DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

Test report No:
NIE: 68826RRF.003

Partial Test report
USA FCC 15.31(h), 15.209, 15.247, 15.407

(*) Identification of item tested	XGS-PON 10G ONT Home Gateway
(*) Trademark	Altice Labs
(*) Model and /or type reference	FiberGateway XSR150Dx
Other identification of the product	HW version: PCB 1497 SW version: 2.3 FCC ID: 2ACJF-FGW-XSR150DX
(*) Features	1 x XGS-PON, 1 x FXS, 4 x Ethernet Gigabit, 1 SFP Slot (Optical or Electrical), Dual Band Wi-Fi 6 4T4R and 1 x USB 3.1 Type C Gen1.
Applicant	Altice Labs S.A. Rua Eng. Ferreira Pinto Basto 3810-106 Aveiro Portugal
Test method requested, standard	USA FCC Part 15.31(h) (10-1-20 Edition): Measurement standard. USA FCC Part 15.247 (10-1-20 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.407 (10-1-20) Edition: Unlicensed National Information Infrastructure (U-NII) Devices. General technical requirements. USA FCC Part 15.209 (10-1-20) Edition: Radiated emission limits; general requirements. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Approved by (name / position & signature)	Rafael López EMC Consumer & RF Lab. Manager 2022.04.22 14:15:57 +02'00'
Date of issue	2022-04-22
Report template No	FDT08_23 (*) "Data provided by the client"

Index

Competences and guarantees 3
General conditions 3
Uncertainty 3
Data provided by the client 3
Usage of samples 4
Test sample description 5
Identification of the client 5
Testing period and place 6
Document history 6
Environmental conditions 6
Remarks and comments 7
Testing verdicts 8
Summary 8
Appendix A: Test results FCC 15.247, FCC 15.407 9

Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación) to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification S.A.U.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").

2 The sample of the FiberGateway is an Optical Terminal Equipment (ONT) unit for Passive Optical Networks (PON) termination in a FTTH (Fiber-To-The-Home) service delivery architecture. FiberGateway communicates with the OLT (Optical Line Terminal) for the PON side and with the customer's premises for the client side. This equipment supports triple-play services - high speed internet (HSI), voice (VoIP), video (IPTV) and Wi-Fi (Dual Band).

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of result.

Usage of samples

Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
68826B/002	XGS-PON 10G ONT Home Gateway	FiberGateway XSR150Dx	PTIN205A5BCF	2021/07/22

Auxiliary elements used with the Sample S/01:

Control Nº	Description	Model	Serial Nº	Date of reception
68826B/003	AC/DC Adapter	WA-36N12FU	--	2021/07/22

Sample S/01 has undergone the following test(s): The Radiated tests indicated in the Appendixes A.

Test sample description

Ports…… :	Port name and description	Cable			
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
Supplementary information to the ports…… :					

Rated power supply .....:	Voltage and Frequency		Reference poles			
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☐	DC:					
	☐	DC:					

Rated Power .....:		
Clock frequencies.....:		
Other parameters .....:		
Software version .....:	Rev 2.3	
Hardware version .....:	PCB 1497	
Dimensions in cm (W x H x D) ....:		
Mounting position .....:	☐	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Hand-held equipment
	☐	Other:

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
Accessories (not part of the test item) .....:	Description	Type	Manufacturer
Documents as provided by the applicant.....:	Description	File name	Issue date

(3) Only applicable to medical equipments

Identification of the client

Altice Labs S.A.
Rua Eng. Ferreira Pinto Basto 3810-106 Aveiro, Portugal

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-11-23
Date (finish)	2021-11-23

Document history

Report number	Date	Description
68826RRF.003	2022-04-22	First release.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Nicolás Salguero.

Used instrumentation:

Radiated Measurements:

		Last Calibration	Due Calibration
1.	Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N/A	N/A
2.	Shielded Room ETS LINDGREN S101	N/A	N/A
3.	EMI Test Receiver 7 GHz ROHDE AND SCHWARZ ESR7	2020/12	2022/12
4.	Preamplifier G>40dB 10MHz-6GHz, BONN ELEKTRONIK, BLNA 0160-01N	2021/03	2022/03
5.	Biconical/Log Antenna 30 MHz - 6 GHz ETS LINDGREN 3142E	2020/04	2023/04
6.	Attenuator 3dB, 2W, DC-18GHz, TECHNIWAVE TWTS2G	2021/02	2022/02
7.	Spectrum Analyzer ROHDE AND SCHWARZ FSW50	2020/07	2022/07
8.	RF Preamplifier, 40 dB ,1-18 GHz BONN ELEKTRONIK BLMA 0118-1M	2021/06	2022/06
9.	Horn Antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2019/11	2022/11
10.	Low Noise Amplifier G>30dB, 18 - 40 GHz BONN ELEKTRONIK BLMA 1840-3G	2019/11	2021/11
11.	Horn Antenna 18-40 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9170	2020/05	2023/05
12.	DC Power Supply 30V/5A KEYSIGHT TECHNOLOGIES U8002A	N/A	N/A
13.	Digital Multimeter FLUKE 175	2020/11	2021/11

Testing verdicts

Not applicable:	N/A
Pass:	P
Fail:	F
Not measured :	N/M

Summary

FCC PART 15 PARAGRAPH Requirement – Test case		Verdict	Remark
FCC 15.31 (h), FCC 15.209 (a), FCC 15.247 (d), FCC 15.407 (b).	Emission limitations radiated (Transmitter)	P	(1)
Supplementary information and remarks: (1) Only Co-location radiated spurious emission test was requested.			

Appendix A: Test results FCC 15.247, FCC 15.407

INDEX

TEST CONDITIONS 11
Radiated emissions 13

TEST CONDITIONS

POWER SUPPLY (V):

Vnominal: 24 Vdc

Type of Power Supply: DC external supply power.

ANTENNAS – WLAN (*):

Ant 0 – DB1: 4.4 dBi, Polarization: Vertical
Ant 1 – DB2: 4.7 dBi, Polarization: Horizontal
Ant 2 – DB3: 4.1 dBi, Polarization: Horizontal
Ant 3 – DB4: 4.5 dBi, Polarization: Vertical

TEST FREQUENCIES:

Based on preliminary testing that identified those corresponding to the worst cases (with the highest E.I.R.P.):

	WLAN (IEEE 802.11 a20 1x1 / ac204080 4x4 / ax204080 4x4)	
Mode:	802.11 a: 6 Mbps	
Channel Spacing:	20 MHz	
Frequency Range:	5725 MHz to 5850 MHz (UNII-3)	
Transmit Channel:	Channel	Channel Frequency (MHz)
	Highest: 165	5825

	WLAN (IEEE 802.11 bgn2040he2040)	
Mode:	802.11 ax: MCS0	
Channel Spacing:	20 MHz	
Frequency Range:	2412 MHz to 2472 MHz	
Transmit Channel:	Channel	Channel Frequency (MHz)
	1	2412

The test set-up was made in accordance to the general provisions of FCC DTS Measurement 558074 D01 DTS Meas Guidance v05r02 dated April 2, 2019.

The EUT was tested in the following operating mode:

- Continuous transmission with a modulated carrier at maximum power in all required channels selecting the supported data rates/modulations types.

During transmitter test the EUT was being controlled by the signalling unit to operate in a continuous transmit mode on the test channel as required and in each of the different modulation modes.

Transmission modes selected with each radio (based on preliminary testing that identified those corresponding to the worst cases)**:**

* WLAN 5 GHz: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in 802.11a20 / 6 Mbps mode configuration as this mode was found to transmit than all the other WLAN 5 GHz modes.

* WLAN 2.4 GHz: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in 802.11ax he20 / MCS0 mode configuration as this mode was found to transmit than all the other WLAN 2.4 GHz modes.

Simultaneous transmission modes selected:

1. WLAN 5 GHz, WLAN 2.4 GHz Co-Location, with the EUT configured to simultaneously transmit two signals at maximum output power, WLAN 5GHz (UNII-3) in 802.11a20 / 6 Mbps and WLAN 2.4 GHz in 802.11ax he20 / MCS0.

Radiated emissions

SPECIFICATION:

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing 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.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table when measuring with peak detector function.

METHOD:

The measurement was performed with the EUT inside an anechoic chamber.

The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency of the co-located radios up to 26 GHz.

The EUT was placed on a non-conductive stand at a 3 meter distance from the measuring antenna for measurements.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded.

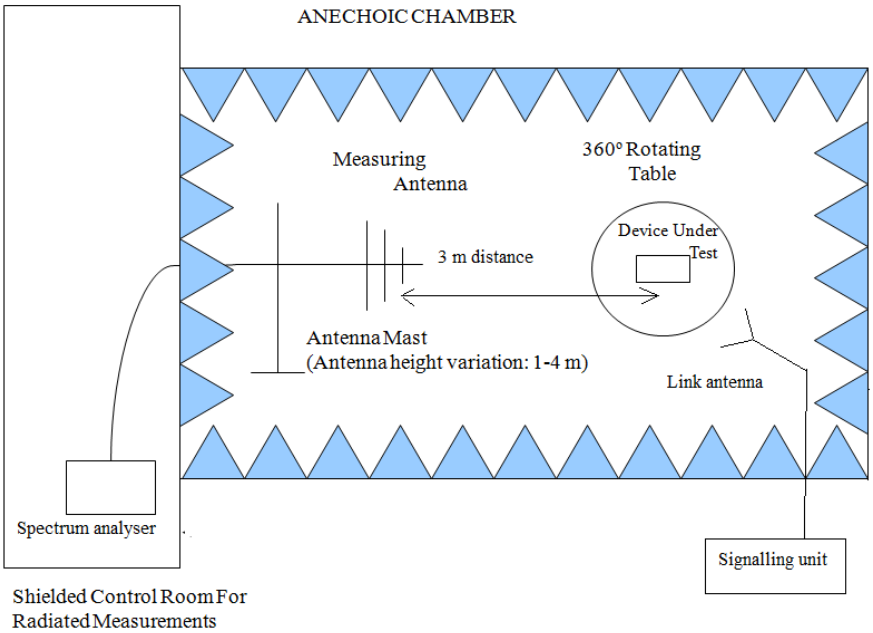
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

These measurements have been performed in order to check the impact of the Co-Location of all radio interfaces (that can be transmitting simultaneously).

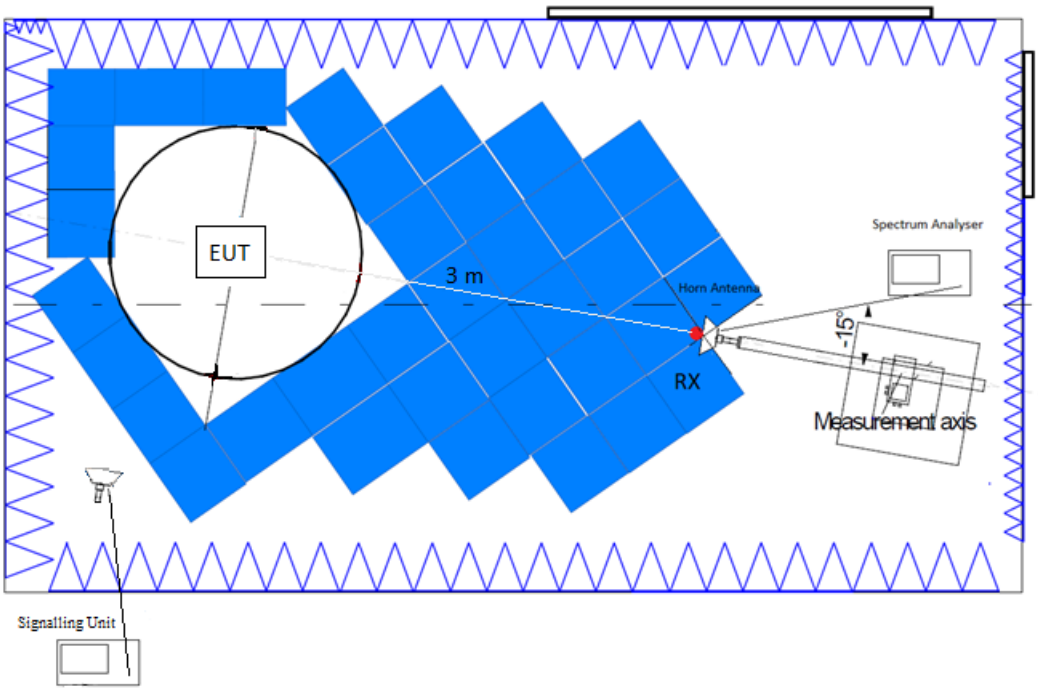
A resolution bandwidth/video bandwidth of 100 kHz/300 kHz was used for frequencies below 1 GHz and 1MHz/3MHz for frequencies above 1 GHz.

TEST SETUP:

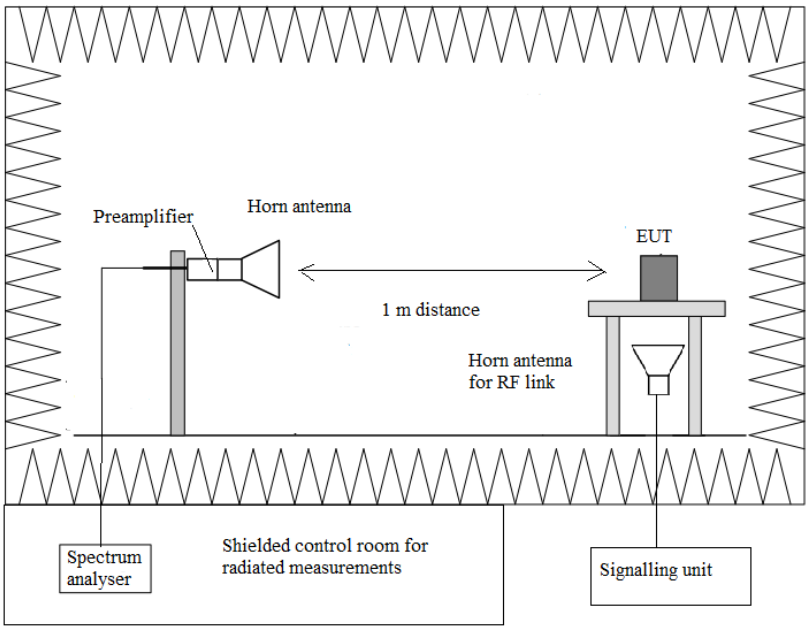
Radiated measurements below 1 GHz.



Radiated measurements setup between 1 GHz to 17 GHz.



Radiated measurements above 17 GHz.



RESULTS:

- **Mode 802.11ax he20 (WLAN 2.4GHz) and 802.11a (WLAN 5GHz):**

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
1 GHz to 40 GHz	PK	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m
1 to 40 GHz	PK	74 dBµV/m (*)
1 to 40 GHz	AVG	54 dBµV/m (*)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

Frequency range 30 MHz - 1 GHz

Spurious frequencies at less than 20 dB below the limit.

Spurious frequency (MHz)	Emission Level (dBµV/m)	Polarization	Detector
46.3990	27.68	V	Quasi Peak
104.6293	34.59	V	Quasi Peak
276.3800	34.89	V	Quasi Peak
399.9943	36.79	V	Quasi Peak
450.0100	37.69	V	Quasi Peak
550.0109	45.53	V	Quasi Peak

Frequency range 1 - 26 GHz

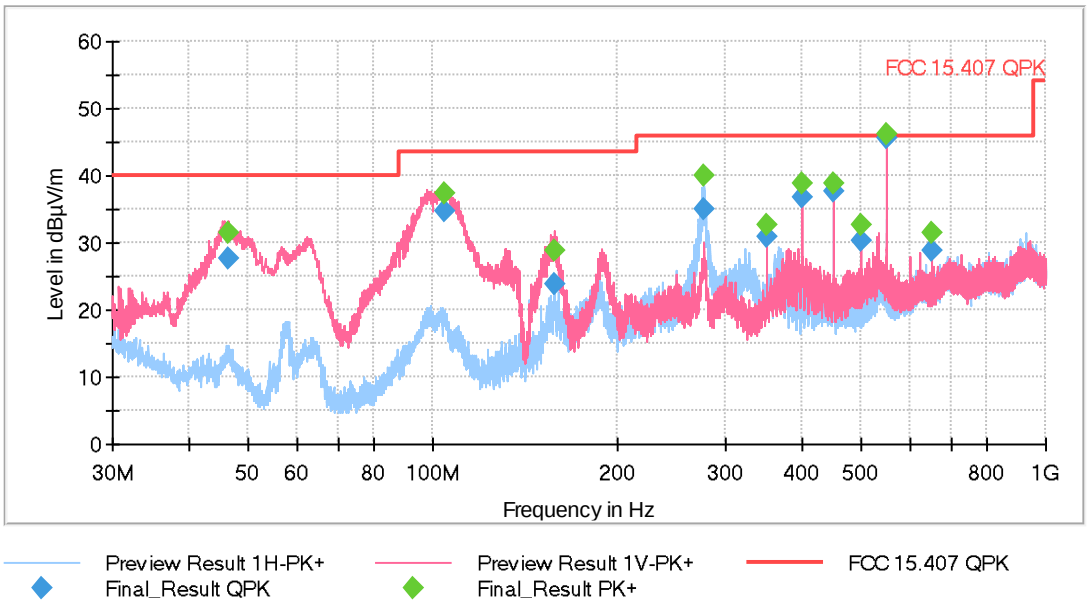
Spurious frequencies at less than 20 dB below the limit.

Spurious frequency (GHz)	Emission Level (dBµV/m)	Polarization	Detector
4.8204	59.05	V	Peak
	46.77		Average
10.0000	50.72	V	Peak
11.6490	50.14	V	Peak
15.0000	51.98	V	Peak

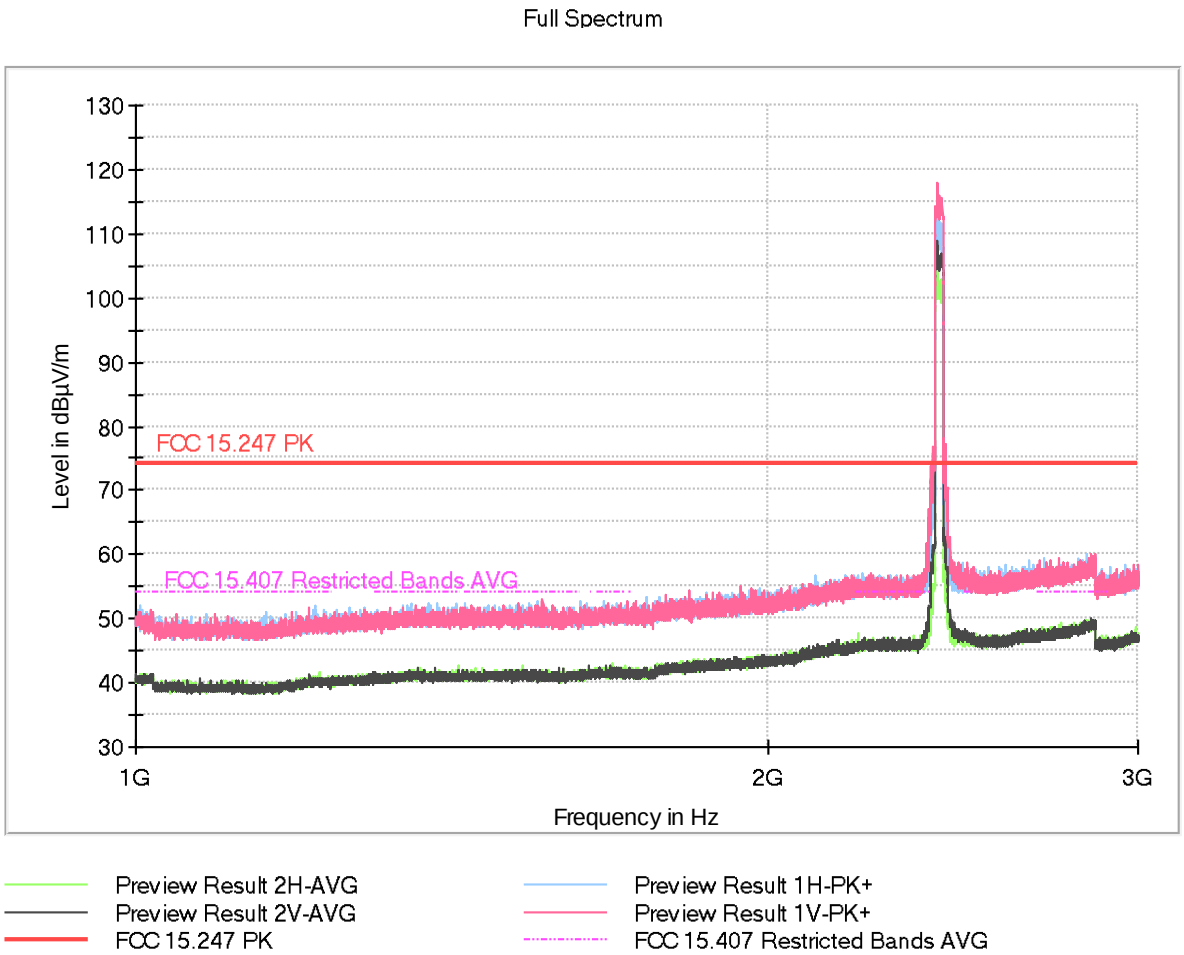
Measurement uncertainty (dB)	<±5.07 for f < 1GHz <±4.00 for f ≥ 1 GHz up to 7 GHz <±4.99 for f ≥ 7 GHz up to 17 GHz <±5.08 for f ≥ 17 GHz up to 26.5 GHz <±5.33 for f ≥ 26.5 GHz up to 40 GHz

Verdict: PASS

FREQUENCY RANGE 30 MHz – 1 GHz

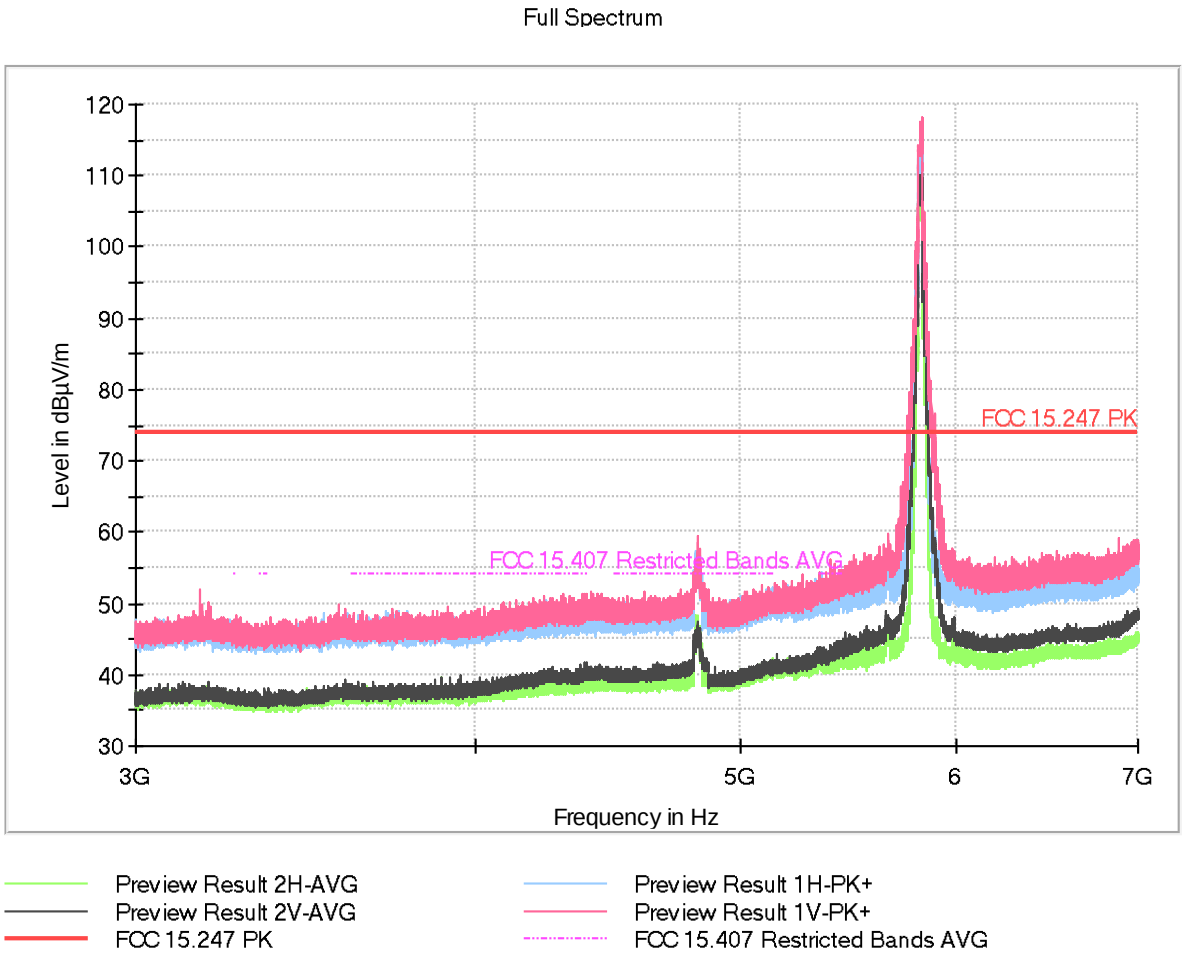


FREQUENCY RANGE 1 – 3 GHz



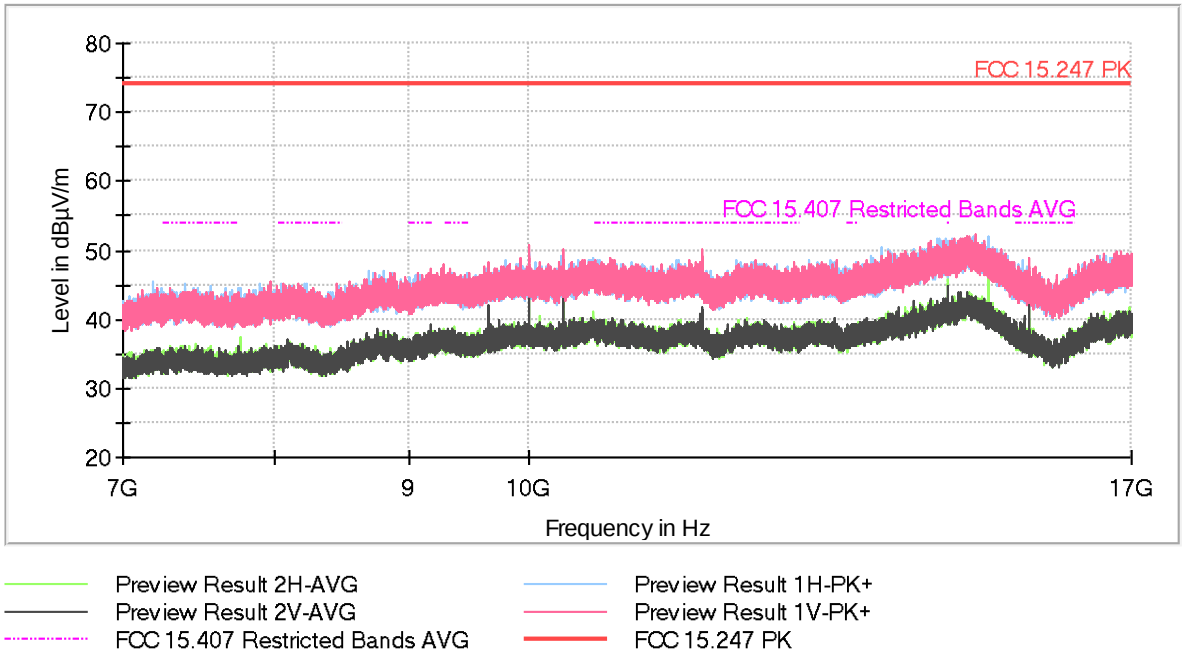
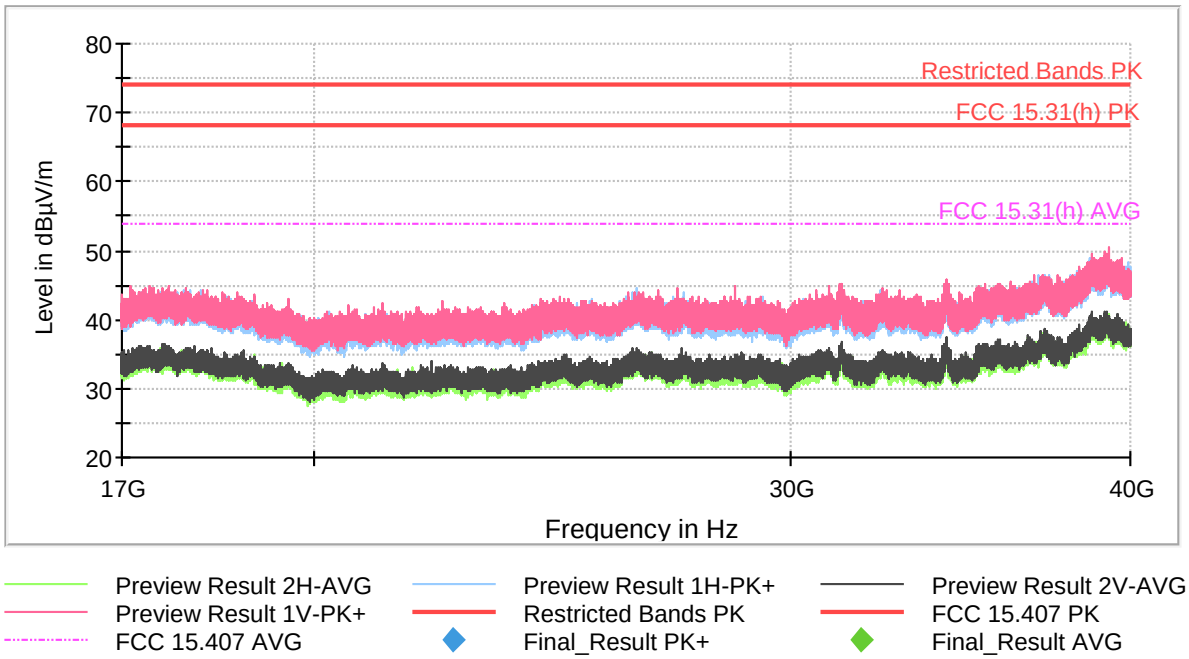
The left peak above the limit is the Carrier frequency 2.4 GHz (2412 MHz) and

FREQUENCY RANGE 3 – 7 GHz



The right peak above the limit is the Carrier frequency 5 GHz (5825 MHz).

FREQUENCY RANGE 7 – 17 GHz



FREQUENCY RANGE 17 – 40 GHz