



FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test Report No:
4606ERM.003A1

Partial Test report

USA FCC Part 15.407 (U-NII), 15.209; & CANADA RSS-247, RSS-Gen
Unlicensed National Information Infrastructure Devices. General technical requirements.
License-Exempt Radio Apparatus (All Frequency Bands): Category I Equipment.
General Requirements and Information for the Certification of Radio Apparatus.

(*) Identification of item tested	Infotainment Head Unit Android Based
(*) Trademark	HARMAN
(*) Model and /or type reference	TAS700 BRA
Other identification of the product	Model: C-Plat FCC ID: 2AHPN-BE2874
(*) Features	AM/FM receiver, Bluetooth EDR, Wi-Fi 2.4GHz & 5GHz
Manufacturer	Harman da Amazonia. Av. Cupiúba, 401 – Distrito Industrial Manaus, Amazonas, 69075-060, Brasil
Test method requested, standard	USA FCC Part 15.407 (03-08-24): Unlicensed National Information Infrastructure Devices. General technical requirements. USA FCC Part 15.209 (06-28-21): Radiated emission limits; general requirements. CANADA RSS-247 Issue 3 (August 2023). CANADA RSS-Gen Issue 5 (March 2019). 789033 D02 General UNII Test Procedures New Rules v02r01 Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	See Appendix A
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	07-25-2024
Report template No	FDT08_23 (*) "Data provided by the client"

Index

ACRONYMS3

COMPETENCES AND GUARANTEES3

GENERAL CONDITIONS3

UNCERTAINTY4

DATA PROVIDED BY THE CLIENT4

USAGE OF SAMPLES5

TEST SAMPLE DESCRIPTION6

IDENTIFICATION OF THE CLIENT7

TESTING PERIOD AND PLACE7

DOCUMENT HISTORY7

ENVIRONMENTAL CONDITIONS8

REMARKS AND COMMENTS8

TESTING VERDICTS9

SUMMARY9

LIST OF EQUIPMENT USED DURING THE TEST10

APPENDIX A: TEST RESULTS. WI-FI 5GHZ11

Acronyms

Acronym ID	Acronym Description
	Emission Bandwidth
# of Tx Chains	Number of Transmission Chains
Avg Power	Maximum Average Conducted Output Power
DC	Duty Cycle
Freq	Frequency
Max EIRP	Maximum Burst EIRP
Mod	Modulation
Mode	Mode
Occ Ch BW	Occupied Channel Bandwidth
Operation Band	Operation Band
PSD	Power Spectrum Density
Port	Active Port
TPC	TPC

Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

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

DEKRA Certification Inc. 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 Certification at the time of performance of the test.

DEKRA Certification Inc. 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.

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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 Certification Inc.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification Inc. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Certification internal document PODT000.

Test case	Frequency (MHz)	U ($k=2$)	Units
RF Power	5150-5850	0.88	dB
Radiated Spurious Emission	30-180	4.27	dB
	180-1000	3.14	dB
	1000-18000	3.30	dB
	18000-40000	3.49	dB

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 consists of a Receiver Assy, Radio & Display.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples used for testing have been selected by: The client.

Sample S/01 is composed of the following element and accessories:

Id	Control Number	Description	Manufacturer / Model	Serial N°	Date of Reception	Application
S/01	4415/20	Infotainment head unit android based	Harman / TAS700 BRA (C-Plat)	T2856HR04690 0006	02-23-2024	Element Under Test
S/01	4415/38	Main Harness (Connector D)	Harman	--	04-04-2024	Accessory

Sample S/01 was used for the test(s): All Conducted tests indicated in appendix A.

Sample S/02 is composed of the following elements and accessories:

Id	Control Number	Description	Manufacturer / Model	Serial N°	Date of Reception	Application
S/02	4415/10	Infotainment head unit android based	Harman / TAS700 BRA (C-Plat)	T2851HR03990 0011	02-23-2024	Element Under Test
S/02	4415/36	USB harness (Connector A)	Harman	--	04-04-2024	Accessory
S/02	4415/37	Speaker output harness (Connector C)	Harman	--	04-04-2024	Accessory
S/02	4415/38	Main Harness (Connector D)	Harman	--	04-04-2024	Accessory
S/02	4415/39	FM radio cable (Connector E)	Harman	--	04-04-2024	Accessory
S/02	4415/40	GPS Cable (Connector B)	Harman	--	04-04-2024	Accessory
S/02	4415/41	FM/AM Antenna	--	--	04-04-2024	Accessory
S/02	4415/42	GNSS Antenna	--	--	04-04-2024	Accessory

Sample S/02 was used for the test(s): All Radiated tests indicated in appendix A.

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
	RF_Port 1 = BT/WLAN-5GHz (Module Pin C01)		[X]	[X]	[]		
	RF_Port 2 = WLAN 2,4GHz (Module Pin K02)		[X]	[X]	[]		
			[]	[]	[]		
			[]	[]	[]		
			[]	[]	[]		
			[]	[]	[]		
Supplementary information to the ports..... :	No Data provided						
Rated power supply..... :	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[]	AC:	[]	[]	[]	[]	[]
	[]	AC:	[]	[]	[]	[]	[]
	[X]	DC: 12 V nominal Car battery, 8V to 16V max					
	[]	DC:					
Rated Power..... :	No Data provided						
Clock frequencies..... :	No Data provided						
Other parameters..... :	No Data provided						
Software version..... :	R5.2						
Hardware version..... :	C1						
Dimensions in (W x H x D)..... :	No Data provided						
Mounting position..... :	[]	Table top equipment					
	[]	Wall/Ceiling mounted equipment					
	[]	Floor standing equipment					
	[]	Hand-held equipment					
	[X]	Other: Installed in vehicle					
Modules/parts..... :	Module/parts of test item		Type		Manufacturer		
	No Data provided						
							
							
							
							

Accessories (not part of the test item) :	Description	Type	Manufacturer
	Bench Setup + antenna		
	Cable Harness		
			
			
Documents as provided by the applicant :	Description	File name	Issue date
	Declaration Equipment Data	FDT30_18 Declaration Equipment Data_30April2024	04/30/2024
			
			
			

Identification of the client

Harman International Industries, Inc.
3001 Cabot Drive,
Novi, MI 48377
USA

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	04-26-2024
Date (finish)	05-02-2024

Document history

Report number	Date	Description
4606ERM.003	05-23-2024	First release.
4606ERM.003A1	07-25-2024	Second release. Updated the Mode information on the report. This modified report replaces and cancels the report 4606ERM.003

Environmental conditions

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

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

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

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The tests have been performed by the technical personnel: Juliana Cherry and Yuqi Wang.

Testing verdicts

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

Summary

FCC PART 15 PARAGRAPH / RSS-247			
Requirement	Test case	Verdict	Remark
FCC 15.407 (a) / RSS-247 6.2	Power Limits. Maximum Output Power	P	N/A
FCC 15.407 (a) / RSS-247 6.2	Maximum Power Spectral Density	N/M	Refer 1
FCC 2.1049 / RSS-Gen 6.7	99% Occupied Bandwidth	N/M	Refer 1
FCC 15.403 / RSS-Gen 6.7	26 dB Emission Bandwidth	N/M	Refer 1
FCC 15.407 (b) / RSS-247 6.2	Band-edge Conducted Emissions	N/M	Refer 1
FCC 15.407 (e) / RSS 247 6.2.4.1	6 dB Emission Bandwidth	N/M	Refer 1
FCC 15.407 (b)(6)15.207 / RSS Gen 8.8	Emission limitations Conducted	N/M	Refer 1
FCC 15.407 (b)(1), (b)(4)(i)/ 15.205 & 15.209 / RSS-Gen 8.9 & 8.10	Undesirable radiated emissions	P	Refer 2
FCC 15.407 (g) / RSS-Gen 6.11 & 8.11	Frequency Stability	N/M	Refer 1
<u>Supplementary information and remarks:</u> - Test was not requested - The results show the worst case.			

List of equipment used during the test

Conducted Measurements

CONTROL NUMBER	DESCRIPTION	Serial No	LAST CALIBRATION	NEXT CALIBRATION
1039	FSV40 Signal Analyzer 40GHz	101627	2022-11-01	2024-11-01
1107	Ethernet SNMP Thermometer	60038026952	2022-08-16	2024-10-18
1313	Wireless Measurement Software R&S WMS32	-	N/A	N/A

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	Serial No	LAST CALIBRATION	NEXT CALIBRATION
878	Power supply (AMETEK / PROG-DC-PS)	1707A01783	N/A	N/A
1012	ESR26 EMI Test Receiver	101478	2023-01-18	2025-01-18
1014	FSV40 Signal Analyzer 40GHz	101626	2023-01-18	2025-01-18
1055	3116C Double-Ridged Waveguide Horn Antenna	211394	2023-02-06	2026-02-06
1377	Double Ridged Horn Antenna	103050	2021-12-01	2024-12-01
1064	3142E Biconilog antenna	208600	2021-12-13	2024-12-13
1108	Ethernet SNMP Thermometer- SAC	60038026954	2022-10-18	2024-10-18
1111	Ethernet SNMP Thermometer	60038026577	2022-10-18	2024-10-18
1179	Semi-Anechoic Chamber	F169021	N/A	N/A
1314	Wireless Measurement Software R&S Emc32	1040-OT102236	N/A	N/A
1461	Low Noise Preamplifier (1-18GHz)	2213857B	2022-06-01	2024-06-01

Appendix A: Test results. Wi-Fi 5GHz

Appendix A

TEST CONDITIONS 14

TEST CASES DETAILS 18

 FCC 15.407 (a) / RSS-247 6.2 Power Limits. Maximum Output Power 18

 FCC 15.407 (b)(1), (b)(4)(i) 15.205 & 15.209 / RSS-Gen 8.9 & 8.10 Undesirable radiated emissions39

PRODUCT INFORMATION

(*): The following information is provided by the client:

Information	Description
Equipment type	Wi-Fi 5GHz
Operating Frequency Range	5150 - 5250 MHz & 5725 - 5875 MHz
Nominal Channel Bandwidth	20/ 40/ 80 MHz
Antenna type	Internal PCB trace antenna
RF Output Power	15 dBm
Antenna gain	+5.74 dBi
Supply Voltage	12 Vdc
Modulation:	16-QAM, 64-QAM, 256-QAM
Transmit Data Rate:	802.11 a/n/ac Rates: IEEE 802.11a: 6, 9, 12, 18, 24, 36, 54 Mbps IEEE 802.11n20: MCS0-7 IEEE 802.11n40: MCS0-9 IEEE 802.11ac20: MCS 0-8 IEEE 802.11ac40: MCS 0-9 IEEE 802.11ac80: MCS 0-9

Worst Case*

A prescan was performed to determine the worst-case scenario. Worst-case scenario detected is shown in the test results.

TEST CONDITIONS

(*): Data provided by the client.

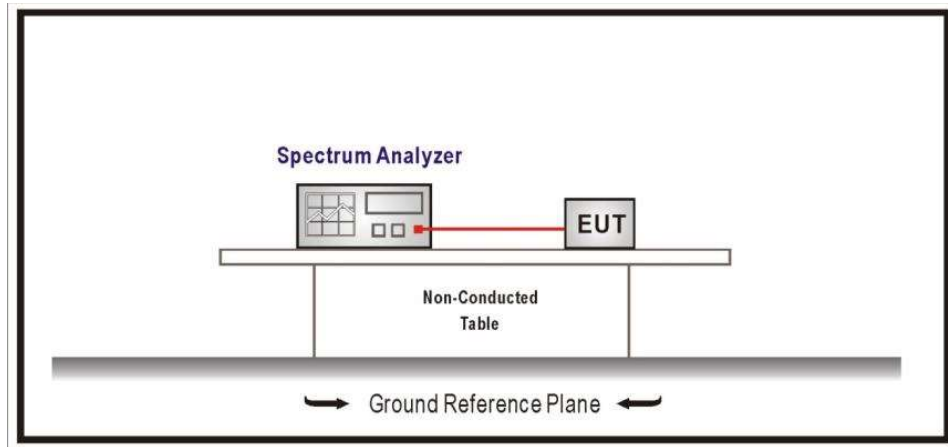
TEST CONDITIONS	DESCRIPTION
TC#01 ⁽¹⁾ (a mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 12 \text{ Vdc}$ <u>Channel Bandwidth:</u> 20 MHz <u>Test Frequencies for Conducted/Radiated tests:</u> UNII 1-3 Frequencies: 5180, 5200, 5240, 5745, 5785, 5825 MHz
TC#02 ⁽¹⁾ (n mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 12 \text{ Vdc}$ <u>Channel Bandwidth:</u> 20 MHz <u>Test Frequencies for Conducted/Radiated tests:</u> UNII 1-3 Frequencies: 5180, 5200, 5240, 5745, 5785, 5825 MHz <u>Channel Bandwidth:</u> 40 MHz <u>Test Frequencies for Conducted/Radiated tests:</u> UNII 1-3 Frequencies: 5190, 5230, 5755, 5795 MHz
TC#03 ⁽¹⁾ (ac mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 12 \text{ Vdc}$ <u>Channel Bandwidth:</u> 20 MHz <u>Test Frequencies for Conducted/Radiated tests:</u> UNII 1-3 Frequencies: 5180, 5200, 5240, 5745, 5785, 5825 MHz <u>Channel Bandwidth:</u> 40 MHz <u>Test Frequencies for Conducted/Radiated tests:</u> UNII 1-3 Frequencies: 5190, 5230, 5755, 5795 MHz <u>Channel Bandwidth:</u> 80 MHz <u>Test Frequencies for Conducted/Radiated tests:</u> UNII 1-3 Frequencies: 5210, 5775 MHz

Note (1): The test set-up was made in accordance to the general provisions of FCC Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General U-NII Test Procedures New Rules v02r01 dated Dec 14, 2017.

The EUT was tested in the following operating mode:

- Continuously transmitting with a modulated carrier at maximum power in all required channels using the supported data rates/modulation types.
- For spurious emissions for OFDM modes 802.11a, 802.11n20/40, and 802.11ac20/40/80, and a preliminary scan was performed to determine the worst case. The following tables and plots show the results for the worst case in 802.11ac40 mode.
- The data rates of 36Mb/s for 802.11a, MCS 3 for 802.11n20/40, MCS3 for 802.11ac20, and MCS4 for 802.11ac40/80 were selected based on preliminary testing that identified those rates corresponding to the worst cases.
- For all modes, the EUT was configured in test mode using a software application. The application was used to enable continuous transmission and to select the test channels as required. The client supplied instructions to configure the EUT. The customer supplied a document containing the setup instructions.

CONDUCTED MEASUREMENTS:



RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at 3 m for the frequency range 30-1000 MHz (Bilog antenna) and 1-18 GHz (Double ridge horn antenna), and 1m for the frequency range 18 GHz- 40 GHz (Double ridge horn antenna).

For radiated emissions in the range 18 - 40 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

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.

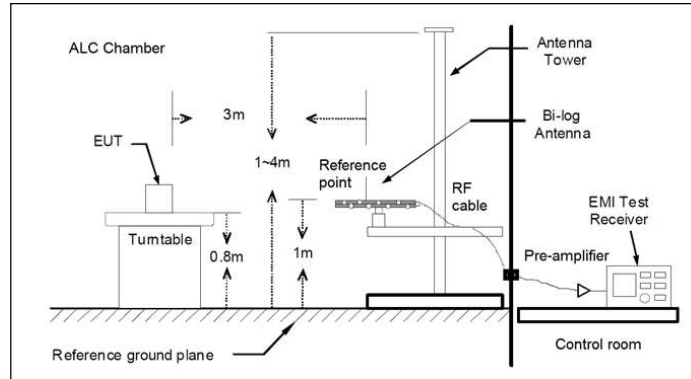


Fig A1: Radiated measurements Setup $f < 1$ GHz

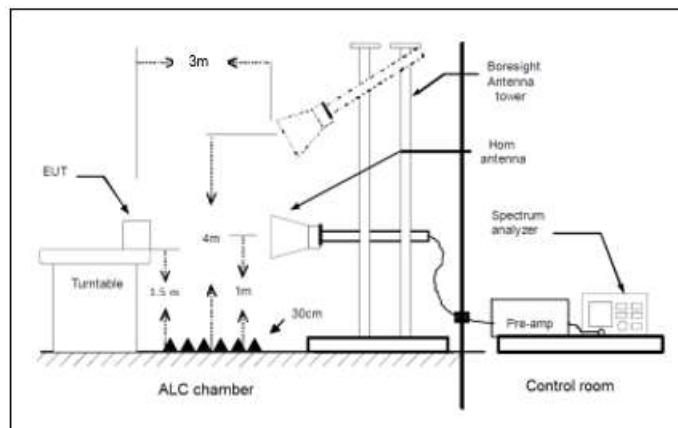


Fig A2: Radiated measurements setup $f > 1-18$ GHz

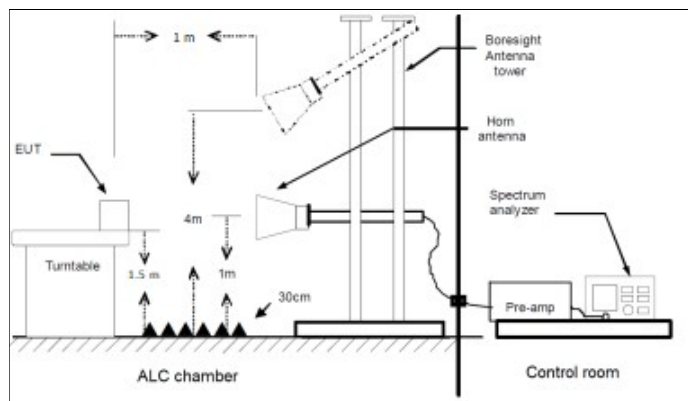


Fig A3: Radiated measurements setup $f > 18$ GHz

TEST CASES DETAILS

FCC 15.407 (a) / RSS-247 6.2 Power Limits. Maximum Output Power

Limits

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247:

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For devices other than devices installed in vehicles:

For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW (23 dBm) or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

For the 5.25-5.35 GHz, 5.470-5.6 GHz, and 5.650-5.725 GHz bands, the maximum conducted output power shall not exceed 250 mW (24 dBm) or $11 + 10 \log_{10} B$, dBm, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less.

For the band 5.725-5.850 GHz, the maximum conducted output power shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna gain: +5.74 dBi

Mode: SISO

Modulation: 802.11a (OFDM 54 Mbit/s)

Results

Freq (MHz)	Avg Power (dBm)	Max EIRP (dBm)
5180.000	6.6	12.3
5200.000	7.5	13.3
5240.000	6.1	11.9
5745.000	6.9	12.7
5785.000	7.3	13.0
5825.000	7.4	13.1

Verdict

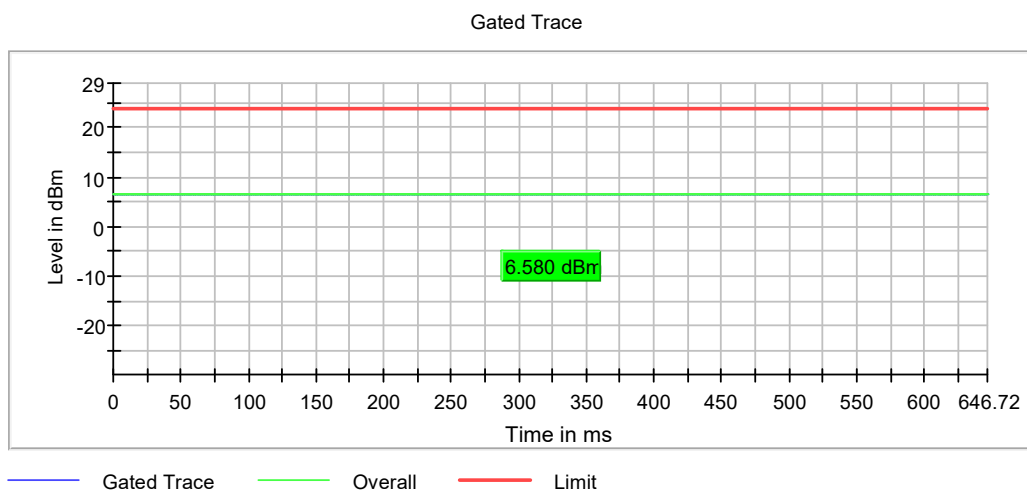
Pass

Attachments

Frequency MHz = 5180.00000

Modulation = 802.11a (OFDM 36 Mbit/s)

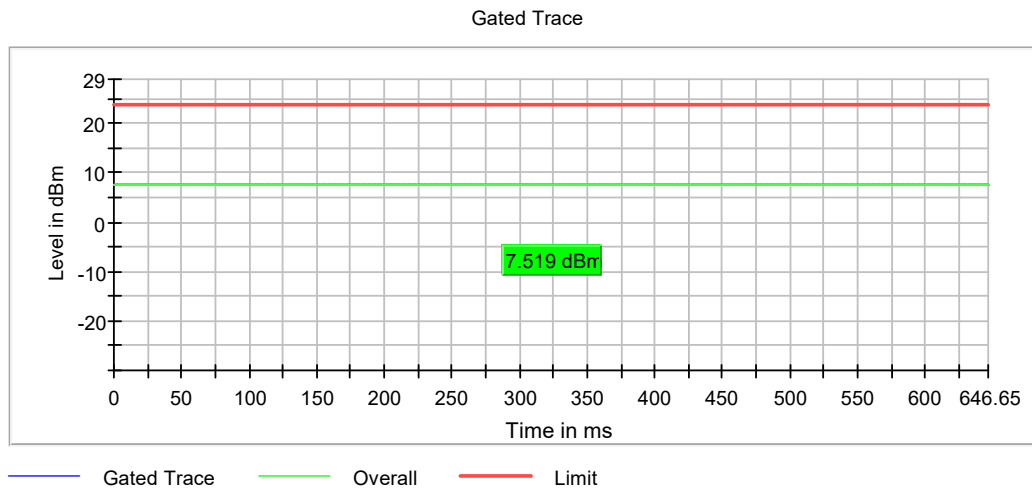
Images:



Frequency MHz = 5200.00000

Modulation = 802.11a (OFDM 36 Mbit/s)

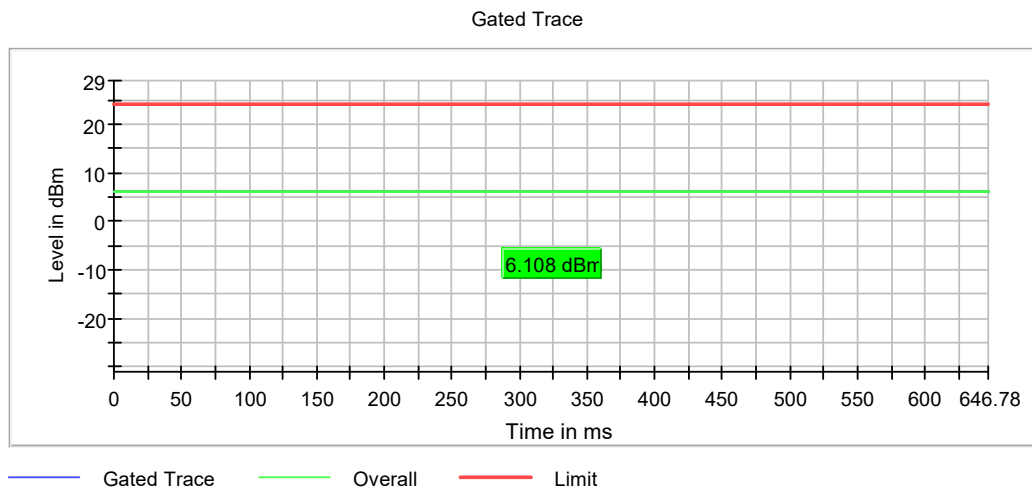
Images:



Frequency MHz = 5240.00000

Modulation = 802.11a (OFDM 36 Mbit/s)

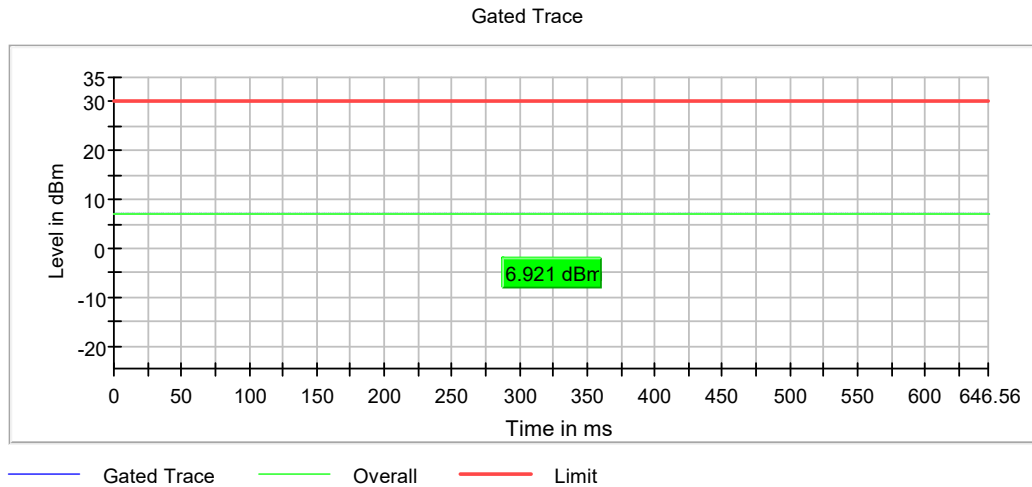
Images:



Frequency MHz = 5745.00000

Modulation = 802.11a (OFDM 36 Mbit/s)

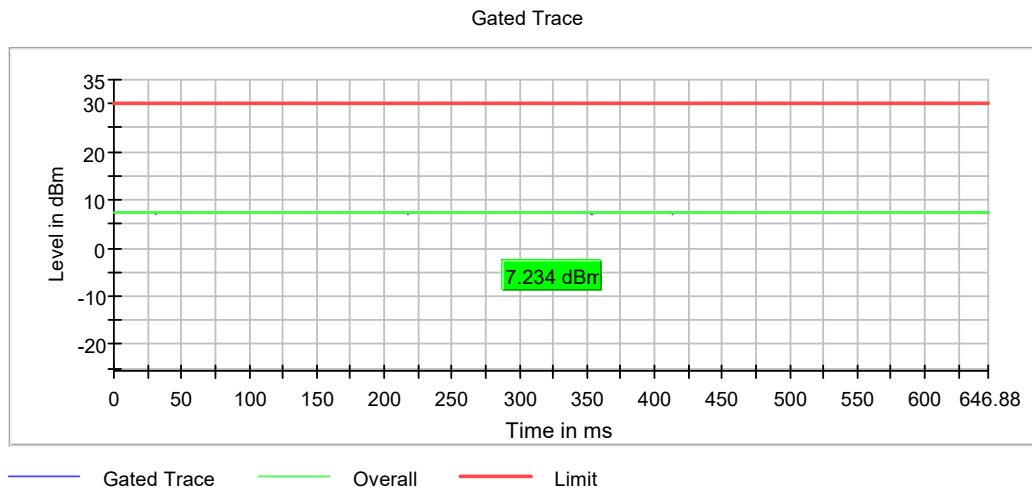
Images:



Frequency MHz = 5785.00000

Modulation = 802.11a (OFDM 36 Mbit/s)

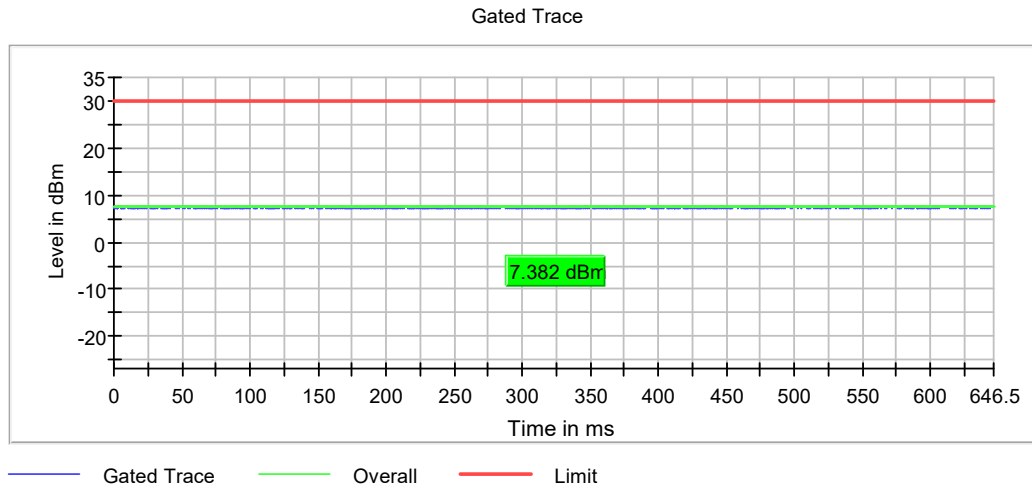
Images:



Frequency MHz = 5825.00000

Modulation = 802.11a (OFDM 36 Mbit/s)

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Antenna gain: +5.74 dBi

Mode: SISO

Modulation: 802.11n HT20 (OFDM MCS3)

Results

Freq (MHz)	Avg Power (dBm)	Max EIRP (dBm)
5180.000	6.9	12.6
5200.000	7.3	13.0
5240.000	6.7	12.4
5745.000	7.3	13.0
5785.000	7.0	12.8
5825.000	7.4	13.1

Verdict

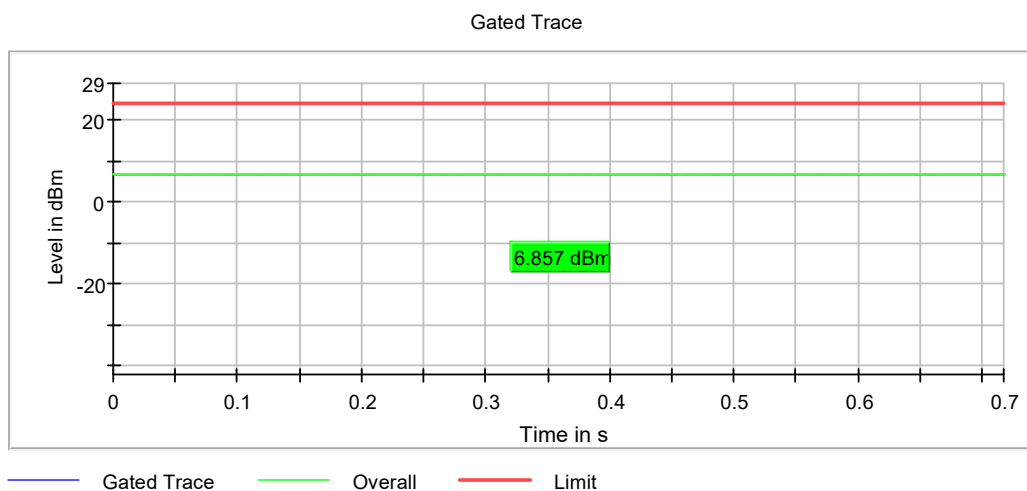
Pass

Attachments

Frequency MHz = 5180.00000

Modulation = 802.11n HT20 (OFDM MCS3)

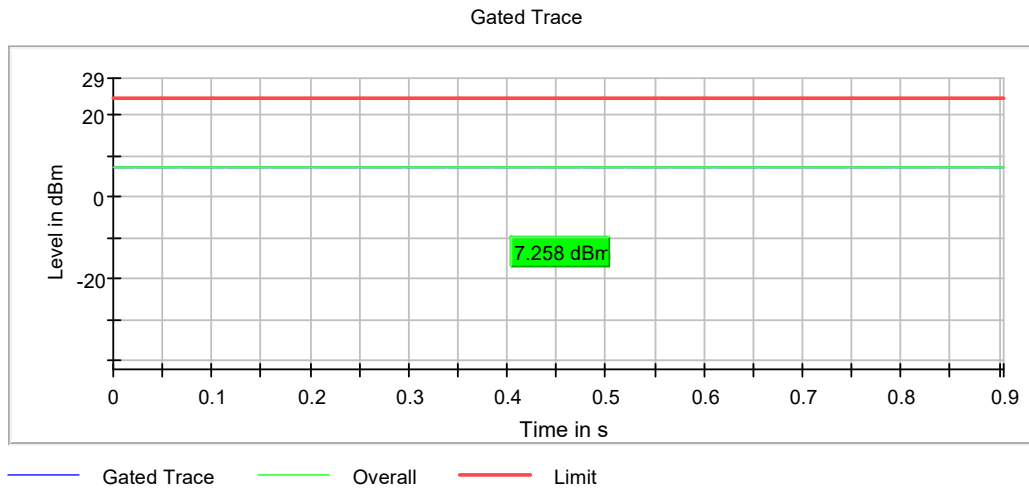
Images:



Frequency MHz = 5200.00000

Modulation = 802.11n HT20 (OFDM MCS3)

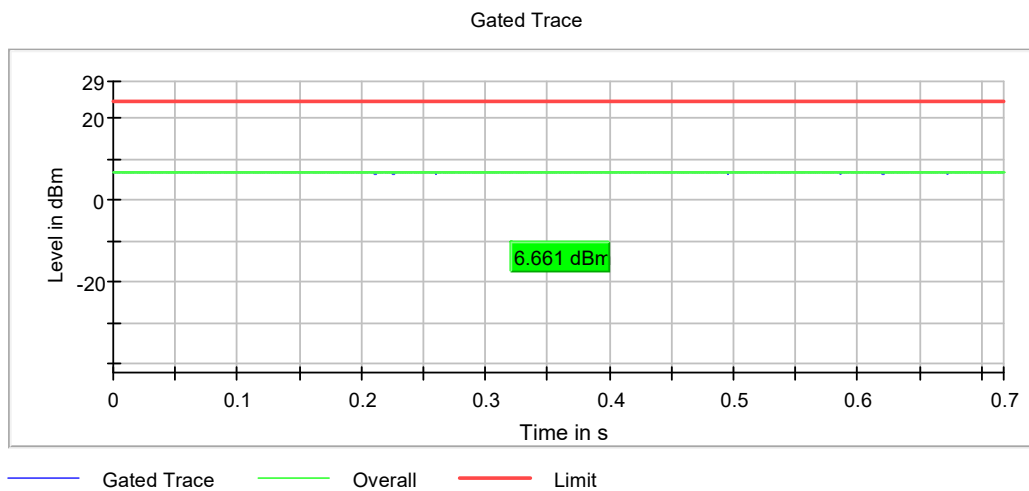
Images:



Frequency MHz = 5240.00000

Modulation = 802.11n HT20 (OFDM MCS3)

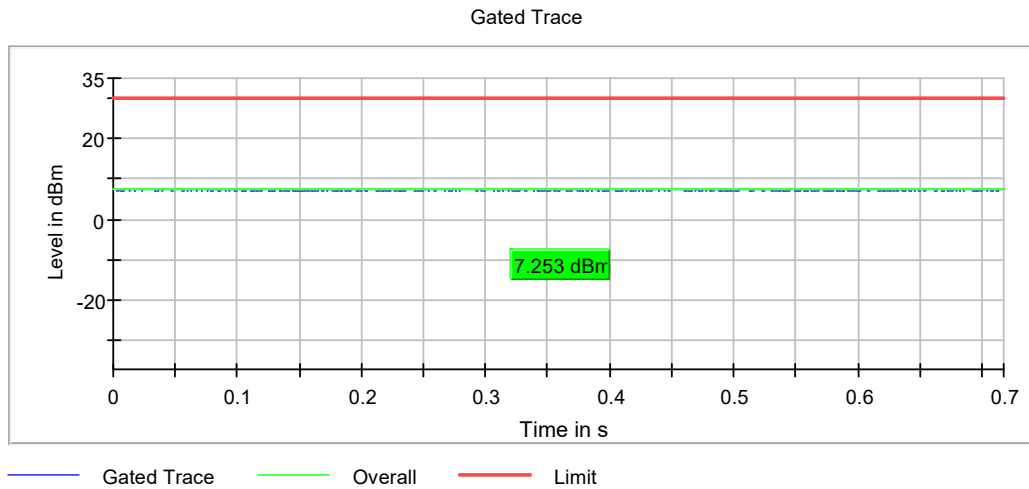
Images:



Frequency MHz = 5745.00000

Modulation = 802.11n HT20 (OFDM MCS3)

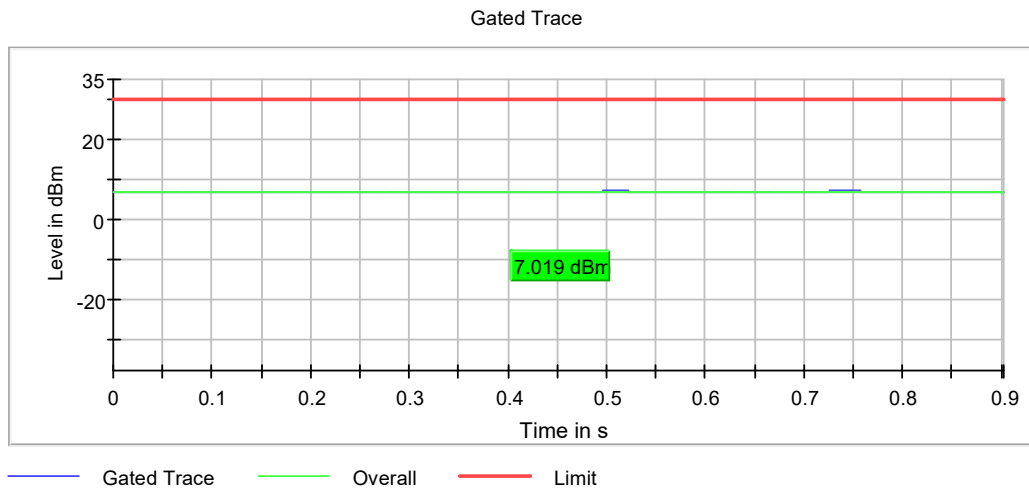
Images:



Frequency MHz = 5785.00000

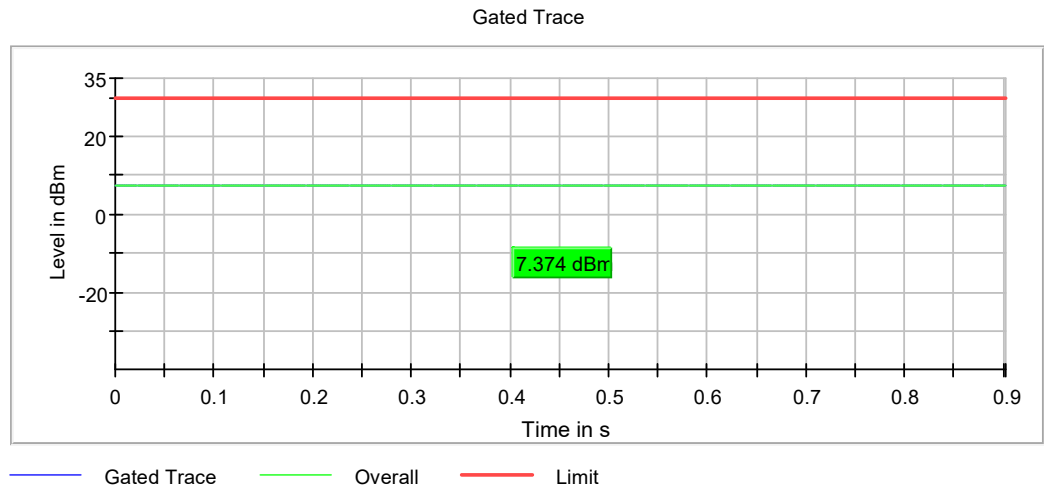
Modulation = 802.11n HT20 (OFDM MCS3)

Images:



Frequency MHz = 5785.00000 Modulation = 802.11n HT20 (OFDM MCS3)

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μs	1.000 μs

Antenna gain: +5.74 dBi

Mode: SISO

Modulation: 802.11n HT40 (OFDM MCS3)

Results

Freq (MHz)	Avg Power (dBm)	Max EIRP (dBm)
5190.000	7.2	12.9
5230.000	6.6	12.4
5755.000	7.2	13.0
5795.000	8.0	13.8

Verdict

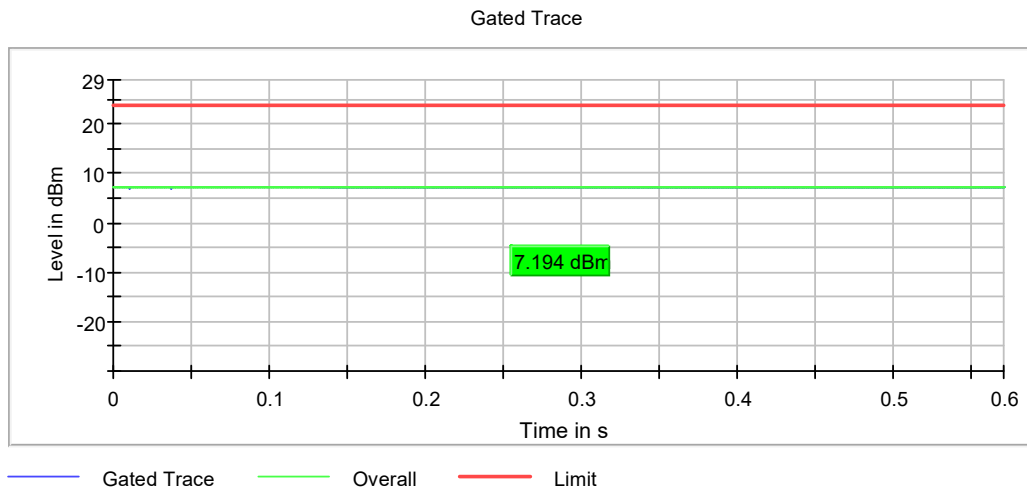
Pass

Attachments

Frequency MHz = 5190.00000

Modulation = 802.11n HT40 (OFDM MCS3)

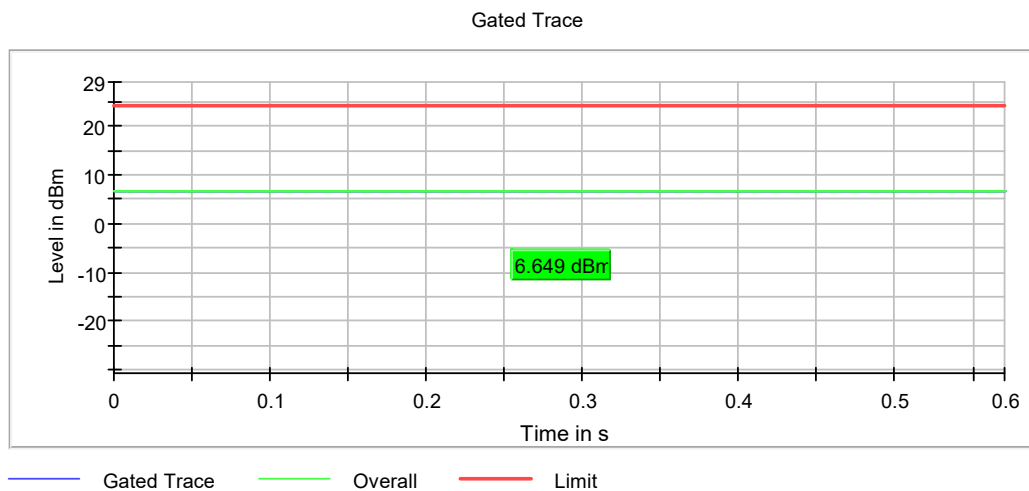
Images:



Frequency MHz = 5230.00000

Modulation = 802.11n HT40 (OFDM MCS3)

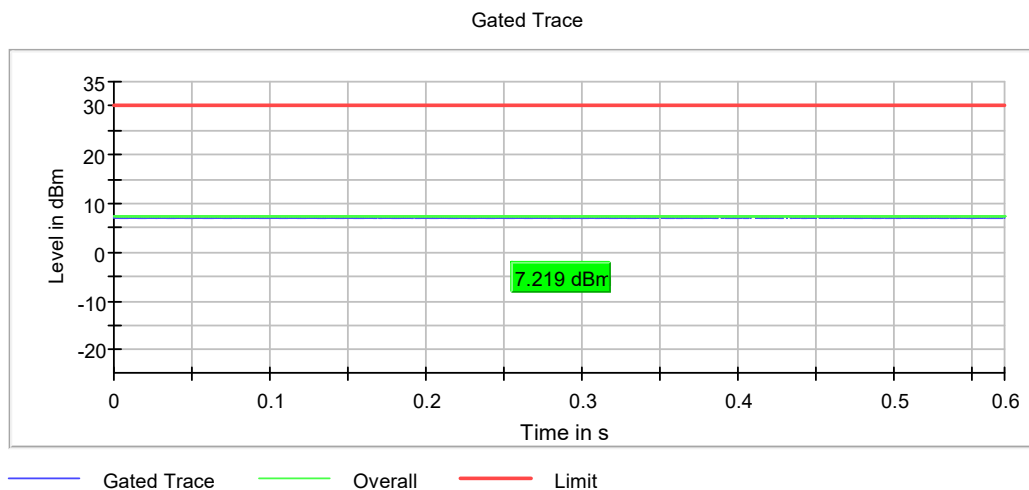
Images:



Frequency MHz = 5755.00000

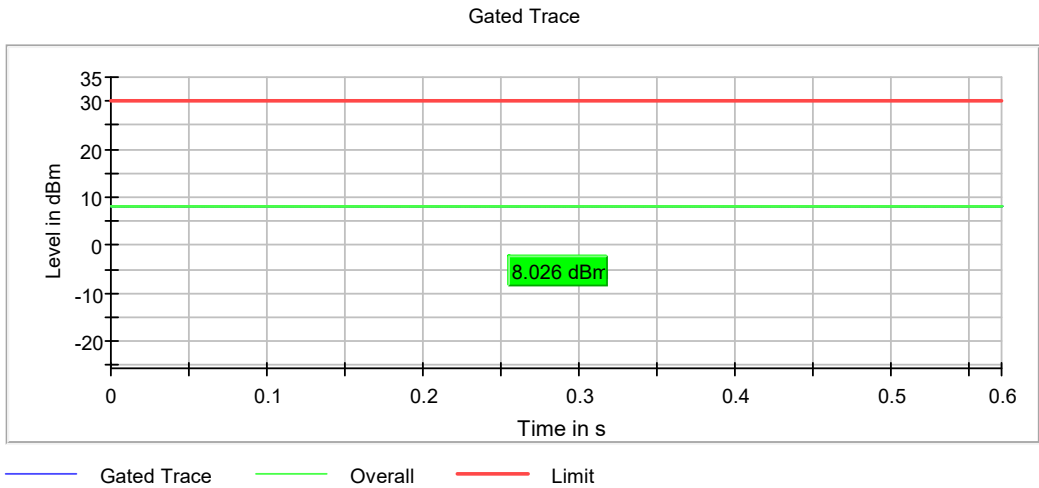
Modulation = 802.11n HT40 (OFDM MCS3)

Images:



Frequency MHz = 5795.00000 Modulation = 802.11n HT40 (OFDM MCS3)

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μs	1.000 μs

Antenna gain: +5.74 dBi

Mode: SISO

Modulation: 802.11ac VHT20 (OFDM MCS3)

Results

Freq (MHz)	Avg Power (dBm)	Max EIRP (dBm)
5180.000	6.9	12.6
5200.000	7.7	13.5
5240.000	6.7	12.4
5745.000	7.2	13.0
5785.000	7.6	13.3
5825.000	7.9	13.7

Verdict

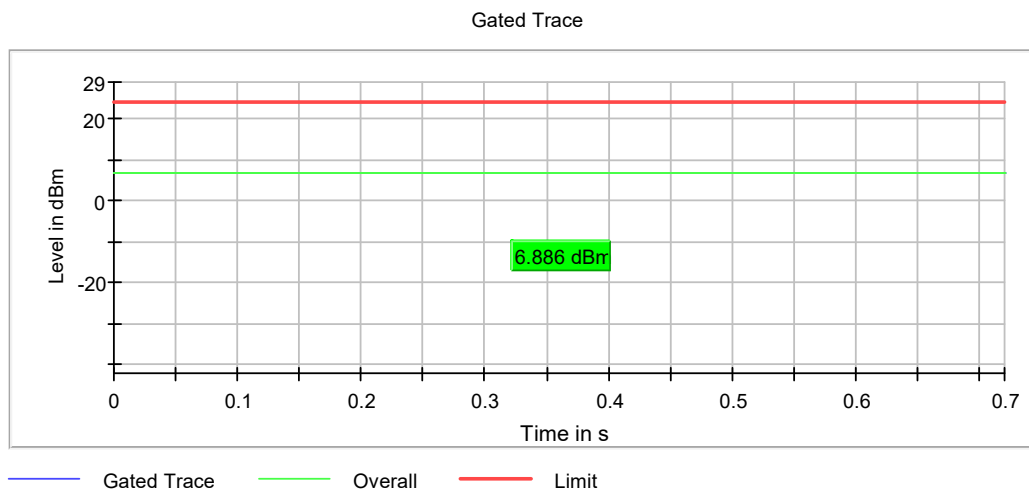
Pass

Attachments

Frequency MHz = 5180.00000

Modulation = 802.11ac VHT20 (OFDM MCS3)

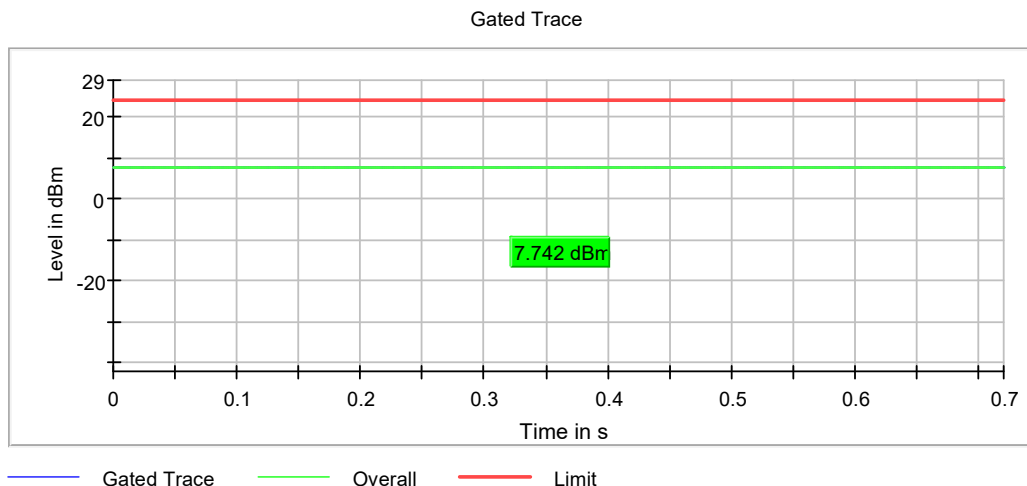
Images:



Frequency MHz = 5200.00000

Modulation = 802.11ac VHT20 SS1 (OFDM MCS8)

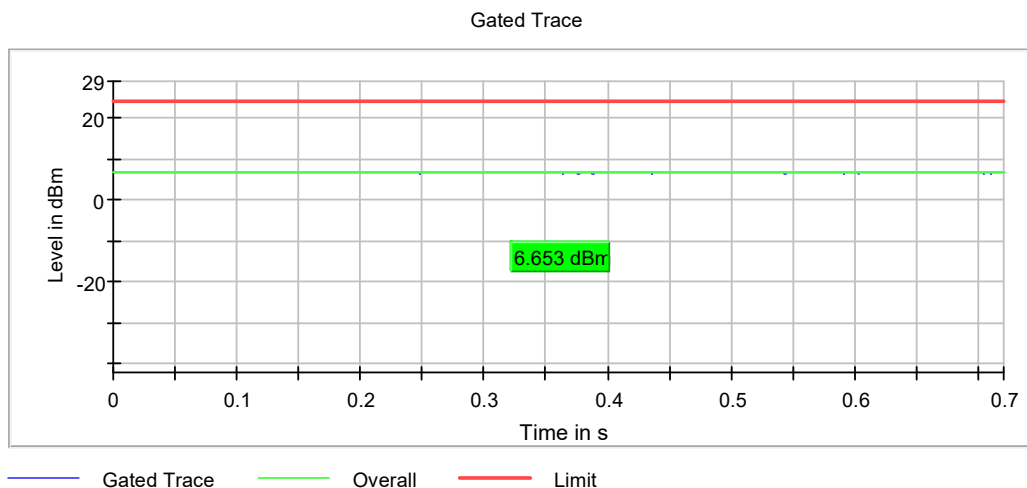
Images:



Frequency MHz = 5240.00000

Modulation = 802.11ac VHT20 (OFDM MCS3)

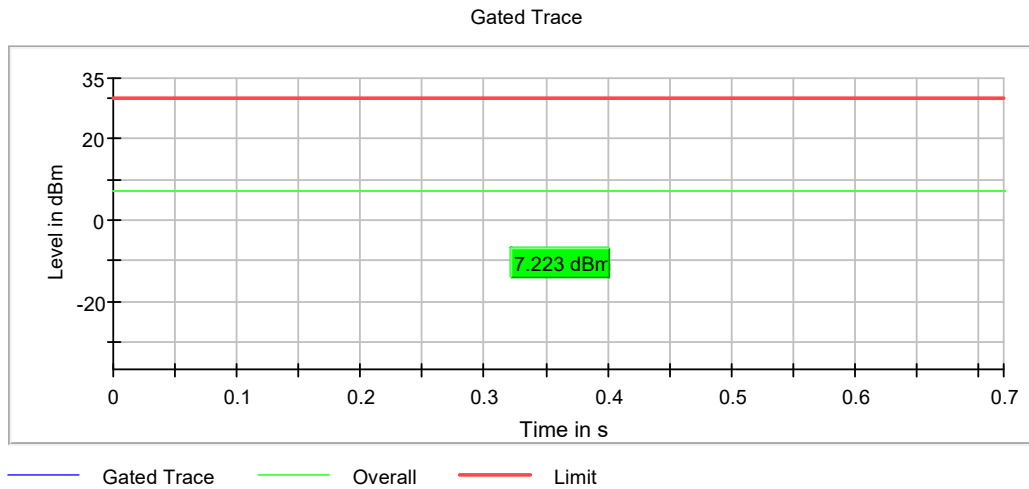
Images:



Frequency MHz = 5745.00000

Modulation = 802.11ac VHT20 (OFDM MCS3)

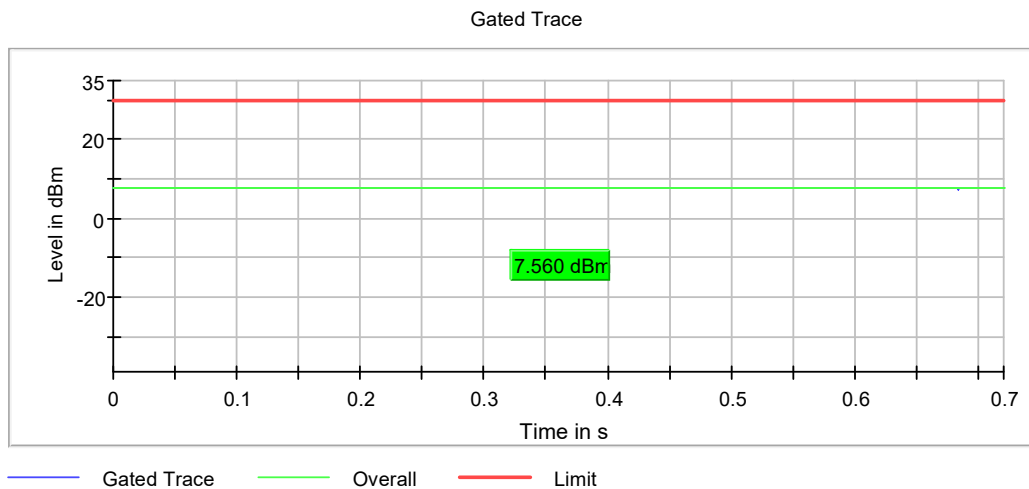
Images:



Frequency MHz = 5785.00000

Modulation = 802.11ac VHT20 (OFDM MCS3)

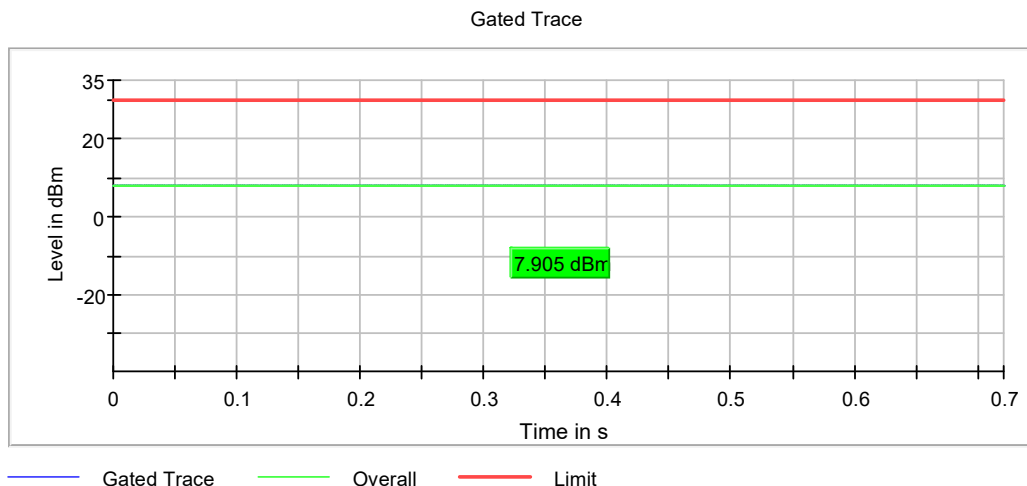
Images:



Frequency MHz = 5825.00000

Modulation = 802.11ac VHT20 (OFDM MCS3)

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Antenna gain: +5.7 dBi

Mode: SISO

Modulation: 802.11ac VHT40 (OFDM MCS4)

Results

Freq (MHz)	Avg Power (dBm)	Max EIRP (dBm)
5190.000	7.2	13.0
5230.000	6.6	12.4
5755.000	7.2	13.0
5795.000	8.0	13.8

Verdict

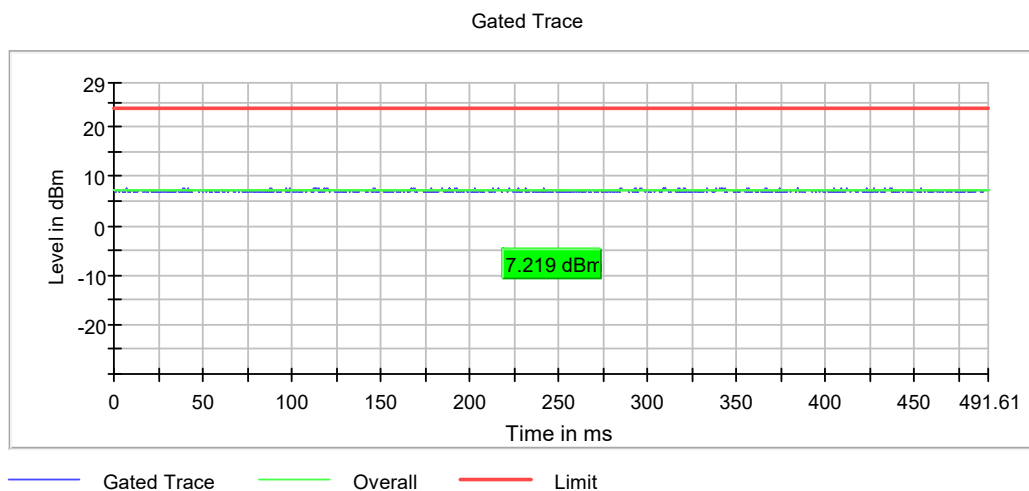
Pass

Attachments

Frequency MHz = 5190.00000

Modulation = 802.11ac VHT40 (OFDM MCS4)

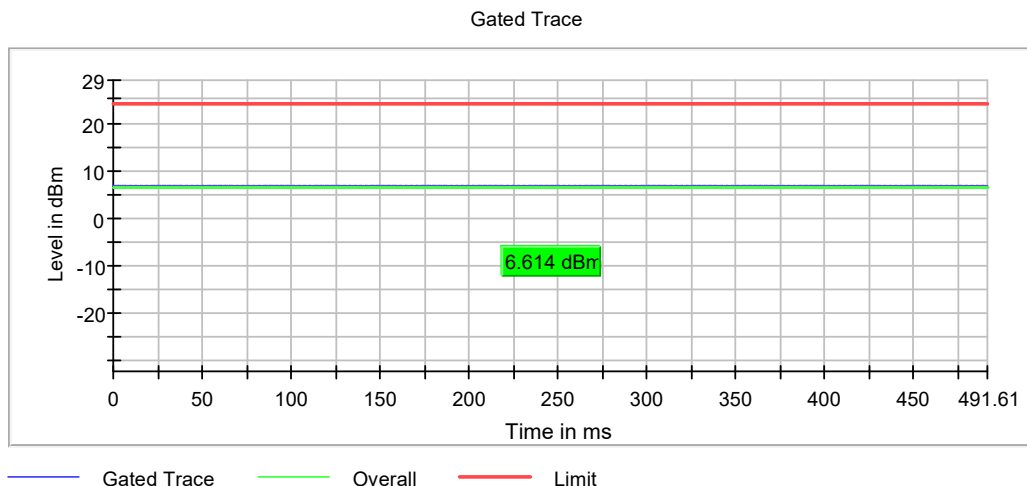
Images:



Frequency MHz = 5230.00000

Modulation = 802.11ac VHT40 (OFDM MCS4)

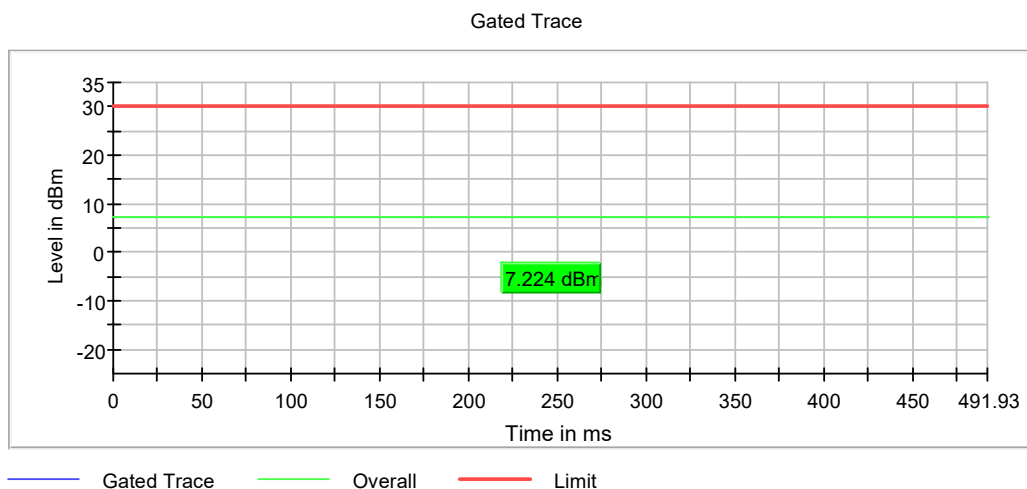
Images:



Frequency MHz = 5755.00000

Modulation = 802.11ac VHT40 (OFDM MCS4)

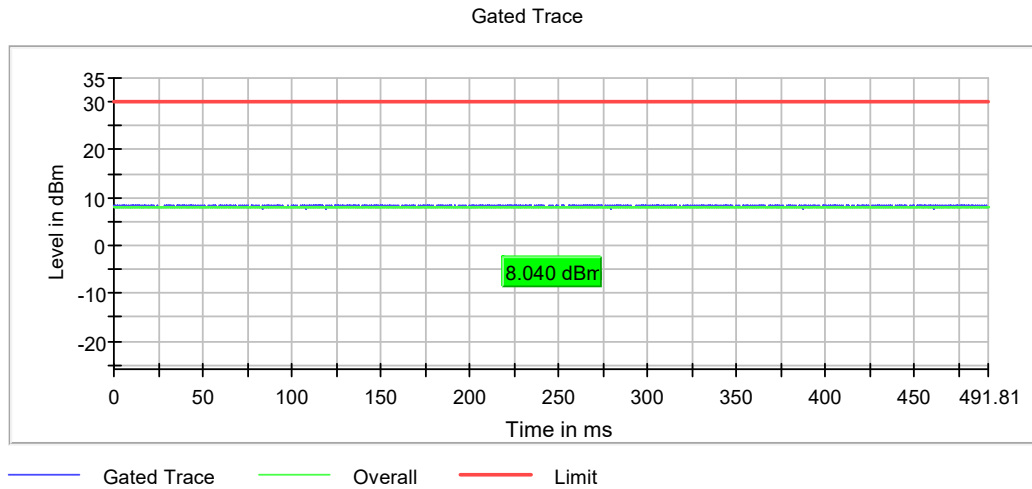
Images:



Frequency MHz = 5795.00000

Modulation = 802.11ac VHT40 (OFDM MCS4)

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Antenna gain: +5.7 dBi

Mode: SISO

Modulation: 802.11ac VHT80 (OFDM MCS4)

Results

Freq (MHz)	Avg Power (dBm)	Max EIRP (dBm)
5210.00000	6.4	12.2
5775.00000	7.4	13.2

Verdict

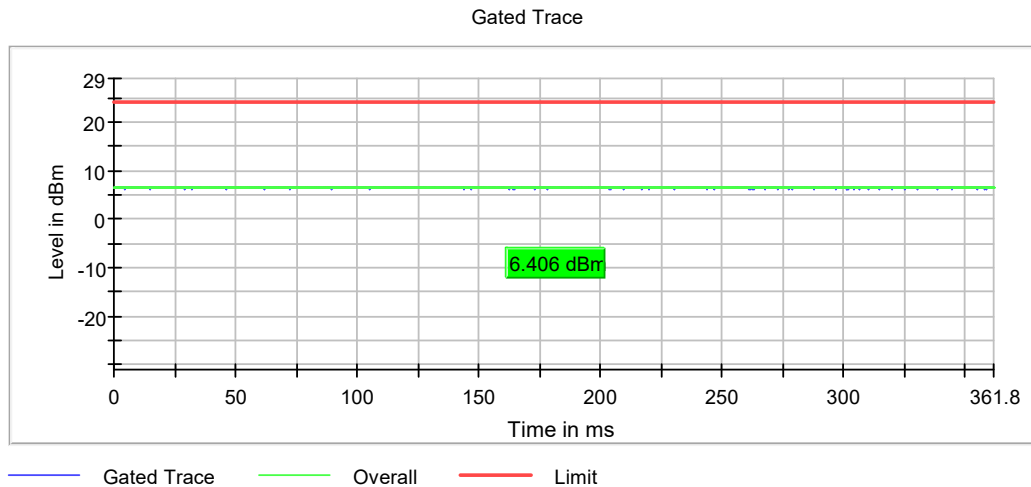
Pass

Attachments

Frequency MHz = 5210.00000

Modulation = 802.11ac VHT80 (OFDM MCS4)

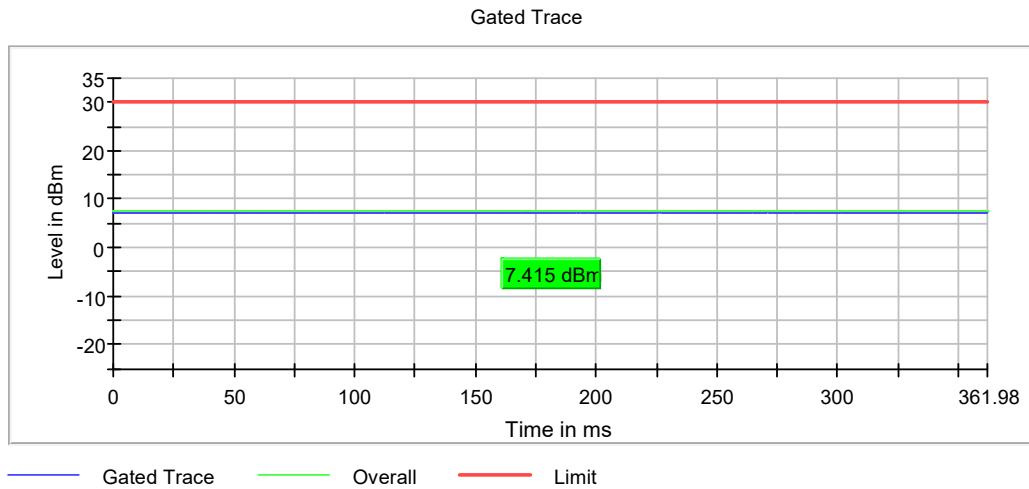
Images:



Frequency MHz = 5775.00000

Modulation = 802.11ac VHT80 (OFDM MCS4)

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

FCC 15.407 (b)(1), (b)(4)(i) 15.205 & 15.209 / RSS-Gen 8.9 & 8.10 Undesirable radiated emissions

Limits

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 ($\mu\text{V/m}$)	Field strength ($\text{dB}\mu\text{V/m}$)	Measurement distance (m)
0.009-0.490	$2400/F(\text{kHz})$	-	300
0.490-1.705	$24000/F(\text{kHz})$	-	300
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 40000	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 is specified when measuring with peak detector function.

**U-NII-1
Results**

Frequency range 9KHz – 30 MHz

No radiofrequency signal generated in the device found below 10° sub-armonic, no further investigation required.

Frequency range 0.03 - 1 GHz

The spurious emissions below 1 GHz do not depend on the operating channel and modulation selected in the EUT.

Modulation: 802.11ac20 (OFDM MCS3)

Results:

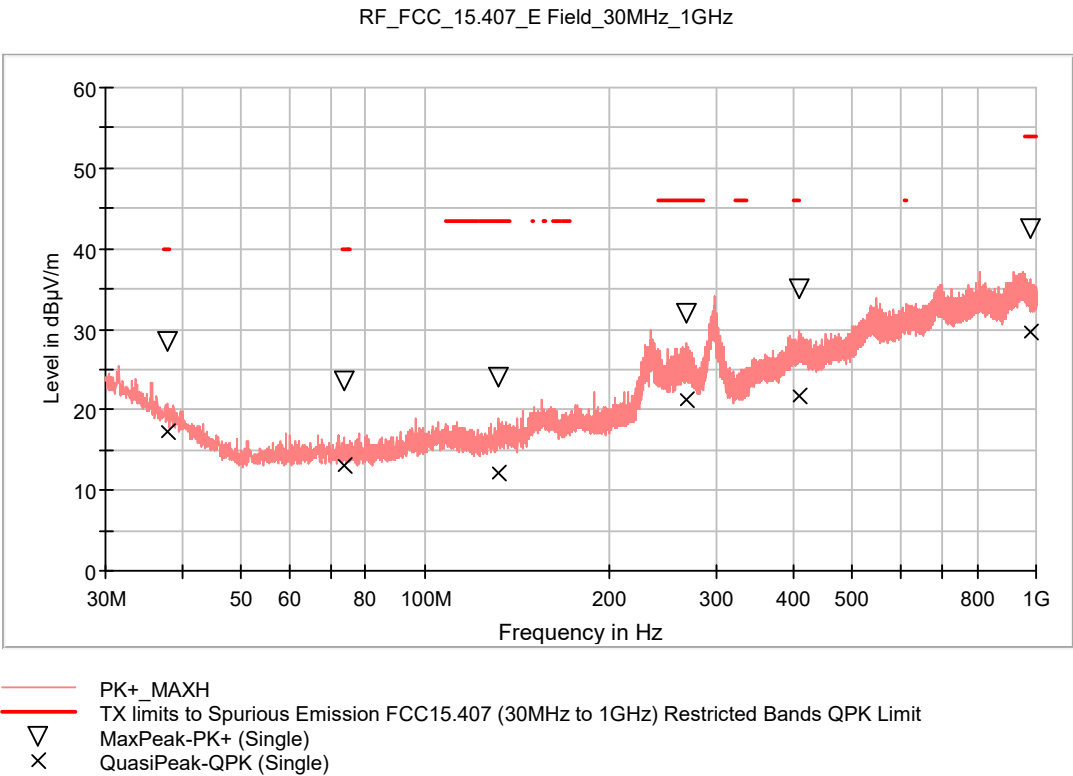
Verdict

Pass

Lowest Channel

Active Port = 1, Frequency Range GHz = [0.03, 1], Frequency MHz = 5200.00000, Modulation = 802.11ac20 (OFDM MCS3), MODE = SISO

Images:

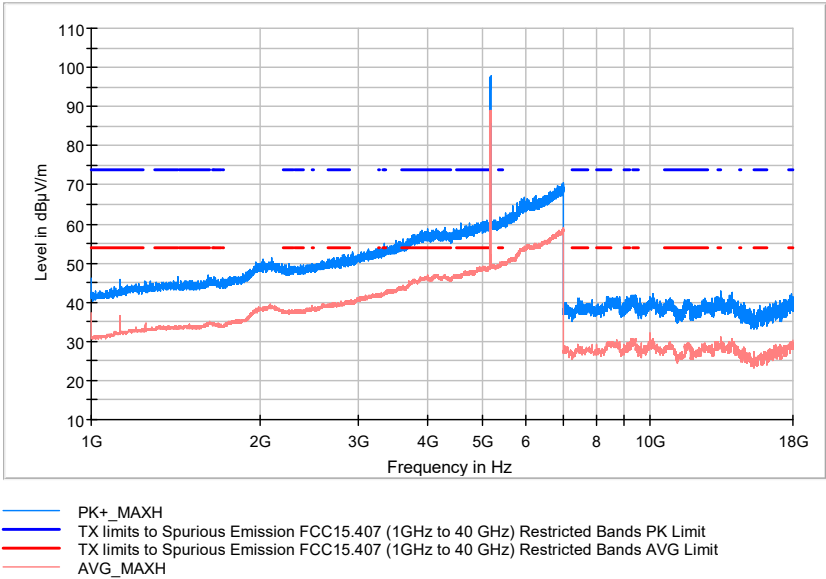


Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	PoI	Margin - QPK (dB)	Limit - QPK (dBµV/m)
37.808500	28.5	17.3	H	22.7	40.0
73.504500	23.7	13.2	H	26.8	40.0
131.850000	24.0	12.2	V	31.3	43.5
267.650000	31.9	21.4	V	24.7	46.0
408.154500	35.0	21.8	V	24.2	46.0
977.011000	42.6	29.6	H	24.4	54.0

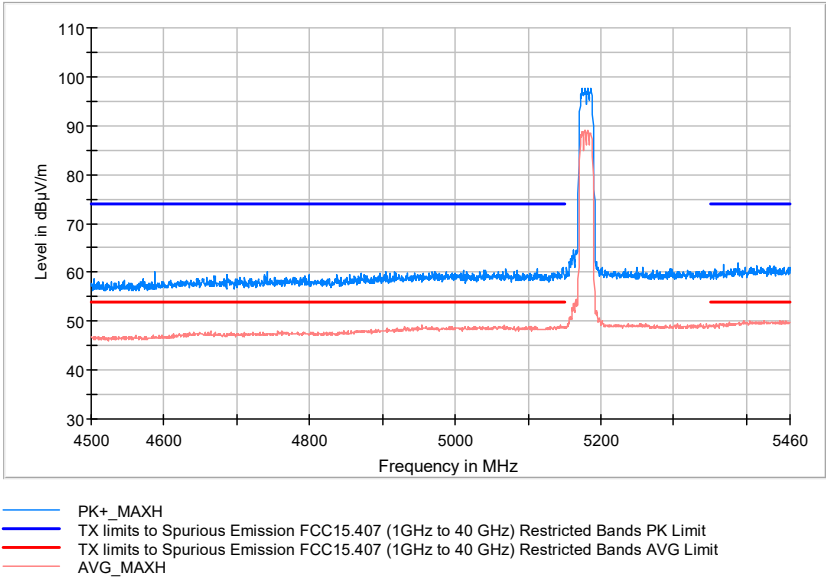
Frequency range 1 - 18 GHz

Frequency Range GHz = [1, 18], Frequency MHz = 5180.00000, Modulation = 802.11ac20 (OFDM MCS3), Mode = SISO

Images:

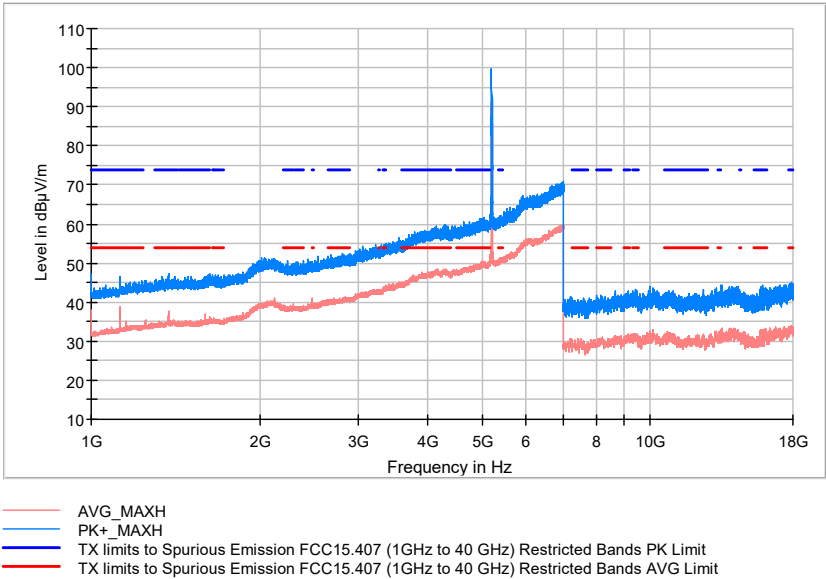


Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
1124.500000	45.8	36.6	V	17.4	54.0	
5181.500000	96.3	89.0	V	---	---	Fundamental

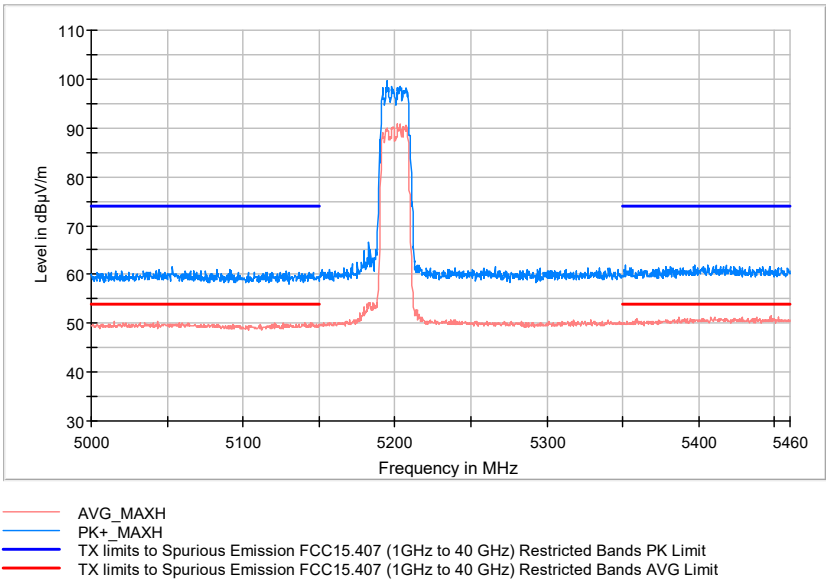


Frequency Range GHz = [1, 18], Frequency MHz = 5200.00000, Modulation = 802.11ac20 (OFDM MCS3), Mode = SISO

Images:

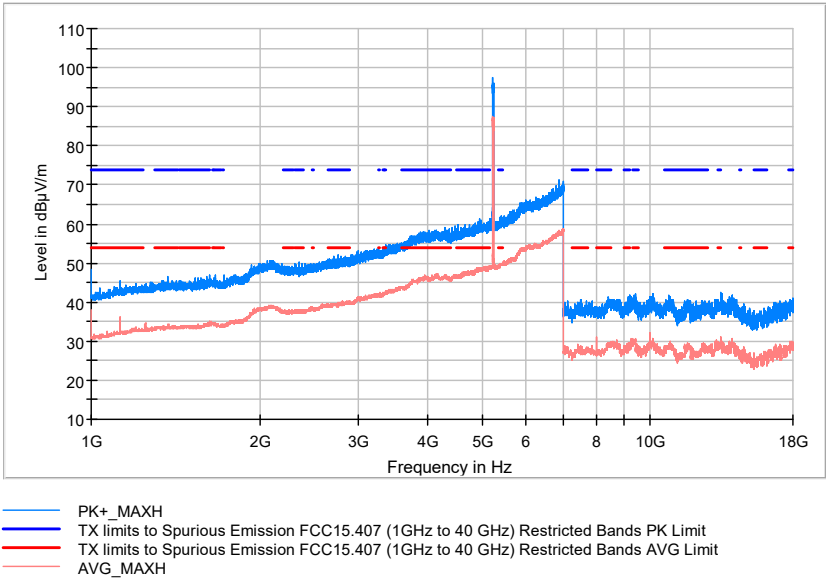


Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
5201.363636	95.9	90.7	V	---	---	Fundamental
10931.500000	42.4	31.9	H	22.1	54.0	

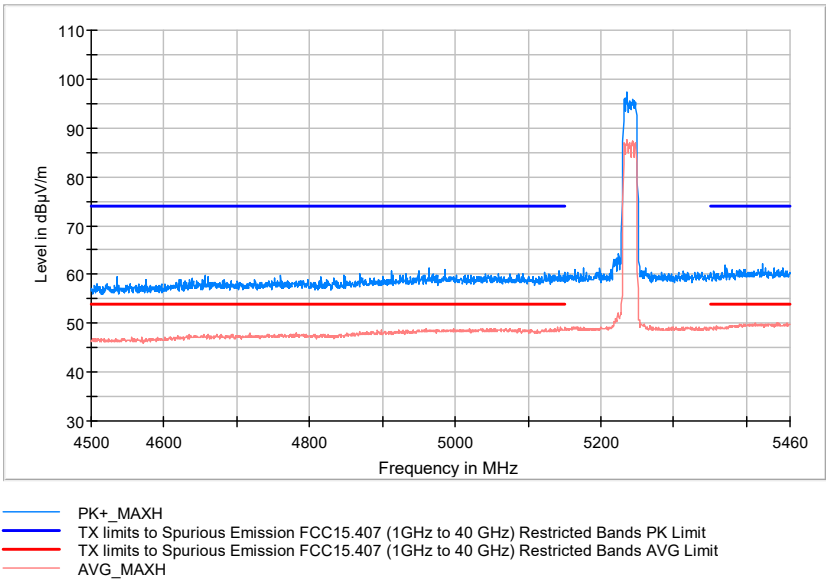


Frequency Range GHz = [1, 18], Frequency MHz = 5240.00000, Modulation = 802.11ac20 (OFDM MCS3), Mode = SISO

Images:

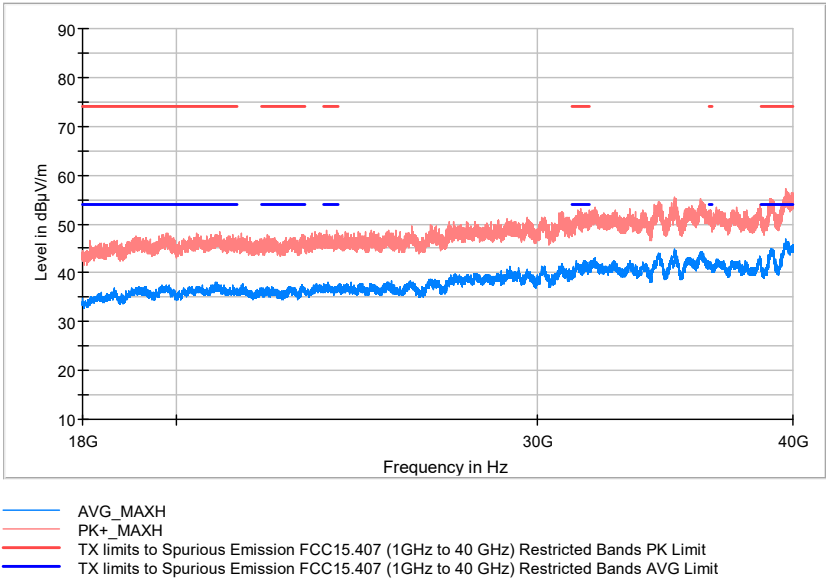


Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
5236.000000	97.4	87.5	V	---	---	Fundamental
11669.500000	39.9	29.1	H	24.9	54.0	



Frequency Range GHz = [18, 40], Frequency MHz = 5180.00000, Modulation = 802.11ac20 (OFDM MCS3),
Mode = SISO

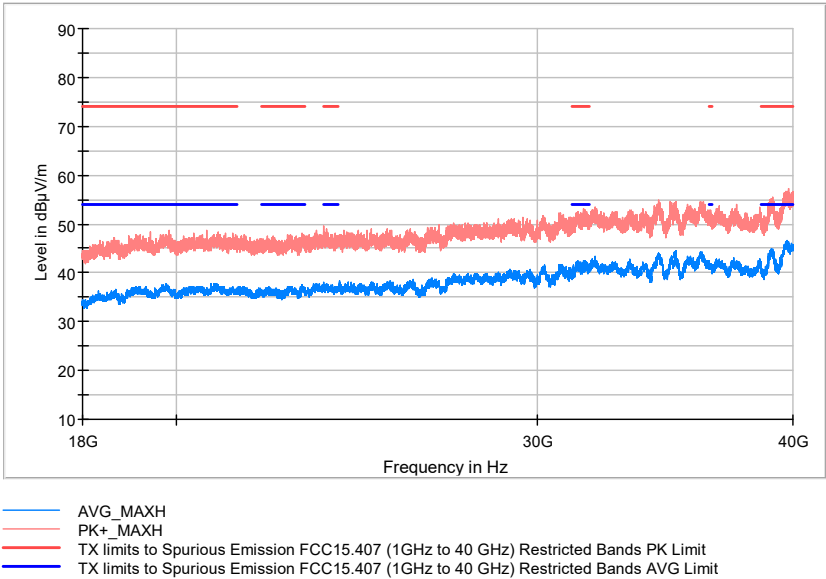
Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)
20925.312500	45.7	37.6	H	16.4	54.0
31348.500000	50.5	42.4	V	11.6	54.0

Frequency Range GHz = [18, 40], Frequency MHz = 5200.00000, Modulation = 802.11ac20 (OFDM MCS3),
Mode = SISO

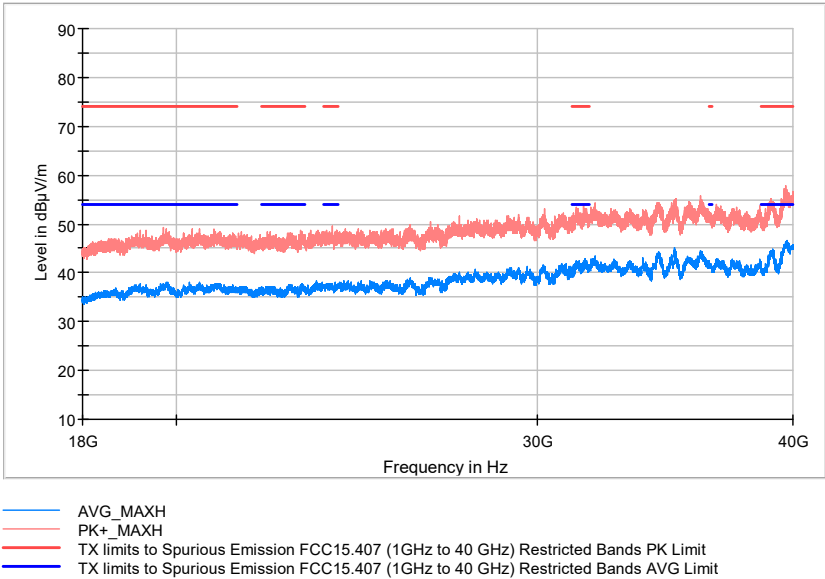
Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)
31635.875000	51.8	42.3	V	11.7	54.0
39714.000000	55.2	46.6	H	7.4	54.0

Frequency Range GHz = [18, 40], Frequency MHz = 5240.00000, Modulation = 802.11ac20 (OFDM MCS3),
Mode = SISO

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23808.000000	46.7	37.9	V	16.1	54.0
36464.875000	51.0	41.9	H	12.1	54.0

**U-NII-3
Results**

Frequency range 0.03 - 1 GHz

The spurious emissions below 1 GHz do not depend on the operating channel and modulation selected in the EUT.

Modulation: 802.11ac40 (OFDM MCS4)

Results:

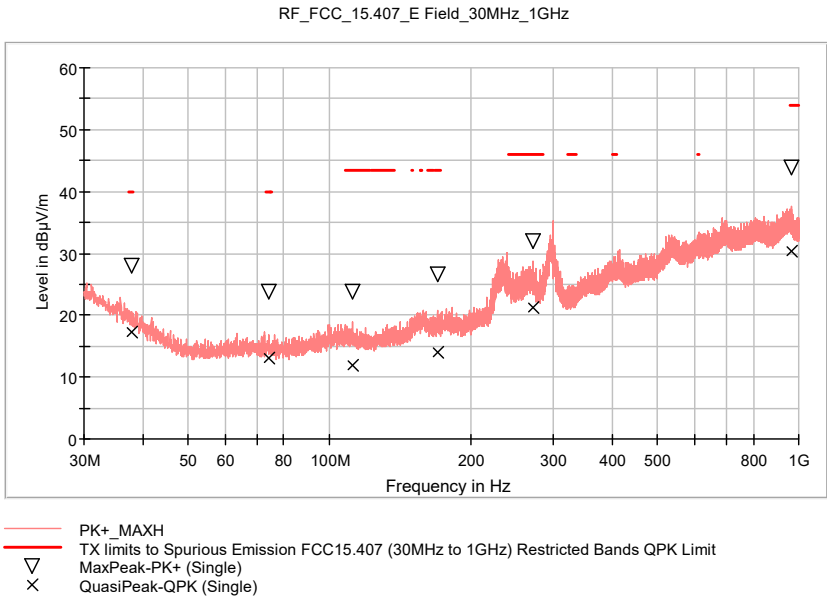
Verdict

Pass

Lowest Channel

Active Port = 1, Frequency Range GHz = [0.03, 1], Frequency MHz = 5577.00000, Modulation = 802.11ac40 (OFDM MCS4), MODE = SISO

Images:

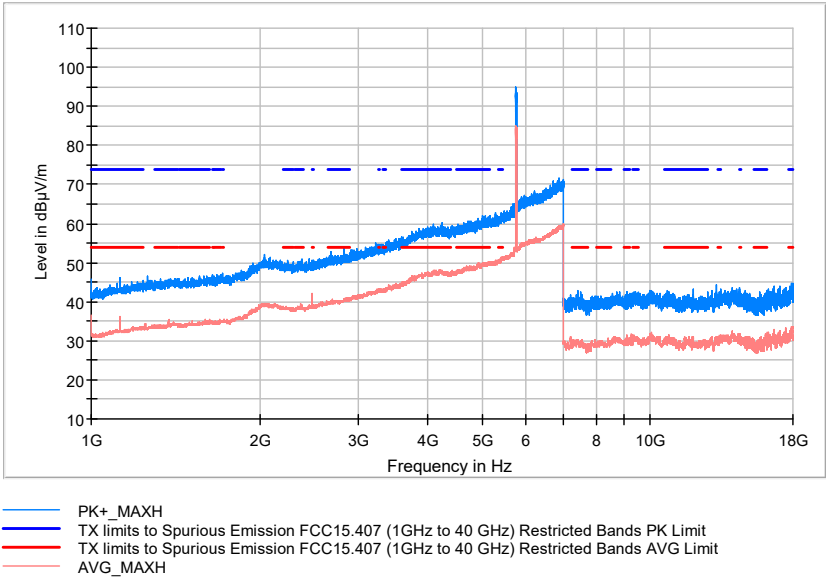


Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
37.857000	28.0	17.3	V	22.7	40.0
74.280500	23.9	13.0	H	27.0	40.0
111.868000	23.9	11.9	H	31.6	43.5
169.583000	26.6	14.0	H	29.5	43.5
270.802500	32.0	21.4	V	24.6	46.0
963.819000	43.8	30.3	V	23.7	54.0

Frequency range 1 - 18 GHz

Frequency Range GHz = [1, 18], Frequency MHz = 5755.00000, Modulation = 802.11ac40 (OFDM MCS4), Mode = SISO

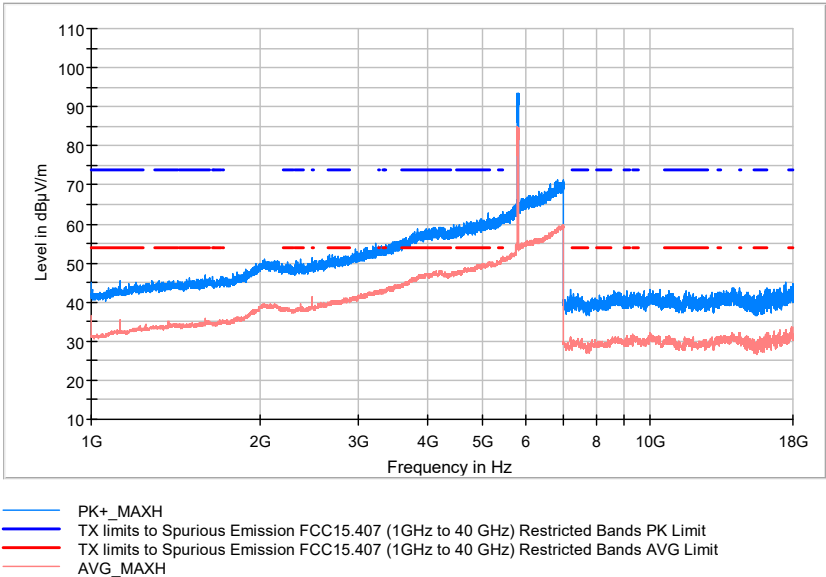
Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
5760.000000	92.2	84.9	H	---	---	Fundamental
11906.916667	41.4	31.1	H	22.9	54.0	

Frequency Range GHz = [1, 18], Frequency MHz = 5795.00000, Modulation = 802.11ac40 (OFDM MCS4),
Mode = SISO

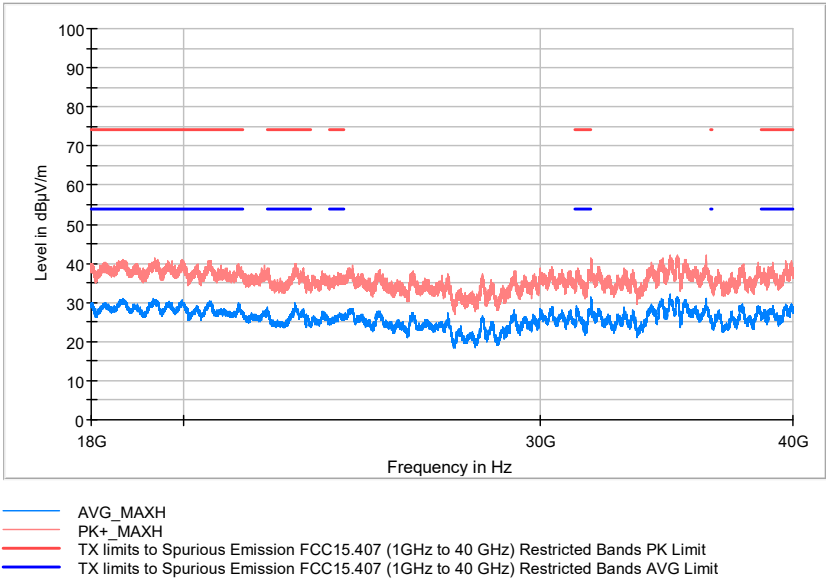
Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
5780.000000	93.1	84.9	H	---	---	Fundamental
11913.333333	39.8	30.9	H	23.1	54.0	

Frequency Range GHz = [18, 40], Frequency MHz = 5755.00000, Modulation = 802.11ac40 (OFDM MCS4),
Mode = SISO

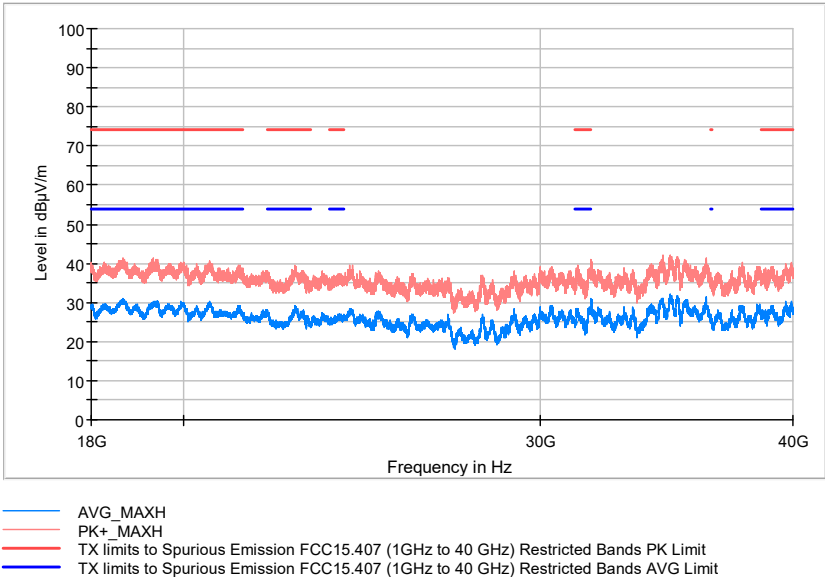
Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23975.062500	35.9	26.1	H	27.9	54.0
31284.562500	37.2	28.4	H	25.6	54.0

Frequency Range GHz = [18, 40], Frequency MHz = 5795.00000, Modulation = 802.11ac40 (OFDM MCS4),
Mode = SISO

Images:



Frequency (MHz)	PK+ MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)
18659.312500	39.8	31.0	V	23.0	54.0
20607.687500	39.2	29.9	H	24.1	54.0
31773.375000	37.4	28.6	V	25.4	54.0

Measurements

Subrange	Step Size	Detectors	Bandwidth	Sweep Time
30 MHz - 1 GHz	48.5 kHz	PK+	100 kHz	1 s
1 GHz - 7 GHz	500 kHz	PK+ ; AVG	1 MHz	1 s
7 GHz - 18 GHz	500 kHz	PK+ ; AVG	1 MHz	1 s
18 GHz - 40 GHz	500 kHz	PK+ ; AVG	1 MHz	1 s