

Prüfbericht-Nr.: <i>Test report no.:</i>	ULR- TC568820300000041F	Auftrags-Nr.: <i>Order no.:</i>	166468642 0030	Seite 1 von 39 Page 1 of 39
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	NA	Auftragsdatum: <i>Order date:</i>	2020-07-27	
Auftraggeber: <i>Client:</i>	Tejas Networks Limited, plot No.25 JP Software Park, Electronic city,Phase-1 Hosur Road, Bangalore-560100			
Prüfgegenstand: <i>Test item:</i>	Optical Network Terminal			
Bezeichnung / Serien -Nr.: <i>Identification / Serial no.:</i>	TJ2100N-14ET			
Auftrags-Inhalt: <i>Order content:</i>	Testing & issue of test report			
Prüfgrundlage: <i>Test specification:</i>	FCC Part 15 Subpart C 15.247, 15.207			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2020-07-21			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A002871314-001			
Prüfzeitraum: <i>Testing period:</i>	2020-08-19 - 2020-08-26			
Ort der Prüfung: <i>Place of testing:</i>	Wireless laboratory, Bangalore			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (India) Pvt. Ltd. 27/B,2nd cross road, Electronic city Phase1, Bangalore-560100, India FCC Test Site Registration No: 496599			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2020-28-08	Ausstellatum: <i>Issue date:</i> 2021-01-11			
Stellung / Position:	Rajesh M Gowda Engineer	Stellung / Position:	Mahammadgouse Kaladagi Assistant Manager	
Sonstiges / Other:	Contains FCC ID: 2AXV9-1638AA			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

V05

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 2 von 39
Page 2 of 39

TEST SUMMARY

Test Item	FCC Clause	Remarks
Maximum Average Conducted Power	FCC 15.247(b)(3)	N/T
Maximum Power Spectral Density	FCC 15.247(e)	N/T
DTS Bandwidth	FCC 15.247(a) (2)	N/T
Emissions in non-restricted frequency bands	FCC 15.247(d)	N/T
Spurious Radiated Emissions and Restricted Bands of Operation	FCC 15.209 / FCC 15.205	Pass
Conducted Emissions on a.c Power Lines	FCC 15.207	Pass

Product Category: Electronics Testing
Test Discipline: EMC Test Facility

Note:

1. *N/T: Not tested – These test cases are not tested, the product uses certified RF module from Eardatek With FCC ID: 2AMM6-1638AA, multiple listing is done to this module with Change in FCC ID process and listed under FCC ID: 2AXV9-1638AA
2. This product contains Wi-Fi 2.4 GHz, Wi-Fi 5GHz and Bluetooth module since client is not using Bluetooth module it is completely disabled by software.
3. Product TJ2100N-14ET has been integrated with following certified radio modules, each module is used for either 2.4 GHz or 5 GHz transmission, simultaneous transmission is possible, for results refer section 3.3 of this report

SI No.	Radio Protocol supported	Radio protocol used in the Host	FCC ID	No of transmitter	Original module Tested By
1	Wi-Fi - 2.4 GHz & 5 GHz	Wi-Fi 2.4 GHz only	2AXV9-1638AA	1	Eardatek
2	Wi-Fi - 2.4 GHz & 5 GHz	Wi-Fi 5 GHz only	2AXV9-1638AA	1	Eardatek

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 3 von 39
Page 3 of 39

REVISION HISTORY OF THIS REPORT

Report Number	Version	Description	Issue date
ULR-TC568820300000041F	01	Initial issue of Report	2020-10-16
ULR-TC568820300000041F	02	Change in ID updates to report	2020-12-24
ULR-TC568820300000041F	03	Reviewer comments updated	2021-01-11

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 4 von 39
Page 4 of 39

Table of Contents

1	GENERAL REMARKS	5
1.1	Attachments	5
2	TEST SITES	6
2.1	Testing Facilities.....	6
2.2	List of Test and Measurement Instruments.....	6
3	GENERAL PRODUCT INFORMATION.....	8
3.1	Product Function and Intended Use.....	8
3.2	Ratings and System Details of Equipment under Test	8
3.3	Simultaneous operation	9
3.4	Measurement Uncertainty:	9
4	TEST SET-UP AND OPERATION MODE	10
4.1	Principle of Configuration Selection	10
4.2	Test Operation and Test Software.....	10
4.3	Special Accessories and Auxiliary Equipment	10
4.4	Countermeasures to achieve EMC Compliance	10
4.5	List of frequencies	10
4.6	Report references.....	11
5	Operational Description	12
6	Block Diagram.....	12
7	TEST METHODOLOGY	13
7.1	Conducted Spurious Emission Test on AC Power Line.....	13
7.1.1	Test Setup Configuration	13
7.2	Radiated Emission Test	14
7.2.1	Test Setup Configuration	14
8	TEST RESULTS FOR Wi-Fi.....	16
8.1	Spurious Radiated Emissions & Restricted Bands of Operation	16
8.2	Simultaneous Mode of Operation.....	34
9	Conducted Spurious Emission Test on AC Power Line	36
10	LIST OF TABLES	39
11	LIST OF FIGURES.....	39

Prüfbericht - Nr.:

ULR-TC568820300000041F

Test Report No.:

Seite 5 von 39

Page 5 of 39

1 GENERAL REMARKS

1.1 Attachments

All attachments are integral part of this test report.

1. TEST SETUP PHOTOS
2. EUT EXTERNAL PHOTOS
3. EUT INTERNAL PHOTOS
4. FCC LABEL AND LABEL LOCATION
5. BLOCK DIAGRAM
6. SPECIFICATION OF EUT
7. SCHEMATIC DIAGRAMS
8. BILL OF MATERIAL
9. USER MANUAL
10. MAXIMUM PERMISSIBLE EXPOSURE INFORMATION

2 TEST SITES

2.1 Testing Facilities

1. TÜV Rheinland (India) Pvt.Ltd.,
27/B, 2nd Cross,
ElectronicCityPhase1
Bangalore – 560 100,
India
2. TUV Rheinland (India) Private Limited
108 , Beside ISBR Business School,
Electronic city Phase I
Bangalore - 560 100.
India

2.2 List of Test and Measurement Instruments

Table 1: List of test and measurement instruments

Equipment	Manufacturer	Model Name	Serial Number	Firmware Versions	Calibration Due Date	Periodicity	Test Facility
EMI Receiver	Rohde & Schwarz	ESU 40	100288	4.43 SP3	11.10.2020	Yearly	Radiated Spurious Emission
Active loop antenna	Schwarzbeck	FMZB 1519 B	1519B-00111	-	31.01.2021	Yearly	
Biconical Antenna	Schwarzbeck	VHBB91 24+BBA 9106	9124-1208+9106-0525	-	16.01.2021	Yearly	
Log - Periodical Antenna	Schwarzbeck	VUSLP 9118 A	VULP911 8A-0733	-	17.01.2021	Yearly	
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1944	-	30.01.2021	Yearly	
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170-0904	-	29.01.2021	Yearly	
Semi Anechoic Chamber	Frankonia	-	-	-	-	-	
Fully Anechoic Chamber	Albatross	-	-	-	-	-	
USB Peak power sensor	Boonton	55006	10231	FW 3.2.4.0	09.01.2021	Yearly	Antenna - Port Measurements
EMI Receiver	Rohde & Schwarz	ESW 44	101732	-	10.12.2020	Yearly	AC Power line conducted emission
LISN	Rohde & Schwarz	ENV 216	100022	-	05.09.2020	Yearly	
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100811	-	09.01.2021	Yearly	

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568820300000041F

Seite 7 von 39

Page 7 of 39

Table 2: Instrument application Software versions

SL. No.	Test Type	Application software	Version
1	Radiated spurious emission measurement in SAC	EMC 32	10.60.00
2	Radiated spurious emission measurement in FAC	EMC 32	10.60.00

3 GENERAL PRODUCT INFORMATION

3.1 Product Function and Intended Use

TJ2100N-14ET system is an access node in FTTH architecture of GPON system. The system is a single card system and is designed to serve a single residential unit. ONT operates in Non-AC conditions and is powered by 12V power adaptor. AC-DC adaptor is provided to support working with 90-270V, 50Hz, AC supply. ONT can be installed on table top and wall mounted enclosure suitable for indoor environments. There are no restrictions on installing the ONT. On one side it has fiber (GPON) interface and on other side it has user interfaces with upto 4 LAN ports with RJ-45 interface supporting 10/100/1000 BaseT, 1 USB, 2x2 MIMO Wi-Fi (IEEE 802.11 a/b/g/n/ac), and 2 POTS interface.

3.2 Ratings and System Details of Equipment under Test

Table 3: Ratings and System Details as declared by Client*

Radio Protocol		Wi-Fi	
Operating Frequency Range		2412MHz to 2462MHz	
No. of Channels		11 (Refer Table 5)	
Channel Spacing		5MHz	
Maximum Measured Power (e.i.r.p)		15.46 dBm (n mode HT40 MCS0 2437MHz)	
Modulation		802.11b: DSSS (DBPSK/DQPSK/CCK) 802.11g/n: OFDM (BPSK/QPSK/16QAM/64QAM)	
Number of antennas		2*2 MIMO (2.4GHz)	
Antenna Gain		Antenna 1, chain 1	5 dBi
		Antenna 2, chain 2	5 dBi
Antenna Type		FPC	
Supply Voltage to Product		1.5A @ 12V DC	
Environmental conditions	Storage	-40°C to +70°C Relative Humidity <95%	
	Operating	0°C to + 45°C Relative Humidity <95%	
EUT Dimension		240 x 61 x 170 mm (LxWxH)	

***Disclaimer:** The information/data is supplied by the client and the same is considered to arrive at the final value. Any changes made apart from the specified specification, can directly impact on the tests results. Refer the products user manual for more details.

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 9 von 39
Page 9 of 39

Note: Product Optical Network Terminal has multiple protocols. All the supported wireless protocols and their respective test results are issued in separate test reports, refer clause 4.6 Report references

3.3 Simultaneous operation

Mode of Combinations of Simultaneous Operations	Wi-Fi -2.4 GHz and Wi-Fi 5GHz
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Note: Simultaneous Operation was performed with the above mentioned combination and worst case test results are mentioned in section 8 of this report.

3.4 Measurement Uncertainty:

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k = 2$

Table 4: Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1.5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ }^{\circ}\text{C}$
Supply Voltages	$\pm 3 \%$
Time	$\pm 5 \%$

Note: The Listed Measurement Uncertainties are the worst-case uncertainty, for the respective test cases. Above Table is for reporting purpose only and not used in determining Final Pass/Fail verdict.

4 TEST SET-UP AND OPERATION MODE

4.1 Principle of Configuration Selection

- Transmission enabled with highest possible duty cycle transmission on low, mid and high channel.

4.2 Test Operation and Test Software

- Software Version: 2.3.4.14
- Hardware Version: Rev3

4.3 Special Accessories and Auxiliary Equipment

- None

4.4 Countermeasures to achieve EMC Compliance

- None

4.5 List of frequencies

Frequency Band (MHz)	Channel No.	Channel Frequency (MHz)
2412 – 2462	1	2412
	2	2417
	3	2422
	4	2427
	5	2432
	6	2437
	7	2442
	8	2447
	9	2452
	10	2457
	11	2462

Table 5: List of Wi-Fi center Frequencies

Channel used for Wi-Fi testing

Channel Bandwidth 20MHz

Channel low : 2412MHz

Channel mid : 2437MHz

Channel high : 2462MHz

Channel Bandwidth 40MHz

Channel low : 2422MHz

Channel mid : 2437MHz

Channel high : 2462MHz

Note:

TUV Sample Identification number : A002871314-001 -Radiated & Conducted test Sample

Prüfbericht - Nr.:

ULR-TC568820300000041F

Test Report No.:

Seite 11 von 39

Page 11 of 39

4.6 Report references

Note: Product Optical Network Terminal has multiple protocols. All the supported wireless protocols and their respective test results are issued in separate test reports, following table lists the report numbers.

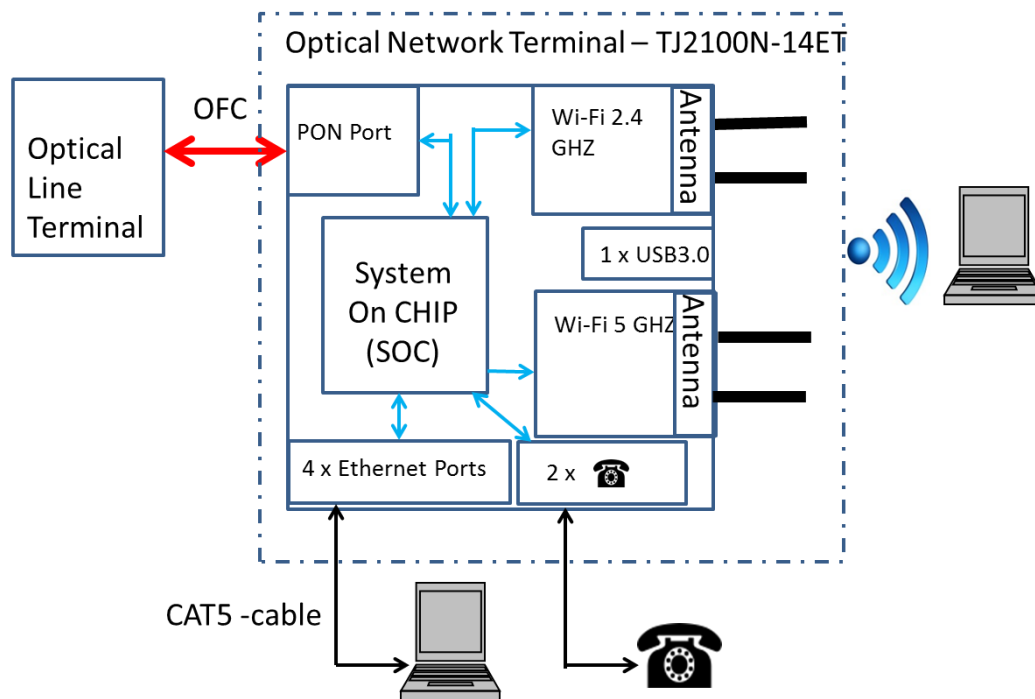
Radio Protocol	Report Number
RF test report for Wi-Fi (2.4GHz) – (This report)	ULR-TC568820300000041F
RF test report for Wi-Fi (5GHz)	ULR-TC568820300000042F

5 Operational Description

TJ2100N-14ET system is an access node in FTTH architecture of GPON system. The system is a single card system and is designed to serve a single residential unit. ONT operates in Non-AC conditions and is powered by 12V power adaptor. AC-DC adaptor is provided to support working with 90-270V, 50Hz, AC supply. ONT can be installed on table top and wall mounted enclosure suitable for indoor environments. There are no restrictions on installing the ONT.

On one side it has fiber (GPON) interface and on other side it has user interfaces with upto 4 LAN ports with RJ-45 interface supporting 10/100/1000 BaseT, 1 USB, 2x2 MIMO Wi-Fi (IEEE 802.11 a/b/g/n/ac) , and 2 POTS interfaces. Interfaces

6 Block Diagram



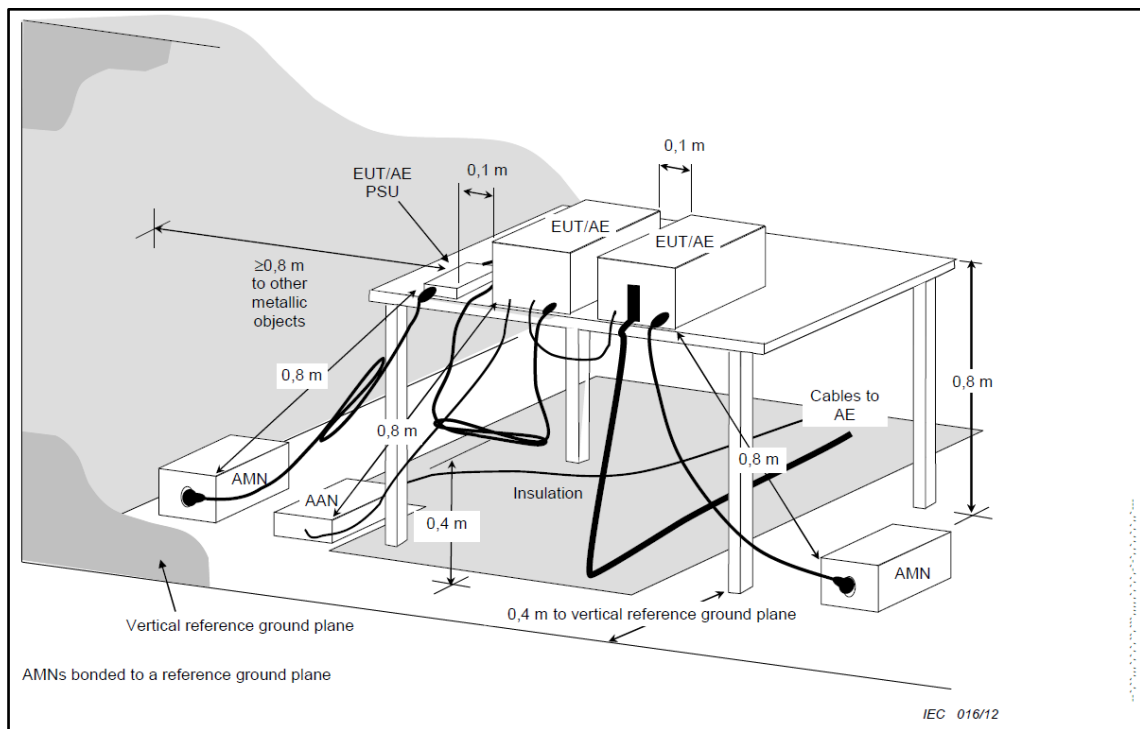
7 TEST METHODOLOGY

7.1 Conducted Spurious Emission Test on AC Power Line

Measured levels of ac power-line conducted emission across the 50Ω LISN port (to which the EUT is connected). All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer.

The device is placed on the test table, raised 80cm above the reference ground plane. The vertical conducting plane is located 40cm to the rear of the device. AC Conducted emission measurement is made over frequency range from 150kHz to 30MHz, this measurement was performed with EUT powered by 2 methods and both method are tested individually, one with an AC adaptor with 110V AC 60Hz supply and second with Wireless charger with supply 110V AC 60Hz.

7.1.1 Test Setup Configuration



7.2 Radiated Emission Test

The radiated emission measurement was performed according to the procedures in ANSI C63.10-2013. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable for below 1 GHz & 1.5 m height for above 1 GHz measurement, and the EUT is 3 meters far from the measuring antenna. The turntable was rotated 360° for obtaining the maximum emission. The height of the measuring antennas was scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained. The measurement above 1000 MHz was performed by horn antenna, The measurement below 30 MHz was performed by loop antenna, Measurement from 30 MHz to 200 MHz was performed by Baloon and Biconical Antenna, and measurement from 200 MHz to 1 GHz was performed by Log-Periodic Antenna.

The EUT was rotated around the X-, Y-, and Z-Axis and the results from worst case axis are recorded

7.2.1 Test Setup Configuration

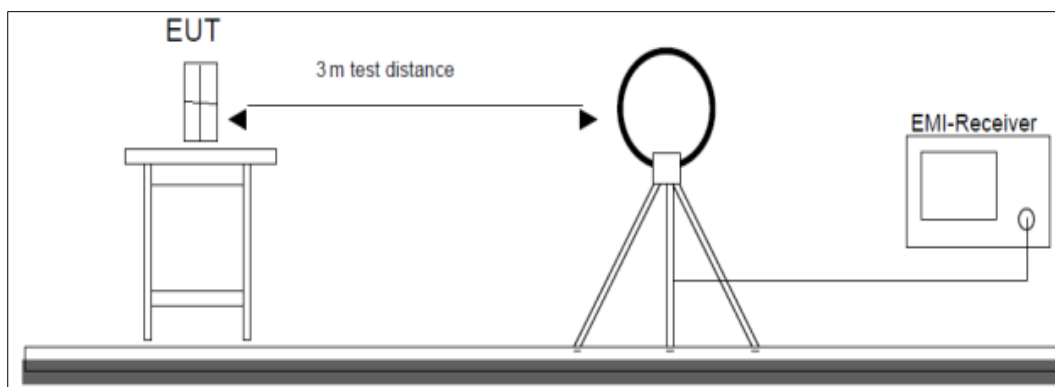


Figure 1: Frequency Range 9 kHz- 30 MHz

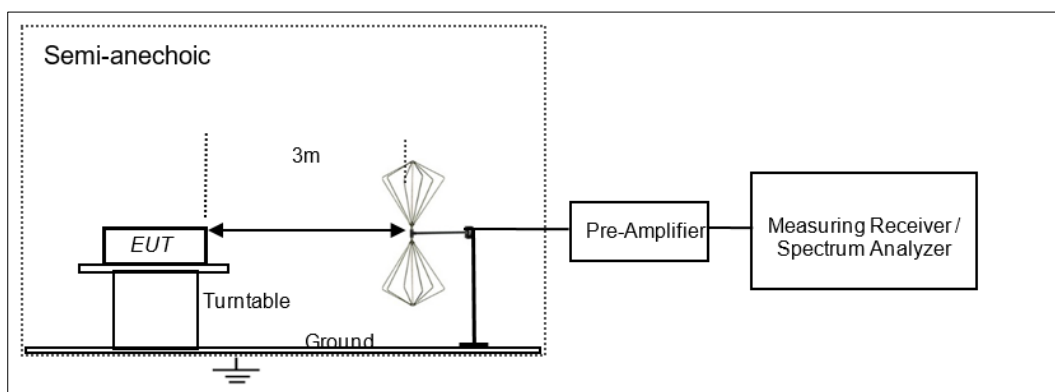


Figure 2: Frequency Range 30 MHz – 200 MHz

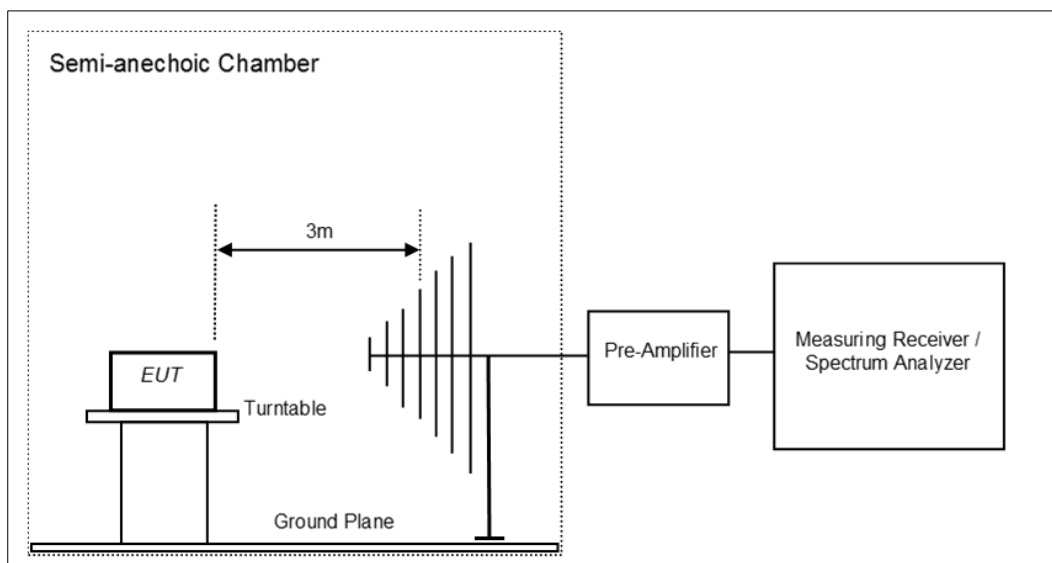


Figure 3: Frequency Range 200 MHz - 1GHz

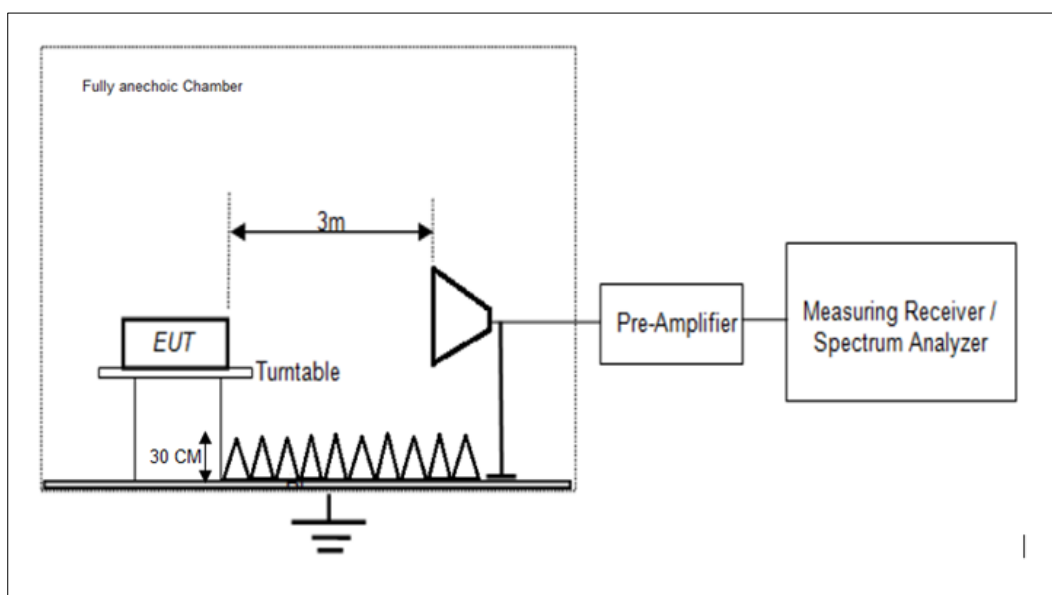


Figure 4: Frequency Range above 1 GHz

8 TEST RESULTS FOR Wi-Fi

8.1 Spurious Radiated Emissions & Restricted Bands of Operation

Result	Pass
Test Specification	FCC part 15 Subpart C 15.247 (d) / (15.209 & 15.205)
Test Method	ANSI C63.10
Measurement Location	Semi Anechoic Chamber 30MHz - 1 GHz Fully Anechoic Chamber 1 GHz - 40GHz
Measurement Bandwidth	100 kHz for frequency range < 1GHz 1 MHz for Frequency range >1GHz
Detector	Refer remarks below
Measuring Distance	3 m
Requirement	As per the limits mentioned in the below table
Test setup	Refer Clause 7 TEST METHODOLOGY

Table 6: Transmitter limits for Radiated emission

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Distance of Measurement (m)
0.009 – 0.490	2400/F(kHz)	48.50 – 13.80	300*
0.490 – 1.705	24000/F(kHz)	33.80 – 23.00	30*
1.705 -30	30	29.54	30*
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Remark: * The limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300 meter, 30 meter and 30 meter range respectively, which corresponds to 128.51 – 93.80, 73.80 – 62.96 and 69.54 dBμV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Conditions:

Temperature (Norm) = + 25 °C Voltage = 12V DC Relative humidity = 62 %

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 17 von 39
Page 17 of 39

Test results:

Note: All the losses are included during measurement and final values are mentioned in the test report. Refer Clause 7 TEST METHODOLOGY for more details

Test results for frequency range 9kHz – 30MHz

No emissions found in frequency range 9 kHz to 30 MHz, and measured levels are below 20dB from the limit line, hence not reported

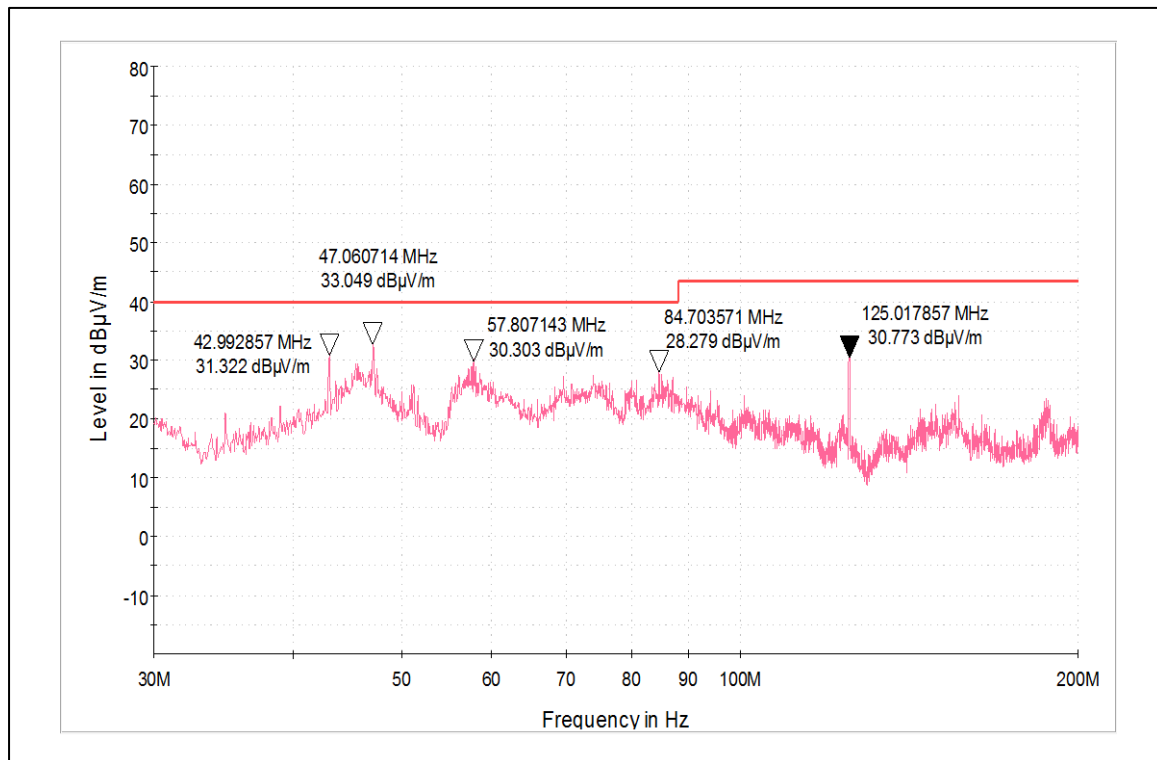
Test results for frequency range 30MHz – 200MHz

Antenna Polarization	Frequency (MHz)	Peak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Vertical	42.99	31.32	40	-8.68
	47.06	33.04	40	-6.96
	84.70	28.27	40	-11.73
	125.01	30.77	43.5	-12.73
	249.97	26.19	46	-19.81
	381.50	25.82	46	-20.18
	499.98	34.54	46	-11.46
	907.27	36.22	46	-9.78
Horizontal	47.12	11.85	40	-28.15
	95.38	17.26	43.5	-26.24
	125.01	18.26	43.5	-25.24
	154.58	19.31	43.5	-24.19
	249.97	24.99	46	-21.01
	290.80	30.30	46	-15.70
	499.98	33.53	46	-12.47
	896.48	34.67	46	-11.33

Prüfbericht - Nr.:
Test Report No.:

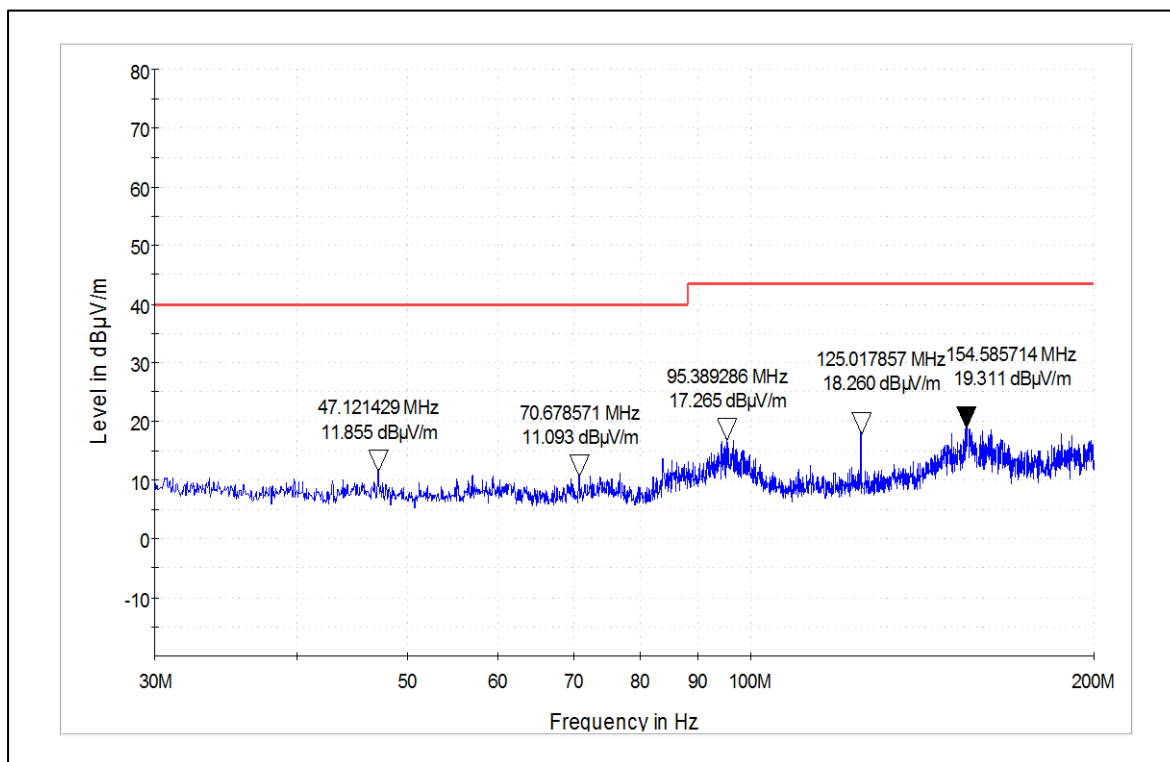
ULR-TC568820300000041F

Seite 18 von 39
Page 18 of 39



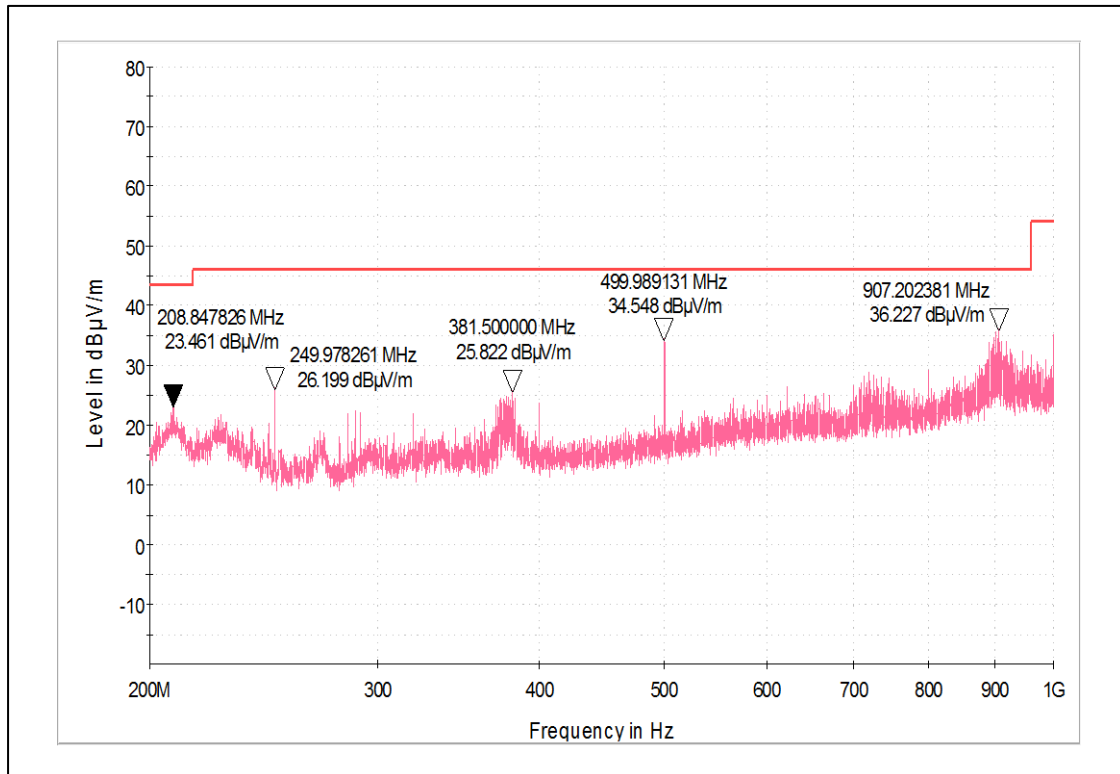
Frequency Range: 30MHz-200MHz

Polarization: Vertical



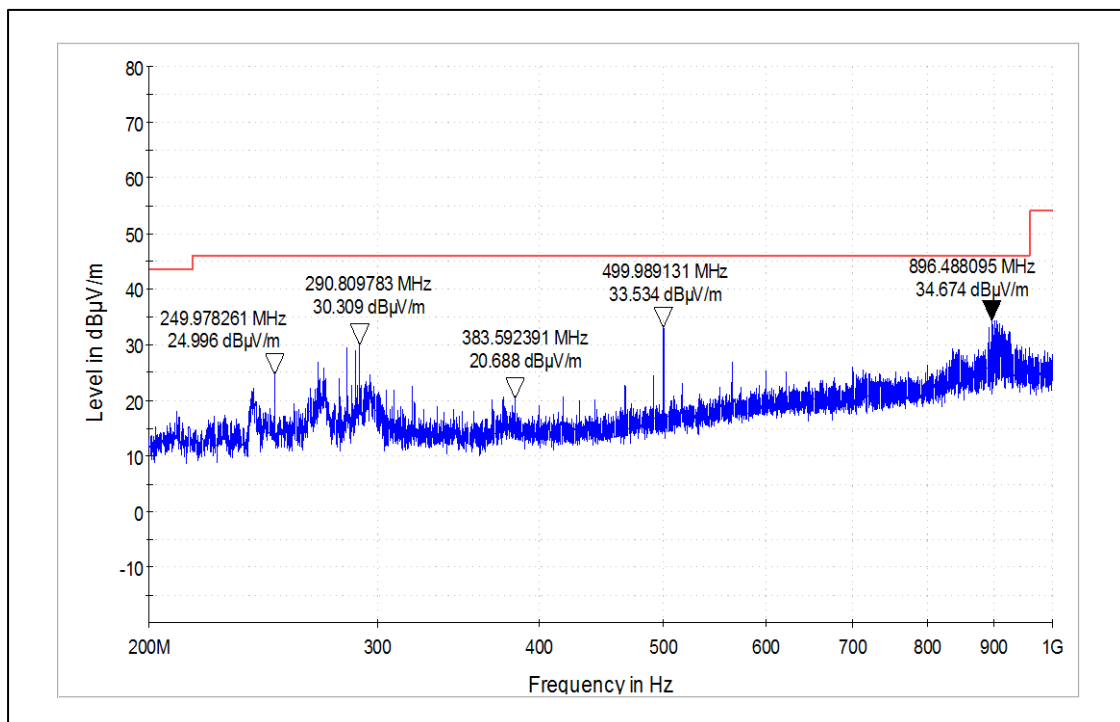
Frequency Range: 30MHz-200MHz

Polarization: Horizontal



Frequency Range: 200MHz-1GHz

Polarization: Vertical



Frequency Range: 200MHz-1GHz

Polarization: Horizontal

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 20 von 39
Page 20 of 39

Test results for the frequencies in the range 1 GHz to 26.5 GHz

Modulation: 802.11b
Data Rate: 1Mbps

Channel Frequency (MHz)	Polarization	Frequency (MHz)	Emission level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2412	Vertical	2390(Pk)	60.77	74*	-13.23
		2390(Av)	30.88	54*	-23.12
		2412(Pk)	81.40	-	-
		2412(Av)	78.61	-	-
		4824(Pk)	58.80	74	-14.41
		4824(Av)	48.16	54	-6.33
		7236(Pk)	No Harmonics Found		
		7236(Av)			
	Horizontal	2390(Pk)	55.82	74*	-18.18
		2390(Av)	35.21	54*	-18.79
		2412(Pk)	96.07	-	-
		2412(Av)	92.74	-	-
		4824(Pk)	59.59	74	-14.41
		4824(Av)	47.67	54	-6.33
		7236(Pk)	No Harmonics Found		
		7236(Av)			
2437	Vertical	2437(Pk)	83.16	-	-
		2437(Av)	80.33	-	-
		4874(Pk)	48.21	74	-25.79
		4874(Av)	34.80	54	-19.20
		7311(Pk)	No Harmonics Found		
		7311(Av)			
	Horizontal	2437(Pk)	95.27	-	-
		2437(Av)	92.58	-	-
		4874(Pk)	49.40	74	-24.60
		4874(Av)	36.21	54	-17.79
		7311(Pk)	No Harmonics Found		
		7311(Av)			
2462	Vertical	2462(Pk)	80.03	-	-
		2462(Av)	76.16	-	-
		2483.5(Pk)	42.92	74*	-31.08
		2483.5(Av)	27.17	54*	-26.83
		4924(Pk)	47.90	74	-26.10
		4924(Av)	34.13	54	-19.87
		7386(Pk)	No Harmonics Found		
		7386(Av)			
	Horizontal	2462(Pk)	97.30	-	-
		2462(Av)	94.58	-	-
		2483.5(Pk)	43.28	74*	-30.72
		2483.5(Av)	30.72	54*	-23.28
		4924(Pk)	47.35	74	-26.65
		4924(Av)	34.71	54	-19.29
		7386(Pk)	No Harmonics Found		
		7386(Av)			

*- : Indicate restricted band of operation §15.205
Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 21 von 39
Page 21 of 39

Modulation: 802.11g
Data Rate: 54Mbps

Channel Frequency (MHz)	Polarization	Frequency (MHz)	Emission level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2412	Vertical	2390(Pk)	58.86	74*	-15.14
		2390(Av)	32.55	54*	-21.45
		2412(Pk)	79.98	-	-
		2412(Av)	70.38	-	-
		4824(Pk)	58.13	74	-15.87
		4824(Av)	44.93	54	-9.07
		7236(Pk)	No Harmonics Found		
		7236(Av)			
	Horizontal	2390(Pk)	63.24	74*	-10.76
		2390(Av)	48.19	54*	-5.81
		2412(Pk)	99.82	-	-
		2412(Av)	90.78	-	-
		4824(Pk)	50.71	74	-23.29
		4824(Av)	38.13	54	-15.87
		7236(Pk)	No Harmonics Found		
		7236(Av)			
2437	Vertical	2437(Pk)	83.68	-	-
		2437(Av)	73.95	-	-
		4874(Pk)	50.16	74	-23.84
		4874(Av)	36.97	54	-17.03
		7311(Pk)	No Harmonics Found		
		7311(Av)			
	Horizontal	2437(Pk)	99.88	-	-
		2437(Av)	90.85	-	-
		4874(Pk)	57.76	74	-16.24
		4874(Av)	44.98	54	-9.02
		7311(Pk)	No Harmonics Found		
		7311(Av)			
2462	Vertical	2462(Pk)	84.51	-	-
		2462(Av)	75.36	-	-
		2483.5(Pk)	48.53	74*	-25.47
		2483.5(Av)	33.89	54*	-20.11
		4924(Pk)	49.52	74	-24.48
		4924(Av)	36.71	54	-17.29
		7386(Pk)	No Harmonics Found		
		7386(Av)			
	Horizontal	2462(Pk)	100.81	-	-
		2462(Av)	90.75	-	-
		2483.5(Pk)	65.22	74*	-8.78
		2483.5(Av)	51.07	54*	-2.93
		4924(Pk)	57.77	74	-16.23
		4924(Av)	45.53	54	-8.47
		7386(Pk)	No Harmonics Found		
		7386(Av)			

*- : Indicate restricted band of operation §15.205
Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

ULR-TC568820300000041F

Seite 22 von 39

Page 22 of 39

Modulation: 802.11n_HT20

Data Rate: MCS0

Channel Frequency (MHz)	Polarization	Frequency (MHz)	Emission level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2412	Vertical	2390(Pk)	60.14	74*	-13.86
		2390(Av)	32.61	54*	-21.39
		2412(Pk)	82.78	-	-
		2412(Av)	73.13	-	-
		4824(Pk)	50.05	74	-23.95
		4824(Av)	36.74	54	-17.26
		7236(Pk)	No Harmonics Found		
		7236(Av)			
	Horizontal	2390(Pk)	61.93	74*	-12.07
		2390(Av)	47.59	54*	-6.41
		2412(Pk)	100.13	-	-
		2412(Av)	90.03	-	-
		4824(Pk)	55.84	74	-18.16
		4824(Av)	43.27	54	-10.73
		7236(Pk)	No Harmonics Found		
		7236(Av)			
2437	Vertical	2437(Pk)	83.63	-	-
		2437(Av)	74.13	-	-
		4874(Pk)	49.84	74	-24.16
		4874(Av)	36.95	54	-17.05
		7311(Pk)	No Harmonics Found		
		7311(Av)			
	Horizontal	2437(Pk)	99.56	-	-
		2437(Av)	89.58	-	-
		4874(Pk)	57.33	74	-16.67
		4874(Av)	44.70	54	-9.30
		7311(Pk)	No Harmonics Found		
		7311(Av)			
2462	Vertical	2462(Pk)	83.65	-	-
		2462(Av)	74.75	-	-
		2483.5(Pk)	48.18	74*	-25.82
		2483.5(Av)	33.46	54*	-20.54
		4924(Pk)	49.16	74	-24.84
		4924(Av)	35.75	54	-18.25
		7386(Pk)	No Harmonics Found		
		7386(Av)			
	Horizontal	2462(Pk)	100.68	-	-
		2462(Av)	90.65	-	-
		2483.5(Pk)	64.94	74*	-9.06
		2483.5(Av)	50.67	54*	-3.33
		4924(Pk)	57.34	74	-16.66
		4924(Av)	44.69	54	-9.31
		7386(Pk)	No Harmonics Found		
		7386(Av)			

*- : Indicate restricted band of operation §15.205

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 23 von 39
Page 23 of 39

Modulation: 802.11n_HT40
Data Rate: MCS7

Channel Frequency (MHz)	Polarization	Frequency (MHz)	Emission level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2422	Vertical	2390(Pk)	60.46	74*	-13.54
		2390(Av)	33.67	54*	-20.33
		2422(Pk)	77.14	-	-
		2422(Av)	66.23	-	-
		4844(Pk)	49.93	74	-28.54
		4844(Av)	37.82	54	-21.4
		7266(Pk)	No Harmonics Found		
		7266(Av)			
	Horizontal	2390(Pk)	64.69	74*	-9.31
		2390(Av)	52.33	54*	-1.67
		2422(Pk)	96.70	-	-
		2422(Av)	85.46	-	-
		4844(Pk)	45.46	74	-28.54
		4844(Av)	32.60	54	-21.40
		7266(Pk)	No Harmonics Found		
		7266(Av)			
2437	Vertical	2437(Pk)	80.45	-	-
		2437(Av)	69.32	-	-
		4874(Pk)	44.29	74	-29.71
		4874(Av)	30.78	54	-23.22
		7311(Pk)	No Harmonics Found		
		7311(Av)			
	Horizontal	2437(Pk)	94.62	-	-
		2437(Av)	83.47	-	-
		4874(Pk)	45.04	74	-28.96
		4874(Av)	31.65	54	-22.35
		7311(Pk)	No Harmonics Found		
		7311(Av)			
2452	Vertical	2452(Pk)	80.45	-	-
		2452(Av)	69.27	-	-
		2483.5(Pk)	47.81	74*	-26.19
		2483.5(Av)	35.85	54*	-18.15
		4904(Pk)	44.37	74	-29.63
		4904(Av)	30.80	54	-23.20
		7356(Pk)	No Harmonics Found		
		7356(Av)			
	Horizontal	2452(Pk)	94.39	-	-
		2452(Av)	83.26	-	-
		2483.5(Pk)	62.86	74*	-11.14
		2483.5(Av)	51.70	54*	-2.30
		4904(Pk)	45.09	74	-28.91
		4904(Av)	31.14	54	-22.86
		7356(Pk)	No Harmonics Found		
		7356(Av)			

*- : Indicate restricted band of operation §15.205
Pk: Peak Detector; Av: Average Detector

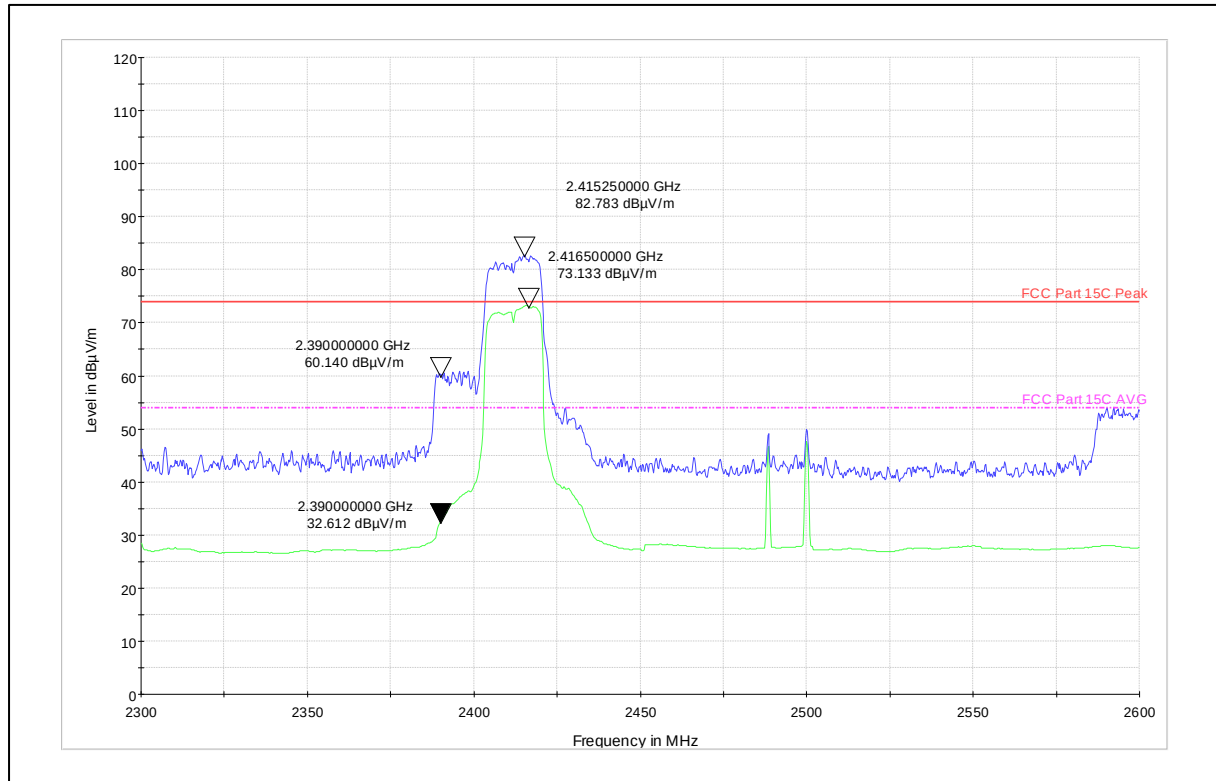
Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 24 von 39
Page 24 of 39

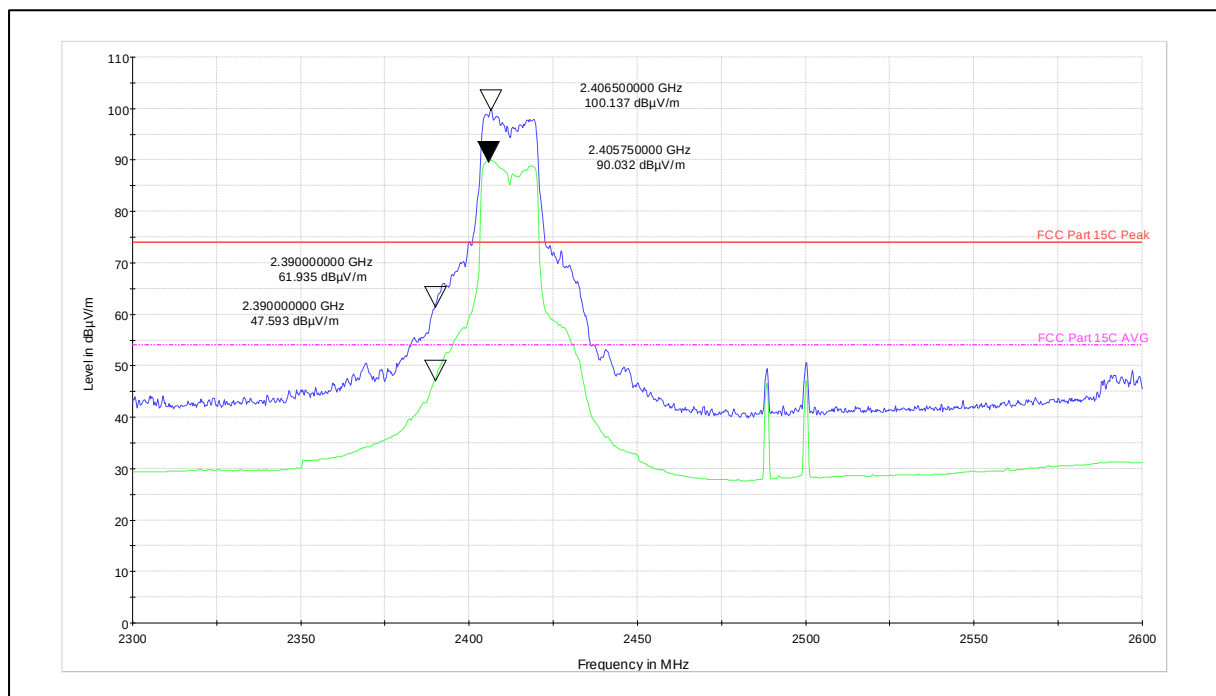
Worst case Plots

Data Rate: n mode HT20 MCS0



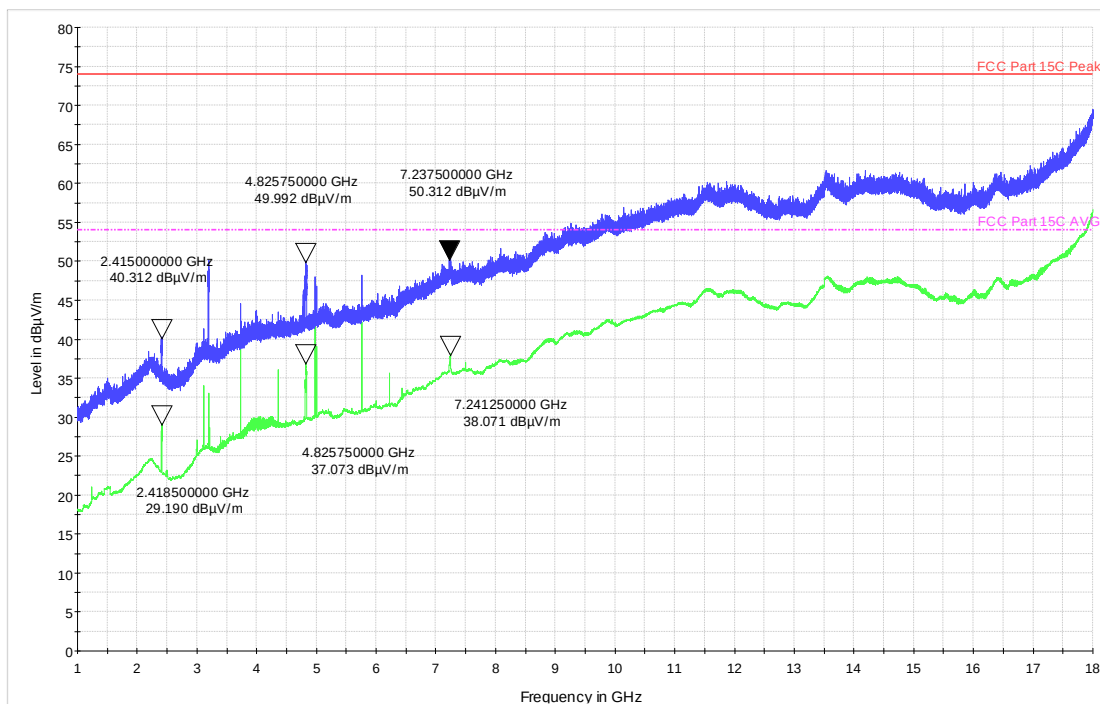
Channel Frequency: 2412MHz

Polarization: Vertical



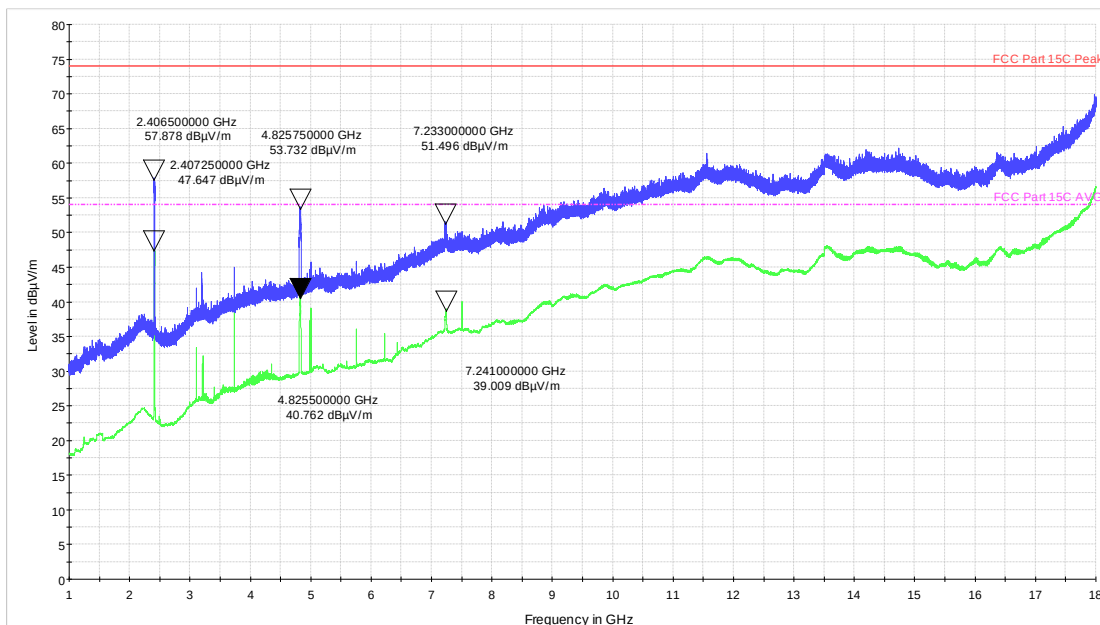
Channel Frequency: 2412MHz

Polarization: Horizontal



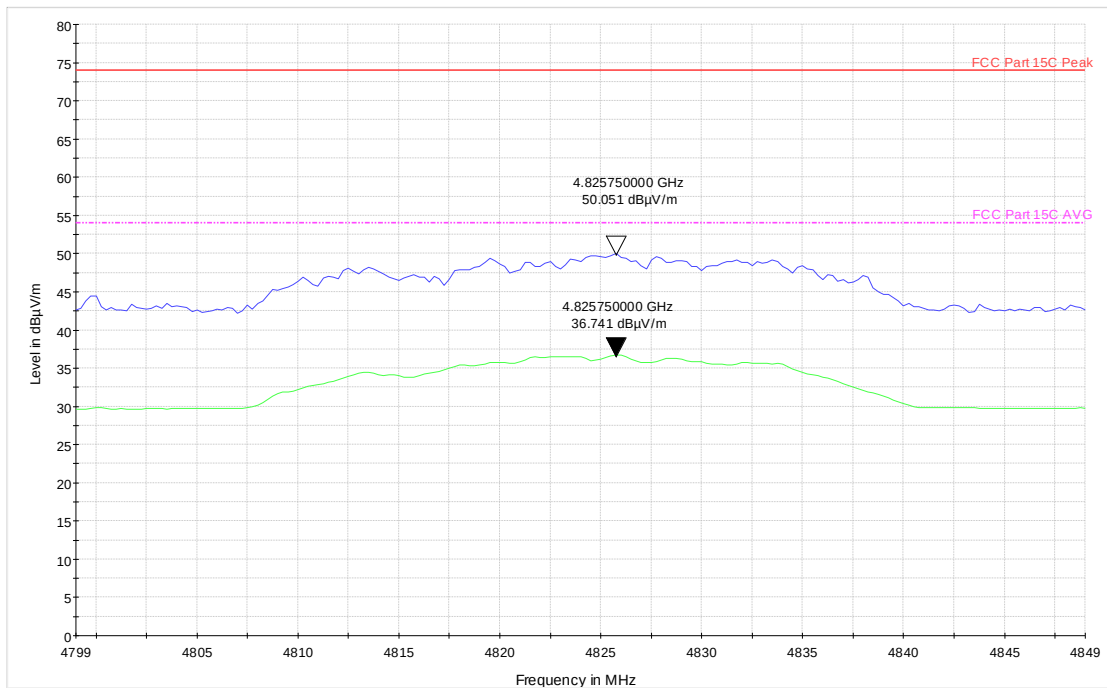
Frequency Range: 1-18GHz

Polarization: Vertical



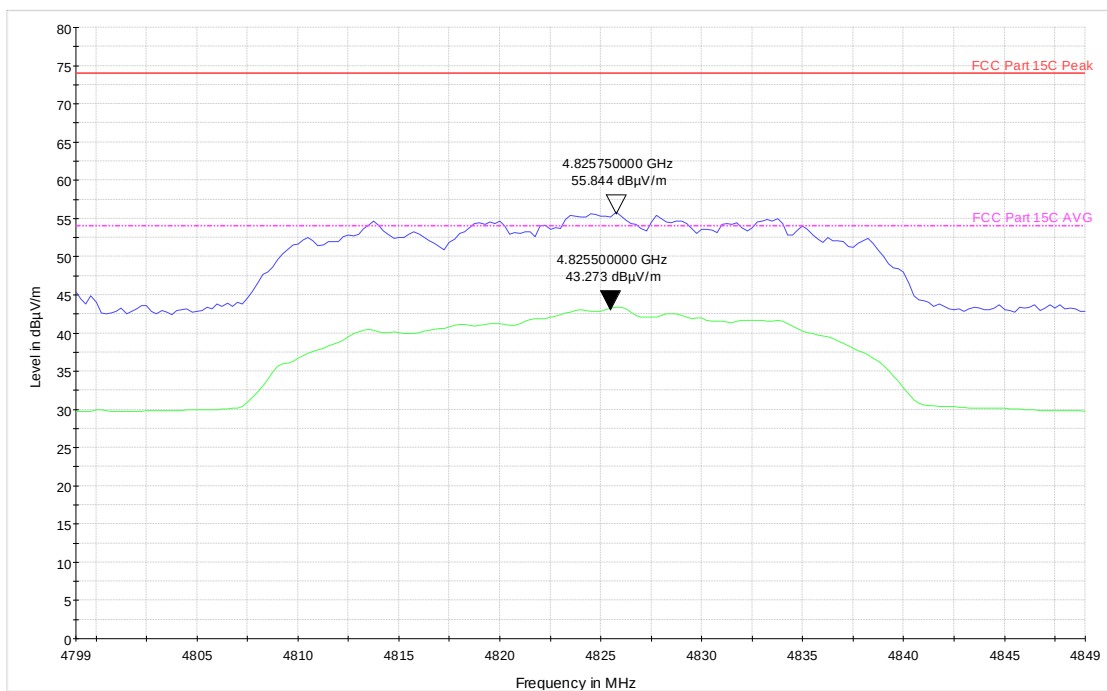
Frequency Range: 1-18GHz

Polarization: Horizontal



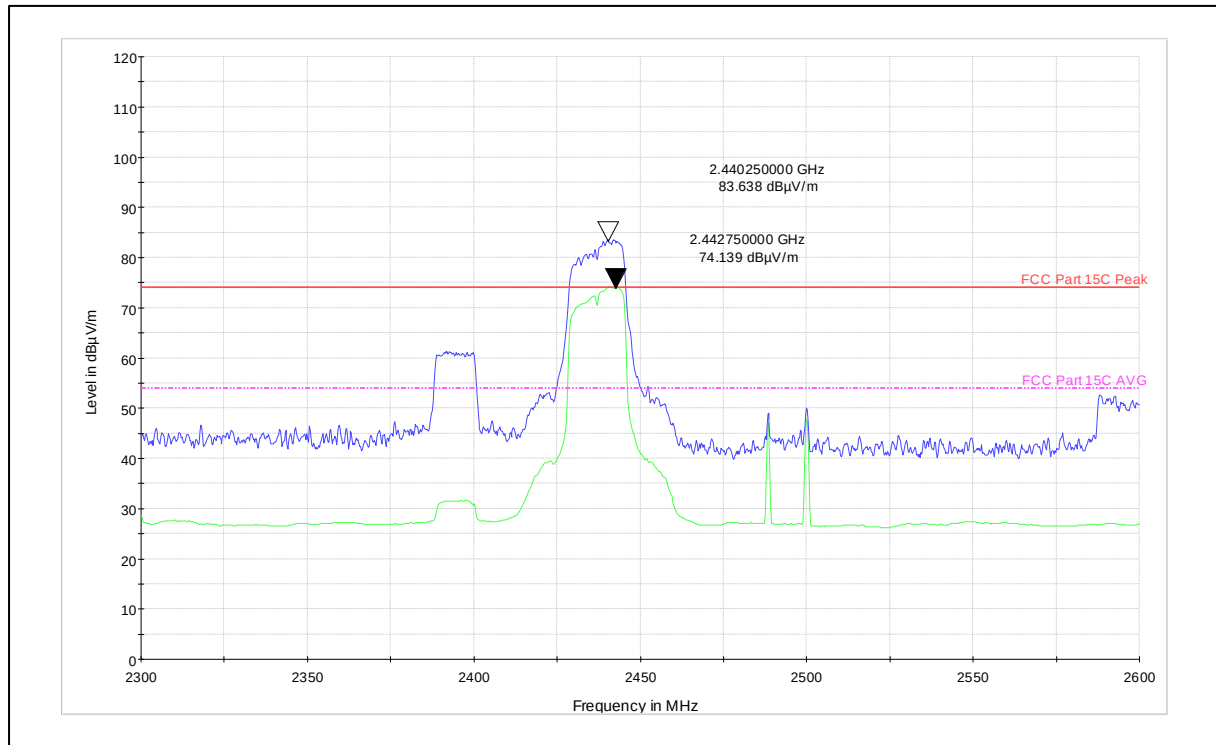
Harmonics2

Polarization: Vertical



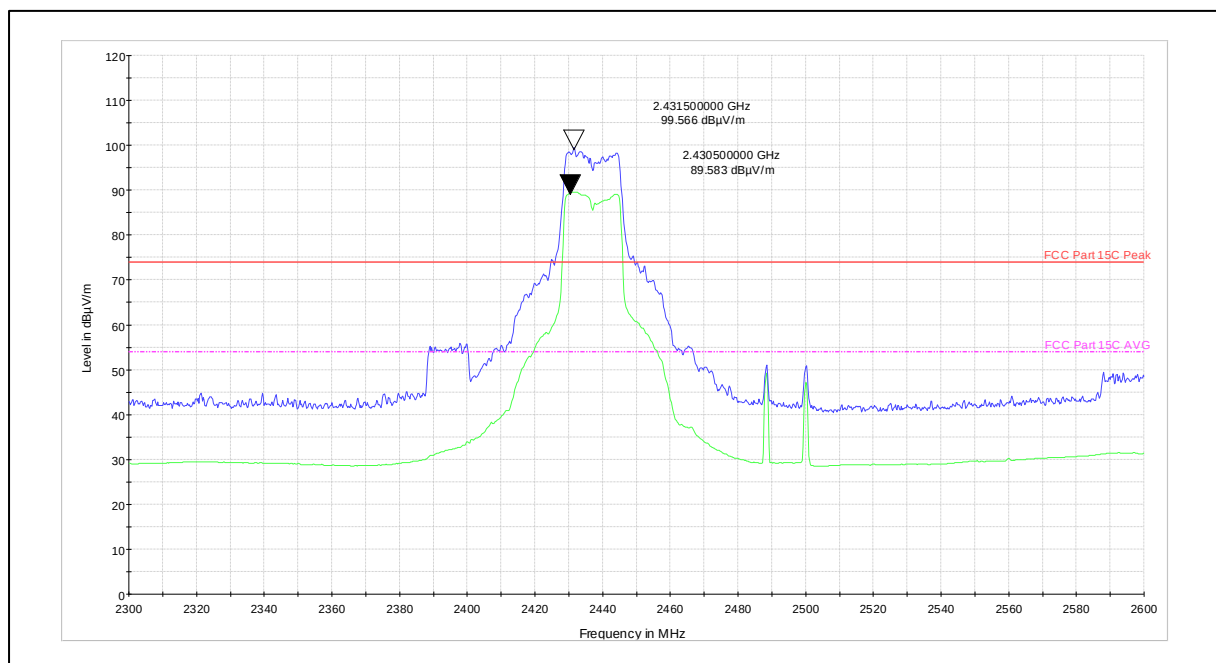
Harmonics2

Polarization: Horizontal



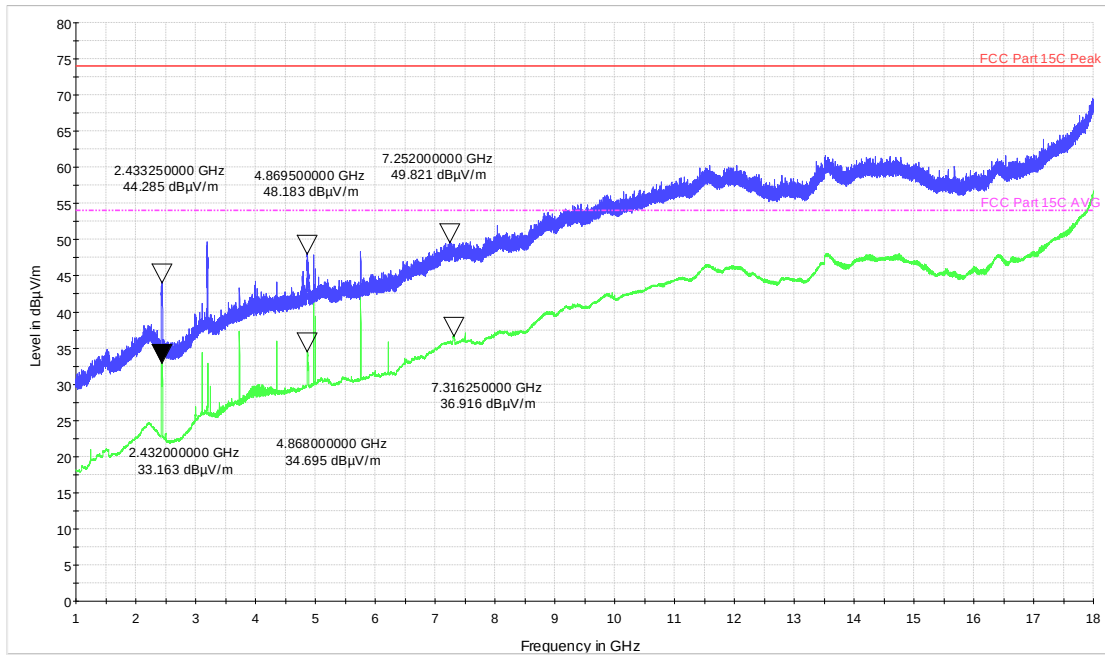
Channel Frequency: 2437MHz

Polarization: Vertical



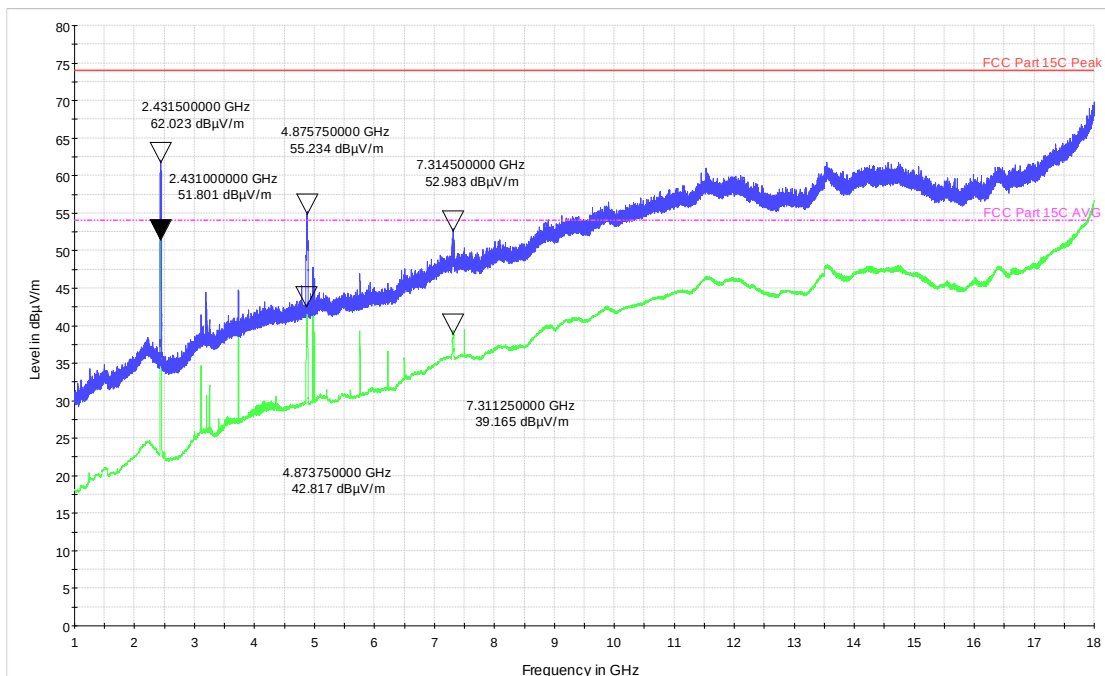
Channel Frequency: 2437MHz

Polarization: Horizontal



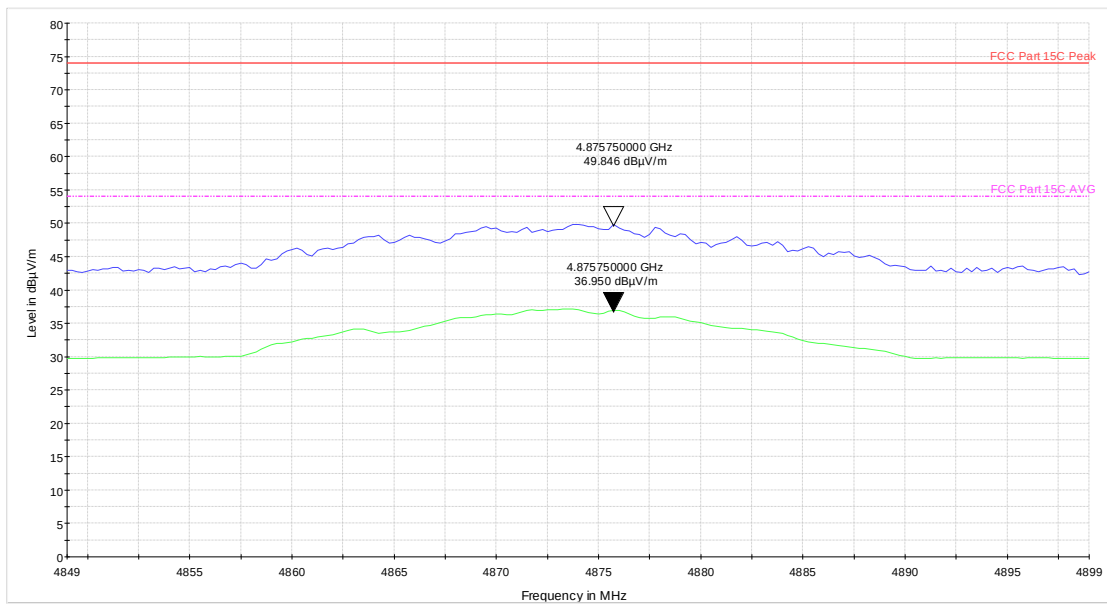
Frequency Range: 1-18GHz

Polarization: Vertical



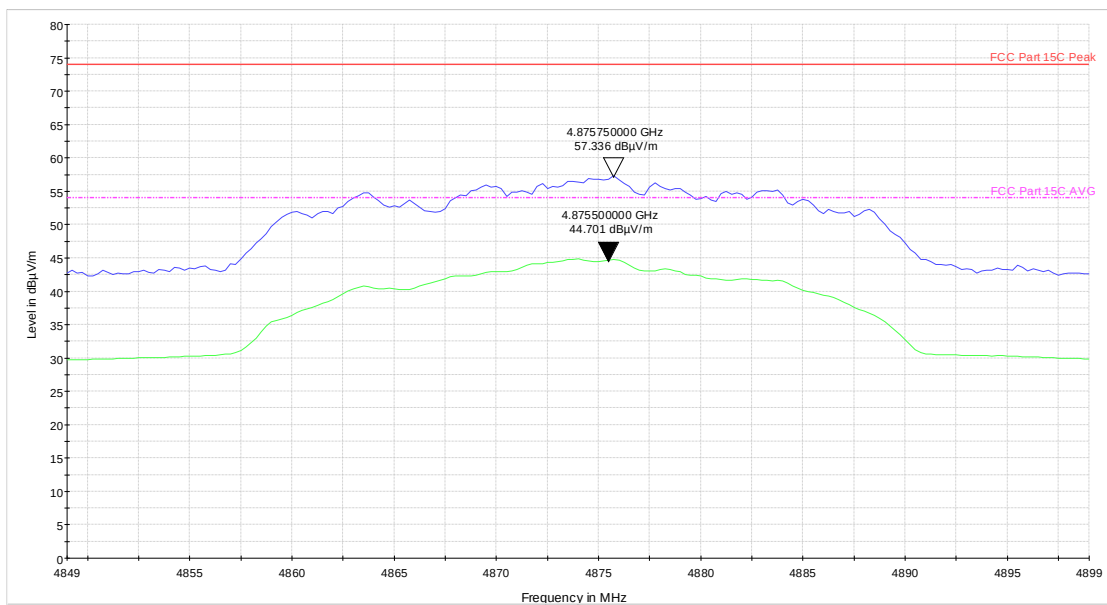
Frequency Range: 1-18GHz

Polarization: Horizontal



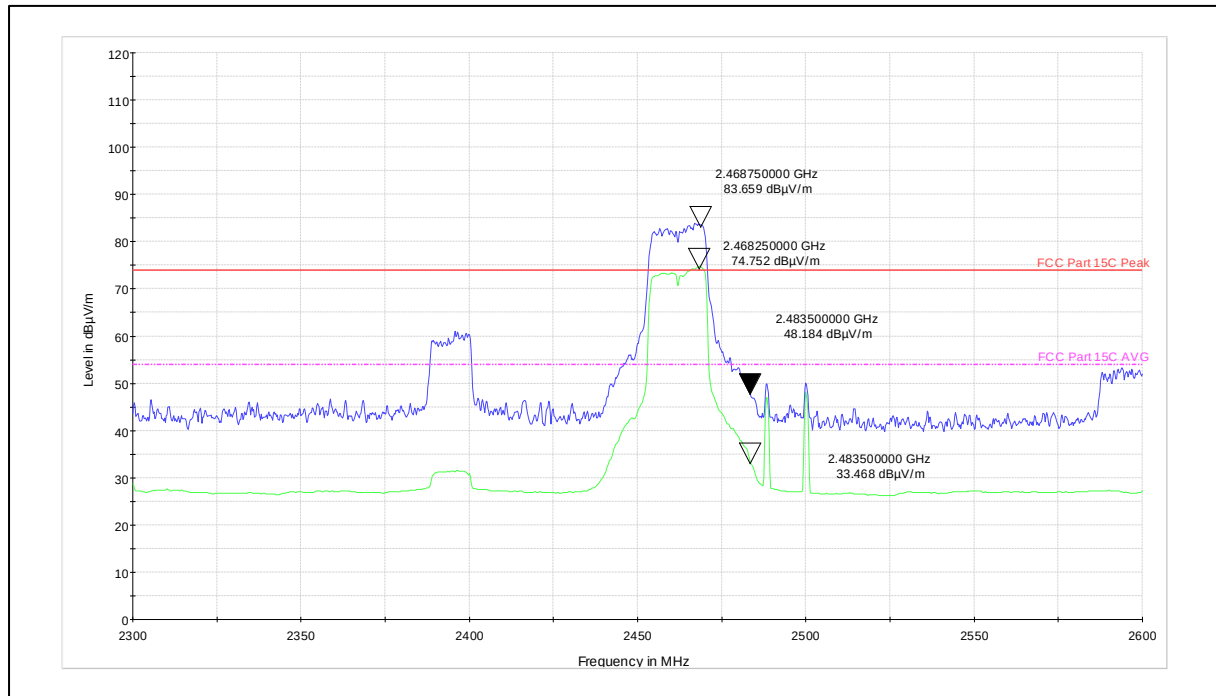
Harmonics2

Polarization: Vertical



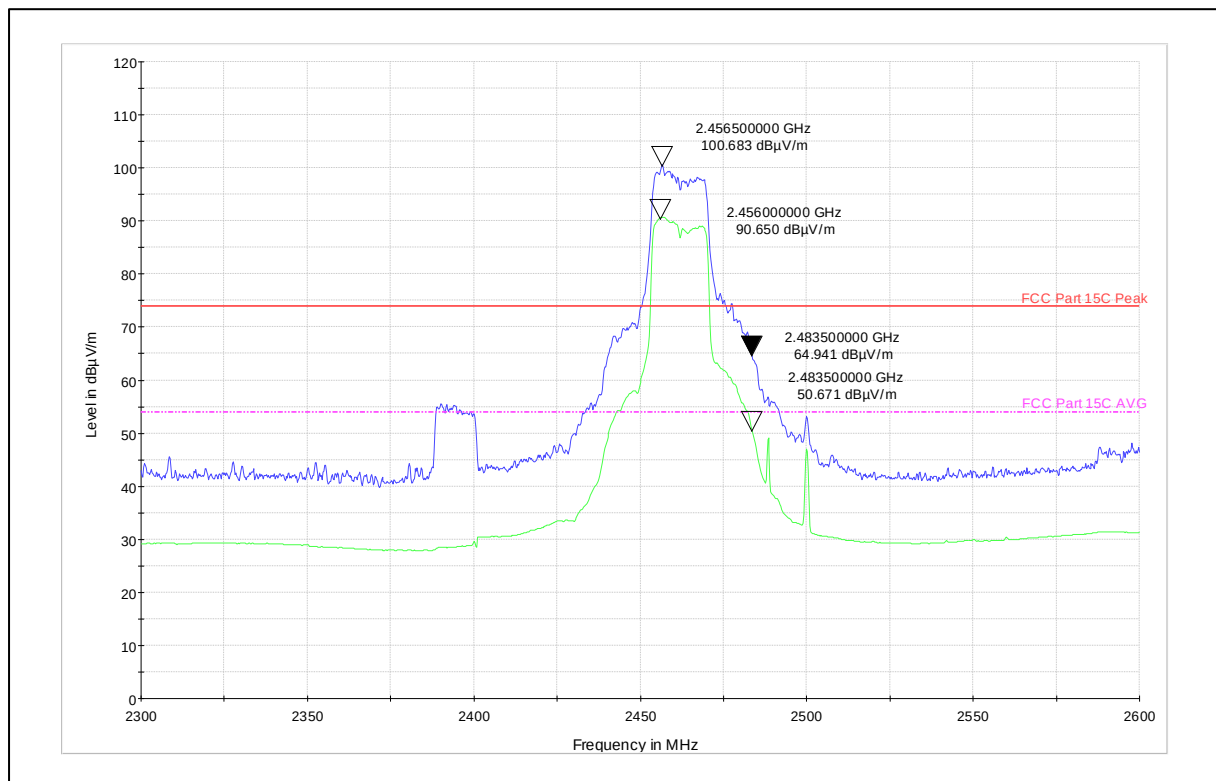
Harmonics2

Polarization: Horizontal



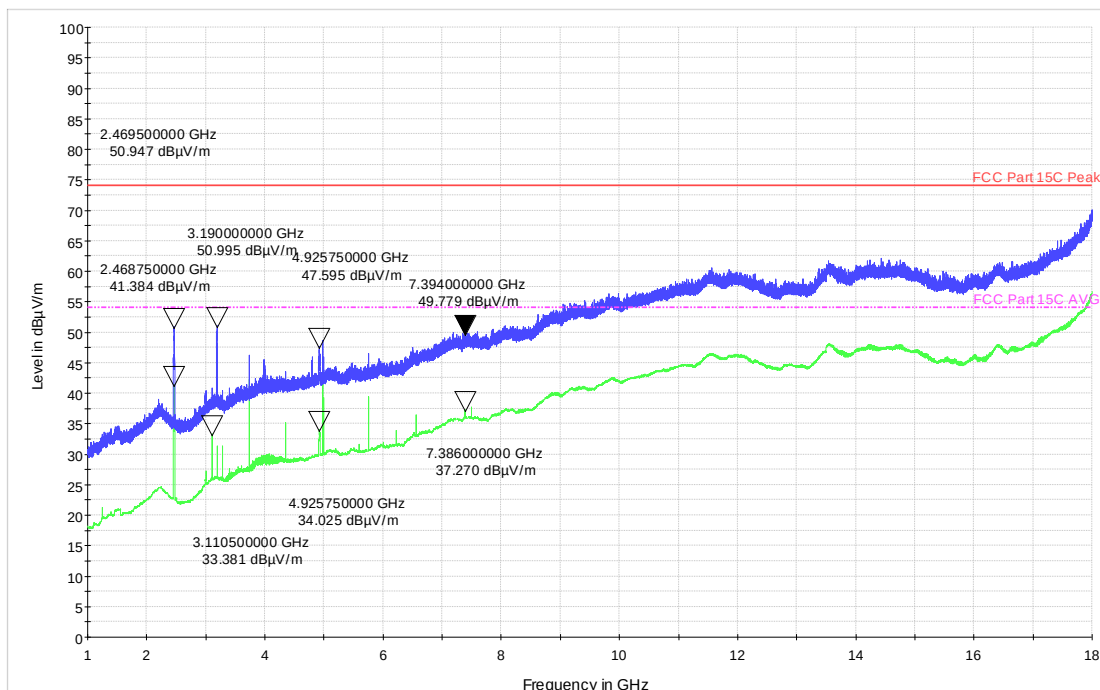
Channel Frequency: 2462MHz

Polarization: Vertical



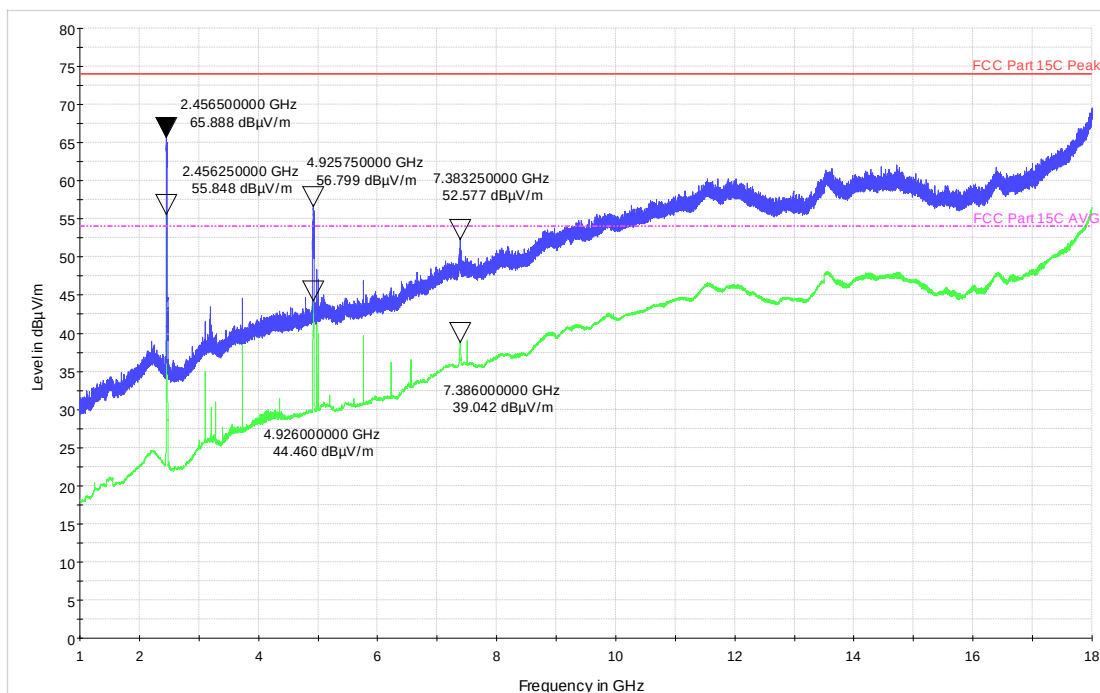
Channel Frequency: 2462MHz

Polarization: Horizontal



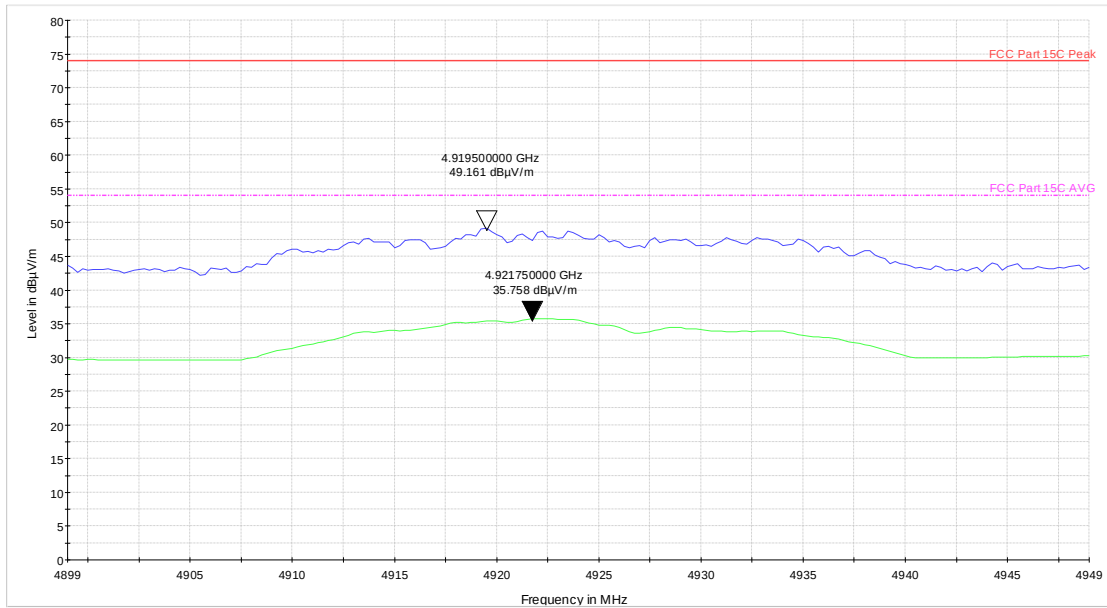
Frequency Range: 1-18GHz

Polarization: Vertical



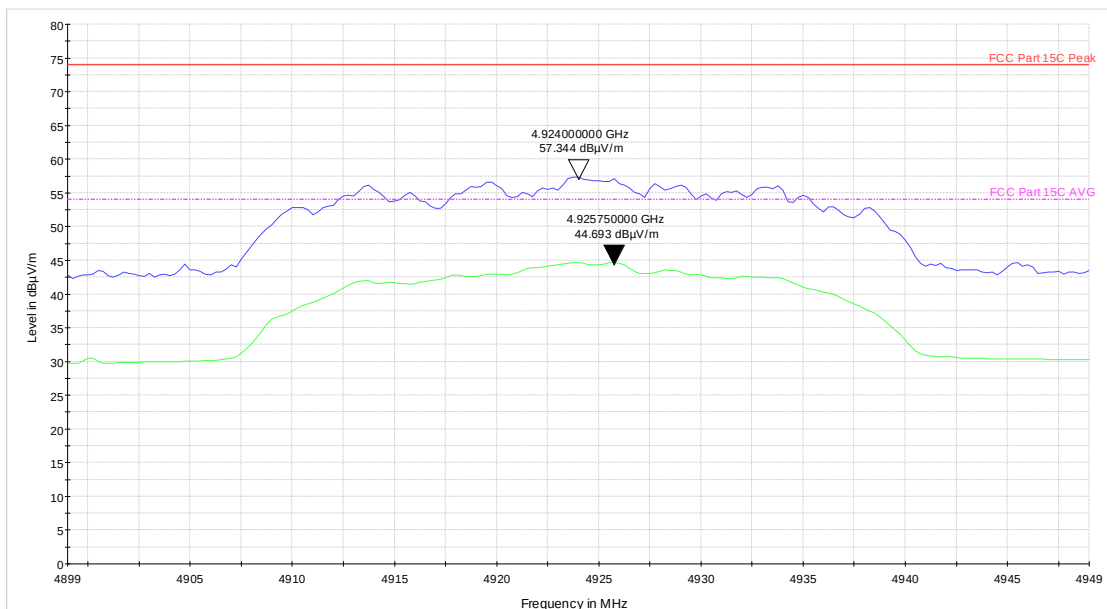
Frequency Range: 1-18GHz

Polarization: Horizontal



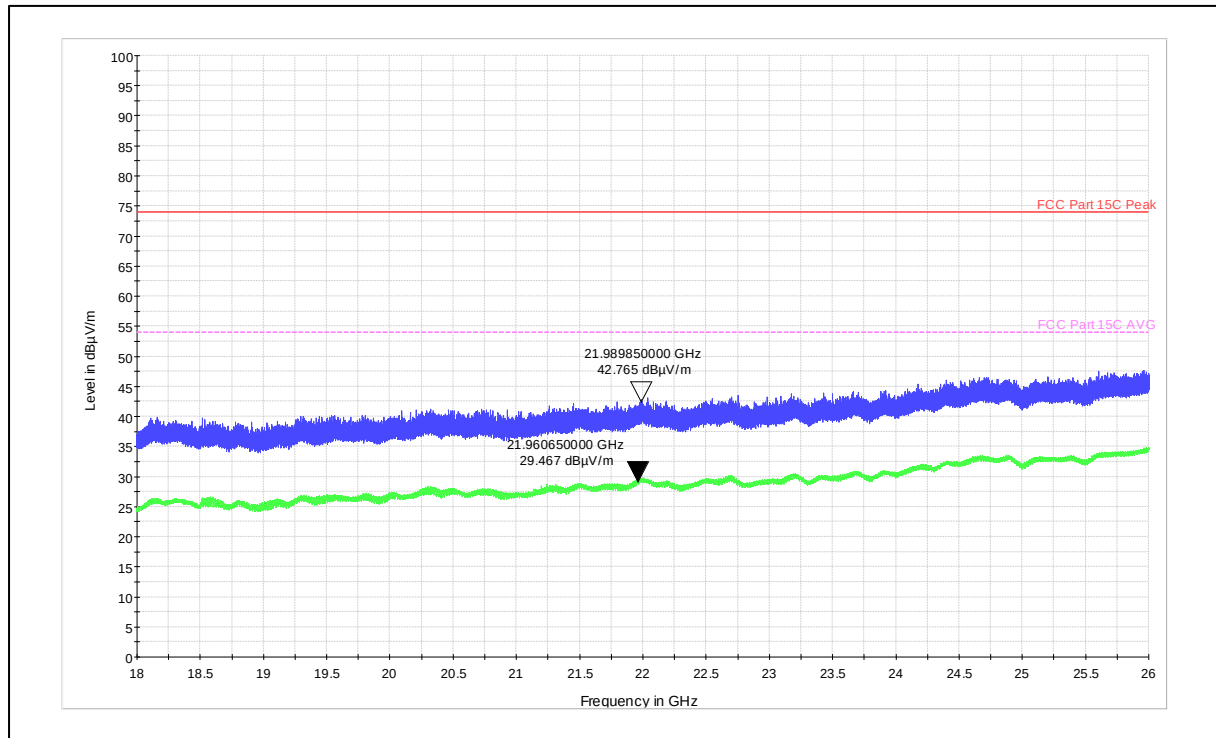
Harmonics2

Polarization: Vertical



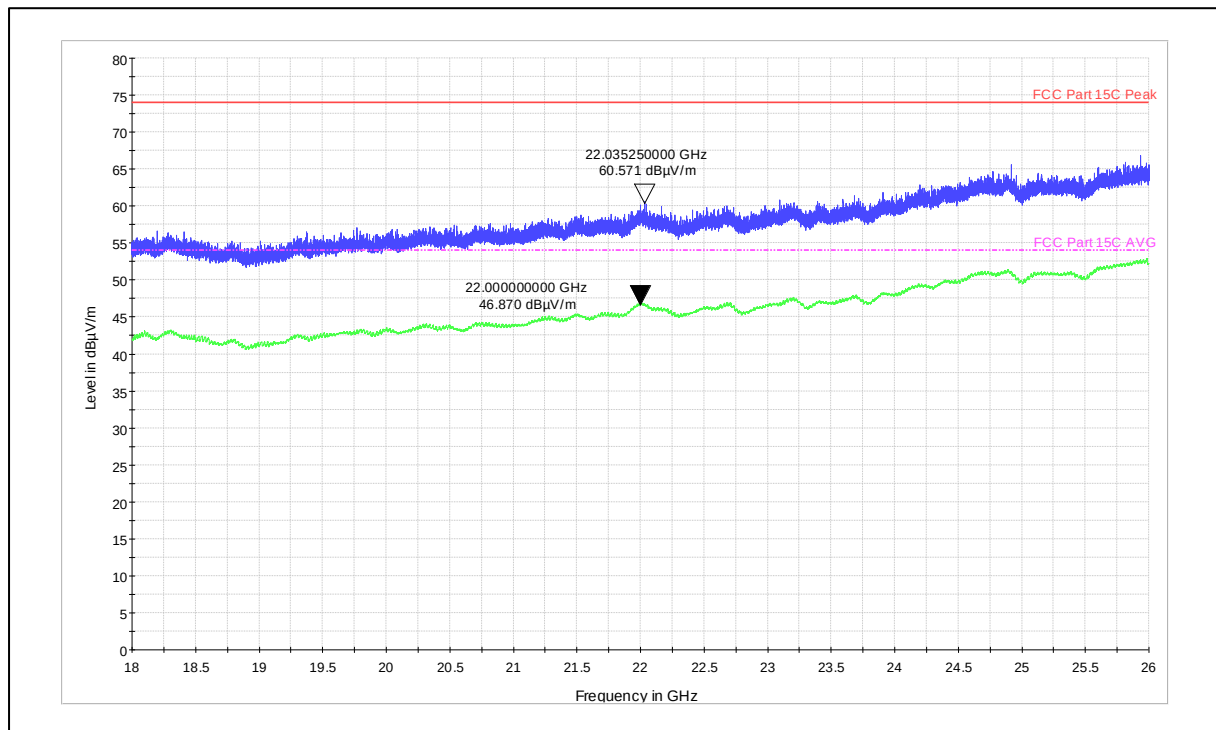
Harmonics2

Polarization: Horizontal



Frequency Range: 18-26GHz

Polarization: Vertical

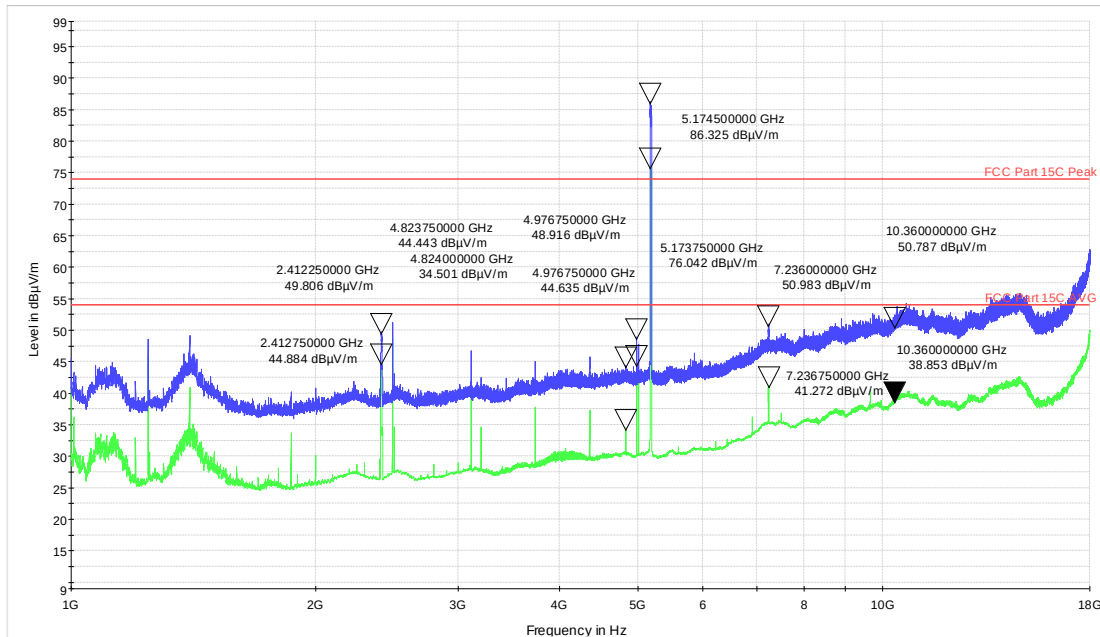


Frequency Range: 18-26GHz

Polarization: Horizontal

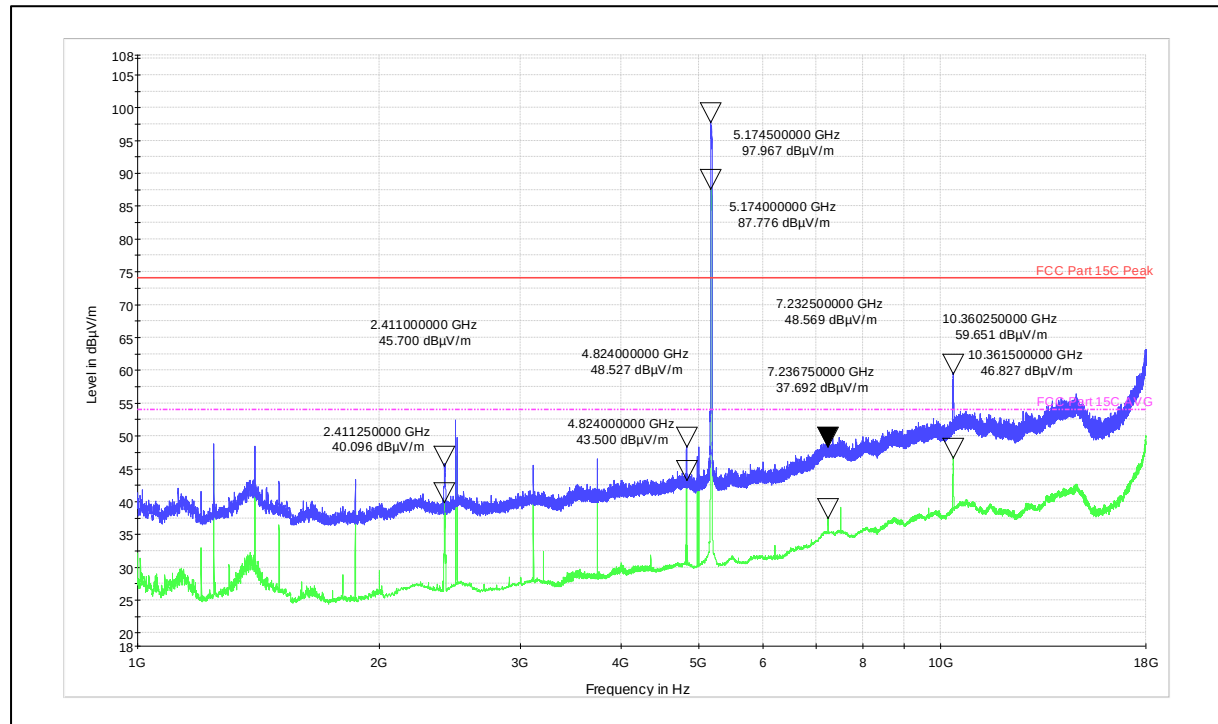
8.2 Simultaneous Mode of Operation

Simultaneous transmission frequencies (MHz)	Polarization	Frequency (MHz)	Emission level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2412 MHz & 5180 MHz	Vertical	4824(Pk)	44.44	74	-29.56
		4824(Av)	34.50	54	-19.50
		7236(Pk)	50.98	74	-23.02
		7236(Av)	41.27	54	-12.73
		10360(Pk)	50.78	74	-25.48
		10360(Av)	38.85	54	-10.50
	Horizontal	4824(Pk)	48.52	74	-25.44
		4824(Av)	43.50	54	-16.31
		7236(Pk)	48.56	74	-23.22
		7236(Av)	37.69	54	-15.15
	Horizontal	10360(Pk)	59.65	74	-14.35
		10360(Av)	46.82	54	-7.18



Frequency Range: 1-18GHz

Polarization: Vertical



Frequency Range: 1-18GHz

Polarization: Horizontal

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 36 von 39
Page 36 of 39

9 Conducted Spurious Emission Test on AC Power Line

Result

Pass

Test Specification : FCC Part 15 Section 15.207
Test Method : ANSI C 63.10-2013
Testing Location : Screened room
Measurement Bandwidth : 9kHz
Frequency Range : 150kHz – 30MHz
Supply Voltage : 110VAC,60Hz
Test Method : Refer TEST METHODOLOGY

***Note: The product has tested with AC to DC adapter**

Limits of section 15.207

Frequency of emission (MHz)	QP Limit (dBμV)	AV Limit (dBμV/m)
0.15 – 0.5	66 – 56*	56 – 46*
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency

Test Conditions:

Normal Temperature = +24°C Voltage (V norm) = 110V AC (Through AC to DC)
RH = 64 %

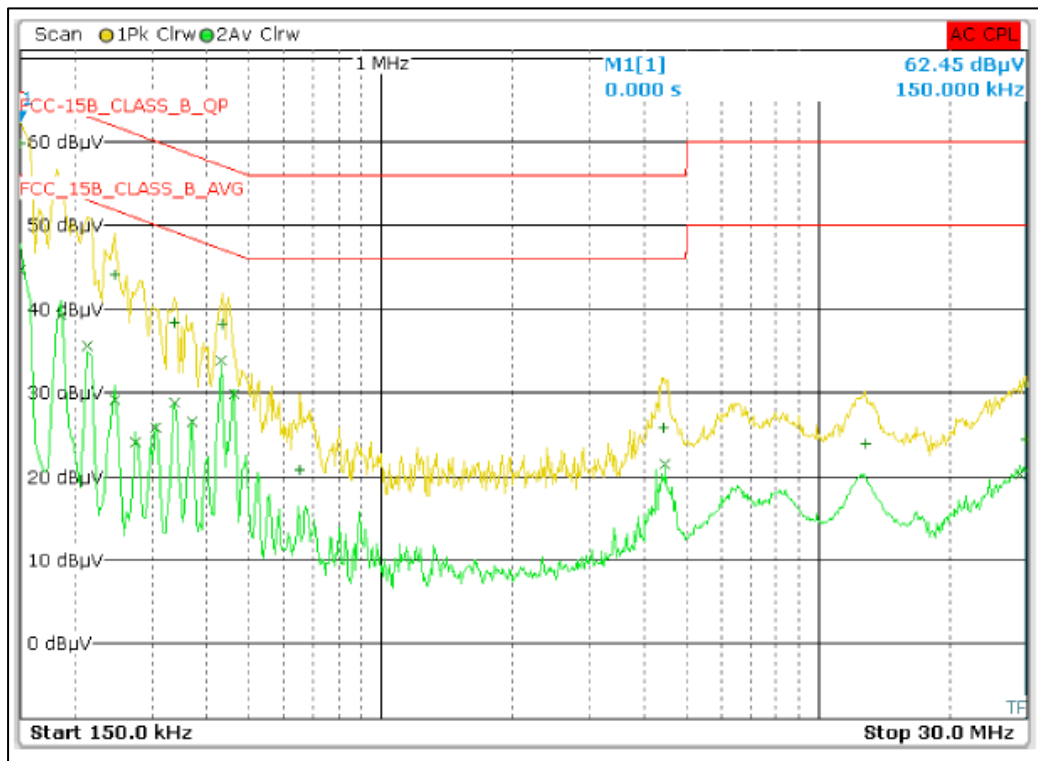
Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 37 von 39
Page 37 of 39

Test result:

Power: 110V 60Hz_LINE



Graph: Line

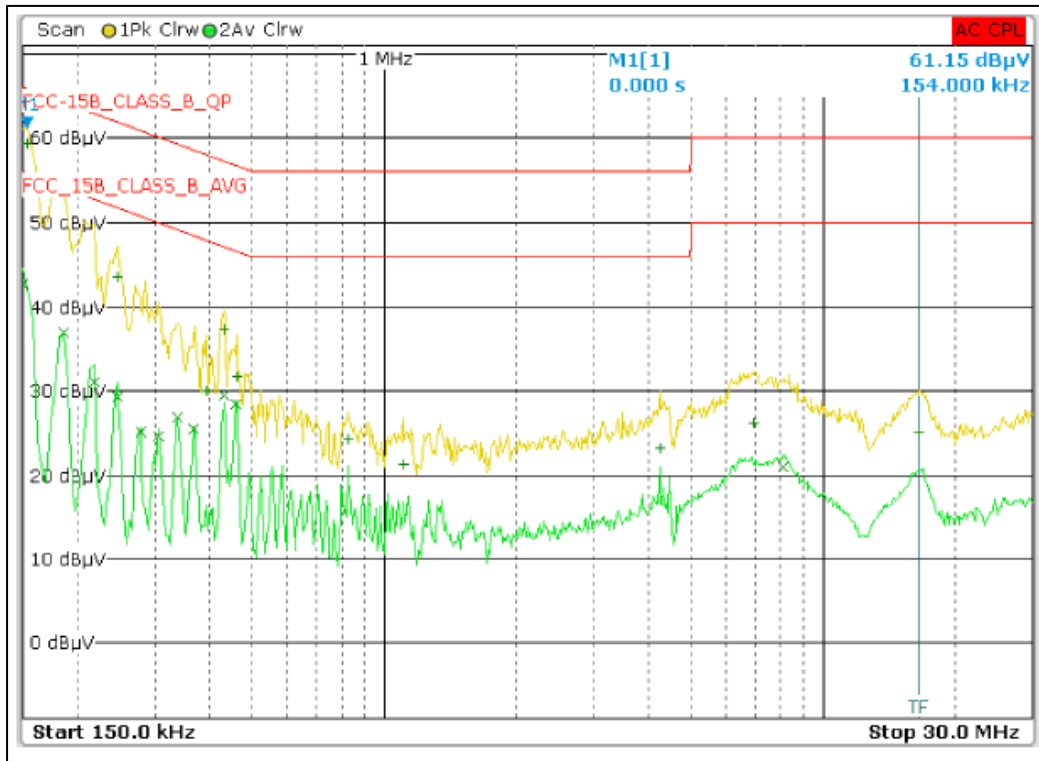
Trace	Frequency	Level (dBµV)	Phase	Detector	Delta Limit/dB
1	150.000000000 kHz	59.82		Quasi Peak	-6.18
1	150.000000000 kHz	59.77		Quasi Peak	-6.23
1	182.000000000 kHz	53.89		Quasi Peak	-10.50
1	182.000000000 kHz	53.81		Quasi Peak	-10.58
2	150.000000000 kHz	44.62		Average	-11.38
2	430.000000000 kHz	33.82		Average	-13.43
2	186.000000000 kHz	39.26		Average	-14.95
2	462.000000000 kHz	29.81		Average	-16.85
2	214.000000000 kHz	35.56		Average	-17.49
1	246.000000000 kHz	44.15		Quasi Peak	-17.74
1	434.000000000 kHz	38.17		Quasi Peak	-19.01
2	338.000000000 kHz	28.85		Average	-20.40
1	338.000000000 kHz	38.48		Quasi Peak	-20.77
2	370.000000000 kHz	26.54		Average	-21.96
2	246.000000000 kHz	29.16		Average	-22.73
2	306.000000000 kHz	25.86		Average	-24.22
2	4.474000000 MHz	21.45		Average	-24.55
2	274.000000000 kHz	24.03		Average	-26.97
2	28.782000000 MHz	20.20		Average	-29.80
1	4.434000000 MHz	25.91		Quasi Peak	-30.09
1	654.000000000 kHz	20.75		Quasi Peak	-35.25
1	29.746000000 MHz	24.54		Quasi Peak	-35.46
1	12.814000000 MHz	23.94		Quasi Peak	-36.06

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 38 von 39
Page 38 of 39

Power: 110V60Hz_NEUTRAL



Graph: Neutral

Trace	Frequency	Level (dBµV)	Phase	Detector	Delta Limit/dB
1	154.000000000 kHz	59.29		Quasi Peak	-6.49
2	150.000000000 kHz	42.83		Average	-13.17
2	186.000000000 kHz	37.03		Average	-17.18
2	430.000000000 kHz	29.46		Average	-17.79
2	458.000000000 kHz	28.47		Average	-18.26
1	246.000000000 kHz	43.63		Quasi Peak	-18.26
1	430.000000000 kHz	37.34		Quasi Peak	-19.91
2	218.000000000 kHz	31.09		Average	-21.80
2	338.000000000 kHz	26.88		Average	-22.37
2	246.000000000 kHz	29.35		Average	-22.54
2	366.000000000 kHz	25.56		Average	-23.03
1	462.000000000 kHz	31.81		Quasi Peak	-24.85
2	306.000000000 kHz	24.59		Average	-25.49
2	278.000000000 kHz	25.22		Average	-25.66
1	394.000000000 kHz	30.10		Quasi Peak	-27.88
2	8.122000000 MHz	20.95		Average	-29.05
1	826.000000000 kHz	24.30		Quasi Peak	-31.70
1	4.246000000 MHz	23.31		Quasi Peak	-32.69
1	6.974000000 MHz	26.19		Quasi Peak	-33.81
1	1.106000000 MHz	21.30		Quasi Peak	-34.70
1	16.558000000 MHz	25.12		Quasi Peak	-34.88

Prüfbericht - Nr.:
Test Report No.:

ULR-TC568820300000041F

Seite 39 von 39
Page 39 of 39

10 LIST OF TABLES

Table 1: List of test and measurement instruments	6
Table 2: Instrument application Software versions	7
Table 3: Ratings and System Details as declared by Client*	8
Table 4: Measurement Uncertainty	9
Table 5: List of Wi-Fi center Frequencies	10
Table 7: Transmitter limits for Radiated emission	16

11 LIST OF FIGURES

Figure 1: Frequency Range 9 kHz- 30 MHz	14
Figure 2: Frequency Range 30 MHz – 200 MHz	14
Figure 3: Frequency Range 200 MHz - 1GHz	15
Figure 4: Frequency Range above 1 GHz	15

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