	9.000	L1	19.6	31.0	64.1
0.206437	32.5	9.000	L1	19.7	30.8	63.3
0.662266	26.8	9.000	L1	19.8	29.2	56.0
22.575368	43.5	9.000	L1	20.3	16.5	60.0
23.215114	43.0	9.000	L1	20.3	17.0	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.659628	17.7	9.000	L1	19.8	28.3	46.0
1.082130	17.6	9.000	L1	19.7	28.4	46.0
1.613061	16.9	9.000	L1	19.8	29.1	46.0
1.733235	17.9	9.000	L1	19.8	28.1	46.0
22.575368	31.5	9.000	L1	20.3	18.5	50.0
23.215114	30.1	9.000	L1	20.3	19.9	50.0

AC120 V, 60 Hz, Neutral:



Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.150600	36.9	9.000	N	19.5	29.1	66.0
0.163117	34.7	9.000	N	19.5	30.6	65.3
0.199152	33.2	9.000	N	19.5	30.4	63.6
0.651775	28.7	9.000	N	19.5	27.3	56.0
22.041064	43.8	9.000	N	20.0	16.2	60.0
23.030502	42.7	9.000	N	20.1	17.3	60.0

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corrected Factor (dB)	Margin (dB)	Limit (dBµV)
0.657000	18.2	9.000	N	19.5	27.8	46.0
1.082130	17.8	9.000	N	19.5	28.2	46.0
1.782352	15.4	9.000	N	19.5	30.6	46.0
4.088893	15.1	9.000	N	19.7	30.9	46.0
22.306616	30.9	9.000	N	20.0	19.1	50.0
23.215114	29.7	9.000	N	20.1	20.3	50.0

Note:

- 1) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

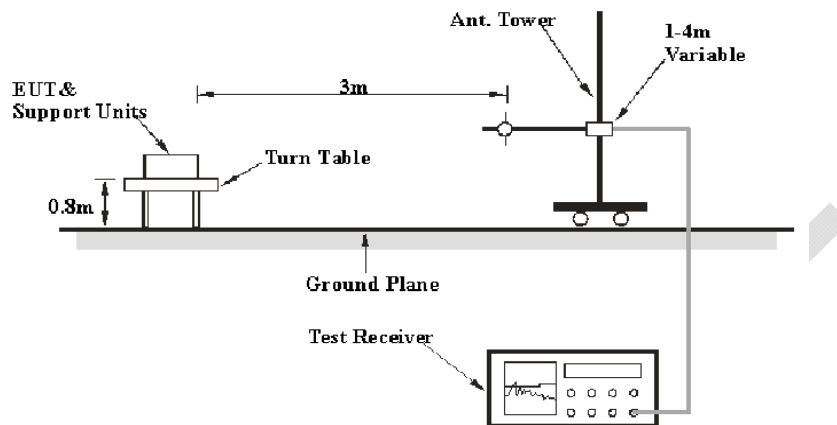
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

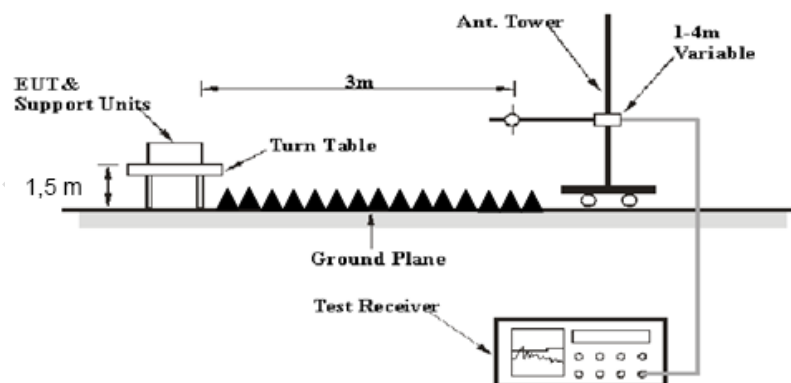
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1GHz:



Above 1GHz:



The 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 15.209, and FCC 15.247 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 25 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	1MHz	PK
	1MHz	3 MHz	1MHz	AV

Test Procedure

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Scan with X-Axis, Y-Axis and Z-Axis position to explore the highest emission level and the worst case was recorded.

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Data

Environmental Conditions

Temperature:	21 °C
Relative Humidity:	47 %
ATM Pressure:	95.8 kPa

The testing was performed by Tom Tang on 2018-01-06.

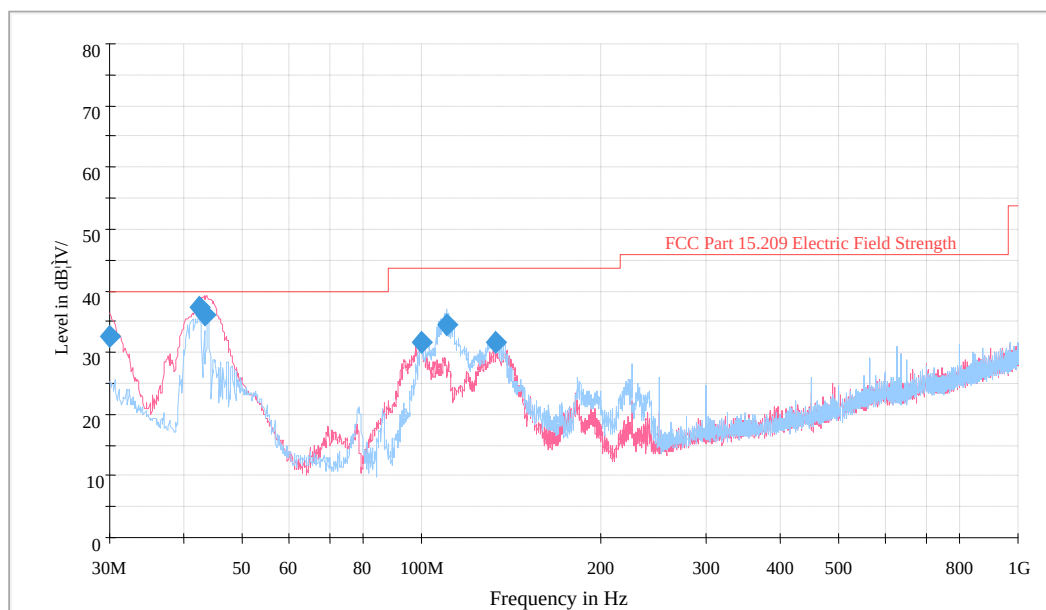
Test Mode: Transmitting

1. Multi-listing 4G Module , Model: LE910-SV1

Below 1GHz

Adapter 1: API315-1212

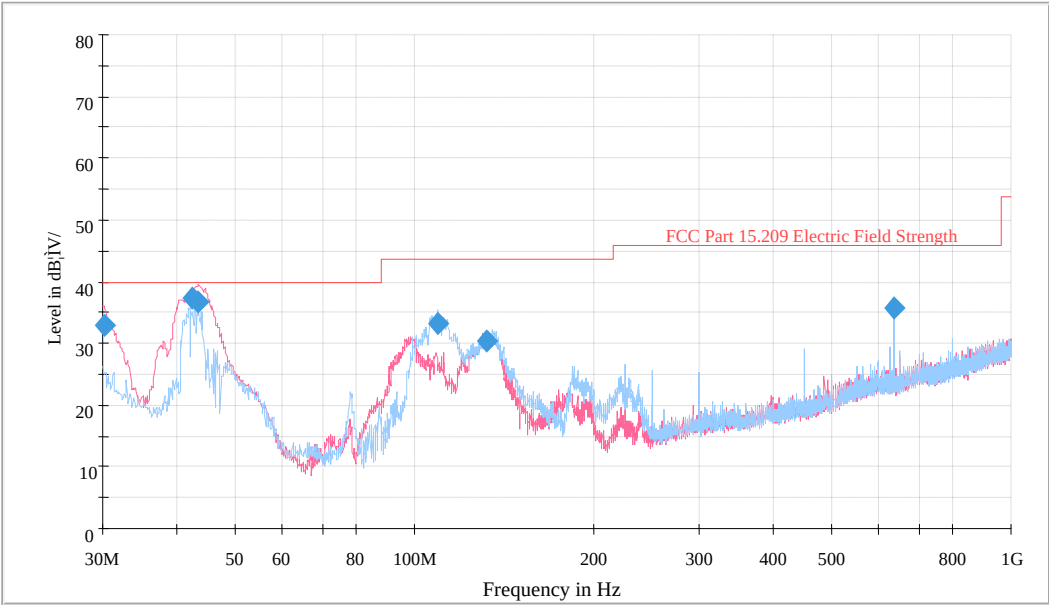
Wi-Fi mode



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
30.000000	32.9	120.000	100.0	V	115.0	-4.8	7.1	40.0
42.488750	37.2	120.000	113.0	V	206.0	-12.8	*2.8	40.0
43.216250	36.2	120.000	100.0	V	190.0	-13.2	*3.8	40.0
99.718750	32.6	120.000	125.0	V	297.0	-15.8	10.9	43.5
110.510000	34.9	120.000	149.0	H	274.0	-12.6	8.6	43.5
133.426250	33.7	120.000	100.0	H	56.0	-10.7	9.8	43.5

* Within Measurement Uncertainty.

Zigbee mode

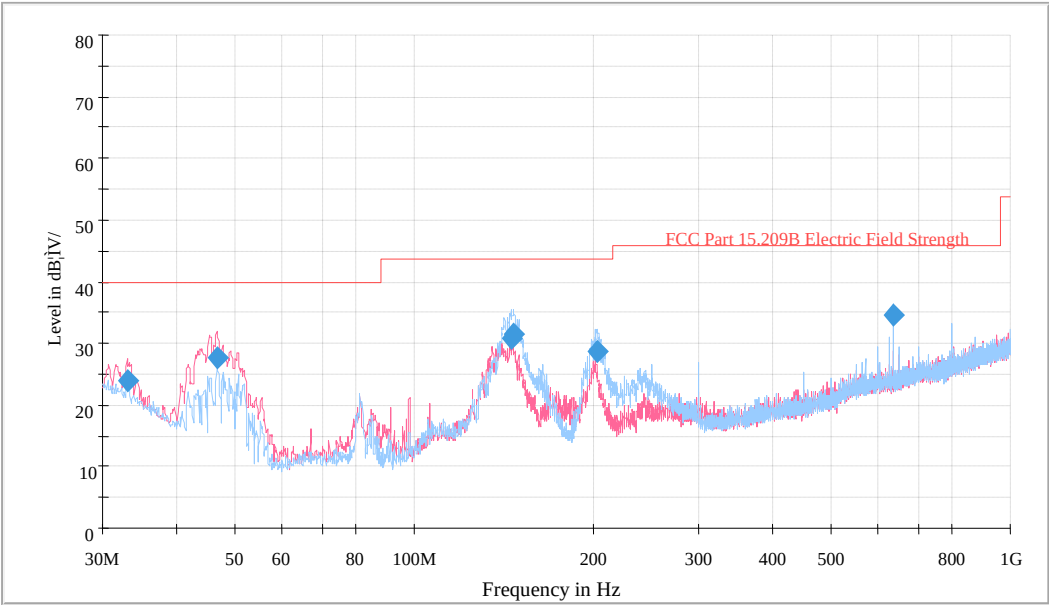


Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
30.121250	33.9	120.000	100.0	V	90.0	-4.9	6.1	40.0
42.488750	37.2	120.000	115.0	V	157.0	-12.8	*2.8	40.0
43.458750	36.9	120.000	101.0	V	115.0	-13.4	*3.1	40.0
109.661250	34.1	120.000	149.0	H	282.0	-12.8	9.4	43.5
132.092500	30.2	120.000	101.0	V	359.0	-10.7	13.3	43.5
637.583750	35.2	120.000	149.0	H	240.0	-4.3	10.8	46.0

* Within Measurement Uncertainty.

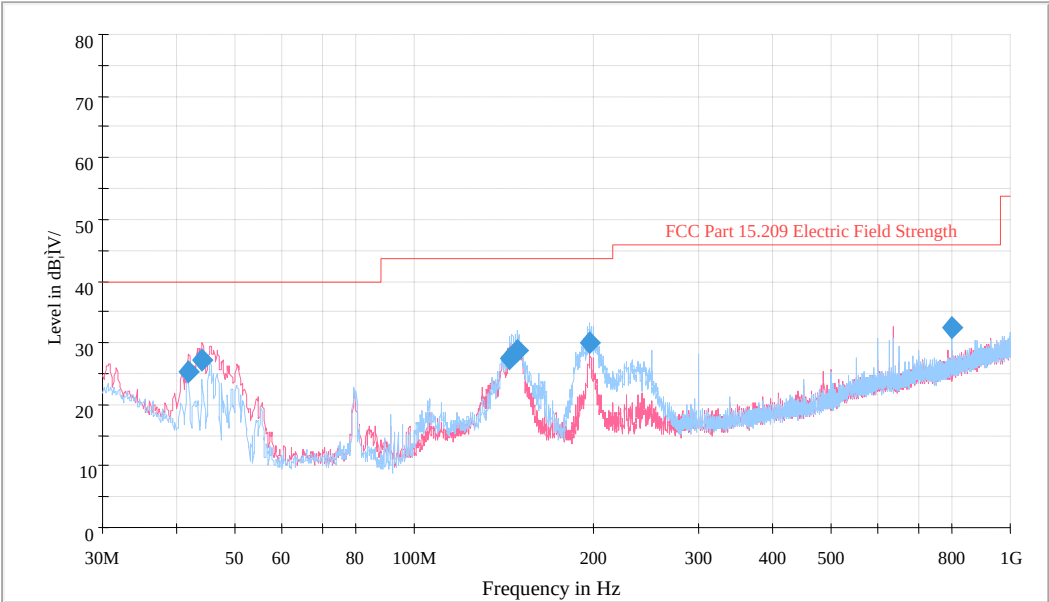
Adapter 2: ZF120A-1203000

Wi-Fi mode



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
33.031250	24.4	120.000	100.0	V	41.0	-6.9	15.6	40.0
46.611250	27.5	120.000	120.0	V	32.0	-15.1	12.5	40.0
145.187500	30.6	120.000	149.0	H	244.0	-10.9	12.9	43.5
147.006250	31.5	120.000	149.0	H	244.0	-11.0	12	43.5
203.266250	28.4	120.000	149.0	H	244.0	-12.7	15.1	43.5
637.462500	34.4	120.000	149.0	H	196.0	-4.3	11.6	46.0

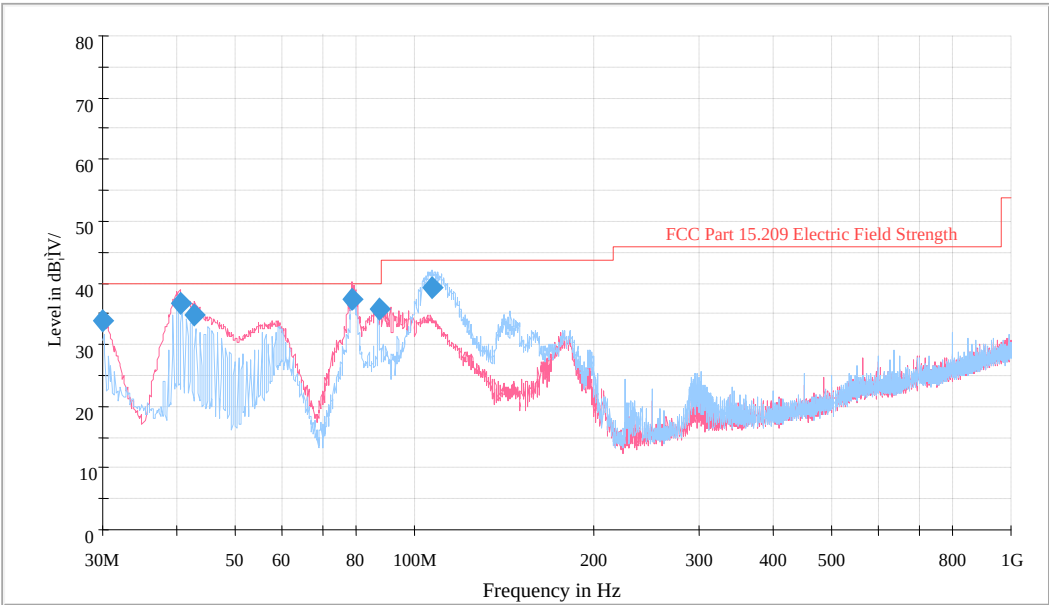
Zigbee mode



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
41.882500	25.2	120.000	115.0	V	218.0	-12.4	14.8	40.0
44.186250	27.4	120.000	121.0	V	60.0	-13.8	12.6	40.0
144.945000	26.9	120.000	148.0	H	216.0	-10.9	16.6	43.5
149.310000	28.8	120.000	148.0	H	216.0	-11.3	14.7	43.5
196.597500	30.1	120.000	101.0	H	257.0	-12.4	13.4	43.5
800.058750	33.4	120.000	101.0	H	286.0	-1.8	12.6	46.0

Adapter 3: WT48-1203000-T

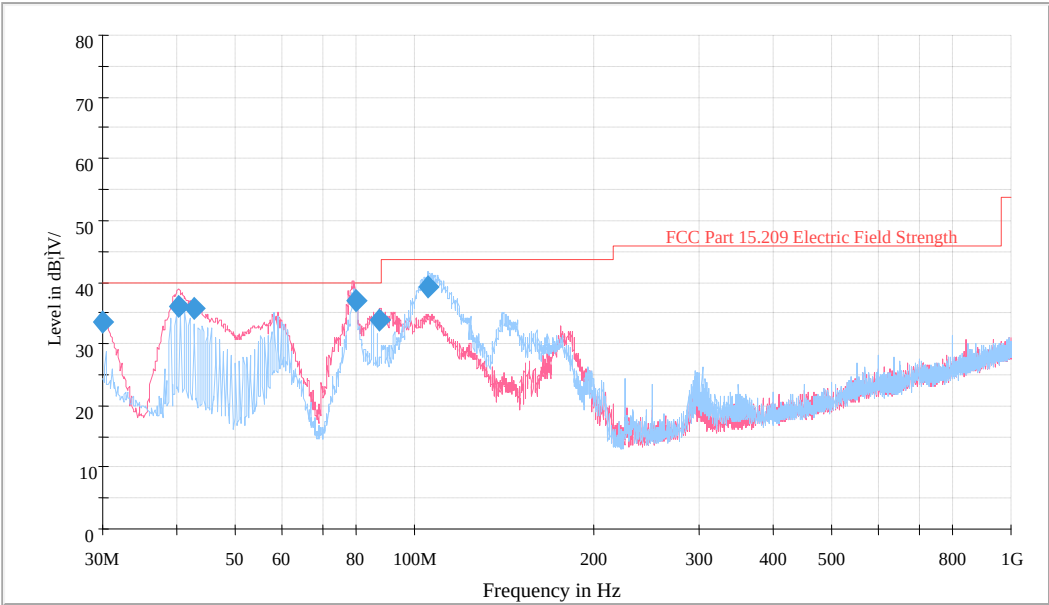
Wi-Fi mode



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
30.000000	34.7	120.000	100.0	V	90.0	-4.8	5.3	40.0
40.427500	36.9	120.000	115.0	V	189.0	-11.5	*3.1	40.0
42.852500	34.7	120.000	100.0	V	156.0	-13.0	5.3	40.0
78.742500	37.4	120.000	101.0	V	239.0	-16.7	*2.6	40.0
87.108750	35.9	120.000	150.0	V	263.0	-17.3	*4.1	40.0
106.751250	39.2	120.000	149.0	H	257.0	-13.6	*4.3	43.5

* Within Measurement Uncertainty.

Zigbee mode



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
30.000000	34.6	120.000	100.0	V	64.0	-4.8	5.4	40.0
40.185000	36.8	120.000	110.0	V	198.0	-11.3	*3.2	40.0
42.852500	36.2	120.000	100.0	V	165.0	-13.0	*3.8	40.0
78.985000	37.4	120.000	100.0	V	174.0	-16.7	*2.6	40.0
87.593750	34.2	120.000	149.0	V	145.0	-17.3	5.8	40.0
105.417500	40.8	120.000	149.0	H	265.0	-14.0	*2.7	43.5

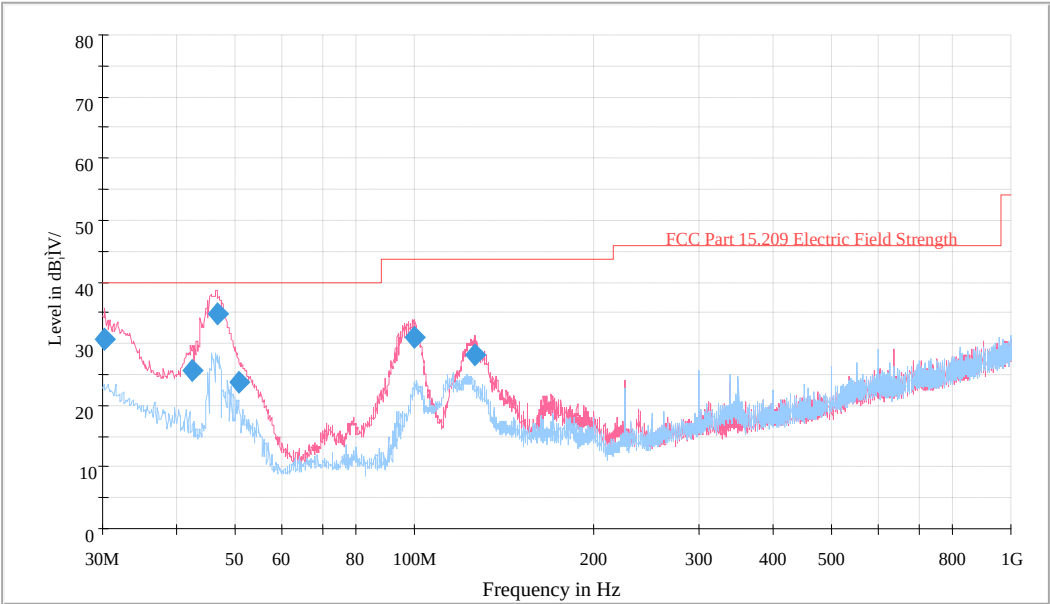
* Within Measurement Uncertainty.

2. Multi-listing 4G Module, Model: LE910-NA1

Below 1GHz

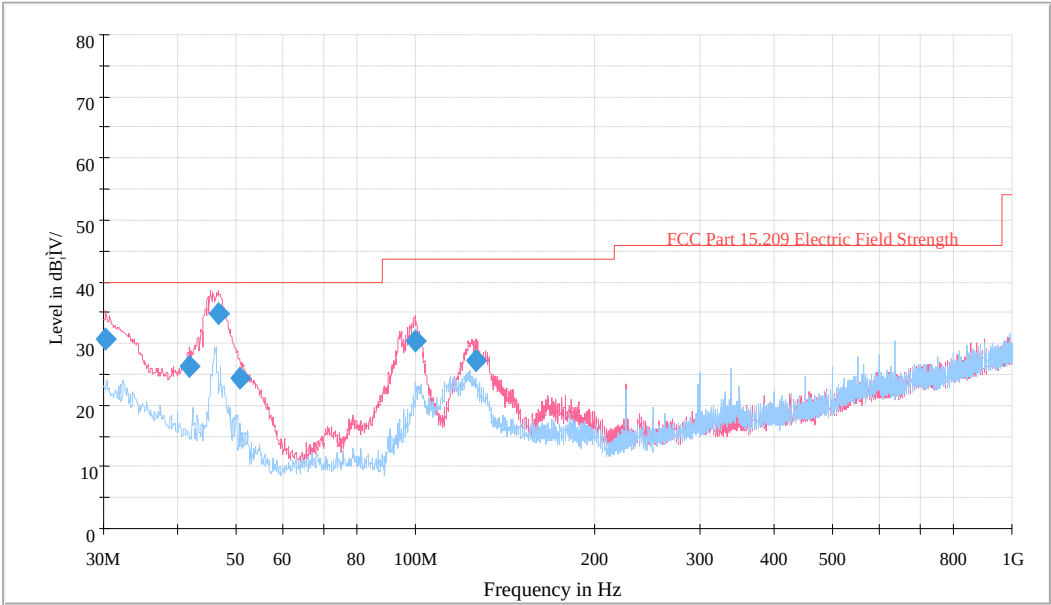
Adapter 1: API315-1212

Wifi mode



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
30.242500	30.6	120.000	102.0	V	131.0	-4.9	9.4	40.0
42.488750	25.8	120.000	108.0	V	217.0	-12.8	14.2	40.0
46.611250	34.6	120.000	138.0	V	241.0	-15.1	5.4	40.0
50.976250	22.9	120.000	127.0	V	175.0	-17.0	17.1	40.0
99.840000	30.3	120.000	150.0	V	183.0	-15.8	13.2	43.5
125.908750	27.3	120.000	146.0	V	324.0	-11.3	16.2	43.5

Zigbee mode

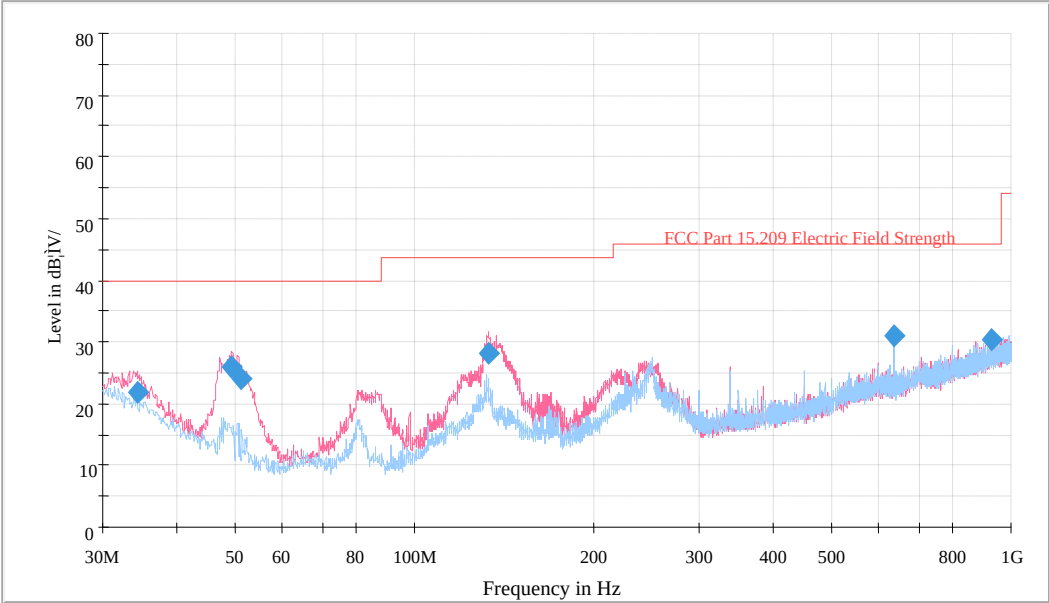


Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
30.242500	30.7	120.000	103.0	V	83.0	-4.9	9.3	40.0
41.882500	21.3	120.000	121.0	V	294.0	-12.4	18.7	40.0
46.732500	35.6	120.000	135.0	V	202.0	-15.2	*4.4	40.0
50.976250	24.2	120.000	117.0	V	143.0	-17.0	15.8	40.0
99.840000	30.4	120.000	148.0	V	202.0	-15.8	13.1	43.5
126.030000	26.8	120.000	123.0	V	330.0	-11.2	16.7	43.5

* Within Measurement Uncertainty.

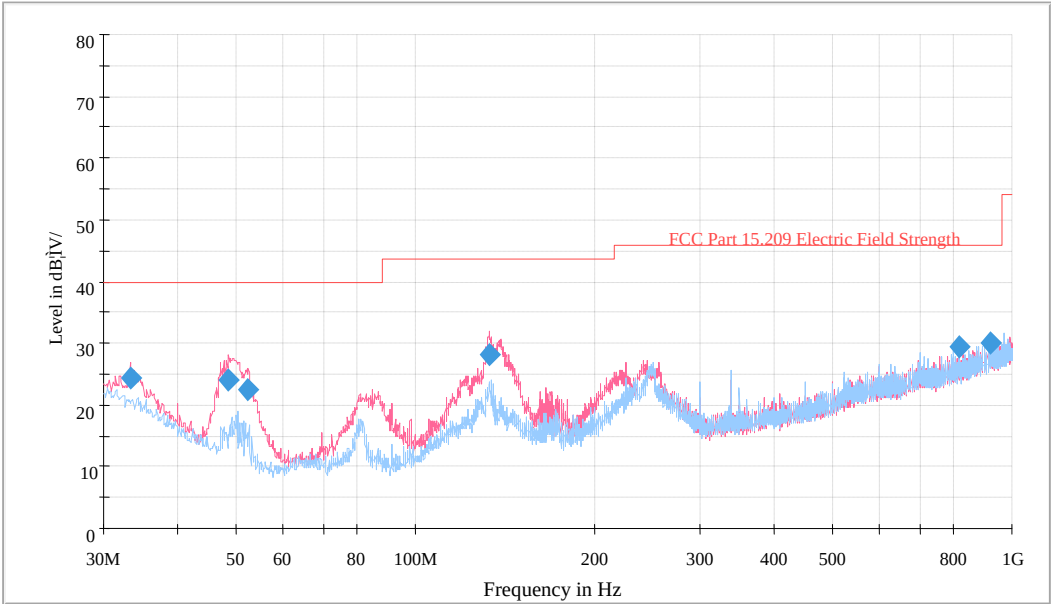
Adapter 2: ZF120A-1203000

Wi-Fi mode



Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
34.243750	22.4	120.000	103.0	V	107.0	-7.7	17.6	40.0
49.400000	25.3	120.000	109.0	V	135.0	-16.6	14.7	40.0
51.218750	24.3	120.000	124.0	V	29.0	-17.1	15.7	40.0
132.941250	28.5	120.000	136.0	V	292.0	-10.7	15.0	43.5
637.462500	30.5	120.000	144.0	H	0.0	-4.3	15.5	46.0
924.703750	30.3	120.000	146.0	H	8.0	0.6	15.7	46.0

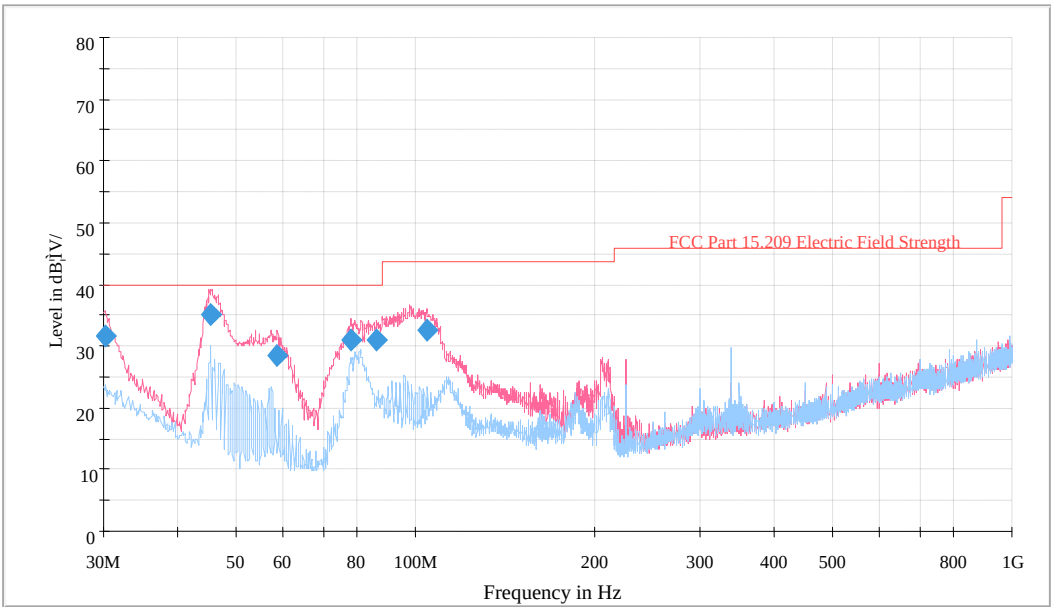
Zigbee mode



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
33.273750	24.7	120.000	103.0	V	0.0	-7.1	15.3	40.0
48.672500	24.2	120.000	124.0	V	64.0	-16.2	15.8	40.0
52.188750	23.0	120.000	136.0	V	210.0	-17.2	17.0	40.0
132.820000	27.9	120.000	134.0	V	310.0	-10.7	15.6	43.5
813.517500	29.4	120.000	145.0	V	318.0	-1.6	16.6	46.0
921.793750	30.1	120.000	142.0	H	270.0	0.5	15.9	46.0

Adapter 3: WT48-1203000-T

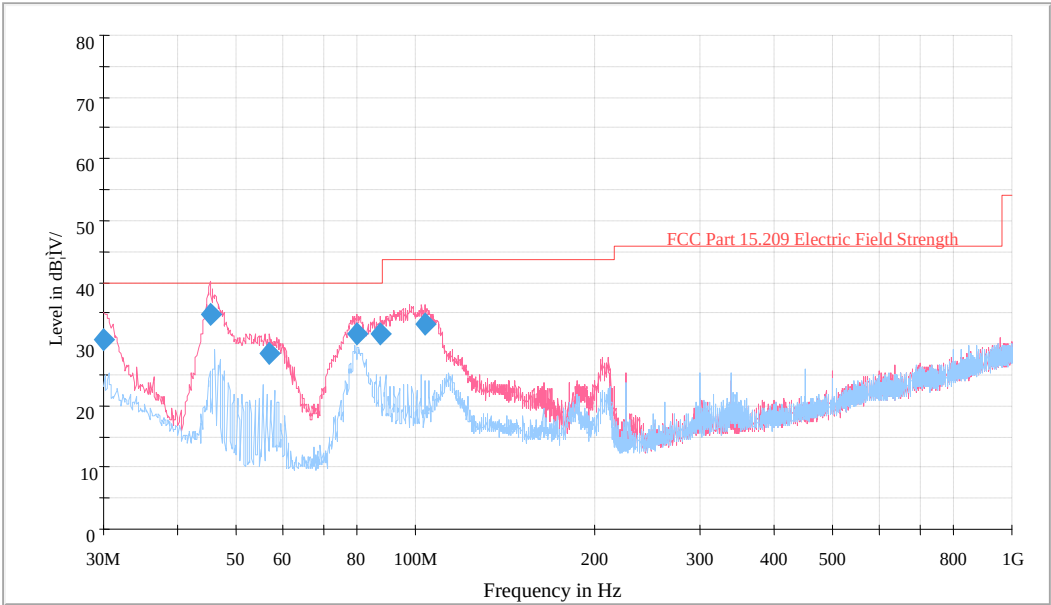
Wi-Fi mode



Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
30.121250	31.6	120.000	105.0	V	47.0	-4.9	8.4	40.0
45.398750	35.4	120.000	117.0	V	174.0	-14.5	*4.6	40.0
58.736250	38.6	120.000	109.0	V	191.0	-17.7	*1.4	40.0
78.015000	31.5	120.000	150.0	V	108.0	-16.6	8.5	40.0
86.138750	31.2	120.000	131.0	V	132.0	-17.2	8.8	40.0
104.447500	32.9	120.000	125.0	V	116.0	-14.3	10.6	43.5

* Within Measurement Uncertainty.

Zigbee mode



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
30.000000	30.3	120.000	101.0	V	38.0	-4.8	9.7	40.0
45.277500	34.7	120.000	134.0	V	207.0	-14.4	5.3	40.0
56.917500	28.7	120.000	125.0	V	158.0	-17.6	11.3	40.0
79.833750	30.7	120.000	141.0	V	141.0	-16.7	9.3	40.0
87.351250	30.4	120.000	133.0	V	141.0	-17.3	9.6	40.0
103.962500	33.8	120.000	120.0	V	99.0	-14.5	9.7	43.5

Adapter 1: API315-1212 - Worst Case

Above 1GHz - Wi-Fi Mode

802.11b Mode

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBμV	PK/AV	H/V	(dB/m)	dB	dB	dBμV/m	dBμV/m	dB
frequency: 2412MHz									
2412	55.20	PK	H	28.74	3.00	0.00	86.94	N/A	N/A
2412	49.55	AV	H	28.74	3.00	0.00	81.29	N/A	N/A
2412	67.70	PK	V	28.74	3.00	0.00	99.44	N/A	N/A
2412	62.38	AV	V	28.74	3.00	0.00	94.12	N/A	N/A
2390	28.34	PK	V	28.67	3.00	0.00	60.01	74.00	13.99
2390	18.64	AV	V	28.67	3.00	0.00	50.31	54.00	*3.69
4824	33.27	PK	V	33.91	5.11	26.87	45.42	74.00	28.58
4824	18.00	AV	V	33.91	5.11	26.87	30.15	54.00	23.85
7236	33.04	PK	V	36.43	6.18	26.36	49.29	74.00	24.71
7236	19.39	AV	V	36.43	6.18	26.36	35.64	54.00	18.36
frequency: 2437MHz									
2437	56.77	PK	H	28.81	3.00	0.00	88.58	N/A	N/A
2437	50.67	AV	H	28.81	3.00	0.00	82.48	N/A	N/A
2437	69.12	PK	V	28.81	3.00	0.00	100.93	N/A	N/A
2437	63.89	AV	V	28.81	3.00	0.00	95.70	N/A	N/A
4874	32.36	PK	V	34.05	5.09	26.87	44.63	74.00	29.37
4874	19.07	AV	V	34.05	5.09	26.87	31.34	54.00	22.66
7311	33.26	PK	V	36.54	6.21	26.40	49.61	74.00	24.39
7311	19.33	AV	V	36.54	6.21	26.40	35.68	54.00	18.32
frequency: 2462MHz									
2462	54.12	PK	H	28.89	2.99	0.00	86.00	N/A	N/A
2462	47.89	AV	H	28.89	2.99	0.00	79.77	N/A	N/A
2462	65.20	PK	V	28.89	2.99	0.00	97.08	N/A	N/A
2462	60.16	AV	V	28.89	2.99	0.00	92.04	N/A	N/A
2483.5	24.79	PK	V	28.95	2.99	0.00	56.73	74.00	17.27
2483.5	12.16	AV	V	28.95	2.99	0.00	44.10	54.00	9.90
4924	29.81	PK	V	34.19	5.07	26.88	42.19	74.00	31.81
4924	17.86	AV	V	34.19	5.07	26.88	30.24	54.00	23.76
7386	29.28	PK	V	36.64	6.25	26.43	45.74	74.00	28.26
7386	15.93	AV	V	36.64	6.25	26.43	32.39	54.00	21.61

**Within measurement uncertainty!*

802.11g Mode

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBμV	PK/AV	H/V	(dB/m)	dB	dB	dBμV/m	dBμV/m	dB
frequency: 2412MHz									
2412	54.45	PK	H	28.74	3.00	0.00	86.19	N/A	N/A
2412	43.51	AV	H	28.74	3.00	0.00	75.25	N/A	N/A
2412	65.03	PK	V	28.74	3.00	0.00	96.77	N/A	N/A
2412	54.35	AV	V	28.74	3.00	0.00	86.09	N/A	N/A
2390	38.48	PK	V	28.67	3.00	0.00	70.15	74.00	*3.85
2390	15.88	AV	V	28.67	3.00	0.00	47.55	54.00	6.45
4824	31.97	PK	V	33.91	5.11	26.87	44.12	74.00	29.88
4824	19.18	AV	V	33.91	5.11	26.87	31.33	54.00	22.67
7236	32.36	PK	V	36.43	6.18	26.36	48.61	74.00	25.39
7236	19.07	AV	V	36.43	6.18	26.36	35.32	54.00	18.68
frequency: 2437MHz									
2437	55.56	PK	H	28.81	3.00	0.00	87.37	N/A	N/A
2437	45.04	AV	H	28.81	3.00	0.00	76.85	N/A	N/A
2437	66.18	PK	V	28.81	3.00	0.00	97.99	N/A	N/A
2437	55.11	AV	V	28.81	3.00	0.00	86.92	N/A	N/A
4874	46.98	PK	V	34.05	5.09	26.87	59.25	74.00	14.75
4874	34.50	AV	V	34.05	5.09	26.87	46.77	54.00	7.23
7311	30.58	PK	V	36.54	6.21	26.40	46.93	74.00	27.07
7311	18.75	AV	V	36.54	6.21	26.40	35.10	54.00	18.90
frequency: 2462MHz									
2462	52.73	PK	H	28.89	2.99	0.00	84.61	N/A	N/A
2462	42.07	AV	H	28.89	2.99	0.00	73.95	N/A	N/A
2462	63.03	PK	V	28.89	2.99	0.00	94.91	N/A	N/A
2462	52.17	AV	V	28.89	2.99	0.00	84.05	N/A	N/A
2483.5	25.35	PK	V	28.95	2.99	0.00	57.29	74.00	16.71
2483.5	11.65	AV	V	28.95	2.99	0.00	43.59	54.00	10.41
4924	30.96	PK	V	34.19	5.07	26.88	43.34	74.00	30.66
4924	16.37	AV	V	34.19	5.07	26.88	28.75	54.00	25.25
7386	31.15	PK	V	36.64	6.25	26.43	47.61	74.00	26.39
7386	16.76	AV	V	36.64	6.25	26.43	33.22	54.00	20.78

*Within measurement uncertainty!

802.11n-HT20 Mode

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBμV	PK/AV	H/V	(dB/m)	dB	dB	dBμV/m	dBμV/m	dB
frequency: 2412MHz									
2412	49.59	PK	H	28.74	3.00	0.00	81.33	N/A	N/A
2412	37.07	AV	H	28.74	3.00	0.00	68.81	N/A	N/A
2412	59.91	PK	V	28.74	3.00	0.00	91.65	N/A	N/A
2412	48.80	AV	V	28.74	3.00	0.00	80.54	N/A	N/A
2390	23.55	PK	V	28.67	3.00	0.00	55.22	74.00	18.78
2390	11.65	AV	V	28.67	3.00	0.00	43.32	54.00	10.68
4824	36.27	PK	V	33.91	5.11	26.87	48.42	74.00	25.58
4824	20.76	AV	V	33.91	5.11	26.87	32.91	54.00	21.09
7236	35.28	PK	V	36.43	6.18	26.36	51.53	74.00	22.47
7236	20.89	AV	V	36.43	6.18	26.36	37.14	54.00	16.86
frequency: 2437MHz									
2437	50.48	PK	H	28.81	3.00	0.00	82.29	N/A	N/A
2437	39.70	AV	H	28.81	3.00	0.00	71.51	N/A	N/A
2437	60.48	PK	V	28.81	3.00	0.00	92.29	N/A	N/A
2437	49.75	AV	V	28.81	3.00	0.00	81.56	N/A	N/A
4874	36.04	PK	V	34.05	5.09	26.87	48.31	74.00	25.69
4874	21.70	AV	V	34.05	5.09	26.87	33.97	54.00	20.03
7311	34.29	PK	V	36.54	6.21	26.40	50.64	74.00	23.36
7311	20.97	AV	V	36.54	6.21	26.40	37.32	54.00	16.68
frequency: 2462MHz									
2462	53.21	PK	H	28.89	2.99	0.00	85.09	N/A	N/A
2462	47.96	AV	H	28.89	2.99	0.00	79.84	N/A	N/A
2462	58.01	PK	V	28.89	2.99	0.00	89.89	N/A	N/A
2462	47.37	AV	V	28.89	2.99	0.00	79.25	N/A	N/A
2483.5	23.00	PK	V	28.95	2.99	0.00	54.94	74.00	19.06
2483.5	11.90	AV	V	28.95	2.99	0.00	43.84	54.00	10.16
4924	33.40	PK	V	34.19	5.07	26.88	45.78	74.00	28.22
4924	16.99	AV	V	34.19	5.07	26.88	29.37	54.00	24.63
7386	30.20	PK	V	36.64	6.25	26.43	46.66	74.00	27.34
7386	16.11	AV	V	36.64	6.25	26.43	32.57	54.00	21.43

802.11n-HT40 Mode

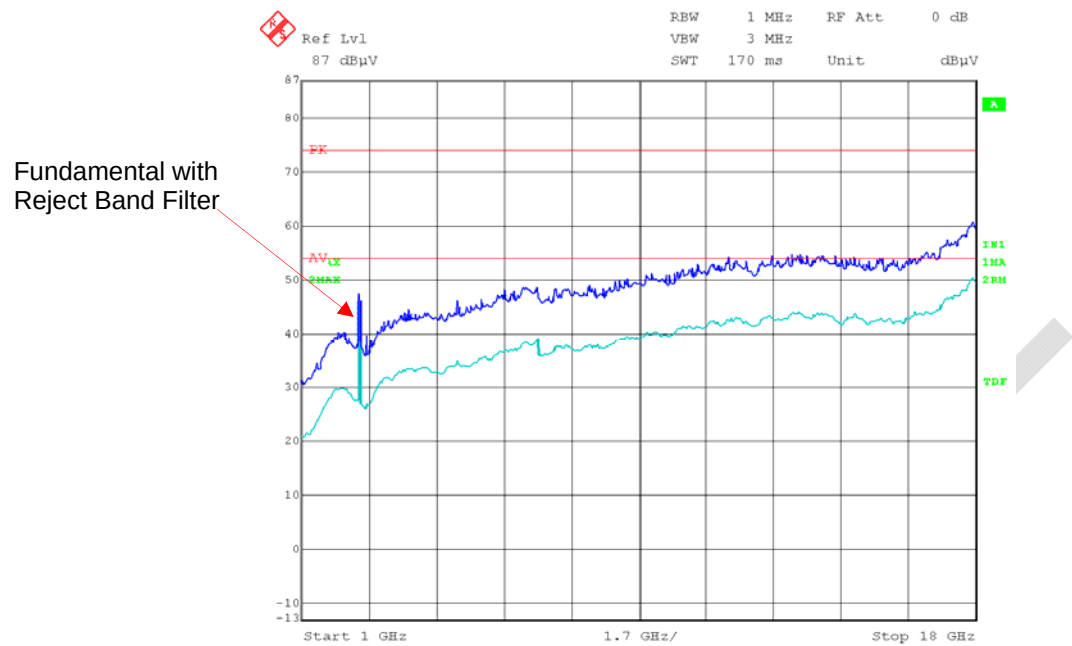
Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBμV	PK/AV	H/V	(dB/m)	dB	dB	dBμV/m	dBμV/m	dB
frequency: 2422MHz									
2422	45.81	PK	H	28.74	3.00	0.00	77.55	N/A	N/A
2422	34.47	AV	H	28.74	3.00	0.00	66.21	N/A	N/A
2422	56.65	PK	V	28.74	3.00	0.00	88.39	N/A	N/A
2422	46.01	AV	V	28.74	3.00	0.00	77.75	N/A	N/A
2390	24.67	PK	V	28.67	3.00	0.00	56.34	74.00	17.66
2390	11.11	AV	V	28.67	3.00	0.00	42.78	54.00	11.22
4844	35.35	PK	V	33.91	5.11	26.87	47.50	74.00	26.50
4844	20.49	AV	V	33.91	5.11	26.87	32.64	54.00	21.36
7266	36.07	PK	V	36.43	6.18	26.36	52.32	74.00	21.68
7266	20.91	AV	V	36.43	6.18	26.36	37.16	54.00	16.84
frequency: 2437MHz									
2437	47.02	PK	H	28.81	3.00	0.00	78.83	N/A	N/A
2437	36.34	AV	H	28.81	3.00	0.00	68.15	N/A	N/A
2437	59.48	PK	V	28.81	3.00	0.00	91.29	N/A	N/A
2437	46.56	AV	V	28.81	3.00	0.00	78.37	N/A	N/A
4874	36.42	PK	V	34.05	5.09	26.87	48.69	74.00	25.31
4874	20.04	AV	V	34.05	5.09	26.87	32.31	54.00	21.69
7311	35.58	PK	V	36.54	6.21	26.40	51.93	74.00	22.07
7311	21.74	AV	V	36.54	6.21	26.40	38.09	54.00	15.91
frequency: 2452MHz									
2452	44.83	PK	H	28.89	2.99	0.00	76.71	N/A	N/A
2452	33.55	AV	H	28.89	2.99	0.00	65.43	N/A	N/A
2452	54.96	PK	V	28.89	2.99	0.00	86.84	N/A	N/A
2452	44.40	AV	V	28.89	2.99	0.00	76.28	N/A	N/A
2483.5	25.58	PK	V	28.95	2.99	0.00	57.52	74.00	16.48
2483.5	11.14	AV	V	28.95	2.99	0.00	43.08	54.00	10.92
4904	48.33	PK	V	34.19	5.07	26.88	60.71	74.00	13.29
4904	37.54	AV	V	34.19	5.07	26.88	49.92	54.00	*4.08
7356	28.66	PK	V	36.64	6.25	26.43	45.12	74.00	28.88
7356	14.63	AV	V	36.64	6.25	26.43	31.09	54.00	22.91

*Within measurement uncertainty!

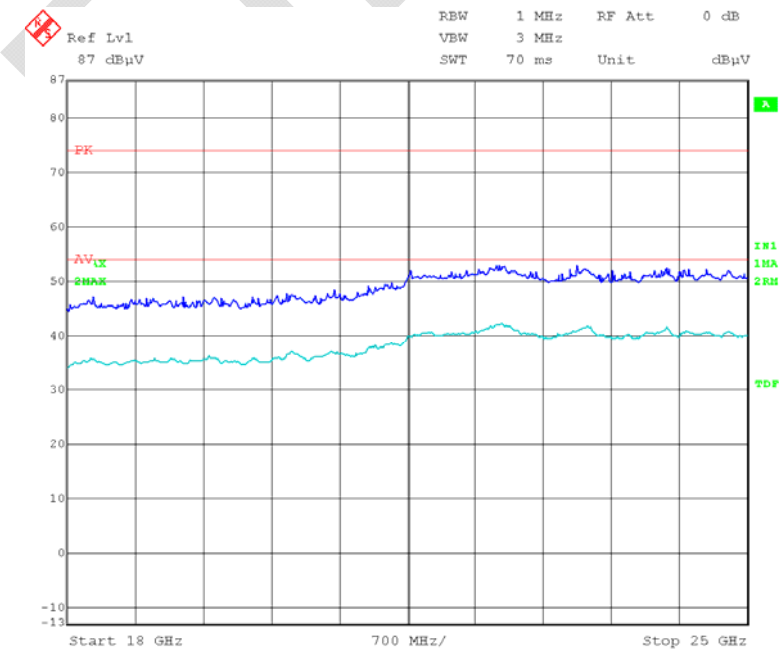
Above 1GHz - Wi-Fi Mode pre-scan plot of worst case below,

802.11g Mode

Middle Channel_Horizontal_1GHz-18GHz

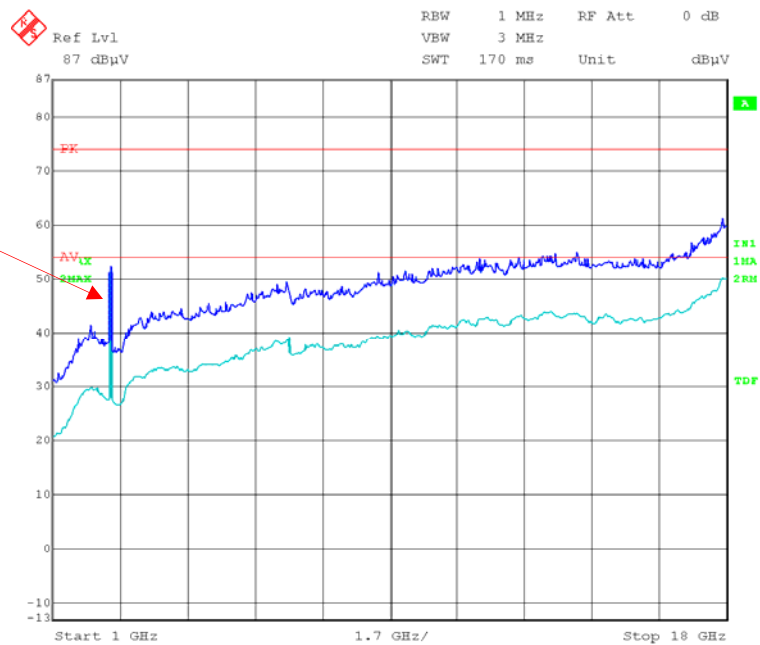


Middle Channel_Horizontal_18GHz-25GHz

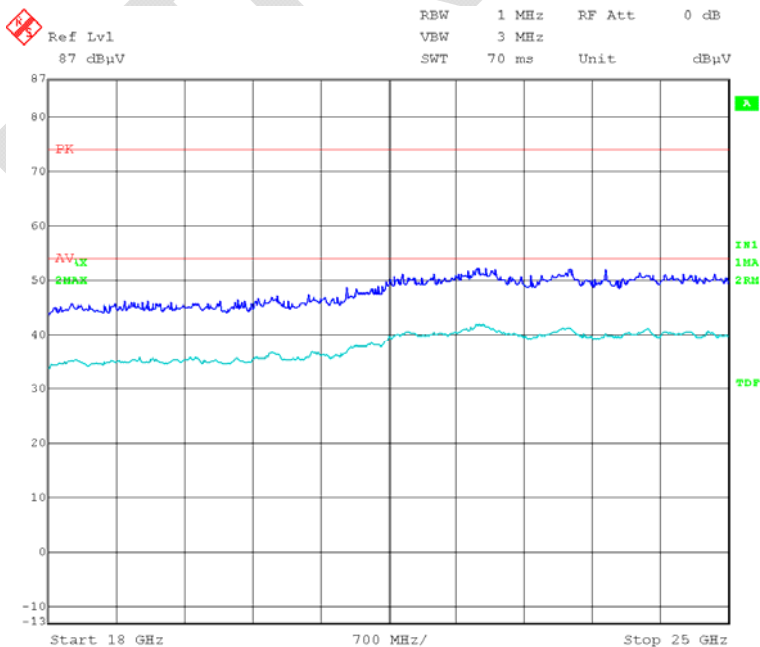


Middle Channel_Vertical_1GHz-18GHz

Fundamental with
Reject Band Filter



Middle Channel_Vertical_18GHz-25GHz



Above 1GHz - Zigbee Mode

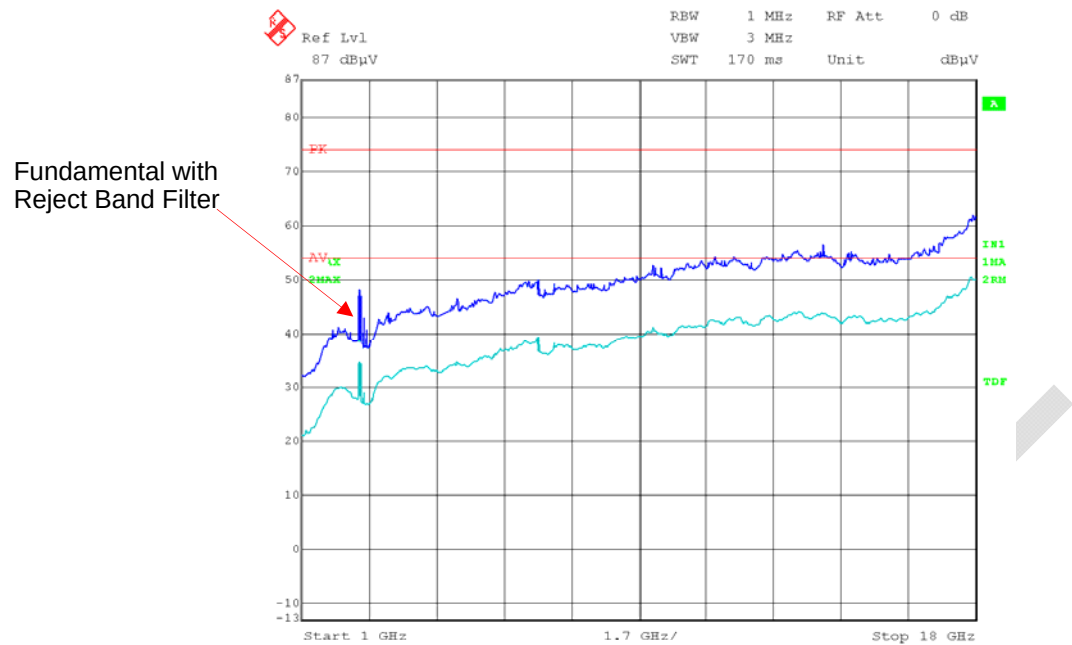
Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBµV	PK/AV	H/V	(dB/m)	dB	dB	dBµV/m	dBµV/m	dB
frequency: 2405MHz									
2405	52.53	PK	H	28.72	3.00	0.00	84.25	N/A	N/A
2405	47.48	AV	H	28.72	3.00	0.00	79.20	N/A	N/A
2405	62.92	PK	V	28.72	3.00	0.00	94.64	N/A	N/A
2405	56.59	AV	V	28.72	3.00	0.00	88.31	N/A	N/A
2390	34.80	PK	V	28.67	3.00	0.00	66.47	74.00	7.53
2390	19.18	AV	V	28.67	3.00	0.00	50.85	54.00	*3.15
4810	36.73	PK	V	33.87	5.12	26.87	48.85	74.00	25.15
4810	22.98	AV	V	33.87	5.12	26.87	35.10	54.00	18.90
7215	34.38	PK	V	36.40	6.17	26.35	50.60	74.00	23.40
7215	20.86	AV	V	36.40	6.17	26.35	37.08	54.00	16.92
frequency: 2440MHz									
2440	54.57	PK	H	28.82	3.00	0.00	86.39	N/A	N/A
2440	50.03	AV	H	28.82	3.00	0.00	81.85	N/A	N/A
2440	63.91	PK	V	28.82	3.00	0.00	95.73	N/A	N/A
2440	59.24	AV	V	28.82	3.00	0.00	91.06	N/A	N/A
4880	38.08	PK	V	34.06	5.09	26.87	50.36	74.00	23.64
4880	24.53	AV	V	34.06	5.09	26.87	36.81	54.00	17.19
7320	34.70	PK	V	36.55	6.22	26.40	51.07	74.00	22.93
7320	21.71	AV	V	36.55	6.22	26.40	38.08	54.00	15.92
frequency: 2475MHz									
2475	53.49	PK	H	28.93	2.99	0.00	85.41	N/A	N/A
2475	49.20	AV	H	28.93	2.99	0.00	81.12	N/A	N/A
2475	60.72	PK	V	28.93	2.99	0.00	92.64	N/A	N/A
2475	57.58	AV	V	28.93	2.99	0.00	89.50	N/A	N/A
4950	35.05	PK	V	34.26	5.05	26.88	47.48	74.00	26.52
4950	19.81	AV	V	34.26	5.05	26.88	32.24	54.00	21.76
7425	30.35	PK	V	36.70	6.27	26.45	46.87	74.00	27.13
7425	17.38	AV	V	36.70	6.27	26.45	33.90	54.00	20.10

Frequency	Receiver		Rx Antenna		Cable loss	Amplifier Gain	Corrected Amplitude	Limit	Margin
	Reading	Measurement	Polar	Factor					
MHz	dBμV	PK/AV	H/V	(dB/m)	dB	dB	dBμV/m	dBμV/m	dB
frequency: 2480MHz									
2480	48.90	PK	H	28.94	2.99	0.00	80.83	N/A	N/A
2480	44.84	AV	H	28.94	2.99	0.00	76.77	N/A	N/A
2480	55.38	PK	V	28.94	2.99	0.00	87.31	N/A	N/A
2480	51.17	AV	V	28.94	2.99	0.00	83.10	N/A	N/A
2483.5	34.04	PK	V	28.95	2.99	0.00	65.98	74.00	8.02
2483.5	18.92	AV	V	28.95	2.99	0.00	50.86	54.00	*3.14
4960	34.92	PK	V	34.29	5.05	26.88	47.38	74.00	26.62
4960	20.66	AV	V	34.29	5.05	26.88	33.12	54.00	20.88
7440	30.95	PK	V	36.72	6.27	26.45	47.49	74.00	26.51
7440	18.83	AV	V	36.72	6.27	26.45	35.37	54.00	18.63

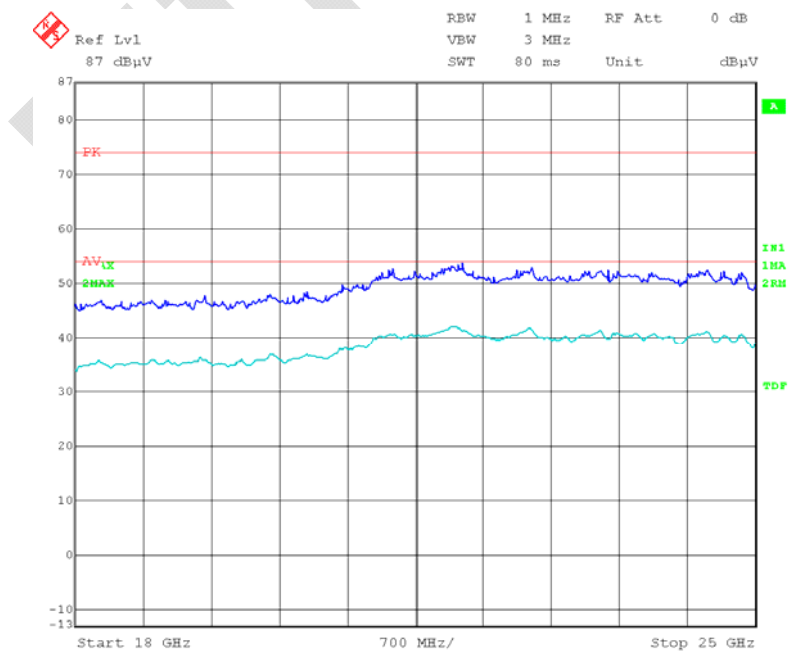
*Within measurement uncertainty!

Above 1GHz - Zigbee Mode pre-scan plot of worst case below,

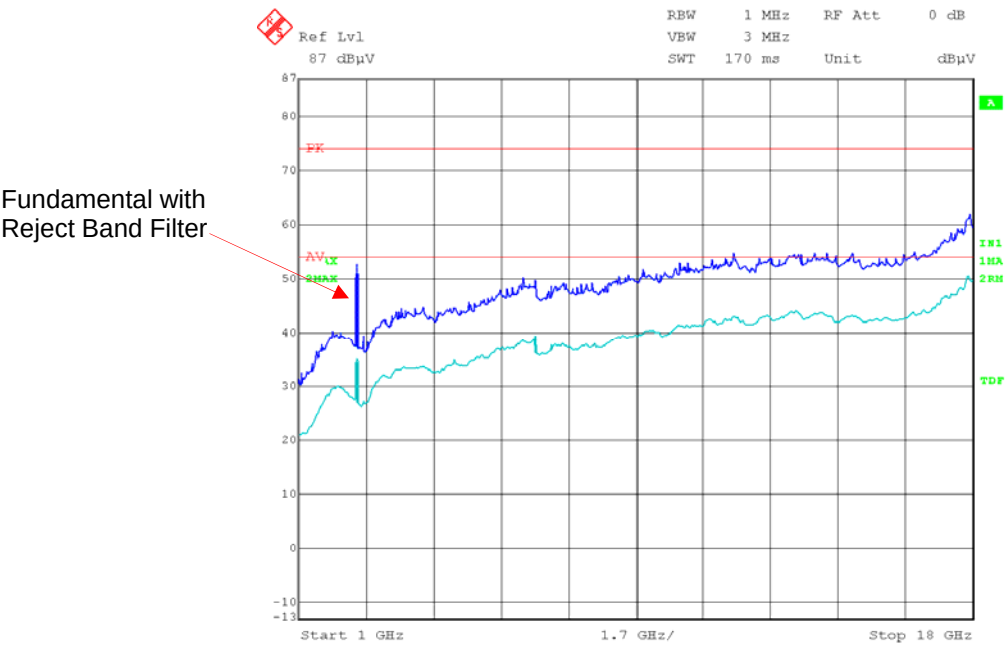
High Channel_Horizontal_1GHz-18GHz



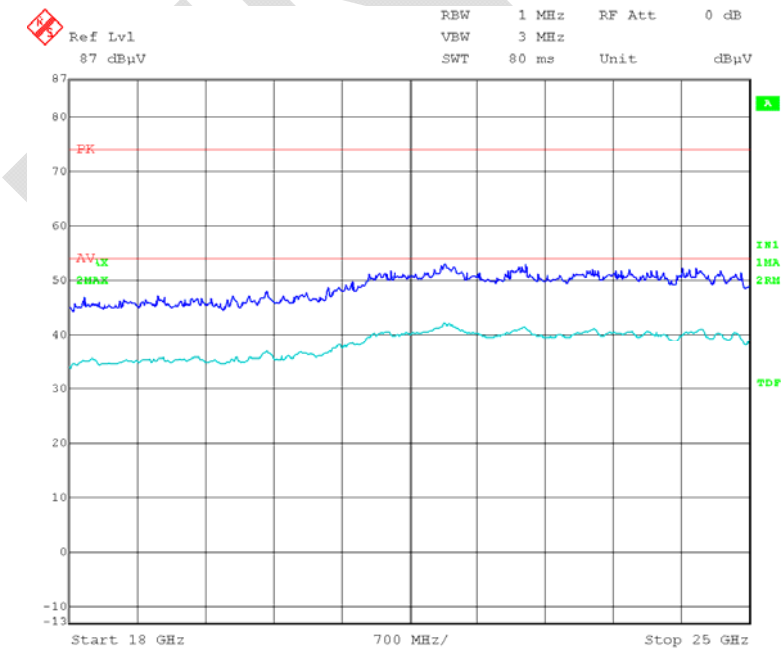
High Channel_Horizontal_18GHz-25GHz



High Channel_Vertical_1GHz-18GHz



High Channel_Vertical_18GHz-25GHz



Co-location evaluation data

1. Multi-listing 4G Module, Model: LE910-SV1

For co-location evaluation data (Wi-Fi+Zigbee+LTE transmitting simultaneously)

Adapter 1: API315-1212 (worst case)

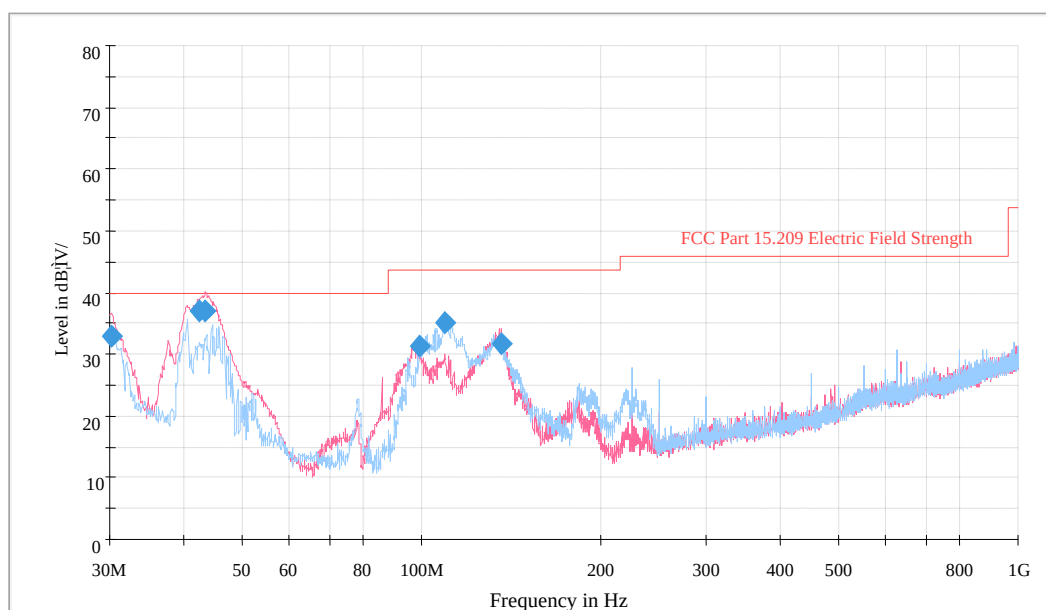
Test mode:

802.11 b - Middle Channel

Zigbee - Middle Channel

LTE - Band 2 -1880MHz

Below 1GHz



Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBµV/m)
30.242500	33.5	120.000	100.0	V	98.0	-4.9	6.5	40.0
42.488750	38.2	120.000	116.0	V	106.0	-12.8	*1.8	40.0
43.458750	37.6	120.000	101.0	V	106.0	-13.4	*2.4	40.0
100.415000	32.4	120.000	118.0	V	256.0	-16.1	11.1	43.5
109.661250	35.6	120.000	149.0	H	269.0	-12.8	7.9	43.5
136.093750	31.9	120.000	101.0	H	0.0	-10.7	11.6	43.5

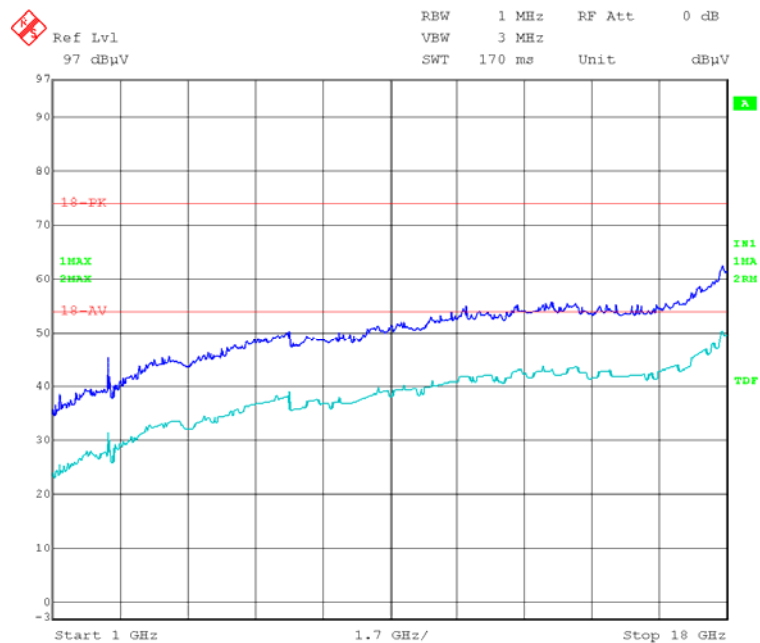
* Within Measurement Uncertainty.

Above 1GHz

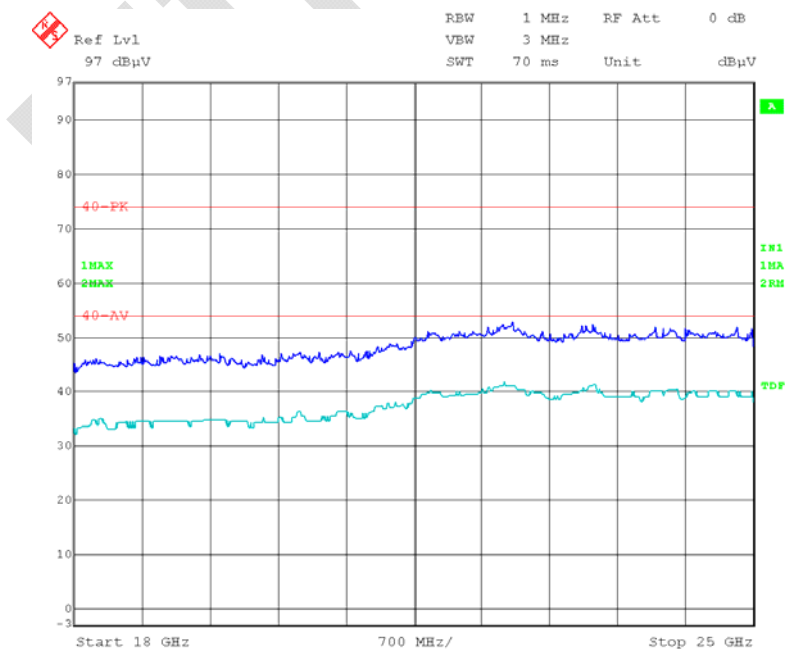
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK/AV)	Polar (H/V)	Factor (dB)					
4874	35.68	PK	V	33.91	5.11	26.87	47.83	74.00	26.17
4874	23.49	AV	V	33.91	5.11	26.87	35.64	54.00	18.36
7311	36.78	PK	V	36.43	6.18	26.36	53.03	74.00	20.97
7311	24.51	AV	V	36.43	6.18	26.36	40.76	54.00	13.24
2390	33.45	PK	V	28.67	3.00	26.87	38.25	74.00	35.75
2390	20.97	AV	V	28.67	3.00	26.87	25.77	54.00	28.23
2483.5	32.85	PK	V	28.95	2.99	26.89	37.90	74.00	36.10
2483.5	19.46	AV	V	28.95	2.99	26.89	24.51	54.00	29.49
4880	35.24	PK	V	33.87	5.12	26.87	47.36	74.00	26.64
4880	23.18	AV	V	33.87	5.12	26.87	35.30	54.00	18.70
7320	35.98	PK	V	36.40	6.17	26.35	52.20	74.00	21.80
7320	24.02	AV	V	36.40	6.17	26.35	40.24	54.00	13.76

Please refer to the below pre-scan plot of worst case:

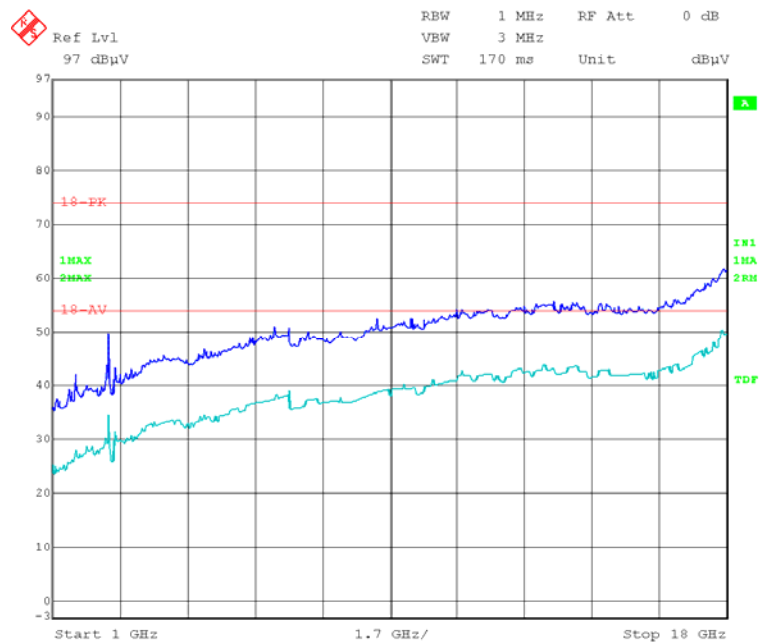
Horizontal_1GHz-18GHz



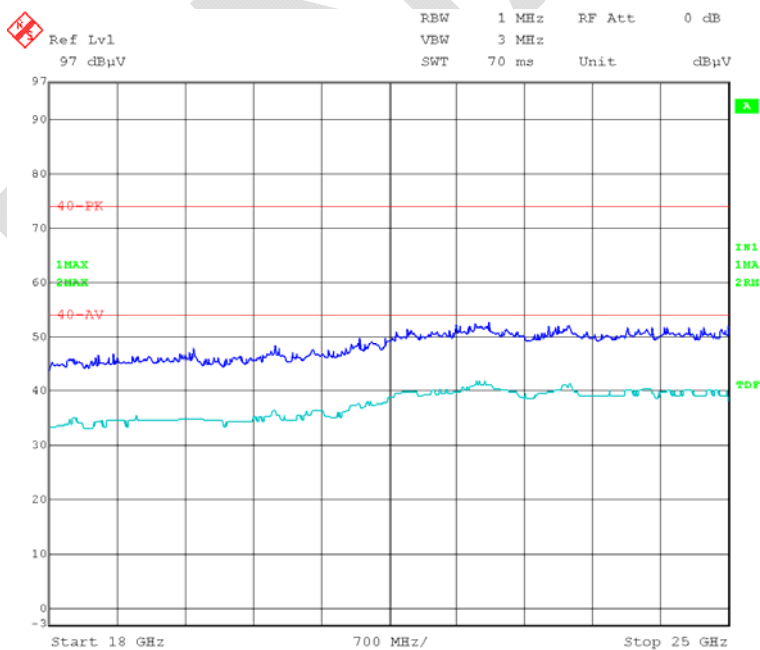
Horizontal_18GHz-25GHz



Vertical_1GHz-18GHz



Vertical_18GHz-25GHz



2. Multi-listing 4G Module, Model: LE910-NA1

For co-location evaluation data (Wi-Fi+Zigbee+LTE transmitting simultaneously)

Adapter 1: API315-1212 (worst case)

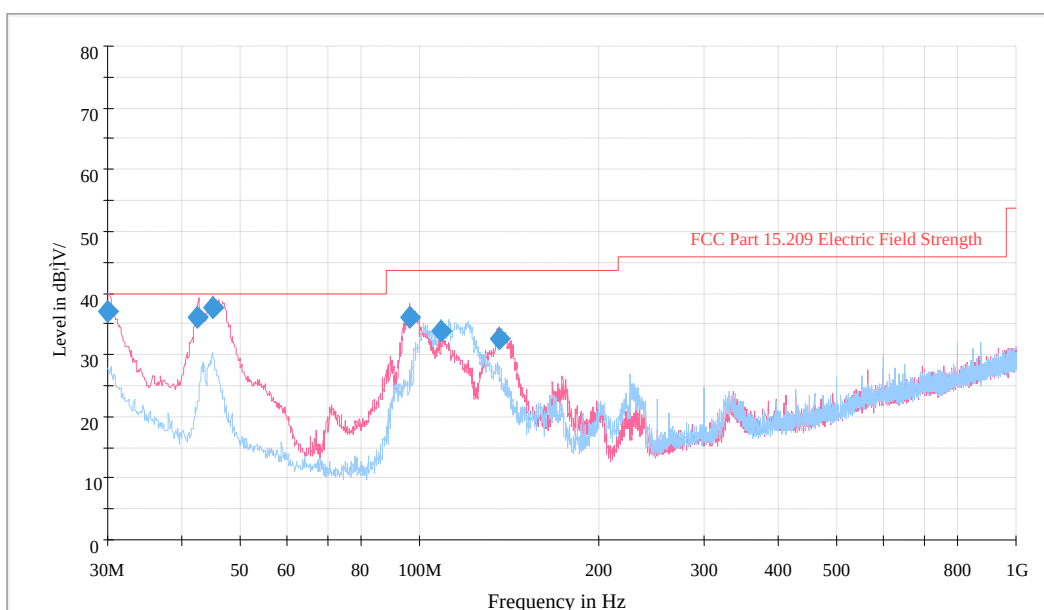
Test mode:

802.11 b - Middle Channel

Zigbee - Middle Channel

LTE - Band 2 -1880MHz

Below 1GHz



Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corrected Factor (dB/m)	Margin (dB)	Limit (dBμV/m)
30.000000	36.9	120.000	100.0	V	116.0	-4.8	*3.1	40.0
42.488750	36.1	120.000	100.0	V	274.0	-12.8	*3.9	40.0
45.156250	37.6	120.000	135.0	V	0.0	-14.3	*2.4	40.0
96.081250	36.1	120.000	100.0	V	306.0	-16.4	7.4	43.5
108.933750	33.8	120.000	149.0	H	267.0	-13.0	9.7	43.5
136.336250	32.5	120.000	149.0	V	159.0	-10.7	11.0	43.5

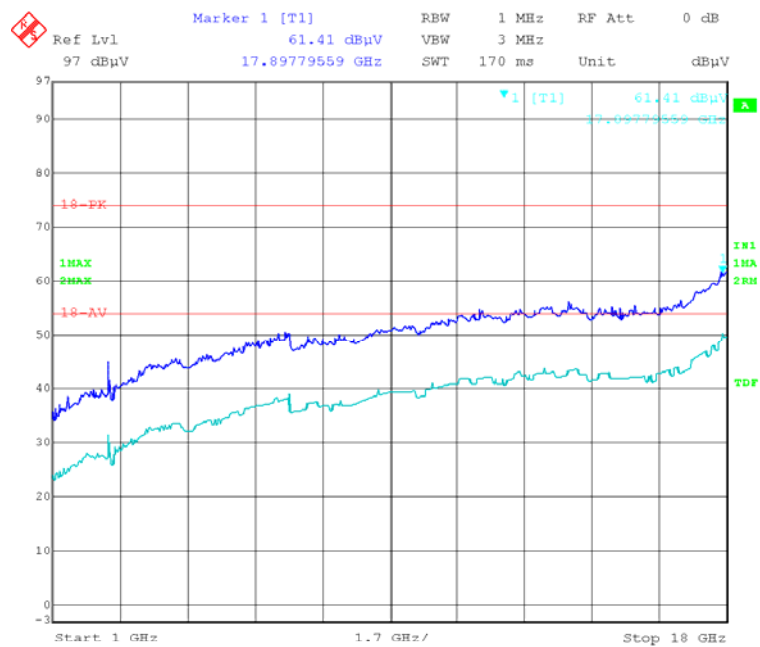
* Within Measurement Uncertainty.

Above 1GHz

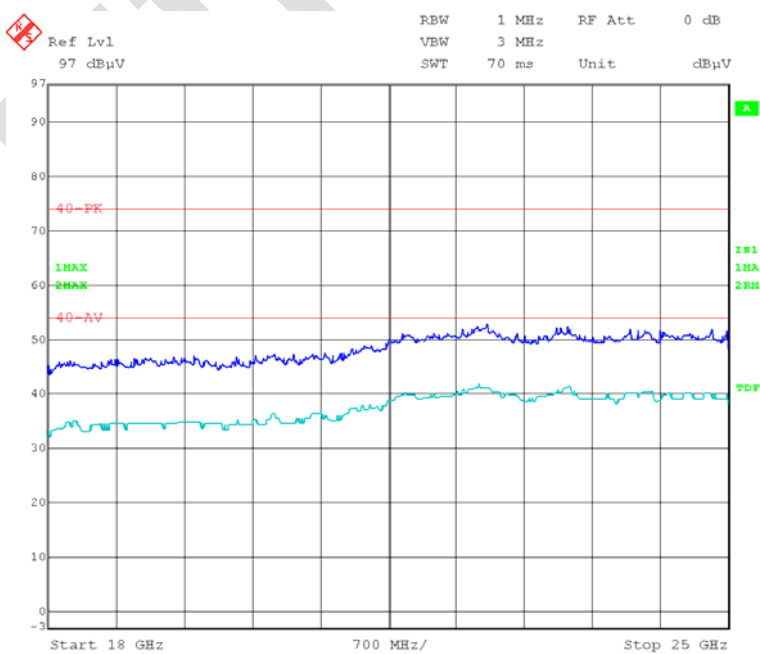
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Measurement (PK/AV)	Polar (H/V)	Factor (dB)					
4874	36.32	PK	V	33.91	5.11	26.87	48.47	74.00	25.53
4874	24.18	AV	V	33.91	5.11	26.87	36.33	54.00	17.67
7311	37.44	PK	V	36.43	6.18	26.36	53.69	74.00	20.31
7311	24.93	AV	V	36.43	6.18	26.36	41.18	54.00	12.82
2390	33.80	PK	V	28.67	3.00	26.87	38.60	74.00	35.40
2390	21.41	AV	V	28.67	3.00	26.87	26.21	54.00	27.79
2483.5	33.45	PK	V	28.95	2.99	26.89	38.50	74.00	35.50
2483.5	19.95	AV	V	28.95	2.99	26.89	25.00	54.00	29.00
4880	35.95	PK	V	33.87	5.12	26.87	48.07	74.00	25.93
4880	23.42	AV	V	33.87	5.12	26.87	35.54	54.00	18.46
7320	36.19	PK	V	36.40	6.17	26.35	52.41	74.00	21.59
7320	24.59	AV	V	36.40	6.17	26.35	40.81	54.00	13.19

Please refer to the below pre-scan plot of worst case:

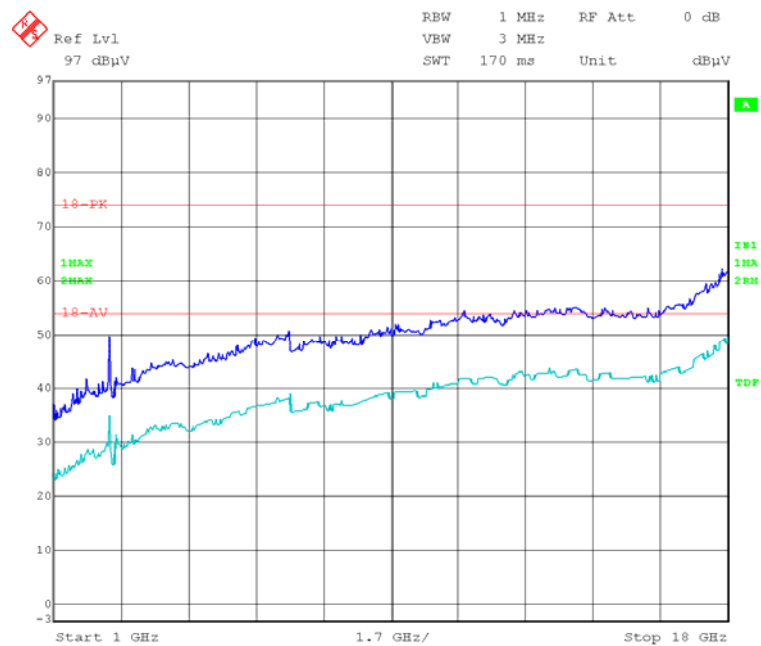
Horizontal_1GHz-18GHz



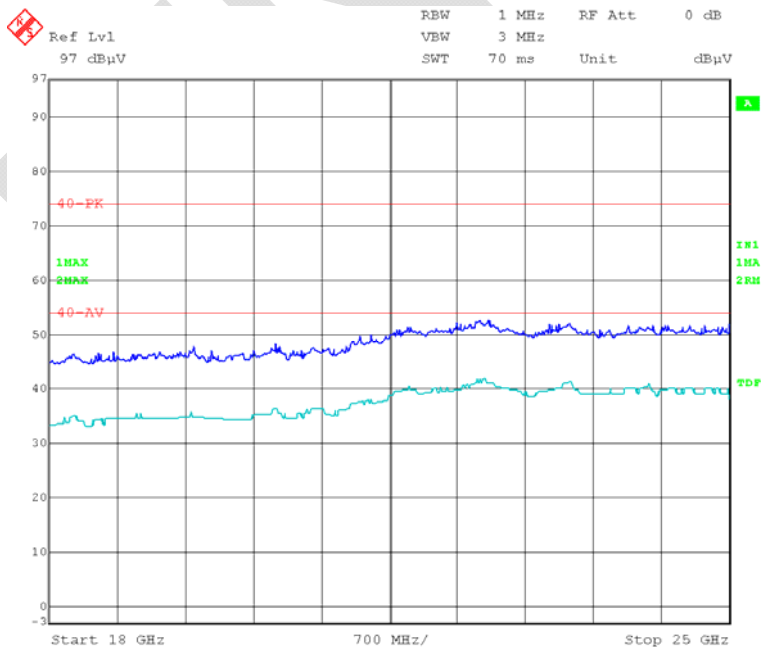
Horizontal_18GHz-25GHz



Vertical_1GHz-18GHz



Vertical_18GHz-25GHz



***** END OF REPORT *****