CE Test Report

Equipment	:	**Sona IF513 802.11ax Wi-Fi 6E Module with Bluetooth 5.4**
Model No.	:	**Sona IF513**
Brand Name	:	**Ezurio**
Applicant	:	**Ezurio LLC**
Address	:	**W66N220 Commerce Court, Cedarburg, WI 53012 United States Of America**
Standard	:	**EN 301 893 V2.1.1 (2017-05)**
Received Date	:	**Jun. 06, 2024**
Tested Date	:	**Jun. 06 ~ Nov. 15, 2024**

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: **Approved by:**

Alex Huang, Gary Chang

Alex Huang / Supervisor **Gary Chang / Manager**

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Appendix A. Carrier Frequencies

Appendix B. Occupied Channel Bandwidth

Appendix C. RF Output Power, Transmit Power Control (TPC) and Power Density

Appendix D. Transmitter Spurious Emissions outside the 5 GHz RLAN Bands

Appendix E. Transmitter Spurious Emissions within the 5 GHz RLAN Band

Appendix F. Receiver Spurious Emissions

Appendix G. Adaptivity

Appendix H. Receiver Blocking

Release Record

Report No.	Version	Description	Issued Date
ER460601AN	Rev. 01	Initial issue	Dec. 06, 2024
ER460601AN	Rev. 02	Modified antenna gain	Dec. 17, 2024
ER460601AN	Rev. 03	Modified antenna gain	Dec. 25, 2024

Summary of Test Result

Ref. Std. Clause	Test Items	Measured	Result
4.2.1	Carrier Frequencies	Meet the requirement of limit.	Pass
4.2.2	Nominal Channel Bandwidth and Occupied Channel Bandwidth	Meet the requirement of limit.	Pass
4.2.3	RF Output Power & Transmit Power Control (TPC)	5.15-5.25GHz: 22.30 dBm 5.25-5.35GHz: 22.63 dBm 5.47-5.725GHz: 21.89 dBm	Pass
4.2.3	Power Density	Meet the requirement of limit.	Pass
4.2.4	Transmitter Unwanted Emissions	Meet the requirement of limit.	Pass
4.2.5	Receiver Spurious Emissions	Meet the requirement of limit.	Pass
4.2.6	Dynamic Frequency Selection (DFS)	Meet the requirement of limit.	Pass
4.2.7	Adaptivity (Channel Access Mechanism)	Meet the requirement of limit.	Pass
4.2.8	Receiver Blocking	Meet the requirement of limit.	Pass
4.2.9	User Access Restrictions	Meet the requirement of limit.	Pass
4.2.10	Geo-location capability	This test is not required since the device does not support this function	NA

Note: The DFS measurement was recorded in Report No.: EY460601.

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Product Details

The four configurations of the EUT are shown on the following:

Model Name	Part No.	Description
Sona IF513	453-00184	Module, Sona IF513, MHF4L
	453-00185	Module, Sona IF513, Trace Pin
	453-00193	Module, Sona IF513, Antenna Diversity, MHF4L
	453-00194	Module, Sona IF513, Antenna Diversity, Trace Pin
	453-00186	Module, Sona IF513, M.2, Key E, SDIO, UART
	453-00195	Module, Sona IF513, Antenna Diversity, M.2, Key E, SDIO, UART
	453-00213	Module, Sona IF513, M.2, Key E, SDIO, UART, Ext. OSC
	453-00214	Module, Sona IF513, Antenna Diversity, M.2, Key E, SDIO, UART, Ext. OSC

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N_{TX})	Data Rate / MCS
5150-5250 5250-5350 5470-5725	a	5180-5240 5260-5320 5500-5700	36-48 [4] 52-64 [4] 100-140 [11]	1	6-54 Mbps
5150-5250 5250-5350 5470-5725	n (HT20)	5180-5240 5260-5320 5500-5700	36-48 [4] 52-64 [4] 100-140 [11]	1	MCS 0-07
5150-5250 5250-5350 5470-5725	ac (VHT20)	5180-5240 5260-5320 5500-5700	36-48 [4] 52-64 [4] 100-140 [11]	1	MCS 0-9
5150-5250 5250-5350 5470-5725	ax (HE20)	5180-5240 5260-5320 5500-5700	36-48 [4] 52-64 [4] 100-140 [11]	1	MCS 0-11
Note 1: 802.11a/n/ac/ax uses a combination of OFDM/OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM and 1024QAM modulation. Note 2: TPC function is supported. Note 3: 802.11ax supports full RU and partial RU configuration.					

1.1.3 Antenna Details

Ant. No.	Manufacturer	Model	Part Number	Type	Connector	Operating Frequencies / Gain (dBi)		
						2.4GHz	5GHz	6GHz
1	Joymax Inc.	TWX-100B RS3B	NA	Dipole	RP-SMA	2	4	4
2	Ezurio	FlexMIMO 6E	EFD2471A3 S-10MH4L	PIFA	MHF4L	2.2	3.8	3.3
3	Ezurio	Mini NanoBlade Flex 6 GHz	EMF2471A 3S-10MH4L	PCB Dipole	MHF4L	2.4	4.4	5.2
4	Ezurio	FlexPIFA 6E	EFB2471A3 S-10MH4L	PIFA	MHF4L	2.2	3.9	3.8

1.1.4 EUT Operational Condition

Power Supply Type	3.3Vdc from host		
SW Version	v28.10.301		
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (85°C)	☒ Tmin (-40°C)
TPC	☒ Support	☐ Not support	
Beamforming	☐ Support	☒ Not support	
RU Configuration	☒ Full RU	☒ Partial RU	
Channel Puncturing	☐ Support	☒ Not support	

1.1.5 Adaptive Equipment

Adaptive Equipment		
☒	Adaptive Equipment without the possibility to switch to a non-adaptive mode:	
	☒	The equipment has implemented an LBT based DAA mechanism:
		☐ The equipment is Frame Based equipment
		☒ The equipment is Load Based equipment
		☐ The equipment can switch dynamically between Frame Based and Load Based equipment
	☐	The equipment has implemented an non-LBT based DAA mechanism
	☐	The equipment can operate in more than one adaptive mode
☐	Adaptive Equipment which can also operate in a non-adaptive mode	

1.1.6 Channel List

Frequency band (MHz)	5150~5350, 5500~5700
802.11a / n HT20 / ac VHT20 / ax HE20	
Channel	Frequency(MHz)
36	5180
40	5200
44	5220
48	5240
52	5260
56	5280
60	5300
64	5320
100	5500
104	5520
108	5540
112	5560
116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700

1.1.7 Test Tool and Duty Cycle

Part No. 453-00184

Test Tool	By command	
Modulation Mode	**Duty Cycle Of Test Signal (%)**	**Duty Factor (dB)**
11a	99.27%	0.03
ax HE20_OFDMA	98.95%	0.05

Test Tool	By command	
Modulation Mode	**Duty Cycle Of Test Signal (%)**	**Duty Factor (dB)**
ax HE20-OFDMA RU26	99.25%	0.03
ax HE20-OFDMA RU52	98.51%	0.07
ax HE20-OFDMA RU106	99.10%	0.04

Part No. 453-00193

Test Tool	By command	
Modulation Mode	**Duty Cycle Of Test Signal (%)**	**Duty Factor (dB)**
11a	99.27%	0.032
ax HE20_OFDMA	98.98%	0.045

Test Tool	By command	
Modulation Mode	**Duty Cycle Of Test Signal (%)**	**Duty Factor (dB)**
ax HE20-OFDMA RU26	99.32%	0.030
ax HE20-OFDMA RU52	98.59%	0.062
ax HE20-OFDMA RU106	99.21%	0.035

Part No. 453-00213

Test Tool	By command	
Modulation Mode	**Duty Cycle Of Test Signal (%)**	**Duty Factor (dB)**
11a	99.27%	0.032
ax HE20_OFDMA	98.95%	0.046

Test Tool	By command	
Modulation Mode	**Duty Cycle Of Test Signal (%)**	**Duty Factor (dB)**
ax HE20-OFDMA RU26	99.28%	0.031
ax HE20-OFDMA RU52	98.53%	0.064
ax HE20-OFDMA RU106	99.12%	0.038

Part No. 453-00214

Test Tool	By command	
Modulation Mode	**Duty Cycle Of Test Signal (%)**	**Duty Factor (dB)**
11a	99.25%	0.033
ax HE20_OFDMA	98.95%	0.046

Test Tool	By command	
Modulation Mode	**Duty Cycle Of Test Signal (%)**	**Duty Factor (dB)**
ax HE20-OFDMA RU26	99.25%	0.033
ax HE20-OFDMA RU52	98.50%	0.065
ax HE20-OFDMA RU106	99.12%	0.038

1.1.8 Power Index of Test Tool

Part No. 453-00184

Modulation Mode	Test Frequency (MHz)			
	5180	**5320**	**5500**	**5700**
11a	65	64	63	63
ax HE20_OFDMA	68	67	65	64

Modulation Mode	Test Frequency (MHz)			
	5180	**5320**	**5500**	**5700**
ax HE20-OFDMA RU26	32	29	28	29
ax HE20-OFDMA RU52	45	43	43	41
ax HE20-OFDMA RU106	58	58	58	56

Part No. 453-00193

Modulation Mode	Test Frequency (MHz)			
	5180	**5320**	**5500**	**5700**
11a	62	62	62	65
ax HE20_OFDMA	64	64	64	66

Modulation Mode	Test Frequency (MHz)			
	5180	**5320**	**5500**	**5700**
ax HE20-OFDMA RU26	27	25	25	29
ax HE20-OFDMA RU52	41	40	41	43
ax HE20-OFDMA RU106	55	55	55	57

Part No. 453-00213

Modulation Mode	Test Frequency (MHz)			
	5180	5320	5500	5700
11a	62	62	62	62
ax HE20_OFDMA	61	63	63	63

Modulation Mode	Test Frequency (MHz)			
	5180	5320	5500	5700
ax HE20-OFDMA RU26	28	24	27	27
ax HE20-OFDMA RU52	41	39	39	39
ax HE20-OFDMA RU106	54	54	54	54

Part No. 453-00214

Modulation Mode	Test Frequency (MHz)			
	5180	5320	5500	5700
11a	67	65	66	66
ax HE20_OFDMA	68	68	68	68

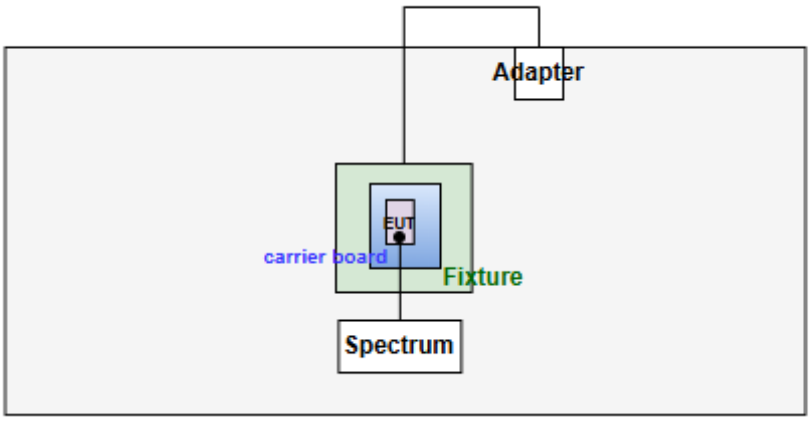
Modulation Mode	Test Frequency (MHz)			
	5180	5320	5500	5700
ax HE20-OFDMA RU26	32	30	30	29
ax HE20-OFDMA RU52	45	43	44	43
ax HE20-OFDMA RU106	58	58	59	57

1.2 Local Support Equipment List

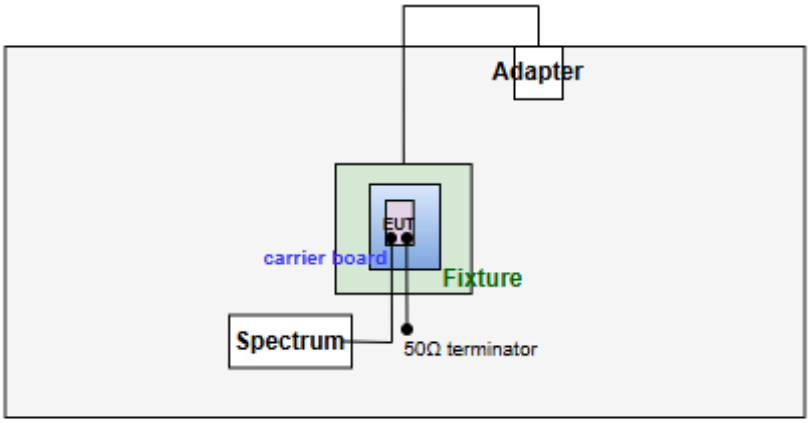
Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**S/N**	**Remarks**
1	Laptop	DELL	Latitude 5400	FKZLWZ2	---
2	Fixture	Ezurio	750-00001-2-0	---	Provided by applicant.
3	Fixture's adapter	Chenzhou Frecom Electronics Co.	F36L7-120300S PACP	---	Provided by applicant.
4	50Ω terminator	Woken	WTER-18S2	---	---

1.3 Test Setup Chart

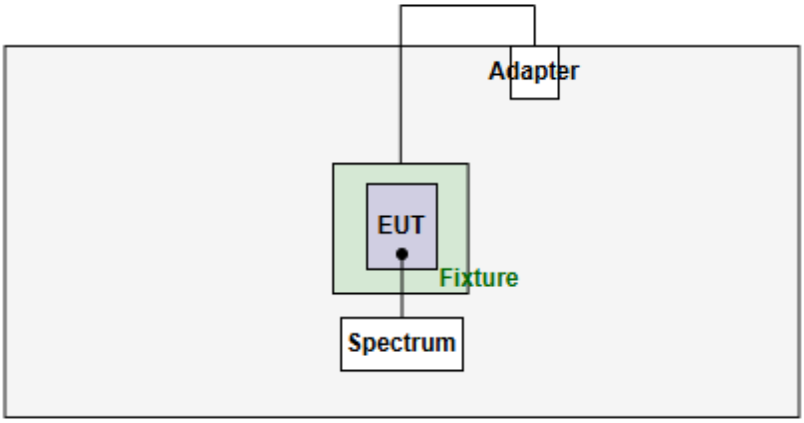
Test Setup Diagram (Conducted Test –Laird part number: 453-00184)



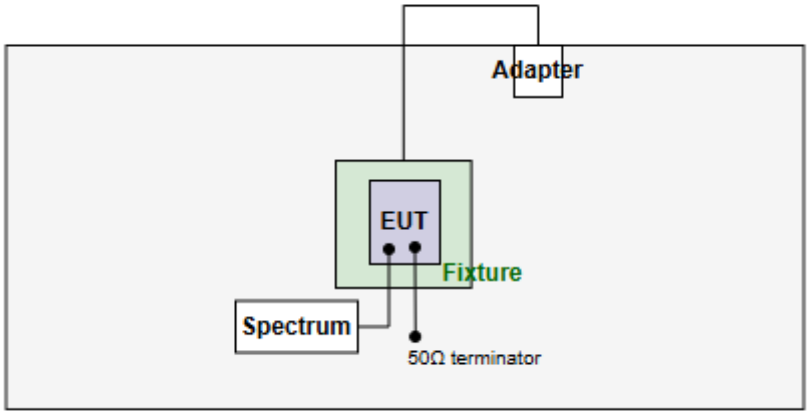
Test Setup Diagram (Conducted Test –Laird part number: 453-00193)



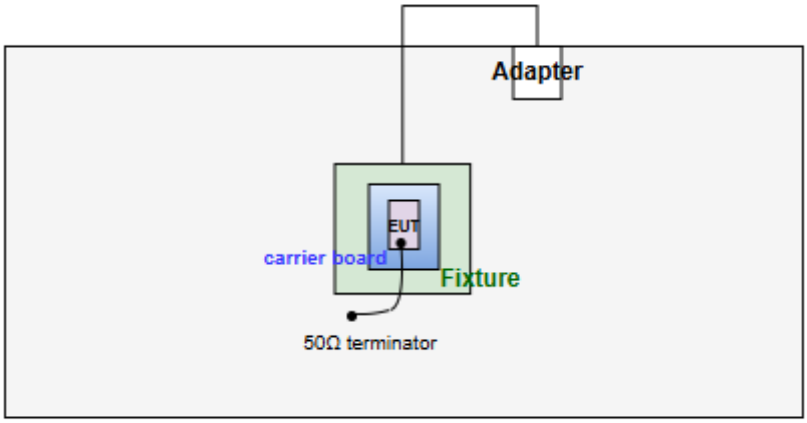
Test Setup Diagram (Conducted Test –Laird part number: 453-00213)



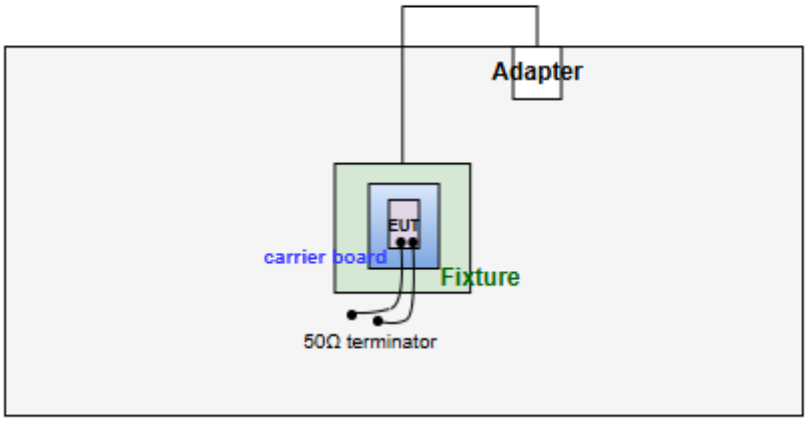
Test Setup Diagram (Conducted Test – Laird part number: 453-00214)



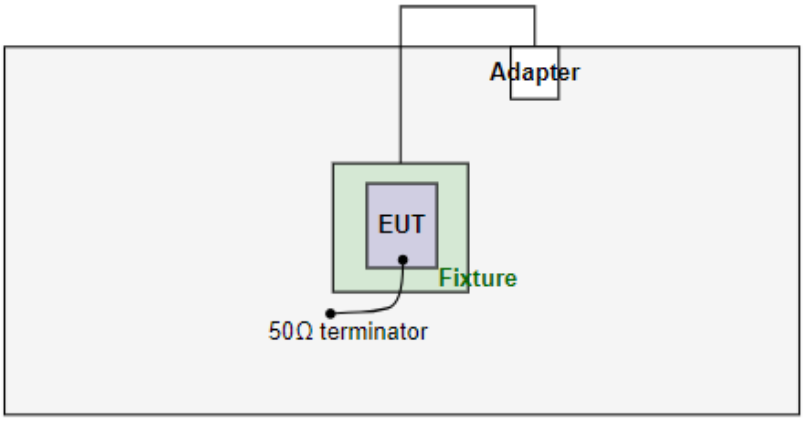
Test Setup Diagram (Radiated Test – Laird part number: 453-00184)



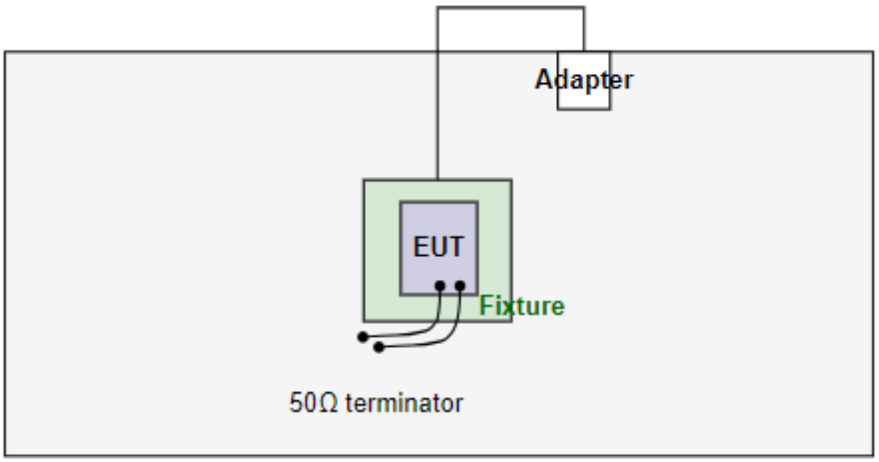
Test Setup Diagram (Radiated Test –Laird part number: 453-00193)



Test Setup Diagram (Radiated Test – Laird part number: 453-00213)



Test Setup Diagram (Radiated Test –Laird part number: 453-00214)



1.4 Test Equipment and Calibration Data

Test Item	Radiated Emissions below 1GHz				
Test Site	Fully –anechoic chamber 2 / (05CH02-WS)				
Test Date	Oct. 08, 2024				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	Agilent	N9010A	MY52221474	Nov. 14, 2023	Nov. 13, 2024
Bilog Antenna 30-1000MHz	SCHWARZBECK	VULB9168	9168-563	Mar. 20, 2024	Mar. 19, 2025
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	9120D-1205	Feb. 16, 2024	Feb. 15, 2025
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170508	Dec. 28, 2023	Dec. 27, 2024
Preamplifier	Agilent	83017A	MY53270013	Feb. 19, 2024	Feb. 18, 2025
Preamplifier	EMC	EMC02325	980188	Jan. 02, 2024	Jan. 01, 2025
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210926	Oct. 11, 2023	Oct. 10, 2024
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210927	Oct. 11, 2023	Oct. 10, 2024
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22621/4	Oct. 11, 2023	Oct. 10, 2024
RF cable-4M	HUBER+SUHNER	SUCOFLEX104	MY32489/4	Oct. 11, 2023	Oct. 10, 2024
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-002	Oct. 11, 2023	Oct. 10, 2024
LF cable-3M	EMC	EMC8D-NM-NM-3000	131102	Oct. 11, 2023	Oct. 10, 2024
LF cable-10M	EMC	EMC8D-NM-NM-10000	131101	Oct. 11, 2023	Oct. 10, 2024
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emissions below 1GHz				
Test Site	Fully –anechoic chamber 2 / (05CH02-WS)				
Test Date	Oct. 15 ~ Nov. 04, 2024				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	Agilent	N9010A	MY52221474	Nov. 14, 2023	Nov. 13, 2024
Bilog Antenna 30-1000MHz	SCHWARZBECK	VULB9168	9168-563	Mar. 20, 2024	Mar. 19, 2025
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	9120D-1205	Feb. 16, 2024	Feb. 15, 2025
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170508	Dec. 28, 2023	Dec. 27, 2024
Preamplifier	Agilent	83017A	MY53270013	Feb. 19, 2024	Feb. 18, 2025
Preamplifier	EMC	EMC02325	980188	Jan. 02, 2024	Jan. 01, 2025
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210926	Oct. 09, 2024	Oct. 08, 2025
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210927	Oct. 09, 2024	Oct. 08, 2025
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22621/4	Oct. 09, 2024	Oct. 08, 2025
RF cable-4M	HUBER+SUHNER	SUCOFLEX104	MY32489/4	Oct. 09, 2024	Oct. 08, 2025
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-002	Oct. 09, 2024	Oct. 08, 2025
LF cable-3M	EMC	EMC8D-NM-NM-3000	131102	Oct. 09, 2024	Oct. 08, 2025
LF cable-10M	EMC	EMC8D-NM-NM-10000	131101	Oct. 09, 2024	Oct. 08, 2025
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Test Date	Oct. 11, 2024				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101486	Mar. 05, 2024	Mar. 04, 2025
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Jul. 01, 2024	Jun. 30, 2025
Power Sensor	Agilent	U2021XA	MY53480019	Mar. 09, 2024	Mar. 08, 2025
Power Sensor	Agilent	U2021XA	MY53510003	Mar. 09, 2024	Mar. 08, 2025
Power Sensor	Agilent	U2021XA	MY54070003	Mar. 26, 2024	Mar. 25, 2025
Power Sensor	Agilent	U2021XA	MY54060013	Mar. 26, 2024	Mar. 25, 2025
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210928	Oct. 13, 2023	Oct. 12, 2024
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210929	Oct. 13, 2023	Oct. 12, 2024
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210930	Oct. 13, 2023	Oct. 12, 2024
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210931	Oct. 13, 2023	Oct. 12, 2024
Measurement Software	Sporton	SENSE	5.10.7	NA	NA
Measurement Software	Agilent	EN RF test	1.1501125	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Test Date	Nov. 15, 2024				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101486	Mar. 05, 2024	Mar. 04, 2025
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Jul. 01, 2024	Jun. 30, 2025
Power Sensor	Agilent	U2021XA	MY53480019	Mar. 09, 2024	Mar. 08, 2025
Power Sensor	Agilent	U2021XA	MY53510003	Mar. 09, 2024	Mar. 08, 2025
Power Sensor	Agilent	U2021XA	MY54070003	Mar. 26, 2024	Mar. 25, 2025
Power Sensor	Agilent	U2021XA	MY54060013	Mar. 26, 2024	Mar. 25, 2025
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210928	Oct. 12, 2024	Oct. 11, 2025
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210929	Oct. 12, 2024	Oct. 11, 2025
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210930	Oct. 12, 2024	Oct. 11, 2025
RF Cable-1M	EMC	EMC104-35M-35M-1000	S/N:210931	Oct. 12, 2024	Oct. 11, 2025
Measurement Software	Sporton	SENSE	5.10.7	NA	NA
Measurement Software	Agilent	EN RF test	1.1501125	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Adaptivity				
Test Site	(TH01-WS)				
Test Date	Jun. 12, 2024				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum	R&S	FSV-7	101607	Feb. 05, 2024	Feb. 04, 2025
RF cable-8M	HUBER+SUHNER	SUCOFLEX_104	22601/4	Oct. 12, 2023	Oct. 11, 2024
RF cable-0.5M	HUBER+SUHNER	SUCOFLEX_104	296081/4	Oct. 12, 2023	Oct. 11, 2024
RF cable-0.2M	HUBER+SUHNER	SUCOFLEX_104	329023/4	Oct. 12, 2023	Oct. 11, 2024
RF cable-0.2M	HUBER+SUHNER	SUCOFLEX_104	329021/4	Oct. 12, 2023	Oct. 11, 2024
MXG-B RF Vector Signal Generator	Agilent	N5182B	MY53050081	May 22, 2024	May 21, 2025
Preamplifier	Burgeon	BPA-530	100219	Nov. 22, 2023	Nov. 21, 2024
Oscilloscope	National Instruments	USB-5133	F651FF	Aug. 17, 2023	Aug. 16, 2024
Combiner(1X2)	Woken	2WAYDIV-1	0120A02056002D	Oct. 13, 2023	Oct. 12, 2024
Combiner(1X2)	Woken	DOM2AEW1A22	0120A02201801O	Oct. 13, 2023	Oct. 12, 2024
Combiner(1X4)	Woken	4WAYDIV	0120A042011010	Oct. 12, 2023	Oct. 11, 2024
Direction Coupler	Marvelous Microwave	MVE4514-20	20	Oct. 12, 2023	Oct. 11, 2024
Attenuator	Warison	WATT-6SR1211	01	Oct. 13, 2023	Oct. 12, 2024
Measurement Software	Sporton	Sporton_3	1.0.0.22	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Receiver Blocking				
Test Site	05CH01-WS				
Test Date	Jun. 06, 2024				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Wireless connectivity tester	R&S	CMW270	100856	Nov. 14, 2023	Nov. 13, 2024
Signal Generator	R&S	SMB100A	175727	May 22, 2024	May 21, 2025
RF cable-0.5M	HUBER+SUHNER	SUCOFLEX_104	500202/4	Oct. 12, 2023	Oct. 11, 2024
RF cable-0.5M	HUBER+SUHNER	SUCOFLEX_104	296088/4	Oct. 12, 2023	Oct. 11, 2024
RF cable-0.2M	HUBER+SUHNER	SUCOFLEX_104	329023/4	Oct. 12, 2023	Oct. 11, 2024
Combiner(1X2)	WOKEN	2WAYDIV	12101200003	Oct. 12, 2023	Oct. 11, 2024
Attenuator	woken	PE7013-10	10-1	Oct. 13, 2023	Oct. 12, 2024
Attenuator	woken	PE7013-10	10-2	Oct. 13, 2023	Oct. 12, 2024
Attenuator	woken	PE7013-20	20-1	Oct. 13, 2023	Oct. 12, 2024
Attenuator	woken	PE7013-20	20-2	Oct. 13, 2023	Oct. 12, 2024
20dB Attenuator	MVE	MVE2462-20	16050401	Oct. 13, 2023	Oct. 12, 2024
30dB Attenuator	MVE	MVE2462-30	16050401	Oct. 13, 2023	Oct. 12, 2024
Note: Calibration Interval of instruments listed above is one year.					

1.5 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

EN 301 893 V2.1.1 (2017-05)

1.6 Deviation from Test Standard and Measurement Procedure

None

1.7 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty		
Parameters	**Uncertainty**	**Limit**
Radio Frequency	±0.001 ppm	$\pm 1 \times 10^{-5}$
RF power conducted	±0.808 dB	±1,5 dB
RF power radiated	±3.40 dB	±6 dB
Spurious emission, conducted	±2.715 dB	±3 dB
Spurious emission, radiated	±3.40dB	±6 dB
Humidity	±3.3%	±5 %
Temperature	±0.4 ºC	±2 °C
Time	±0.1 %	±10 %

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	TH01-WS, 05CH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)
Test Site	05CH02-WS
Address of Test Site	No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

2.2 The Worst Test Modes and Channel Details

full RU configuration							
Test item	**Modulation Mode**	**Test Frequency (MHz)**	**Data Rate**	**Test method**	**Mode**	**Test Configuration**	**Note**
Carrier Frequencies Occupied Channel Bandwidth Transmitter Unwanted Emissions within the 5 GHz RLAN Band	11a ax HE20_OFDMA	5180 / 5320 / 5500 / 5700	6 Mbps MCS 0	Conducted	TX	1	---
RF Output Power Power Spectral Density	11a ax HE20_OFDMA	5180 / 5320 / 5500 / 5700	6 Mbps MCS 0	Conducted	TX	1, 2, 3, 4	---
Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands	11a ax HE20_OFDMA	5180 / 5700	6 Mbps MCS 0	Conducted	TX	1	---
				Radiated			Note 2
Receiver Spurious Emissions	11a ax HE20_OFDMA	5180 / 5700	6 Mbps MCS 0	Conducted	RX	1	---
				Radiated			Note 2
Adaptivity	ax HE20_OFDMA	5180 / 5500	MCS 0	Conducted	TX	1	---
Receiver Blocking	11a	5180 / 5700	6 Mbps	Conducted	RX	1	---

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** result was found as the worst case and was shown in this report.
2. The 50Ω terminator is connected to antenna port of EUT for radiated emission measurement.
3. Test configurations are listed as below:

   Configuration 1: Laird part number: 453-00184

   Configuration 2: Laird part number: 453-00193

   Configuration 3: Laird part number: 453-00213

   Configuration 4: Laird part number: 453-00214

partial RU configuration							
Test item	**Modulation Mode**	**Test Frequency (MHz)**	**Data Rate**	**Test method**	**Mode**	**Test Configuration**	**Note**
RF Output Power Power Spectral Density	ax HE20_OFDMA RU26 RU52 RU106	5180 / 5320 / 5500 / 5700	MCS 0	Conducted	TX	1, 2, 3, 4	---
Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands	ax HE20-OFDMA RU106	5180 / 5700	MCS 0	Conducted	TX	1	---
				Radiated			Note 2

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** result was found as the worst case and was shown in this report.
2. The 50Ω terminator is connected to antenna port of EUT for radiated emission measurement.
3. Test configurations are listed as below:

   Configuration 1: Laird part number: 453-00184

   Configuration 2: Laird part number: 453-00193

   Configuration 3: Laird part number: 453-00213

   Configuration 4: Laird part number: 453-00214

3 Transmitter Test Results

3.1 Carrier Frequencies

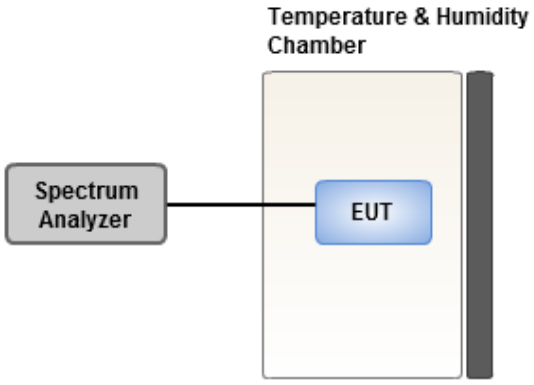
3.1.1 Limit of Carrier Frequencies

The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range f_c ± 20 ppm.

3.1.2 Test Procedures

Reference to clause 5.4.2.2 of ETSI EN 301 893 V2.1.1 (2017-05).

3.1.3 Test Setup



3.1.4 Test Results

Ambient Condition	24-25°C / 60-65%	**Tested By**	Hugo Zhen

Refer to Appendix A.

3.2 Occupied Channel Bandwidth

3.2.1 Limit of Occupied Channel Bandwidth

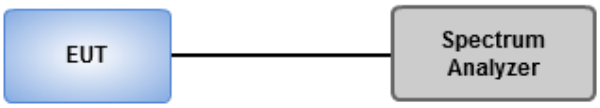
The Nominal Channel Bandwidth for a single Operating Channel shall be 20 MHz

The Occupied Channel Bandwidth shall be between 80 % and 100 % of the Nominal Channel Bandwidth. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement.
The Occupied Channel Bandwidth might change with time/payload.

3.2.2 Test Procedures

Reference to clause 5.4.3.2 of ETSI EN 301 893 V2.1.1 (2017-05).

3.2.3 Test Setup



3.2.4 Test Results

Ambient Condition	24-25°C / 60-65%	**Tested By**	Hugo Zhen

Refer to Appendix B.

3.3 RF Output Power, Transmit Power Control (TPC) and Power density

3.3.1 Limit of RF Output Power, Transmit Power Control (TPC) and Power Density

Mean e.i.r.p. limits for RF output power and Power Density at the highest power level (P_H)

Frequency range (MHz)	Mean e.i.r.p. limit for P_H (dBm)		Mean e.i.r.p. density limit (dBm/MHz)	
	With TPC	Without TPC	With TPC	Without TPC
5 150 to 5 350	23	20/23 (see note 1)	10	7/10 (see note 2)
5 470 to 5 725	30 (see note 3)	27 (see note 3)	17 (see note 3)	14 (see note 3)

Note 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm.
Note 2: The applicable limit is 7 dBm/MHz except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz.
Note 3: Slave devices without a *Radar Interference Detection* function shall comply with the limits for the frequency range 5 250 MHz to 5 350 MHz.

Mean e.i.r.p. limits for RF Output Power at the lowest power level of the TPC range

Frequency range (MHz)	Mean e.i.r.p. (dBm) limit for P_L
5 250 to 5 350	17
5 470 to 5 725	24 (see note)

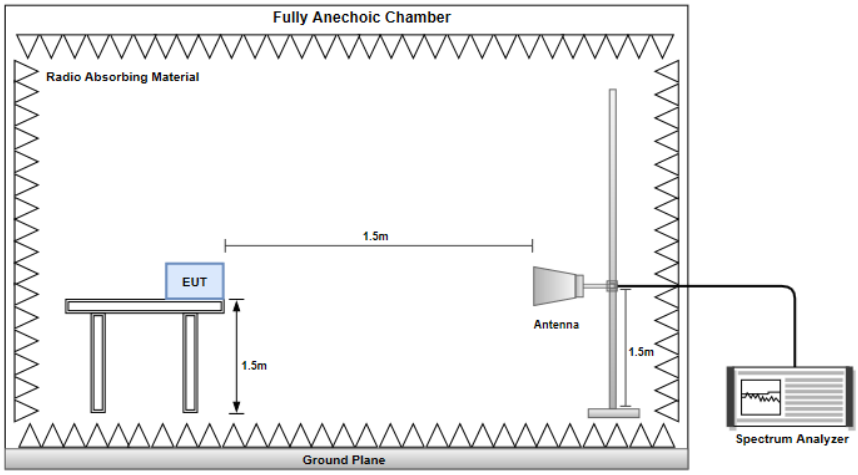
Note: Slave devices without a *Radar Interference Detection* function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.

3.3.2 Test Procedures

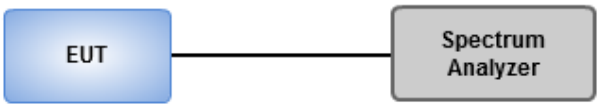
Reference to clause 5.4.4.2 of ETSI EN 301 893 V2.1.1 (2017-05).

3.3.3 Test Setup

For RF Output Power, Transmit Power Control (TPC) / Power Density



For Power Density



3.3.4 Test Results

Ambient Condition	24-25°C / 60-65%	**Tested By**	Hugo Zhen

Refer to Appendix C.

3.4 Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands

3.4.1 Limit of Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands

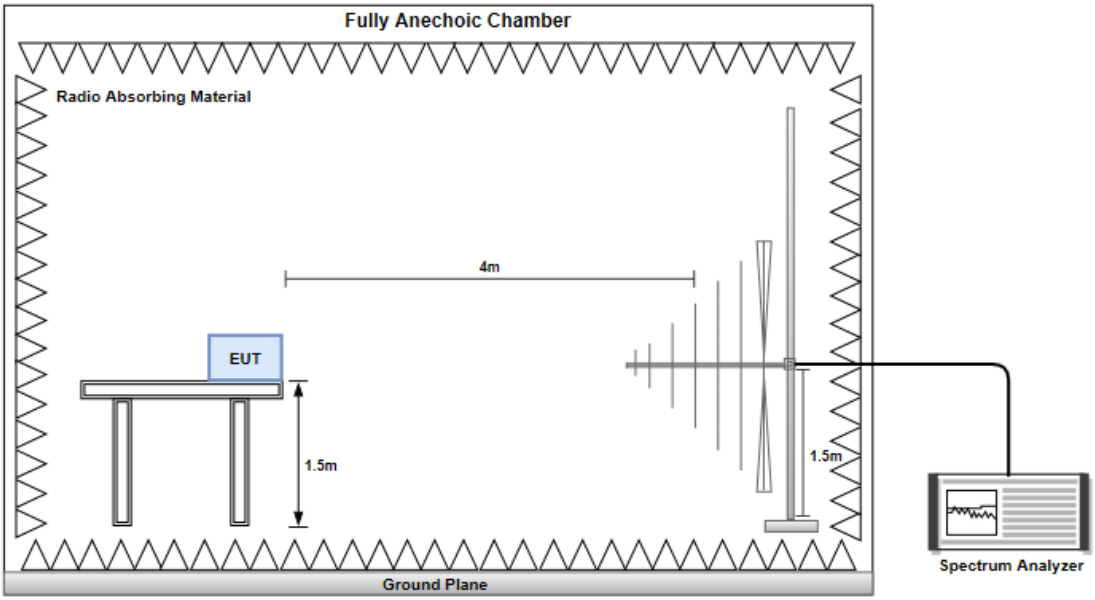
Frequency Range	Maximum Power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 5,15 GHz	-30 dBm	1 MHz
5,35 GHz to 5,47 GHz	-30 dBm	1 MHz
5,725 GHz to 26 GHz	-30 dBm	1 MHz

3.4.2 Test Procedures

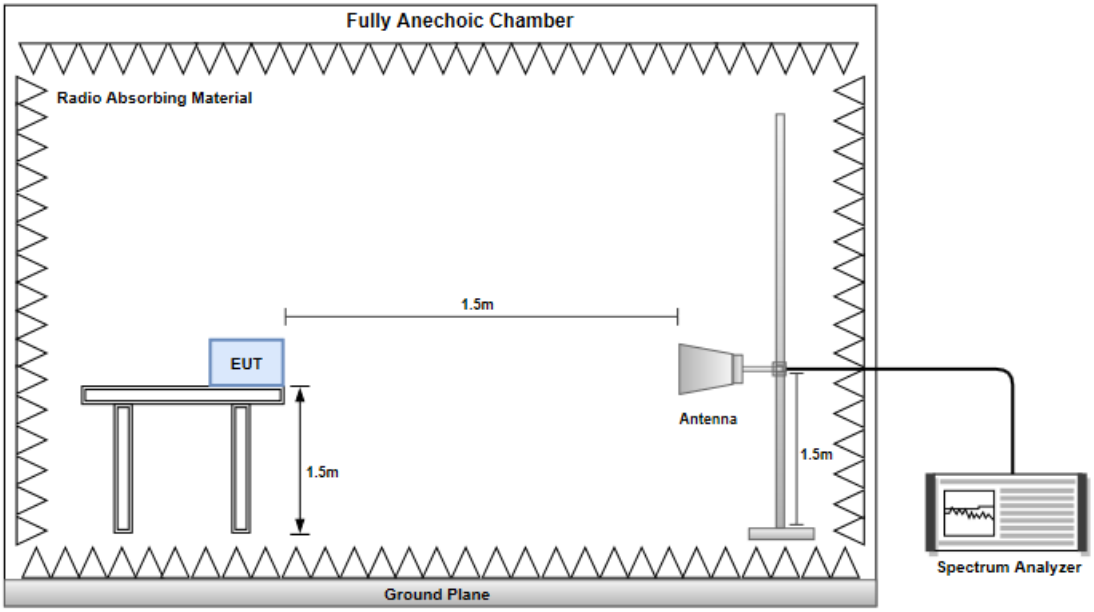
Reference to clause 5.4.5.2 of ETSI EN 301 893 V2.1.1 (2017-05).

3.4.3 Test Setup

Below 1GHz



Above 1 GHz

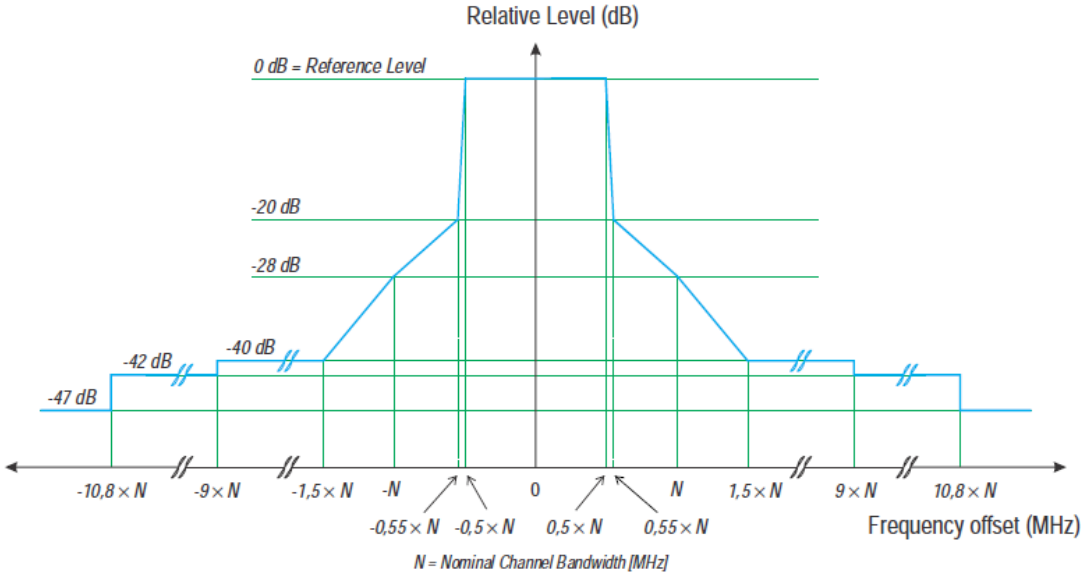


3.4.4 Test Results

Refer to Appendix D.

3.5 Transmitter Unwanted Emissions within the 5 GHz RLAN Band

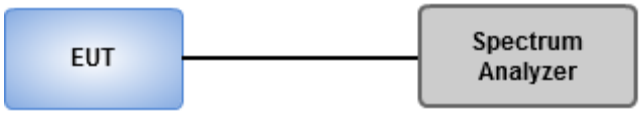
3.5.1 Limit of Transmitter Unwanted Emissions within the 5 GHz RLAN Band



3.5.2 Test Procedures

Reference to clause 5.4.6.2 of ETSI EN 301 893 V2.1.1 (2017-05).

3.5.3 Test Setup



3.5.4 Test Results

Ambient Condition	24-25°C / 60-65%	**Tested By**	Hugo Zhen

Refer to Appendix E.

4 Receiver Test Results

4.1 Receiver Spurious Emissions

4.1.1 Limit of Receiver Spurious Emissions

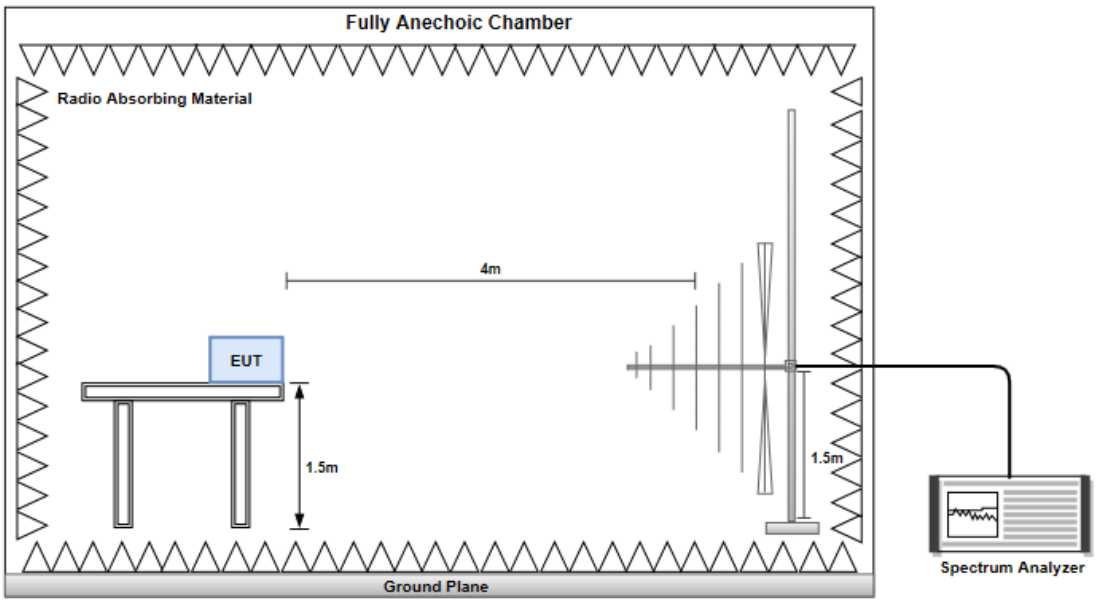
Frequency Range	Maximum Power	Measurement Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 26 GHz	-47 dBm	1 MHz

4.1.2 Test Procedures

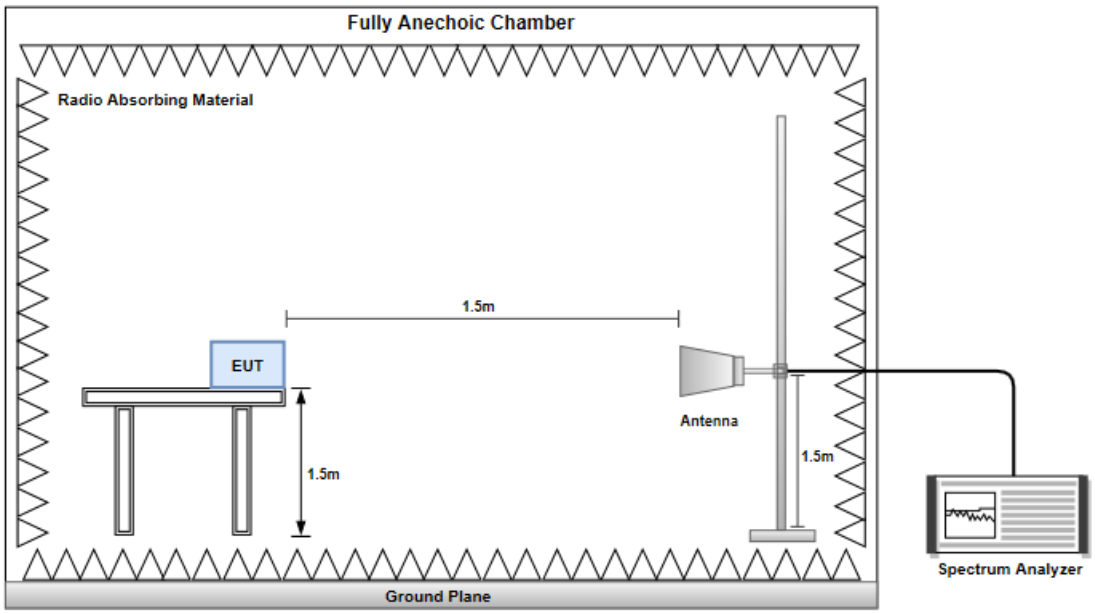
Reference to clause 5.4.7.2 of ETSI EN 301 893 V2.1.1 (2017-05).

4.1.3 Test Setup

Below 1GHz



Above 1 GHz



4.1.4 Test Results

Refer to Appendix F.

5 Adaptivity Test Results

5.1 Adaptivity

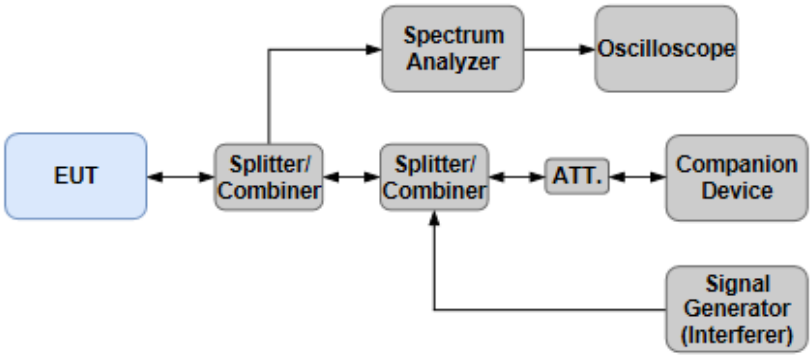
5.1.1 Adaptivity Limit

Adaptivity Limit
☐ Frame Based Equipment The ED Threshold Level (TL), at the input of the receiver, shall be proportional to the maximum transmit power (PH) according to the formula which assumes a 0 dBi receive antenna and PH to be specified in dBm e.i.r.p. For P_H ≤ 13 dBm: TL = -75 dBm/MHz For 13 dBm < P_H < 23 dBm: TL = -85 dBm/MHz + (23 dBm - P_H) For P_H ≥ 23 dBm: TL = -85 dBm/MHz
☒ Load Based Equipment ☒ **Option 1:** For equipment that for its operation in the 5 GHz bands is conforming to IEEE 802.11™-2016 [9], clause 17, clause 19 or clause 21, or any combination of these clauses, the *ED Threshold Level (TL)* is independent of the equipment's maximum transmit power (P_H). Assuming a 0 dBi receive antenna the *ED Threshold Level (TL)* shall be: TL = -75 dBm/MHz
☐ **Option 2:** For equipment conforming to one or more of the clauses listed in Option 1, and to at least one other operating mode, and for equipment conforming to none of the clauses listed in Option 1, the *ED Threshold Level (TL)* shall be proportional to the equipment's maximum transmit power (P_H). Assuming a 0 dBi receive antenna the *ED Threshold Level (TL)* shall be: For P_H ≤ 13 dBm: TL = -75 dBm/MHz For 13 dBm < P_H < 23 dBm: TL = -85 dBm/MHz + (23 dBm - P_H) For P_H ≥ 23 dBm: TL = -85 dBm/MHz
☒ Short Control Signalling Transmissions: ● within an observation period of 50 ms, the number of *Short Control Signalling Transmissions* by the equipment shall be equal to or less than 50; and ● the total duration of the equipment's *Short Control Signalling Transmissions* shall be less than 2 500 µs within said observation period.
☒ Channel Access Mechanism / Maximum Channel Occupancy Time(s) : For Supervising Devices refer to clause 4.2.7.3.2.4 Table 7. For Supervised Devices refer to clause 4.2.7.3.2.4 Table 8. ☒Option A: Measurement for Channel Access Mechanism and Maximum Channel Occupancy Time(s) ☐Option B: Compliance by declaration for the Channel Access Mechanism and Maximum Channel Occupancy Time(s)

5.1.2 Test Procedures

Reference to clause 5.4.9.3 of ETSI EN 301 893 V2.1.1 (2017-05).

5.1.3 Test Setup



5.1.4 Test Results

Ambient Condition	23°C / 67%	**Tested By**	Jack Li

Refer to Appendix G.

6 Receiver Blocking Test Results

6.1 Receiver Blocking

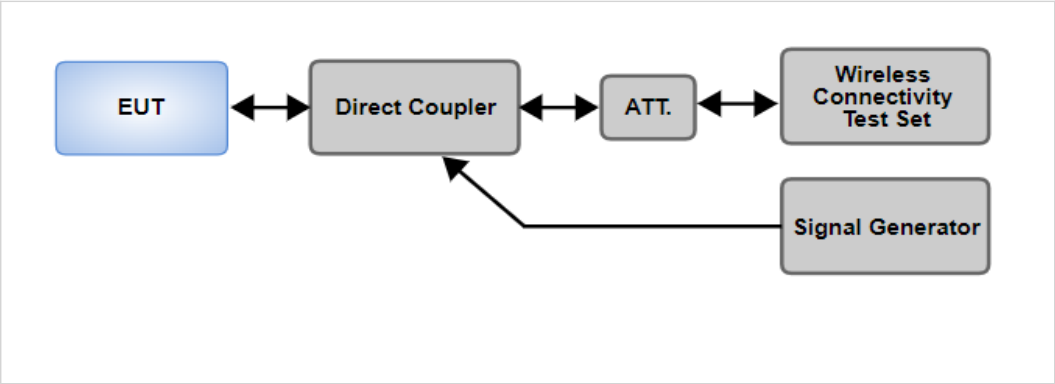
6.1.1 Limit of Receiver Blocking

Receiver Blocking Parameters				
Wanted Signal Mean Power from Companion Device (dBm)	Blocking Signal Frequency (MHz)	Blocking Signal Power (dBm) (see note 2)		Type of Blocking Signal
		Master or Slave with radar detection	Slave without radar detection	
P_{min} + 6 dB	5 100	-53	-59	Continuous Wave
P_{min} + 6 dB	4 900 5 000 5 975	-47	-53	Continuous Wave
Note 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria (The minimum performance criterion shall be a PER of less than or equal to 10 %) in the absence of any blocking signal. Note 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.				

6.1.2 Test Procedures

Reference to clause 5.4.10.2 of ETSI EN 301 893 V2.1.1 (2017-05).

6.1.3 Test Setup



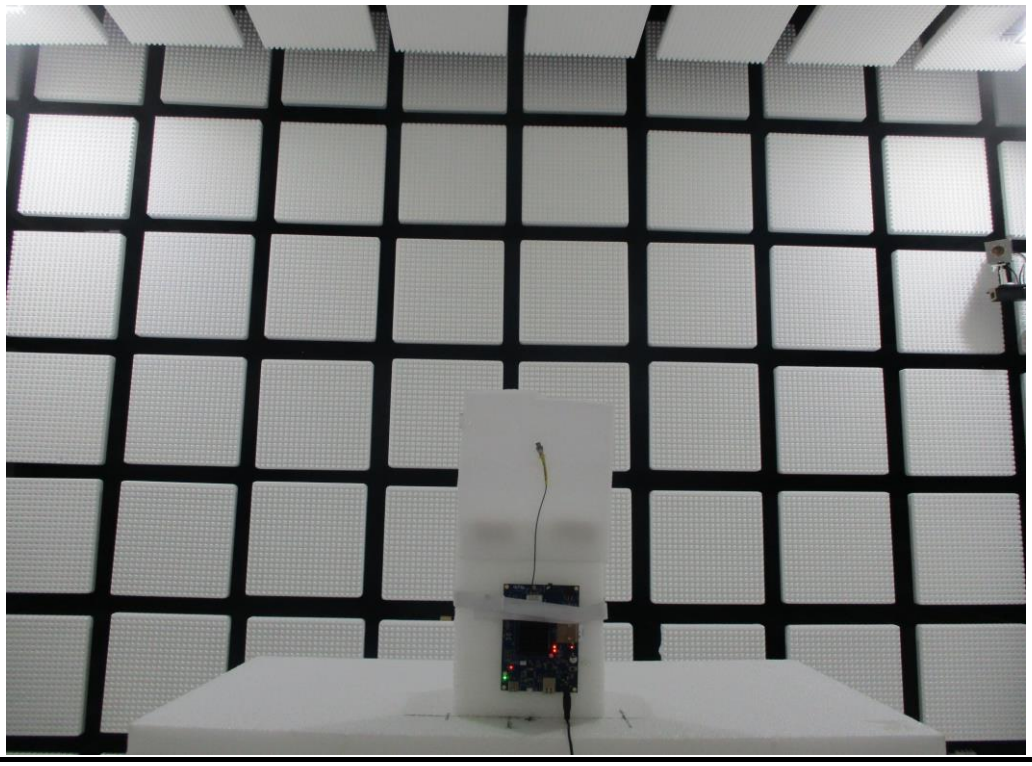
6.1.4 Test Results

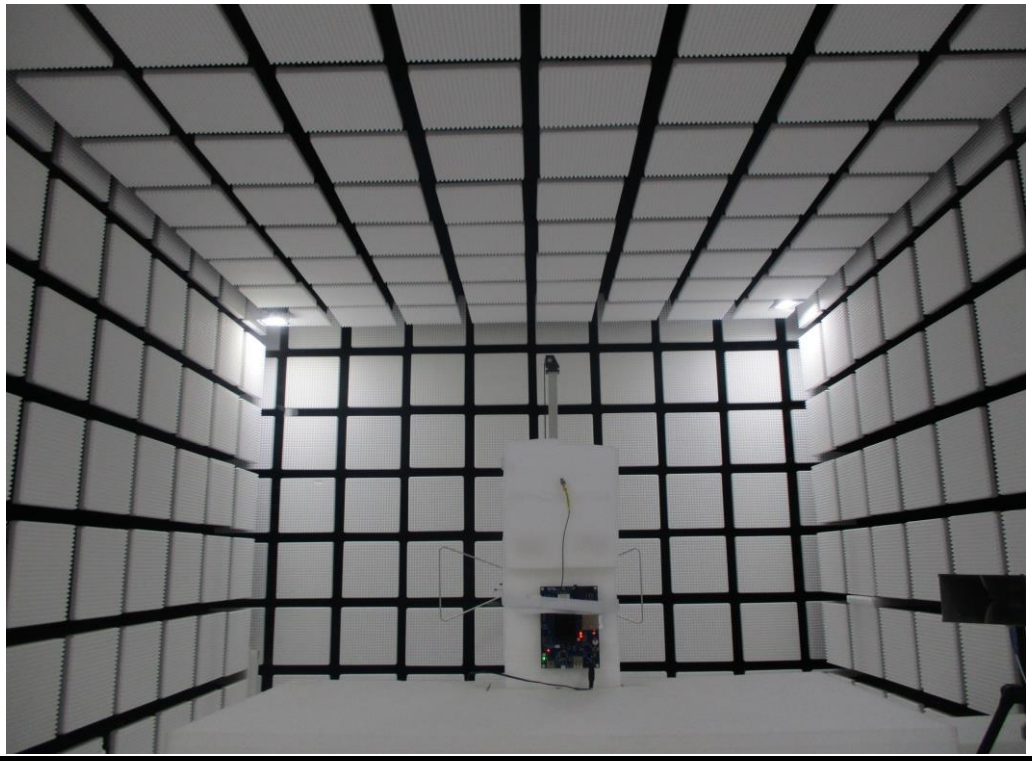
Ambient Condition	22.5°C / 64%	**Tested By**	Jack Li

Refer to Appendix H.

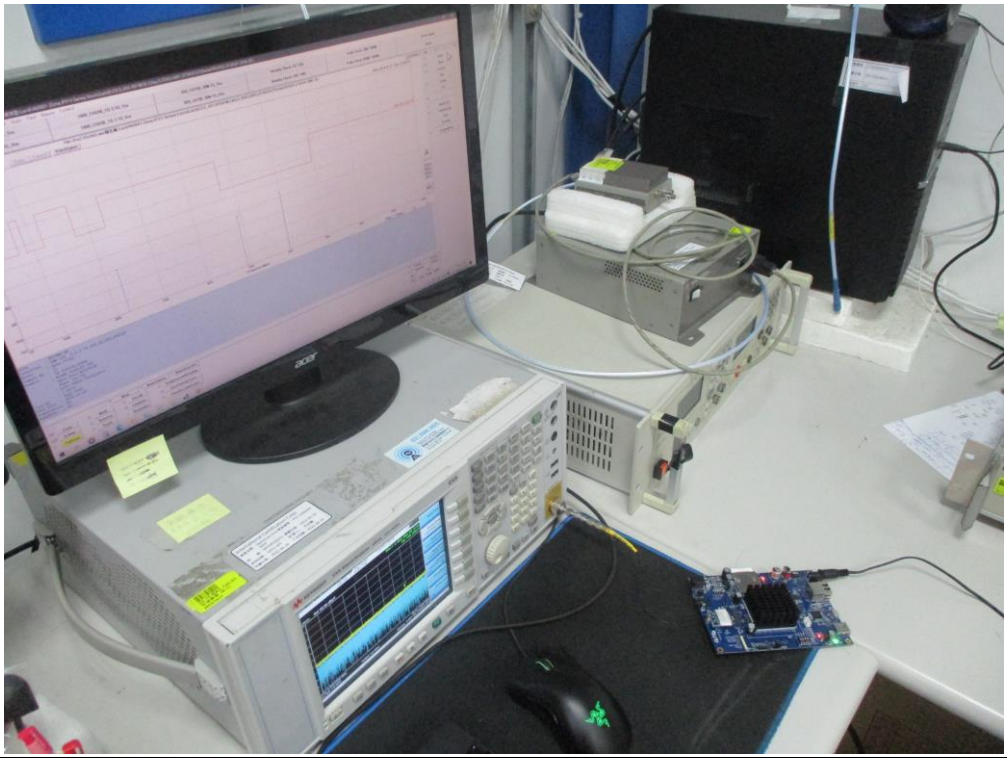
7 Photographs of the Test Configuration

Spurious Emission Test (RSE)

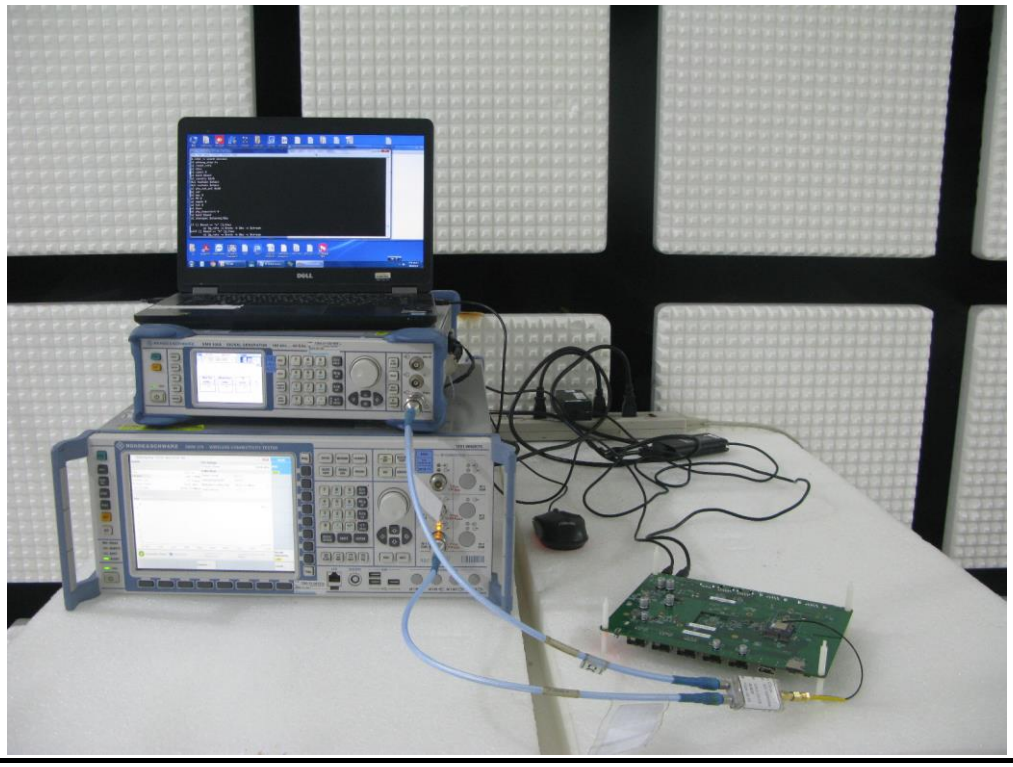




Spurious Emission Test (CSE)



Receiver Blocking Test



Adaptivity Test

8 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan (R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

No.2-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666
Fax: 886-3-318-0345
Email: ICC_Service@icertifi.com.tw

═END═

Configuration 1: Laird part number: 453-00184

Summary

Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port
5.15-5.25GHz	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	Pass	5.18G	5.18007194G	13.8878	20	1
802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX	Pass	5.18G	5.18007217G	13.9323	20	1
5.25-5.35GHz	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	Pass	5.32G	5.32007253G	13.6343	20	1
802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX	Pass	5.32G	5.32007288G	13.6997	20	1
5.47-5.725GHz	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	Pass	5.7G	5.70008053G	14.1286	20	1
802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX	Pass	5.7G	5.70008038G	14.1016	20	1

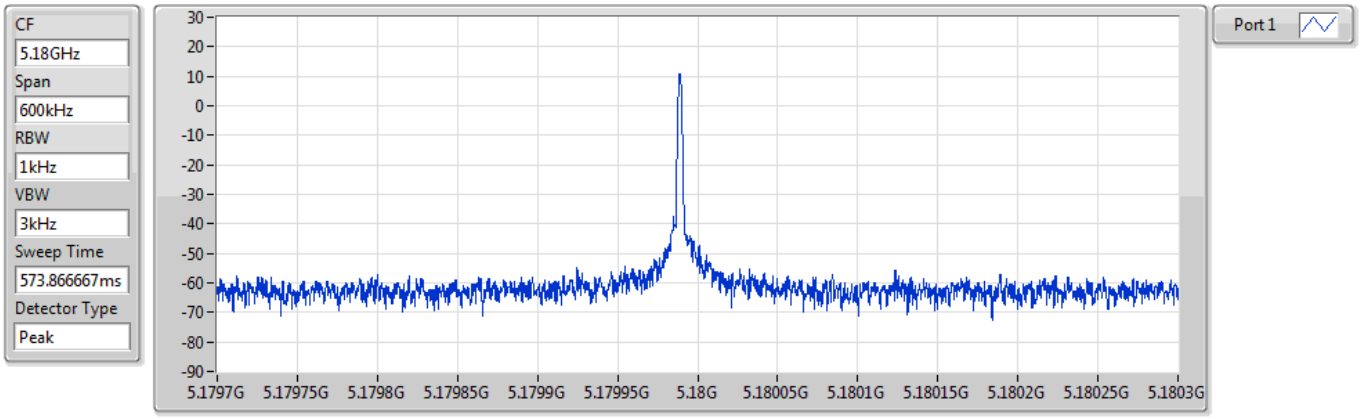
Result

Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-	-	-
5180MHz_Tnom	Pass	5.18G	5.1799888G	2.1618	20	1
5180MHz_Tmin	Pass	5.18G	5.18001381G	2.6658	20	1
5180MHz_Tmax	Pass	5.18G	5.18007194G	13.8878	20	1
5320MHz_Tnom	Pass	5.32G	5.31998811G	2.2351	20	1
5320MHz_Tmin	Pass	5.32G	5.32001331G	2.5021	20	1
5320MHz_Tmax	Pass	5.32G	5.32007253G	13.6343	20	1
5500MHz_Tnom	Pass	5.5G	5.49998713G	2.3391	20	1
5500MHz_Tmin	Pass	5.5G	5.50001386G	2.5207	20	1
5500MHz_Tmax	Pass	5.5G	5.50007313G	13.296	20	1
5700MHz_Tnom	Pass	5.7G	5.69998607G	2.4434	20	1
5700MHz_Tmin	Pass	5.7G	5.70001553G	2.724	20	1
5700MHz_Tmax	Pass	5.7G	5.70008053G	14.1286	20	1
802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX	-	-	-	-	-	-
5180MHz_Tnom	Pass	5.18G	5.17998743G	2.4272	20	1
5180MHz_Tmin	Pass	5.18G	5.18001372G	2.6482	20	1
5180MHz_Tmax	Pass	5.18G	5.18007217G	13.9323	20	1
5320MHz_Tnom	Pass	5.32G	5.31998804G	2.2475	20	1
5320MHz_Tmin	Pass	5.32G	5.32001327G	2.495	20	1
5320MHz_Tmax	Pass	5.32G	5.32007288G	13.6997	20	1
5500MHz_Tnom	Pass	5.5G	5.49998704G	2.3563	20	1
5500MHz_Tmin	Pass	5.5G	5.50001388G	2.5229	20	1
5500MHz_Tmax	Pass	5.5G	5.50007395G	13.4451	20	1
5700MHz_Tnom	Pass	5.7G	5.69998604G	2.4492	20	1
5700MHz_Tmin	Pass	5.7G	5.70001563G	2.7413	20	1
5700MHz_Tmax	Pass	5.7G	5.70008038G	14.1016	20	1

802.11a_Nss1,(6Mbps)_1TX — Freq. Stability

5180MHz_Tnom

15/11/2024

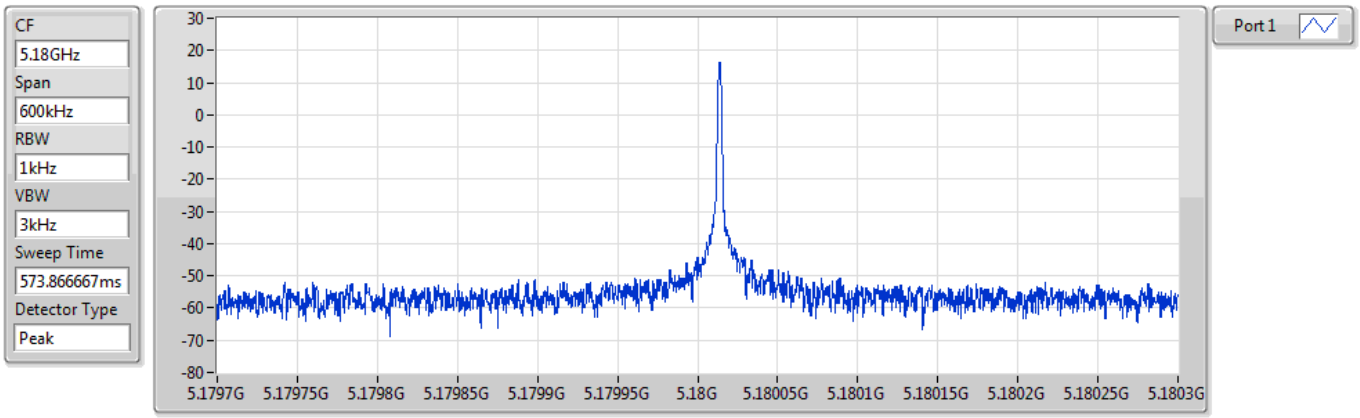


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.18G	5.1799888G	NaN	NaN	2.1618	20	1	-

802.11a_Nss1,(6Mbps)_1TX — Freq. Stability

5180MHz_Tmin

15/11/2024



Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.18G	5.18001381G	NaN	NaN	2.6658	20	1	-

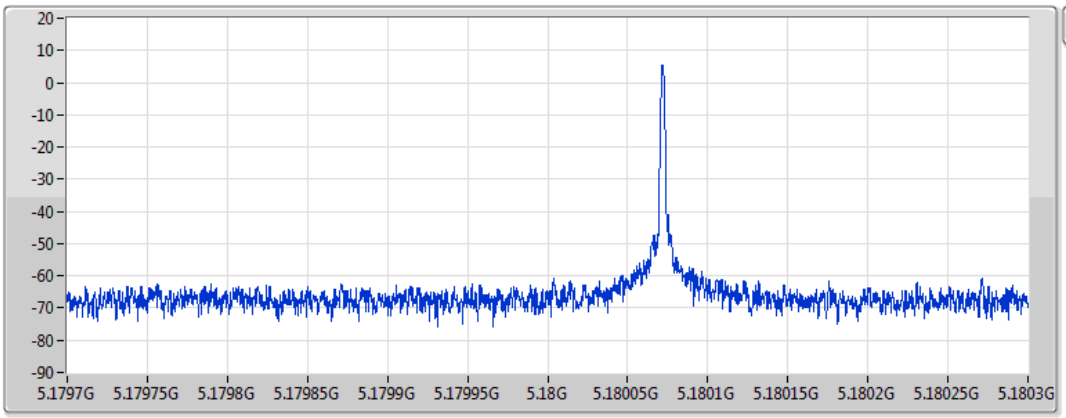
802.11a_Nss1,(6Mbps)_1TX Freq. Stability

5180MHz_Tmax

15/11/2024

CF 5.18GHz
Span 600kHz
RBW 1kHz
VBW 3kHz
Sweep Time 573.866667ms
Detector Type Peak

Port 1



Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.18G	5.18007194G	NaN	NaN	13.8878	20	1	-

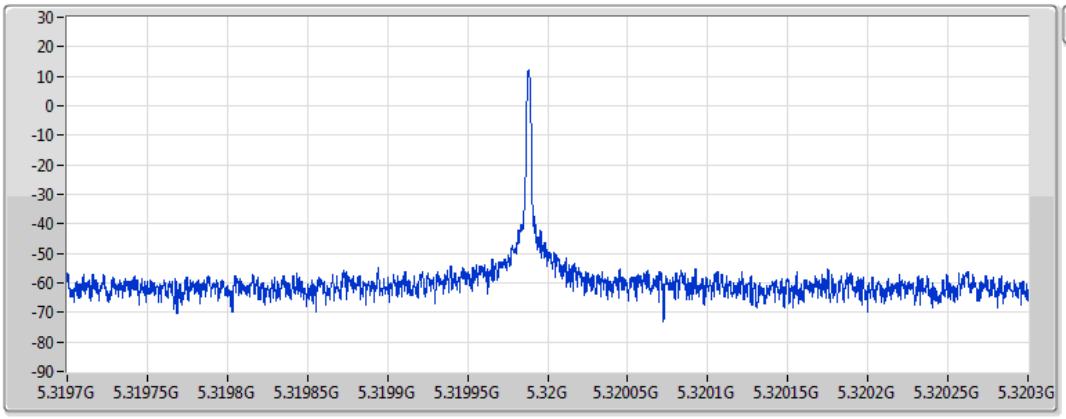
802.11a_Nss1,(6Mbps)_1TX Freq. Stability

5320MHz_Tnom

15/11/2024

CF 5.32GHz
Span 600kHz
RBW 1kHz
VBW 3kHz
Sweep Time 573.866667ms
Detector Type Peak

Port 1

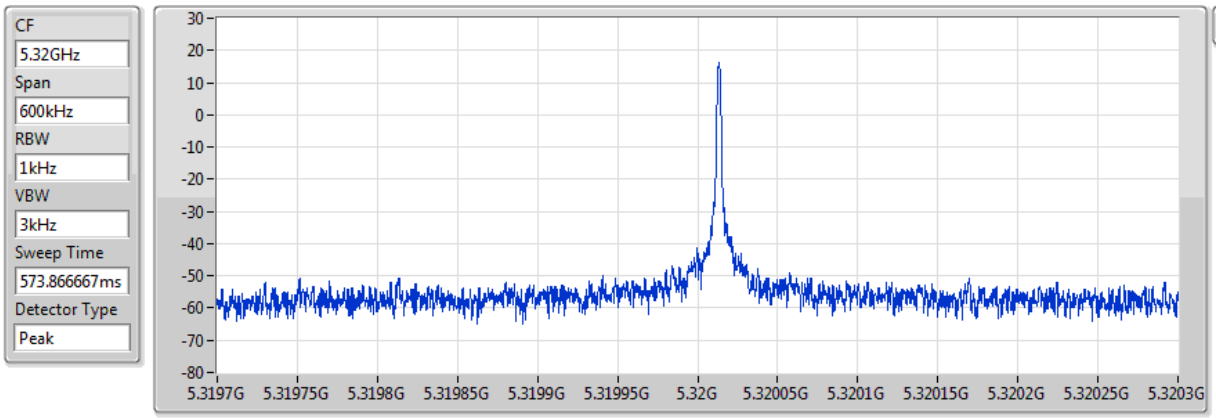


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.32G	5.31998811G	NaN	NaN	2.2351	20	1	-

802.11a_Nss1,(6Mbps)_1TX Freq. Stability

5320MHz_Tmin

15/11/2024

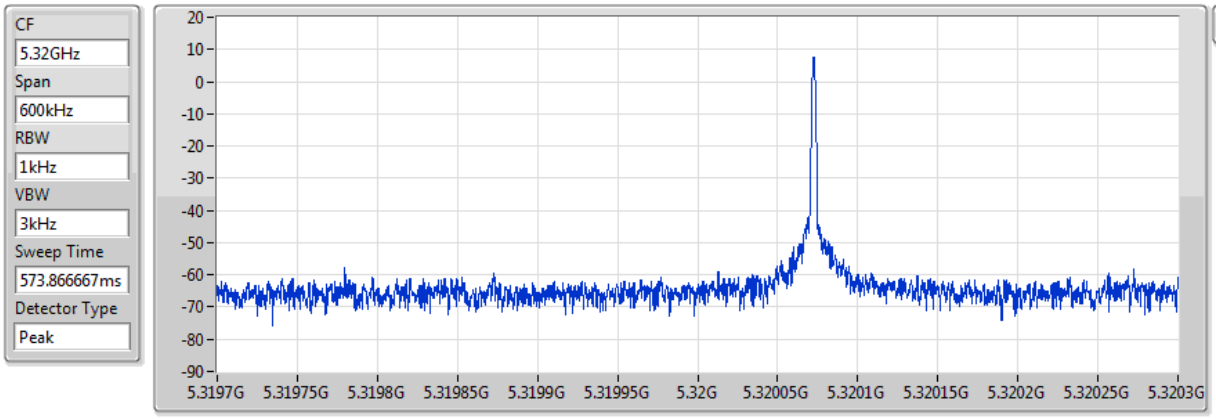


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.32G	5.32001331G	NaN	NaN	2.5021	20	1	-

802.11a_Nss1,(6Mbps)_1TX Freq. Stability

5320MHz_Tmax

15/11/2024



Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.32G	5.32007253G	NaN	NaN	13.6343	20	1	-

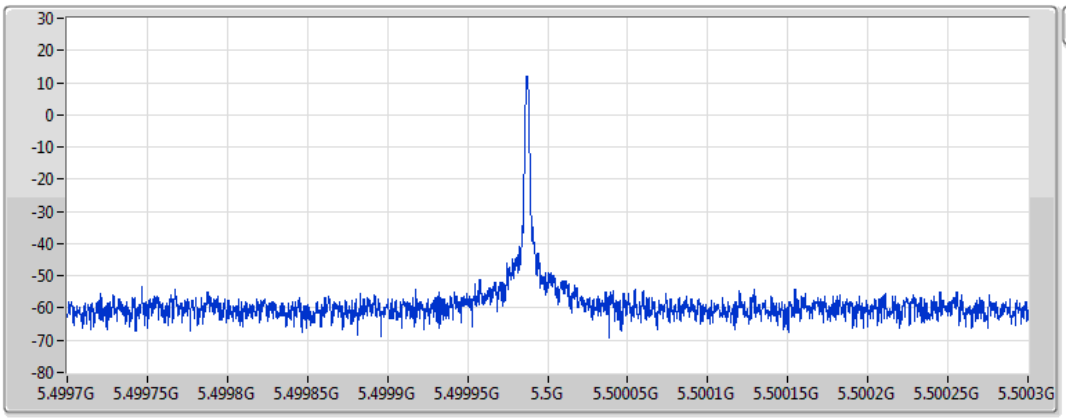
802.11a_Nss1,(6Mbps)_1TX — Freq. Stability

5500MHz_Tnom

15/11/2024

CF 5.5GHz
Span 600kHz
RBW 1kHz
VBW 3kHz
Sweep Time 573.866667ms
Detector Type Peak

Port 1



Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.5G	5.49998713G	NaN	NaN	2.3391	20	1	-

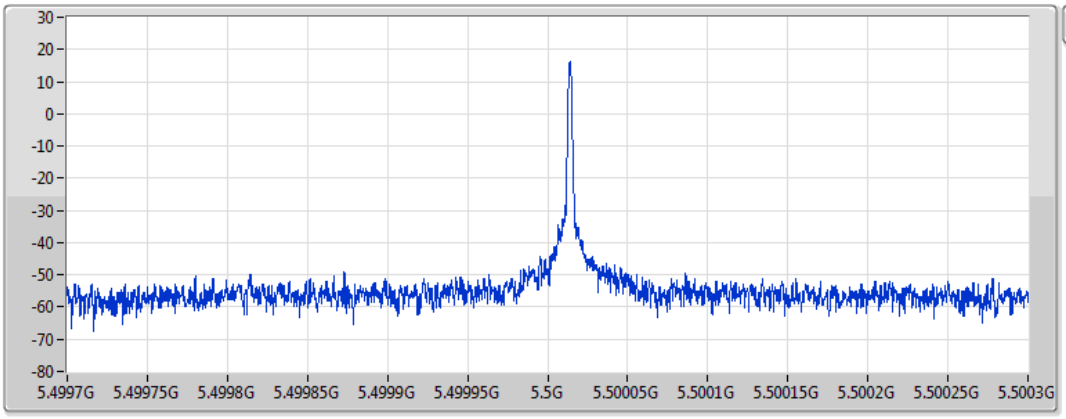
802.11a_Nss1,(6Mbps)_1TX — Freq. Stability

5500MHz_Tmin

15/11/2024

CF 5.5GHz
Span 600kHz
RBW 1kHz
VBW 3kHz
Sweep Time 573.866667ms
Detector Type Peak

Port 1

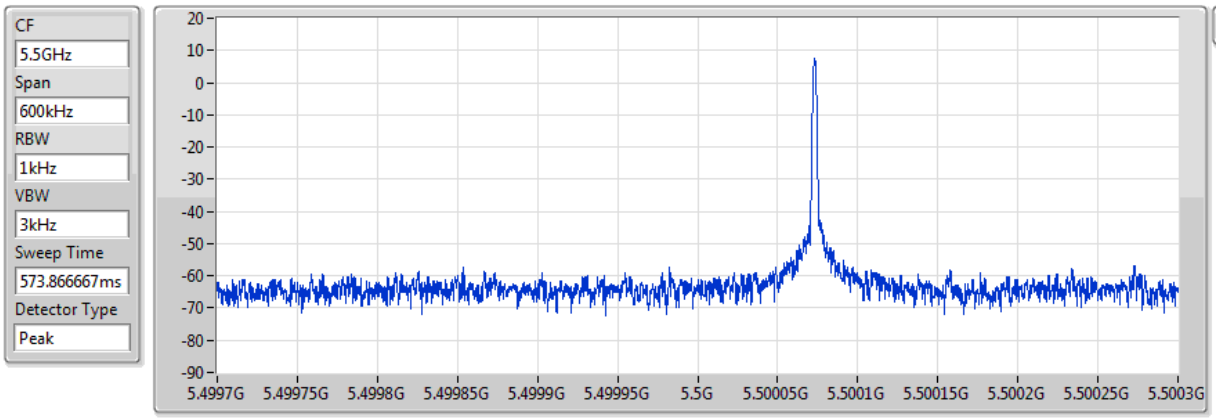


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.5G	5.50001386G	NaN	NaN	2.5207	20	1	-

802.11a_Nss1,(6Mbps)_1TX — Freq. Stability

5500MHz_Tmax

15/11/2024

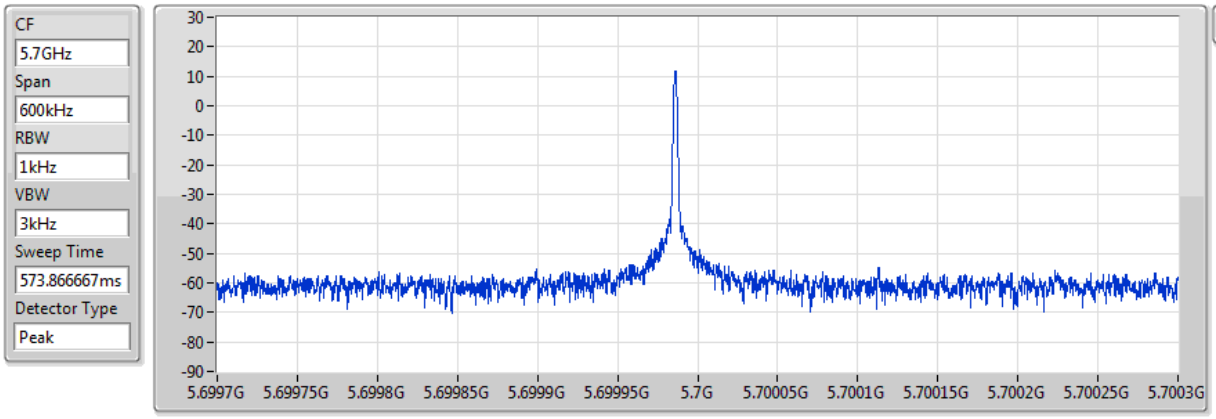


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.5G	5.50007313G	NaN	NaN	13.296	20	1	-

802.11a_Nss1,(6Mbps)_1TX — Freq. Stability

5700MHz_Tnom

15/11/2024

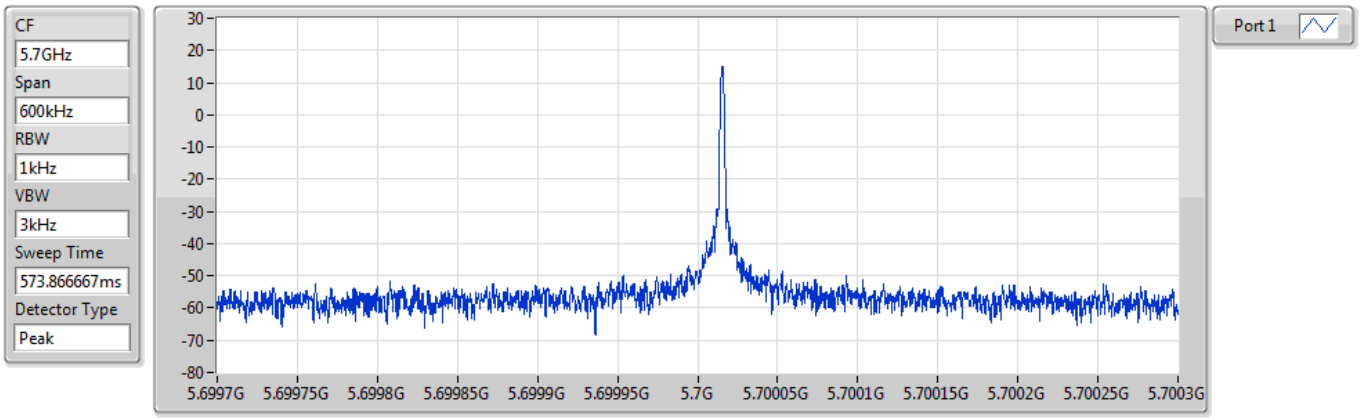


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.7G	5.69998607G	NaN	NaN	2.4434	20	1	-

802.11a_Nss1,(6Mbps)_1TX Freq. Stability

5700MHz_Tmin

15/11/2024

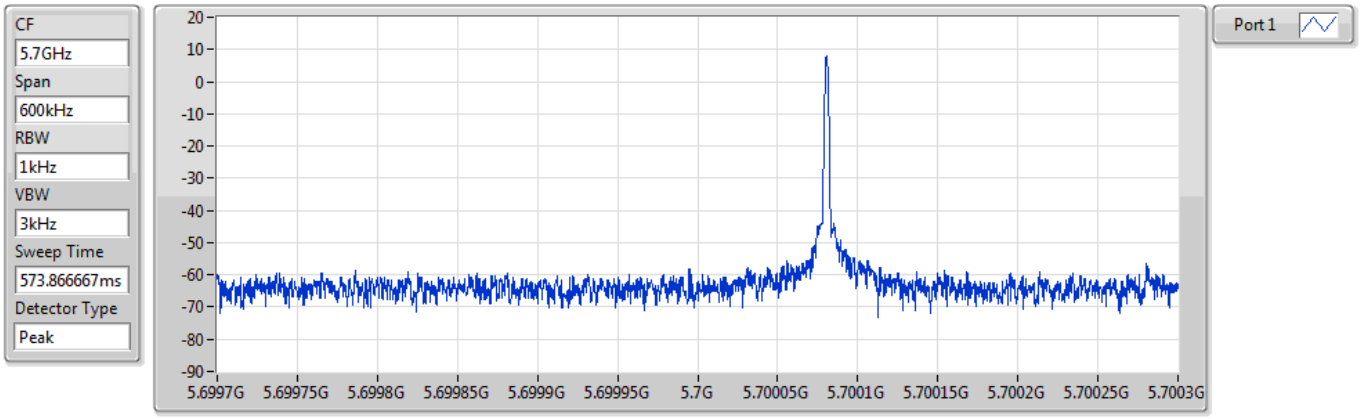


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.7G	5.70001553G	NaN	NaN	2.724	20	1	-

802.11a_Nss1,(6Mbps)_1TX Freq. Stability

5700MHz_Tmax

15/11/2024

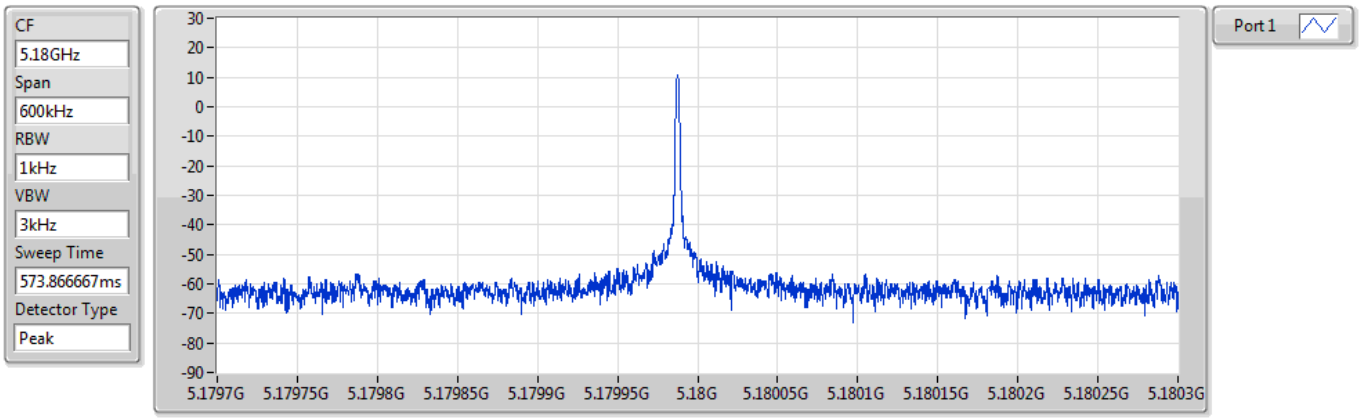


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.7G	5.70008053G	NaN	NaN	14.1286	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5180MHz_Tnom

Freq. Stability

15/11/2024

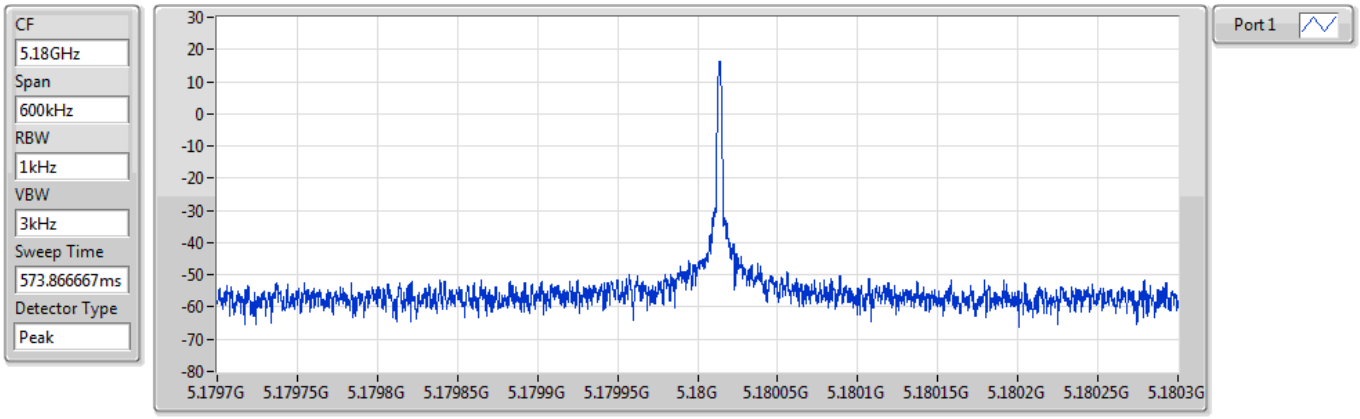


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.18G	5.17998743G	NaN	NaN	2.4272	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5180MHz_Tmin

Freq. Stability

15/11/2024

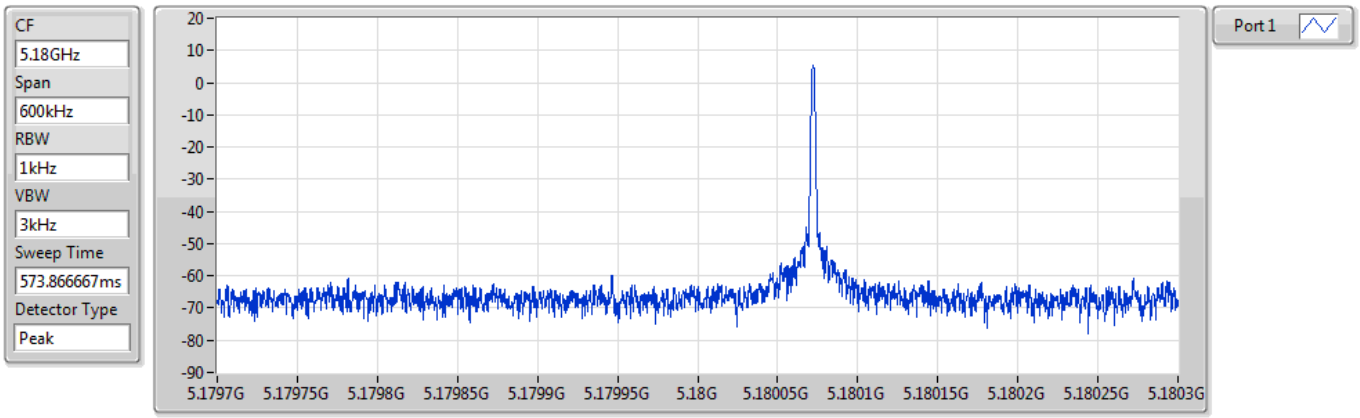


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.18G	5.18001372G	NaN	NaN	2.6482	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX Freq. Stability

5180MHz_Tmax

15/11/2024

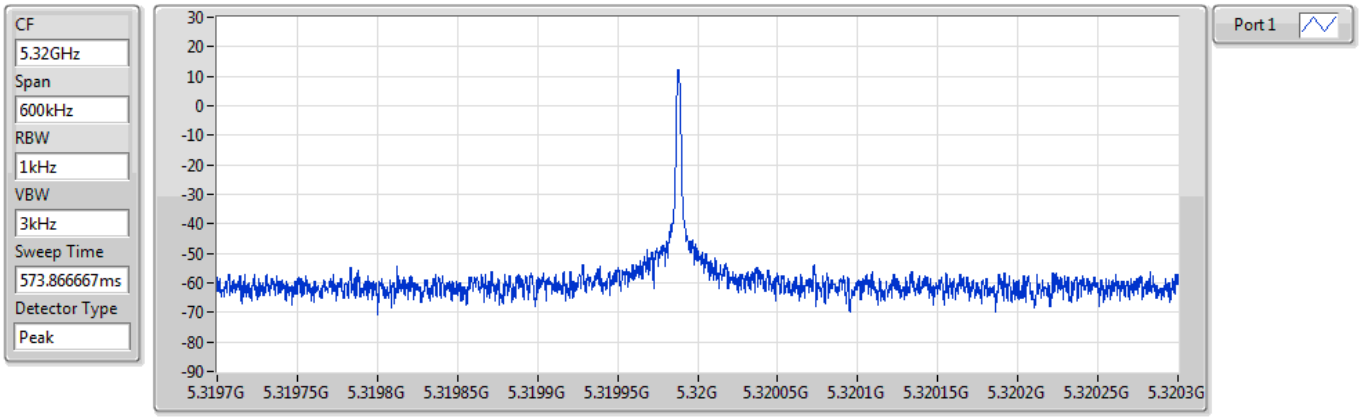


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.18G	5.18007217G	NaN	NaN	13.9323	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX Freq. Stability

5320MHz_Tnom

15/11/2024

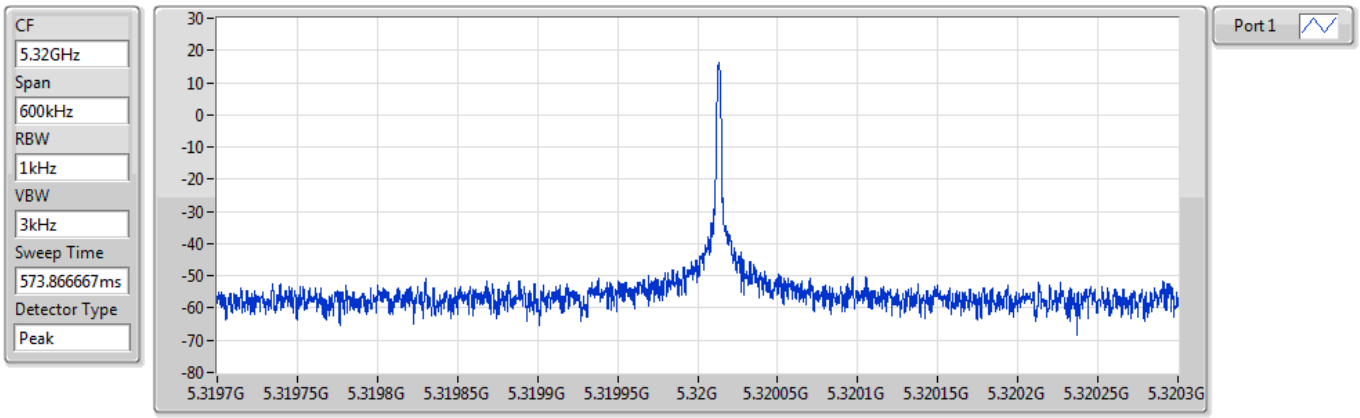


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.32G	5.31998804G	NaN	NaN	2.2475	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5320MHz_Tmin

Freq. Stability

15/11/2024

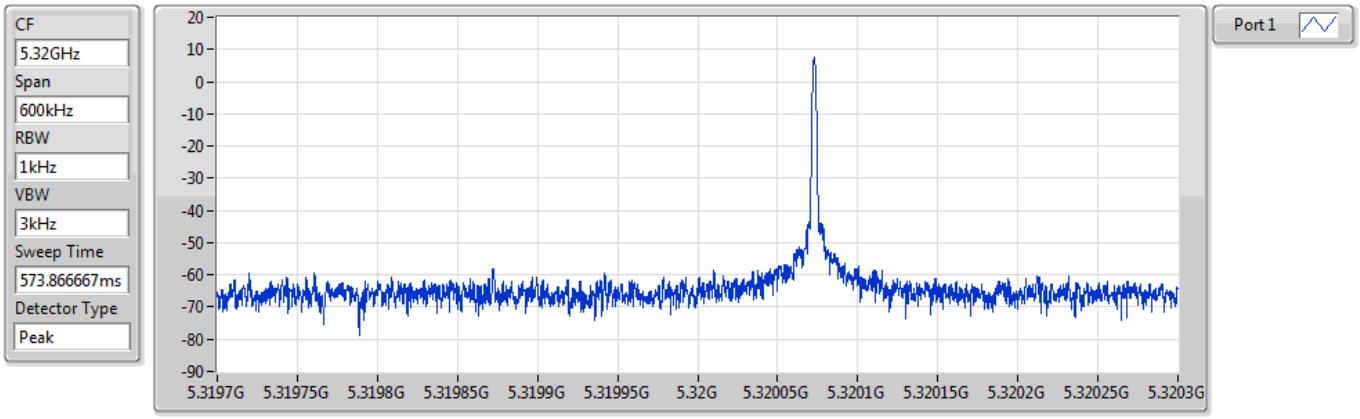


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.32G	5.32001327G	NaN	NaN	2.495	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5320MHz_Tmax

Freq. Stability

15/11/2024

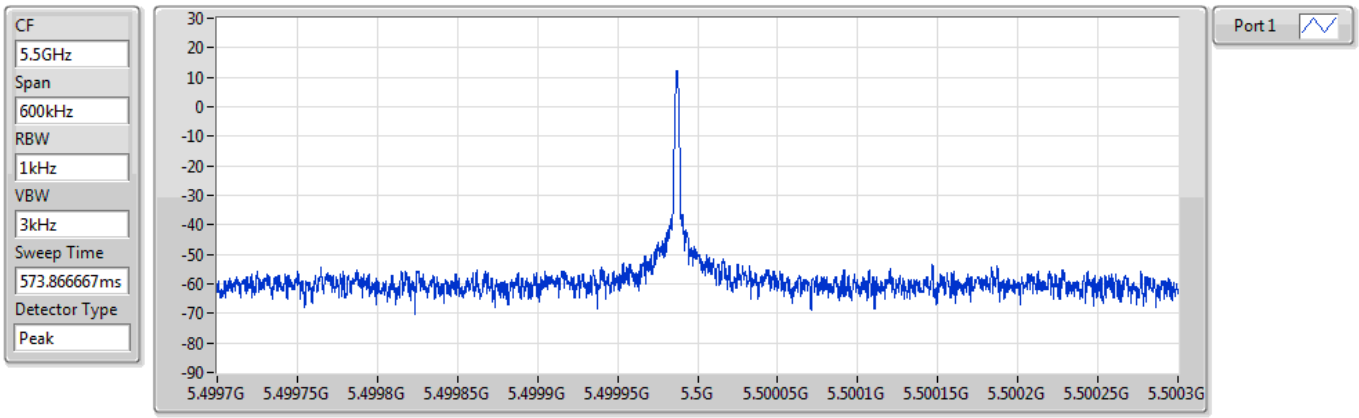


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.32G	5.32007288G	NaN	NaN	13.6997	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5500MHz_Tnom

Freq. Stability

15/11/2024

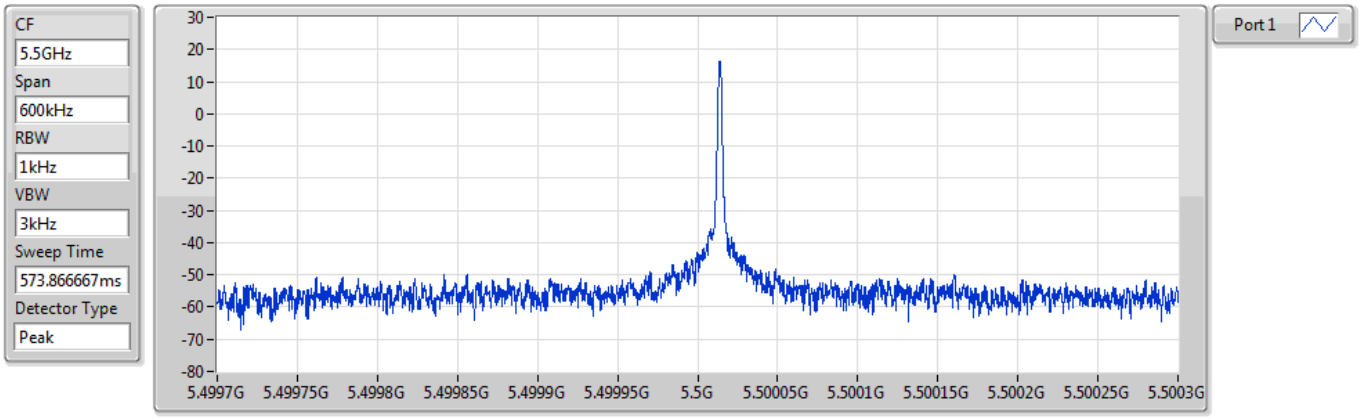


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.5G	5.49998704G	NaN	NaN	2.3563	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5500MHz_Tmin

Freq. Stability

15/11/2024

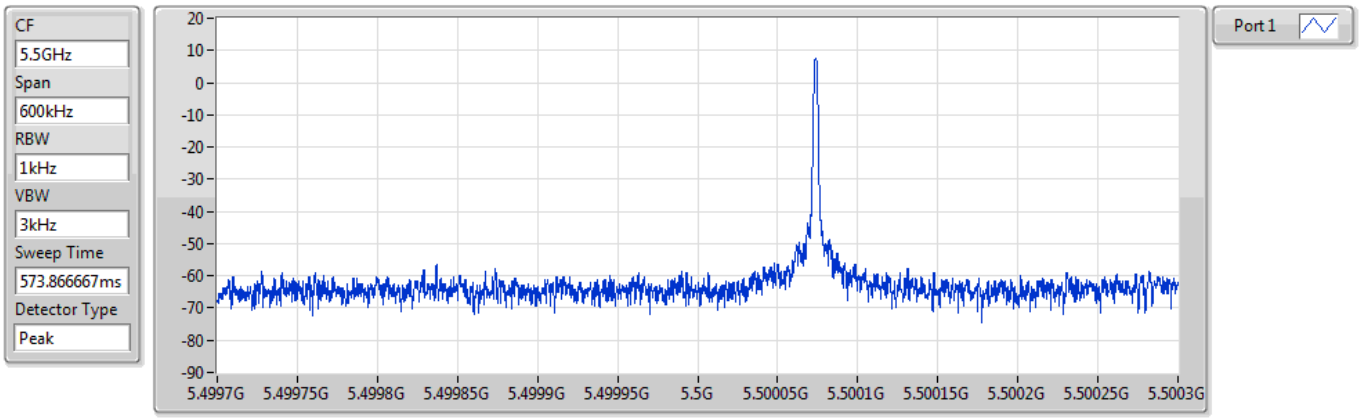


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.5G	5.50001388G	NaN	NaN	2.5229	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5500MHz_Tmax

Freq. Stability

15/11/2024

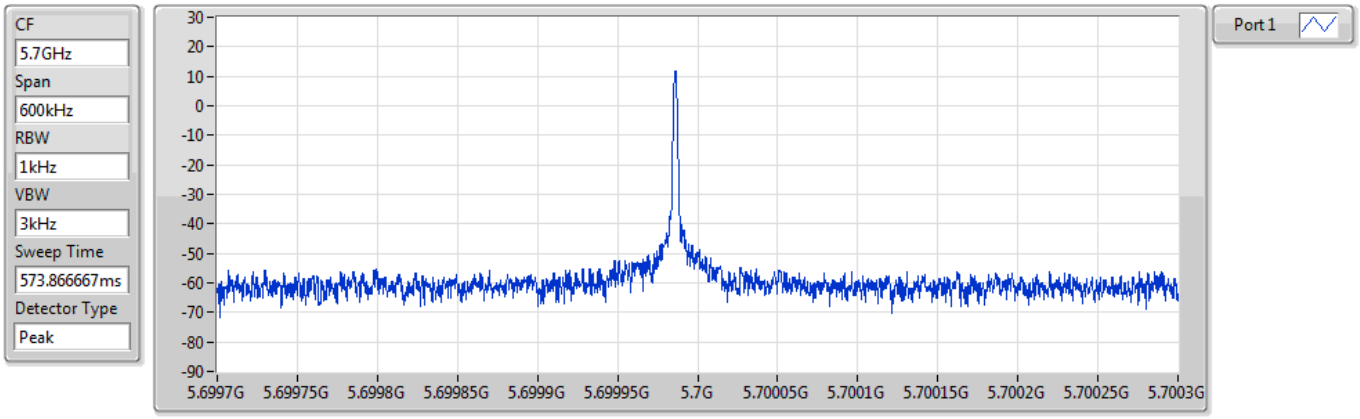


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.5G	5.50007395G	NaN	NaN	13.4451	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5700MHz_Tnom

Freq. Stability

15/11/2024

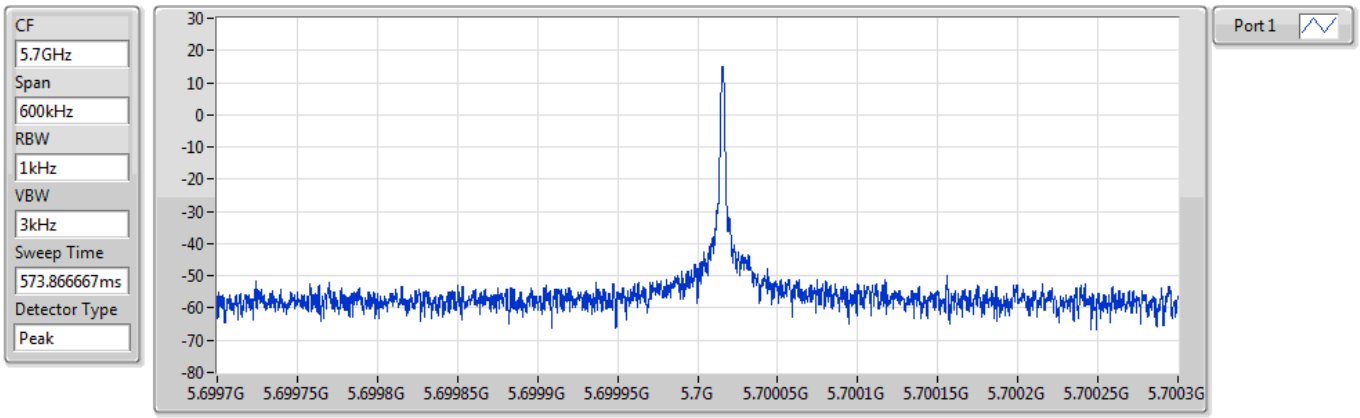


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.7G	5.69998604G	NaN	NaN	2.4492	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5700MHz_Tmin

Freq. Stability

15/11/2024

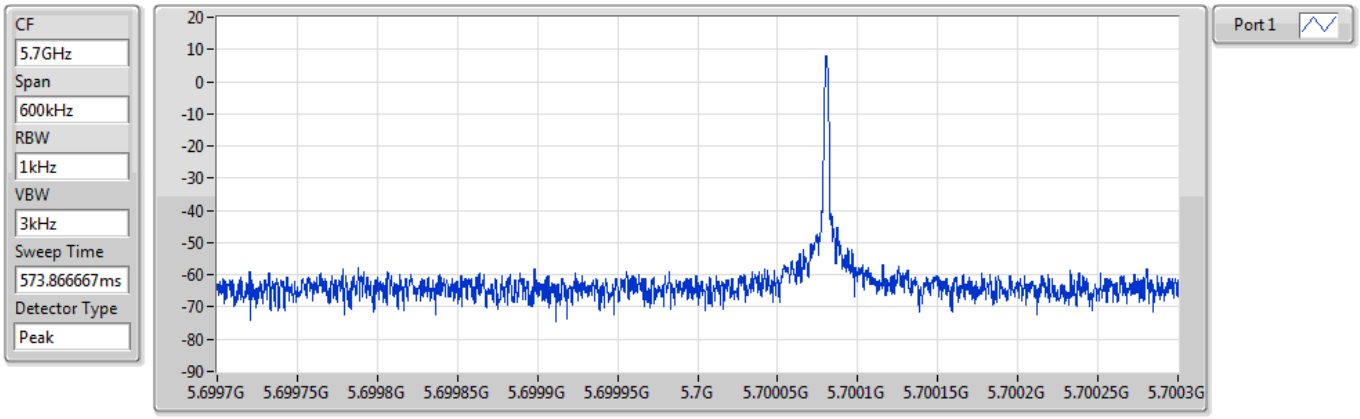


Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.7G	5.70001563G	NaN	NaN	2.7413	20	1	-

802.11ax HEW20_OFDMA_Nss1,(MCS0)_1TX 5700MHz_Tmax

Freq. Stability

15/11/2024



Ch(Hz)	Center(Hz)	Fl(Hz)	Fh(Hz)	ppm	Limit(ppm)	Port	Remark
5.7G	5.70008038G	NaN	NaN	14.1016	20	1	-

Summary

Mode	OBW (Hz)	ITU-Code
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_1TX	16.426M	16M4D1D
ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX	18.958M	19M0D1D
5.25-5.35GHz	-	-
802.11a_Nss1,(6Mbps)_1TX	16.412M	16M4D1D
ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX	19.012M	19M0D1D
5.47-5.725GHz	-	-
802.11a_Nss1,(6Mbps)_1TX	16.415M	16M4D1D
ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX	18.996M	19M0D1D

OBW = 99% occupied bandwidth

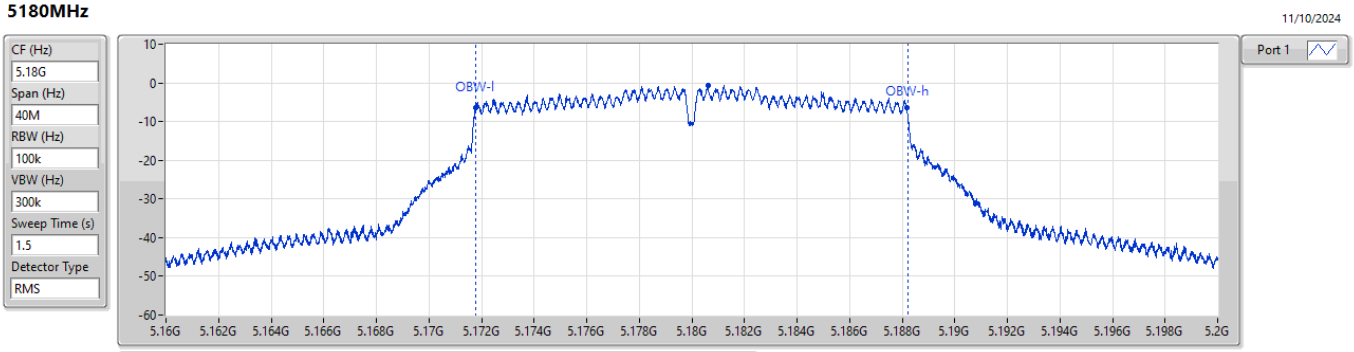
Result

Mode	Result	Limit (Hz)	fl-OBW (Hz)	fh-OBW (Hz)	OBW (Hz)
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-	-
5180MHz_Tnom	Pass	16M~20M	5.171776G	5.188202G	16.426M
5320MHz_Tnom	Pass	16M~20M	5.31177G	5.328182G	16.412M
5500MHz_Tnom	Pass	16M~20M	5.49177G	5.508184G	16.413M
5700MHz_Tnom	Pass	16M~20M	5.691761G	5.708176G	16.415M
ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX	-	-	-	-	-
5180MHz_Tnom	Pass	16M~20M	5.170503G	5.189461G	18.958M
5320MHz_Tnom	Pass	16M~20M	5.310468G	5.32948G	19.012M
5500MHz_Tnom	Pass	16M~20M	5.490476G	5.509471G	18.996M
5700MHz_Tnom	Pass	16M~20M	5.690479G	5.70946G	18.98M

fl-OBW = fl lower edge 99% occupied bandwidth; fh-OBW = fh higher edge 99% occupied bandwidth; OBW = 99% occupied bandwidth;
N dB = 6dB down bandwidth

5.15-5.25GHz_802.11a_Nss1,(6Mbps)_1TX **EBW**

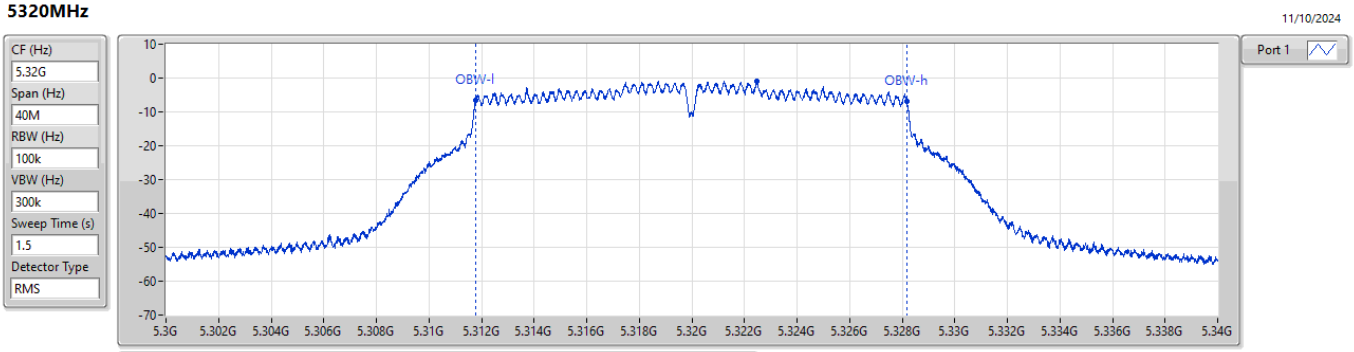
5180MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.39M	5.17178G	5.18817G	16.426M	5.171776G	5.188202G	16M~20M	1

5.25-5.35GHz_802.11a_Nss1,(6Mbps)_1TX **EBW**

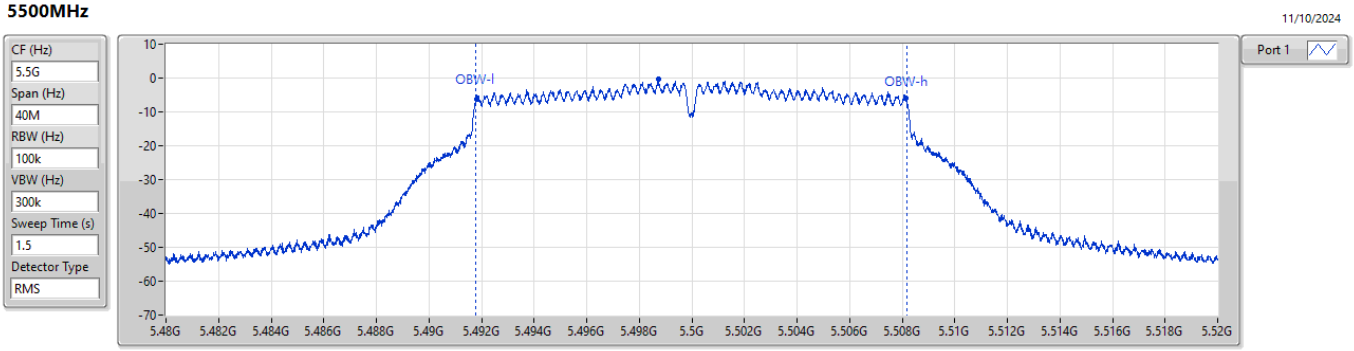
5320MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.41M	5.31177G	5.32818G	16.412M	5.31177G	5.328182G	16M~20M	1

5.47-5.725GHz_802.11a_Nss1,(6Mbps)_1TX **EBW**

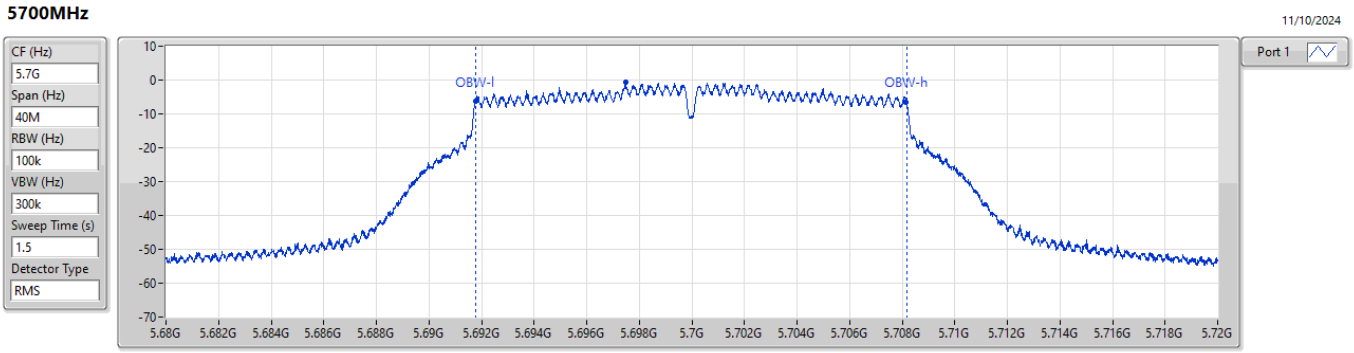
5500MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.35M	5.4918G	5.50815G	16.413M	5.49177G	5.508184G	16M~20M	1

5.47-5.725GHz_802.11a_Nss1,(6Mbps)_1TX **EBW**

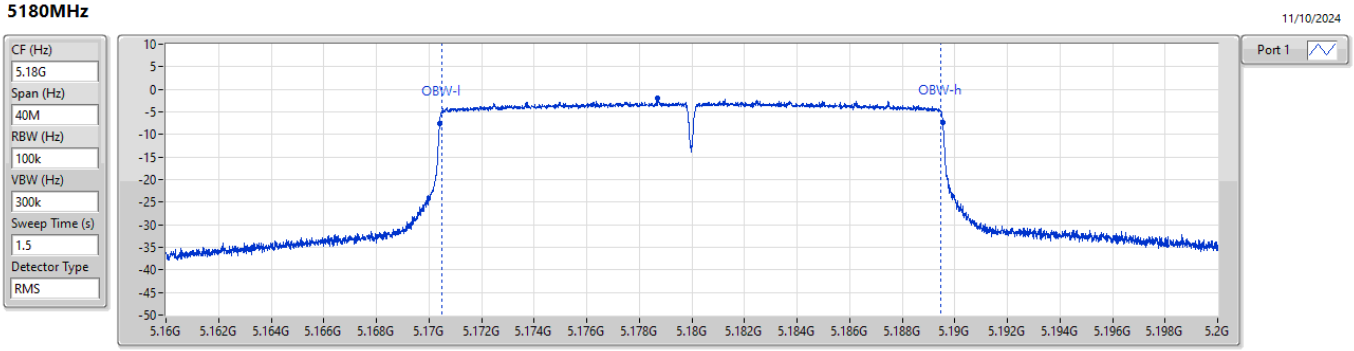
5700MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
16.39M	5.69177G	5.70816G	16.415M	5.691761G	5.708176G	16M~20M	1

5.15-5.25GHz_ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX **EBW**

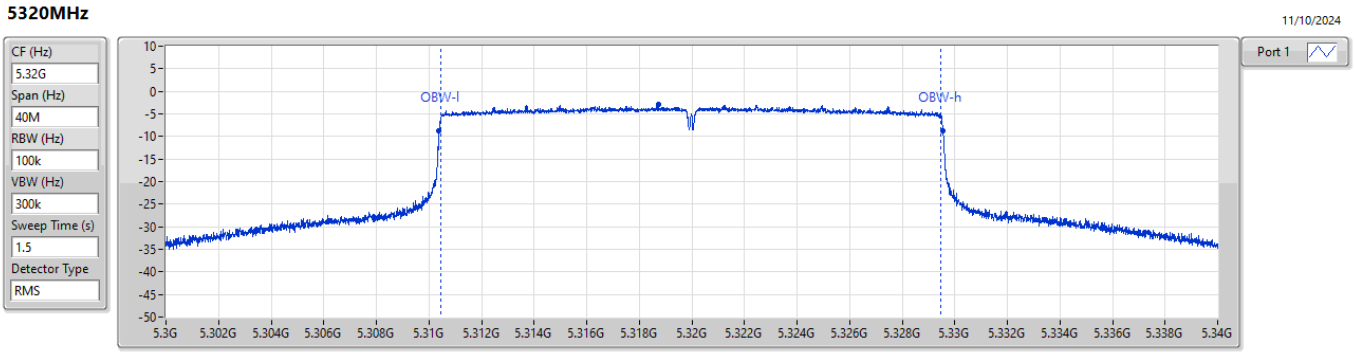
5180MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
19.14M	5.17041G	5.18955G	18.958M	5.170503G	5.189461G	16M~20M	1

5.25-5.35GHz_ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX **EBW**

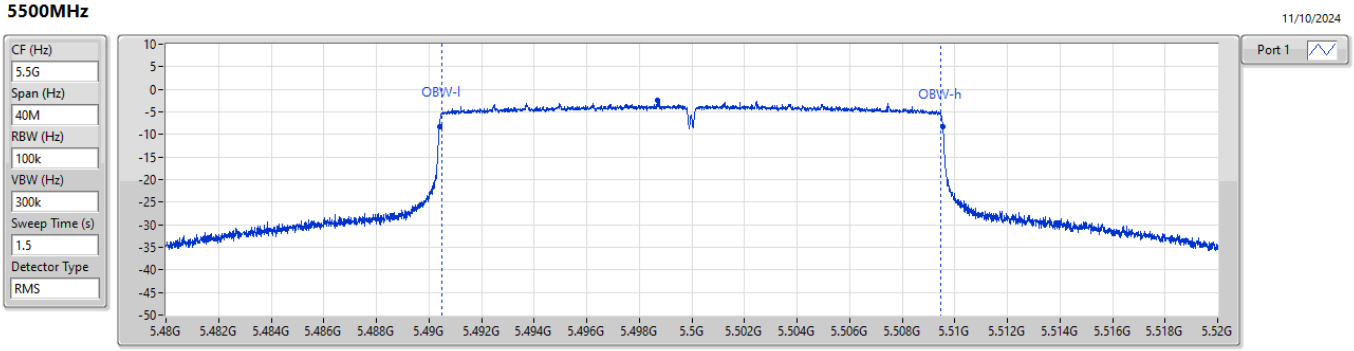
5320MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
19.17M	5.31039G	5.32956G	19.012M	5.310468G	5.32948G	16M~20M	1

5.47-5.725GHz_ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX **EBW**

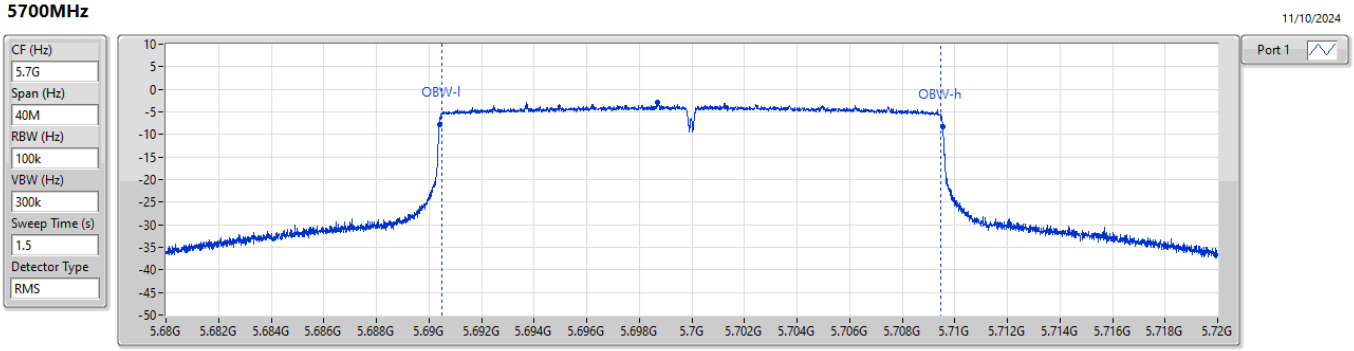
5500MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
19.15M	5.4904G	5.50955G	18.996M	5.490476G	5.509471G	16M~20M	1

5.47-5.725GHz_ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX **EBW**

5700MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
19.15M	5.6904G	5.70955G	18.98M	5.690479G	5.70946G	16M~20M	1

full RU configuration

RF Output Power at the Highest Power

Maximum Transmit Power (dBm)				
Condition	**Freq. (MHz)**	**802.11a**	**ax HE20-OFDMA**	**Limit (dBm)**
TnomVnom	5180	20.15	20.70	23
TminVnom	5180	21.67	22.30	23
TmaxVnom	5180	19.44	19.94	23
TnomVnom	5320	20.05	20.71	23
TminVnom	5320	22.17	22.63	23
TmaxVnom	5320	18.68	19.37	23
TnomVnom	5500	20.00	20.74	23
TminVnom	5500	20.51	21.21	23
TmaxVnom	5500	19.51	20.15	23
TnomVnom	5700	20.15	20.76	23
TminVnom	5700	21.34	21.89	23
TmaxVnom	5700	19.75	20.31	23

RF Output Power at the Lowest Power

Maximum Transmit Power (dBm)				
Condition	**Freq. (MHz)**	**802.11a**	**ax HE20-OFDMA**	**Limit (dBm)**
TnomVnom	5320	14.05	14.71	17
TminVnom	5320	16.17	16.63	17
TmaxVnom	5320	12.68	13.37	17
TnomVnom	5500	14.00	14.74	17
TminVnom	5500	14.51	15.21	17
TmaxVnom	5500	13.51	14.15	17
TnomVnom	5700	14.15	14.76	17
TminVnom	5700	15.34	15.89	17
TmaxVnom	5700	13.75	14.31	17

Power Density

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz) e.i.r.p.	Limit (dBm/1MHz) e.i.r.p.	Results
11a	5180	9.90	10	Pass
11a	5320	9.80	10	Pass
11a	5500	9.82	10	Pass
11a	5700	9.92	10	Pass
ax HE20-OFDMA	5180	9.81	10	Pass
ax HE20-OFDMA	5320	9.82	10	Pass
ax HE20-OFDMA	5500	9.82	10	Pass
ax HE20-OFDMA	5700	9.86	10	Pass

partial RU configuration

RF Output Power (dBm)						
Condition	Freq. (MHz)	ax HE20-OFDMA			Limit (dBm)	Results
		RU26	RU52	RU106		
$T_{nom}V_{nom}$	5180	12.95	15.81	18.70	23	Pass
$T_{min}V_{nom}$	5180	14.50	17.42	20.25	23	Pass
$T_{max}V_{nom}$	5180	12.30	15.05	17.95	23	Pass
$T_{nom}V_{nom}$	5320	12.68	15.76	18.60	23	Pass
$T_{min}V_{nom}$	5320	14.83	17.98	20.45	23	Pass
$T_{max}V_{nom}$	5320	11.35	14.42	17.27	23	Pass
$T_{nom}V_{nom}$	5500	12.85	15.92	18.75	23	Pass
$T_{min}V_{nom}$	5500	13.39	16.39	19.29	23	Pass
$T_{max}V_{nom}$	5500	12.38	15.43	18.19	23	Pass
$T_{nom}V_{nom}$	5700	12.95	15.97	18.60	23	Pass
$T_{min}V_{nom}$	5700	14.07	17.20	19.72	23	Pass
$T_{max}V_{nom}$	5700	12.52	15.52	18.27	23	Pass

Power Density

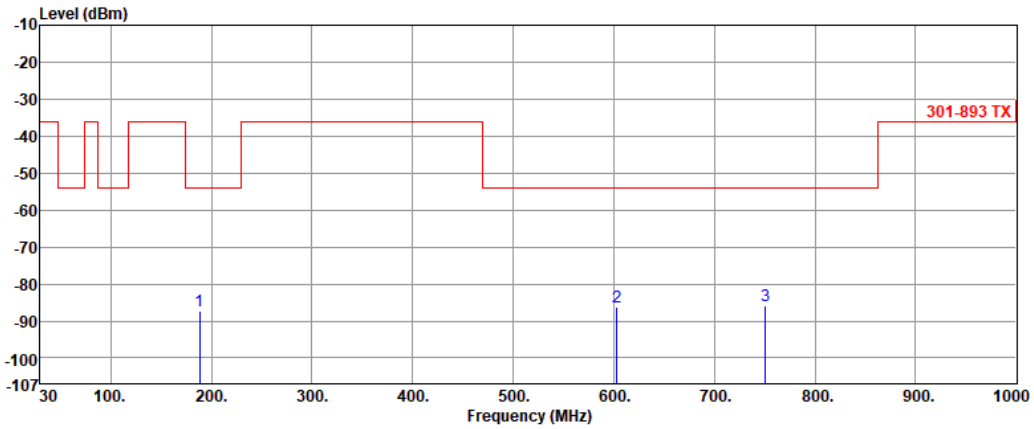
Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz) e.i.r.p.	Limit (dBm/1MHz) e.i.r.p.	Results
ax HE20-OFDMA RU26	5180	9.90	10	Pass
ax HE20-OFDMA RU26	5320	9.55	10	Pass
ax HE20-OFDMA RU26	5500	9.91	10	Pass
ax HE20-OFDMA RU26	5700	9.86	10	Pass
ax HE20-OFDMA RU52	5180	9.80	10	Pass
ax HE20-OFDMA RU52	5320	9.80	10	Pass
ax HE20-OFDMA RU52	5500	9.89	10	Pass
ax HE20-OFDMA RU52	5700	9.98	10	Pass
ax HE20-OFDMA RU106	5180	9.95	10	Pass
ax HE20-OFDMA RU106	5320	9.83	10	Pass
ax HE20-OFDMA RU106	5500	9.95	10	Pass
ax HE20-OFDMA RU106	5700	9.95	10	Pass

full RU configuration

Emissions (Below 1GHz)

Modulation	11a
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

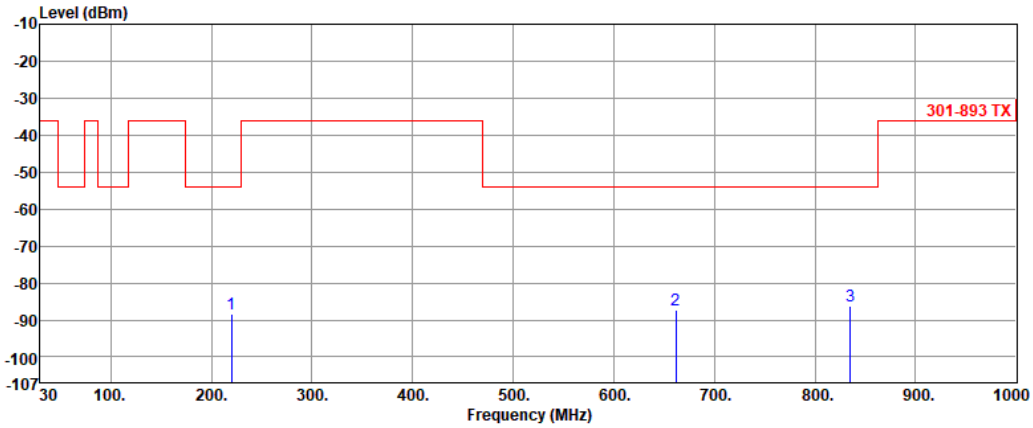


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	188.11	-87.16	-54.00	-33.16	0.00	-87.16
2	603.27	-86.41	-54.00	-32.41	0.00	-86.41
3	750.71	-85.73	-54.00	-31.73	0.00	-85.73

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65

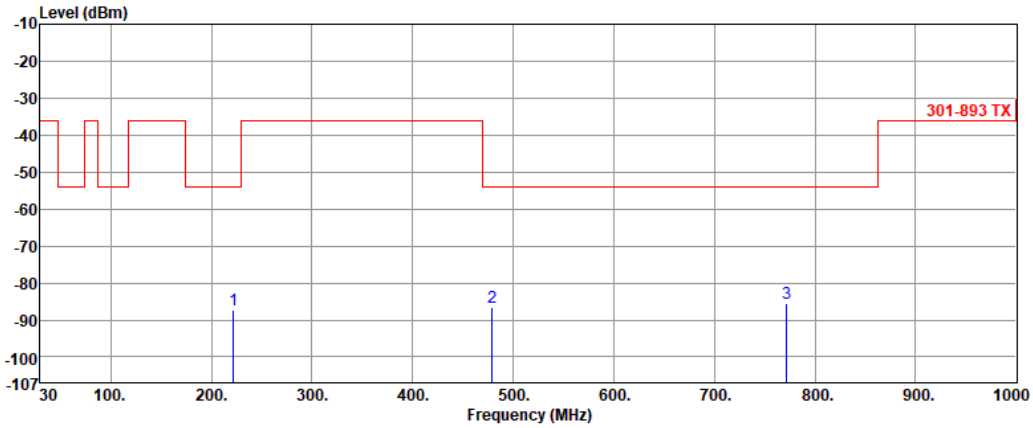


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	220.12	-88.34	-54.00	-34.34	0.00	-88.34
2	661.47	-87.19	-54.00	-33.19	0.00	-87.19
3	835.10	-86.27	-54.00	-32.27	0.00	-86.27

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

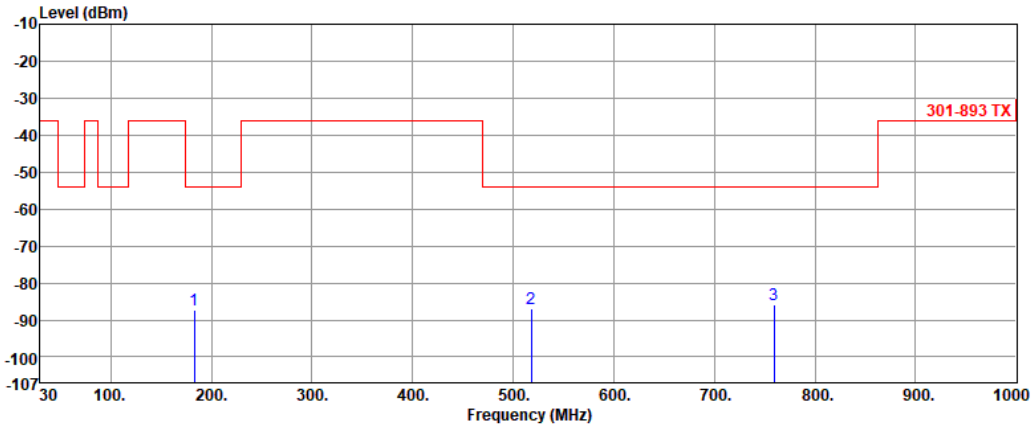


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	222.06	-87.41	-54.00	-33.41	0.00	-87.41
2	479.11	-86.61	-54.00	-32.61	0.00	-86.61
3	772.05	-85.49	-54.00	-31.49	0.00	-85.49

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65



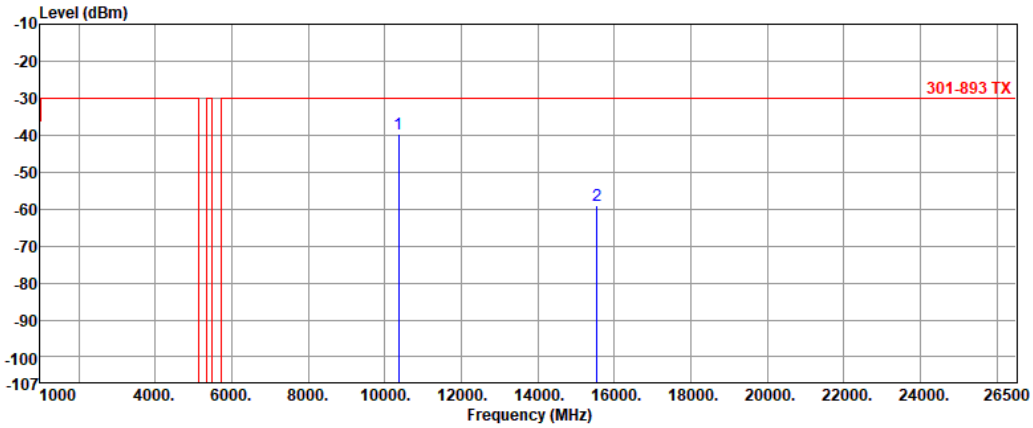
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	183.26	-87.49	-54.00	-33.49	0.00	-87.49
2	517.91	-86.87	-54.00	-32.87	0.00	-86.87
3	759.44	-85.77	-54.00	-31.77	0.00	-85.77

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Emissions (Above 1GHz)

Modulation	11a
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

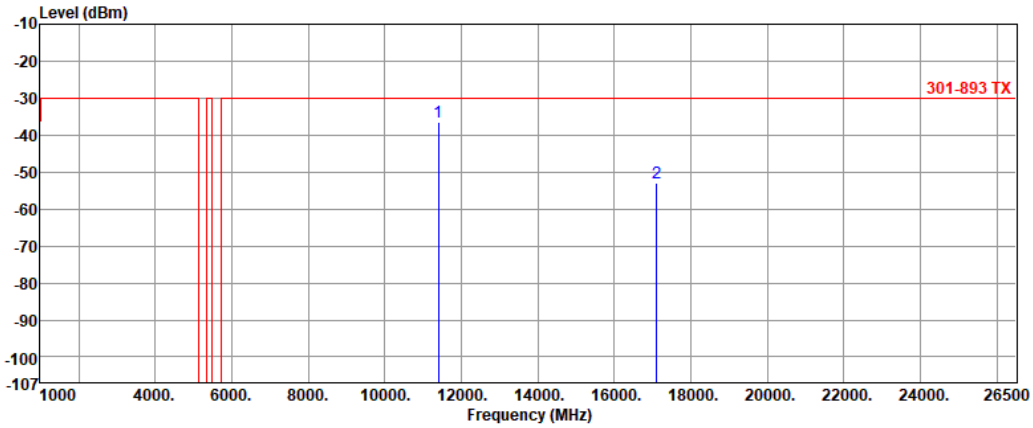


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10359.04	-39.73	-30.00	-9.73	0.00	-39.73
2	15540.40	-59.06	-30.00	-29.06	0.00	-59.06

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65

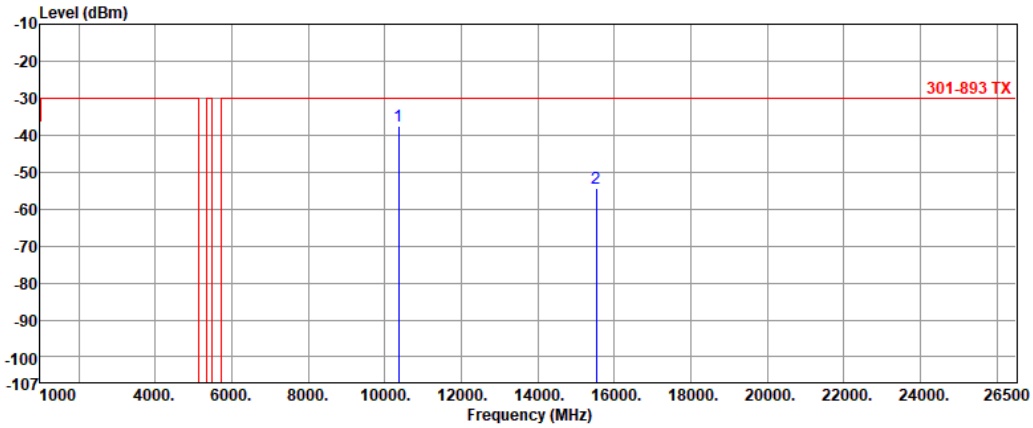


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11401.55	-36.63	-30.00	-6.63	0.00	-36.63
2	17097.99	-52.99	-30.00	-22.99	0.00	-52.99

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

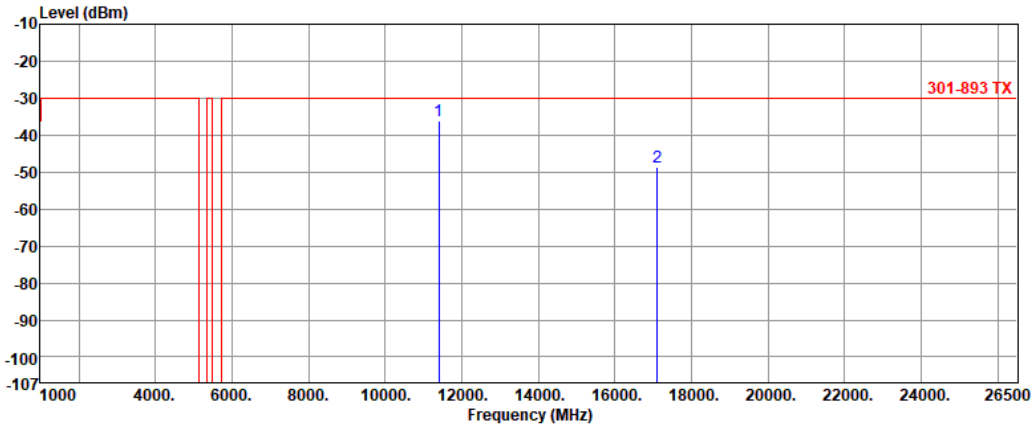


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10355.96	-37.57	-30.00	-7.57	0.00	-37.57
2	15533.81	-54.34	-30.00	-24.34	0.00	-54.34

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11405.58	-35.98	-30.00	-5.98	0.00	-35.98
2	17100.69	-48.78	-30.00	-18.78	0.00	-48.78

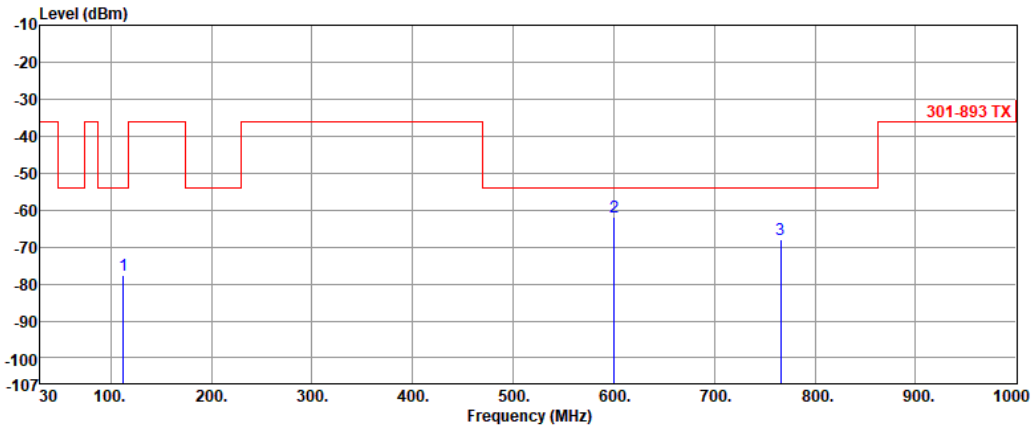
Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

full RU configuration

Emissions (Below 1GHz)

Modulation	11a	**Test Freq. (MHz)**	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

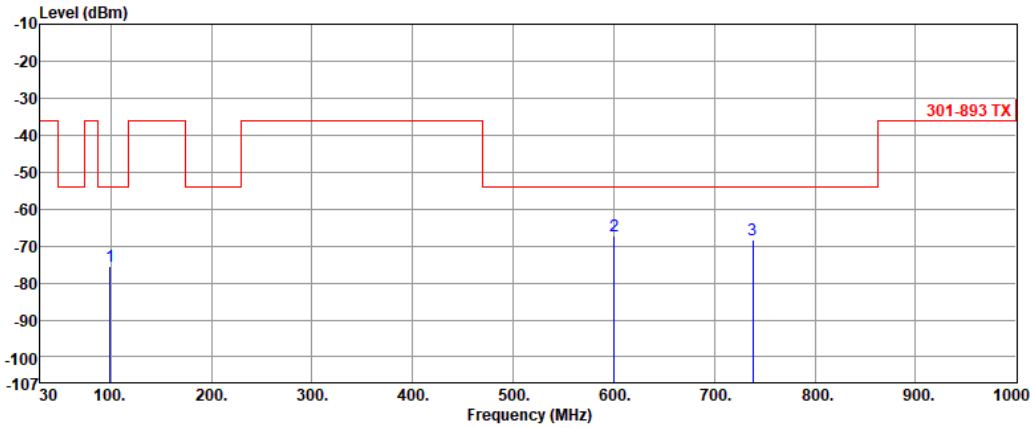


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	112.63	-77.72	-54.00	-23.72	-3.39	-74.33
2	600.41	-61.89	-54.00	-7.89	5.81	-67.70
3	765.74	-68.05	-54.00	-14.05	8.40	-76.45

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	**Test Freq. (MHz)**	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

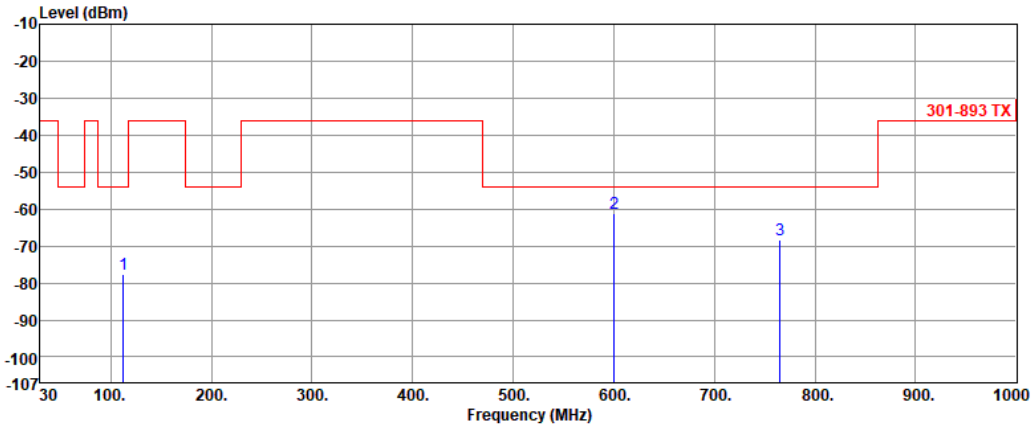


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	99.42	-75.34	-54.00	-21.34	-4.25	-71.09
2	600.62	-67.39	-54.00	-13.39	5.61	-73.00
3	738.01	-68.22	-54.00	-14.22	8.58	-76.80

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	**Test Freq. (MHz)**	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

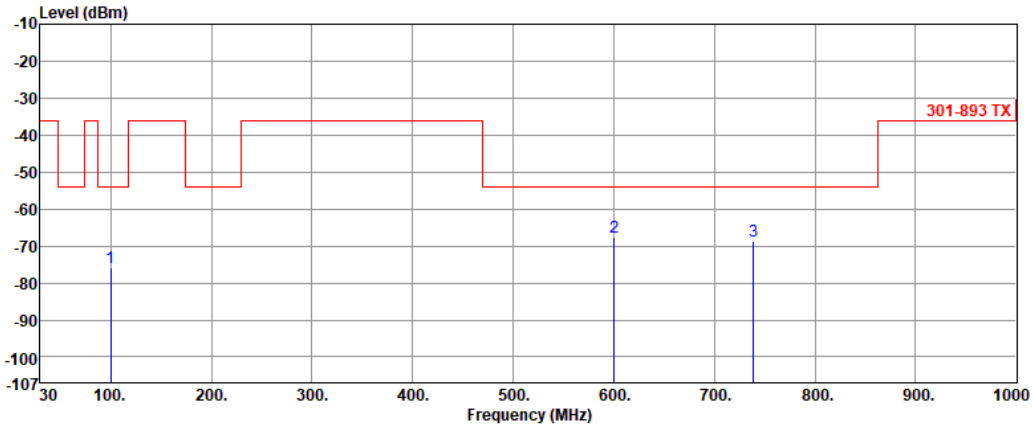


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	112.71	-77.49	-54.00	-23.49	-3.40	-74.09
2	600.09	-61.30	-54.00	-7.30	5.79	-67.09
3	765.44	-68.48	-54.00	-14.48	8.40	-76.88

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	**Test Freq. (MHz)**	5700
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

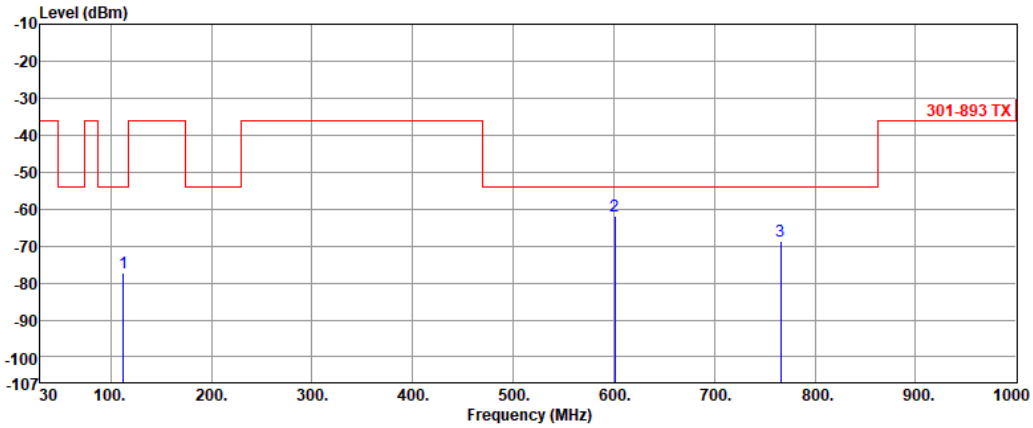


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	99.91	-75.72	-54.00	-21.72	-4.16	-71.56
2	600.16	-67.53	-54.00	-13.53	5.60	-73.13
3	738.64	-68.80	-54.00	-14.80	8.60	-77.40

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	**Test Freq. (MHz)**	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

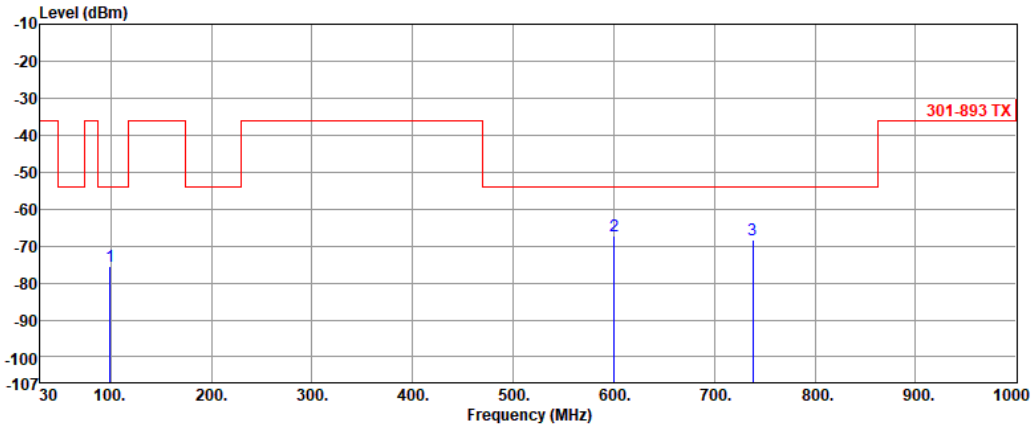


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	112.77	-77.32	-54.00	-23.32	-3.40	-73.92
2	600.82	-61.80	-54.00	-7.80	5.83	-67.63
3	765.83	-68.68	-54.00	-14.68	8.40	-77.08

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	**Test Freq. (MHz)**	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

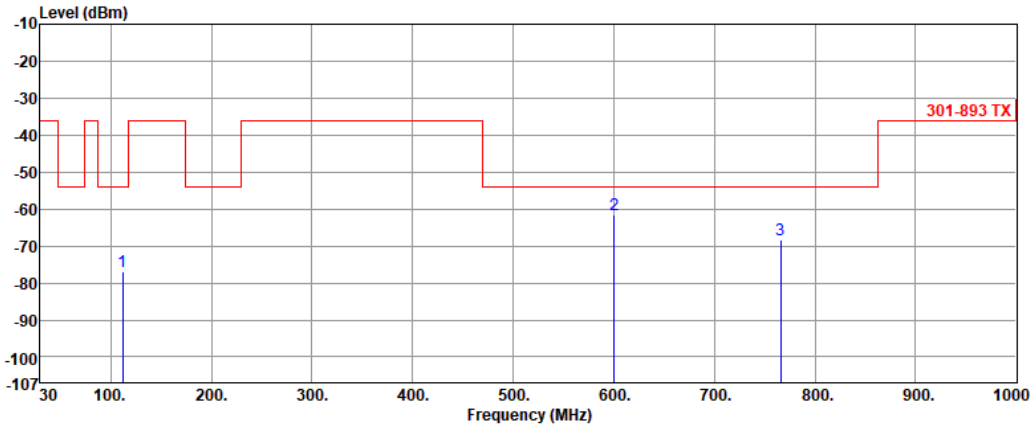


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	99.43	-75.35	-54.00	-21.35	-4.24	-71.11
2	600.28	-67.26	-54.00	-13.26	5.60	-72.86
3	738.46	-68.21	-54.00	-14.21	8.60	-76.81

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	**Test Freq. (MHz)**	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

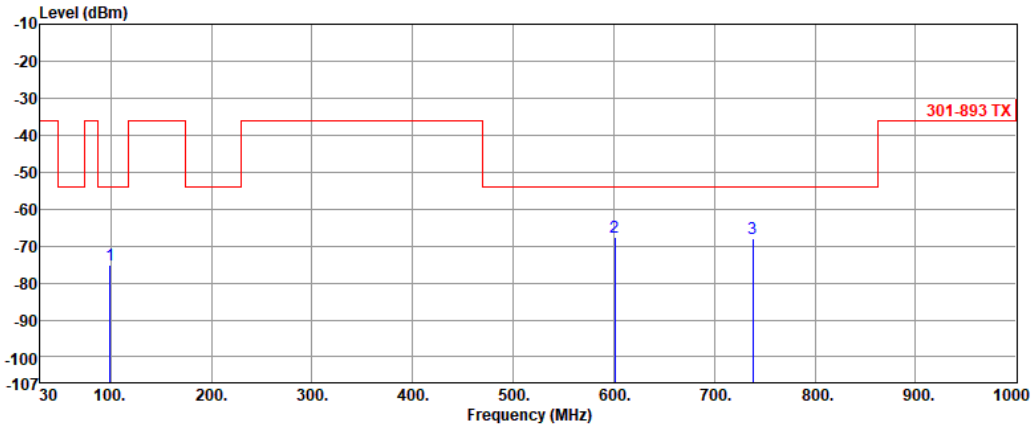


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	112.01	-77.10	-54.00	-23.10	-3.36	-73.74
2	600.20	-61.65	-54.00	-7.65	5.80	-67.45
3	765.93	-68.17	-54.00	-14.17	8.40	-76.57

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	**Test Freq. (MHz)**	5700
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65



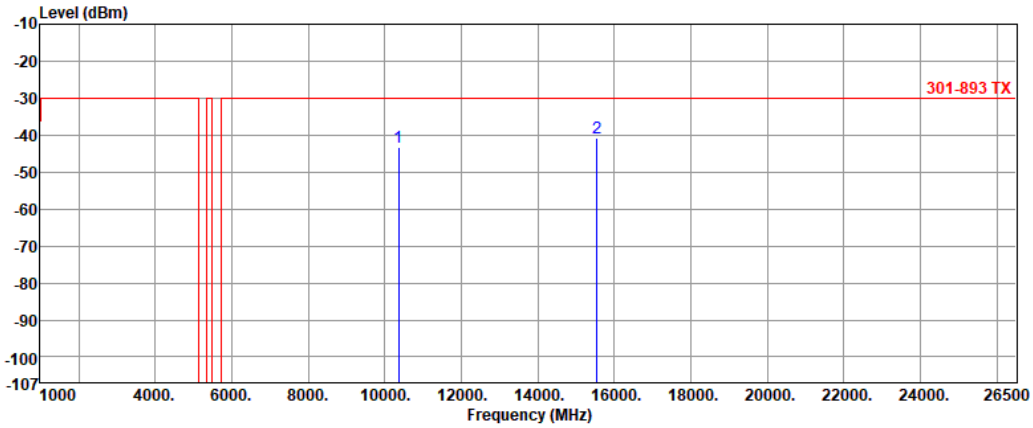
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	99.48	-75.04	-54.00	-21.04	-4.24	-70.80
2	600.77	-67.75	-54.00	-13.75	5.62	-73.37
3	738.18	-68.12	-54.00	-14.12	8.59	-76.71

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Emissions (Above 1GHz)

Modulation	11a	**Test Freq. (MHz)**	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

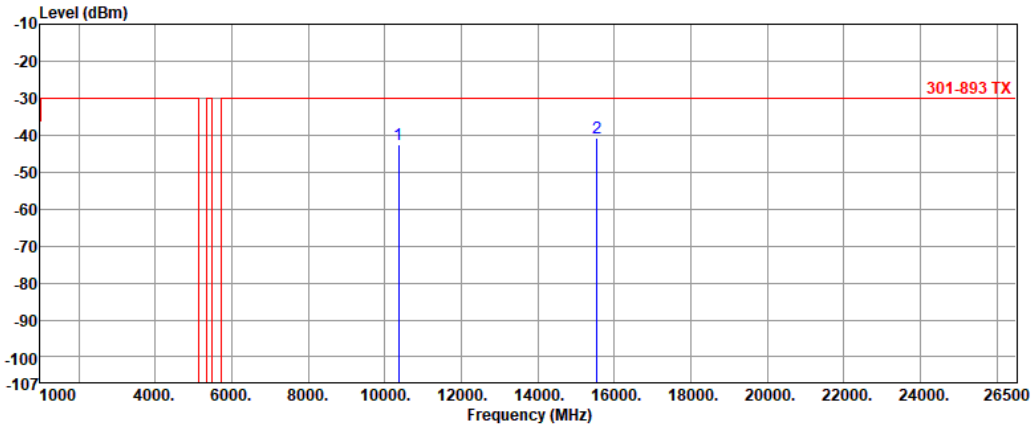


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10359.97	-43.27	-30.00	-13.27	22.66	-65.93
2	15539.81	-40.86	-30.00	-10.86	24.25	-65.11

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	**Test Freq. (MHz)**	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

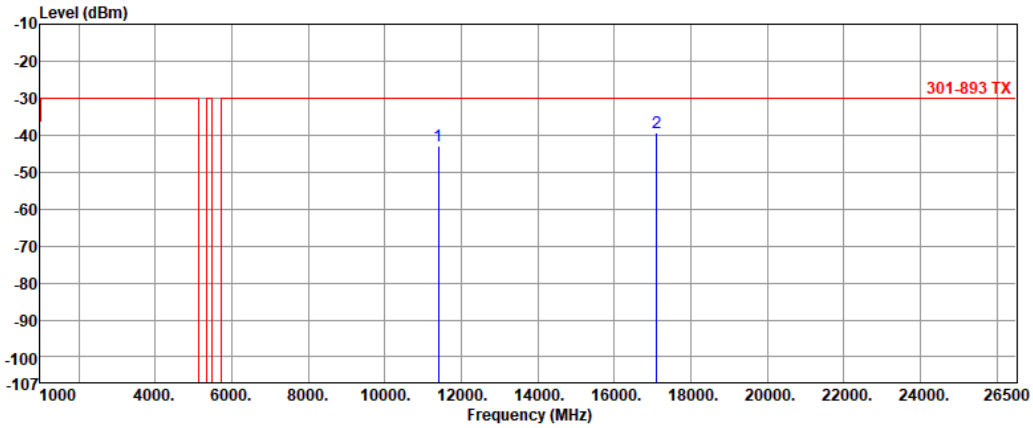


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10359.95	-42.59	-30.00	-12.59	23.08	-65.67
2	15539.76	-40.66	-30.00	-10.66	24.00	-64.66

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	**Test Freq. (MHz)**	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

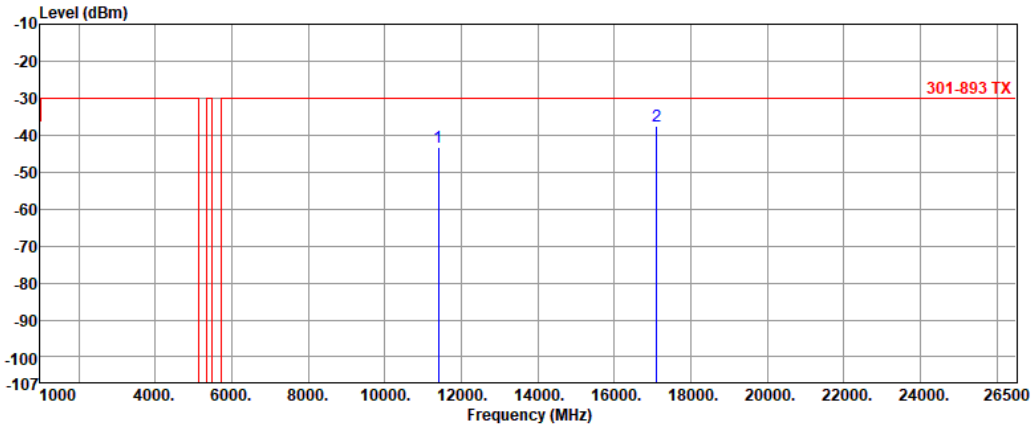


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11400.26	-42.81	-30.00	-12.81	22.67	-65.48
2	17099.65	-39.32	-30.00	-9.32	24.59	-63.91

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	**Test Freq. (MHz)**	5700
Polarization	Vertical		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

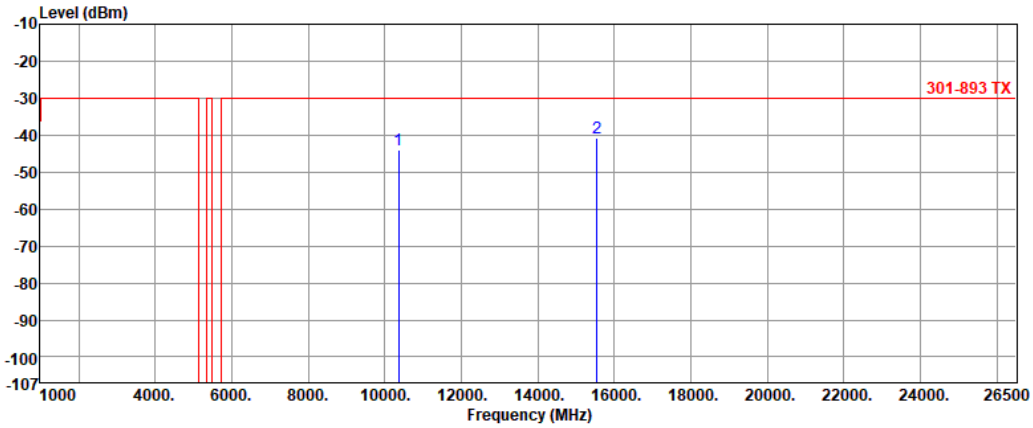


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11399.81	-43.31	-30.00	-13.31	22.00	-65.31
2	17099.64	-37.69	-30.00	-7.69	26.40	-64.09

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	**Test Freq. (MHz)**	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

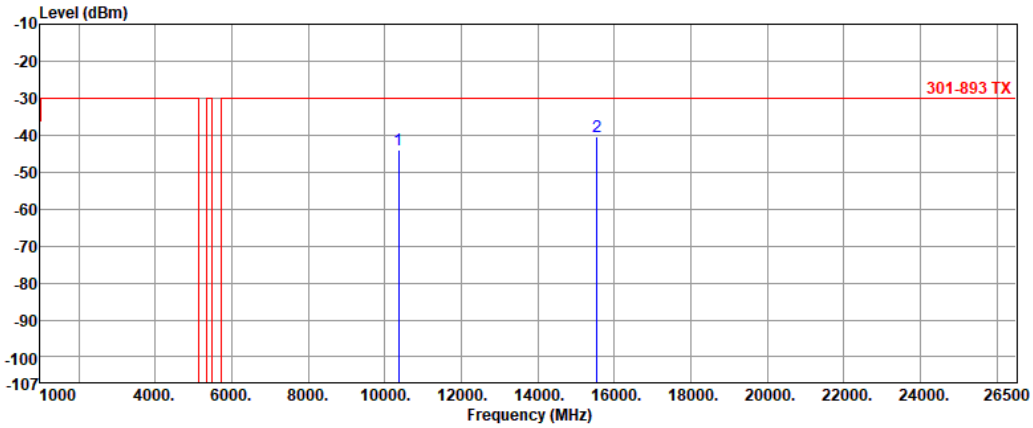


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10359.65	-43.88	-30.00	-13.88	22.66	-66.54
2	15539.74	-40.79	-30.00	-10.79	24.25	-65.04

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	**Test Freq. (MHz)**	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

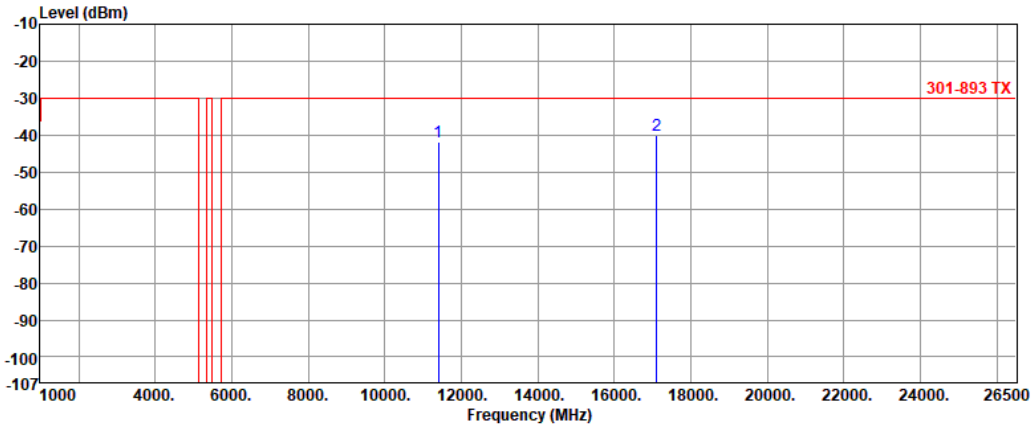


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10360.30	-43.87	-30.00	-13.87	23.08	-66.95
2	15540.49	-40.29	-30.00	-10.29	24.00	-64.29

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	**Test Freq. (MHz)**	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

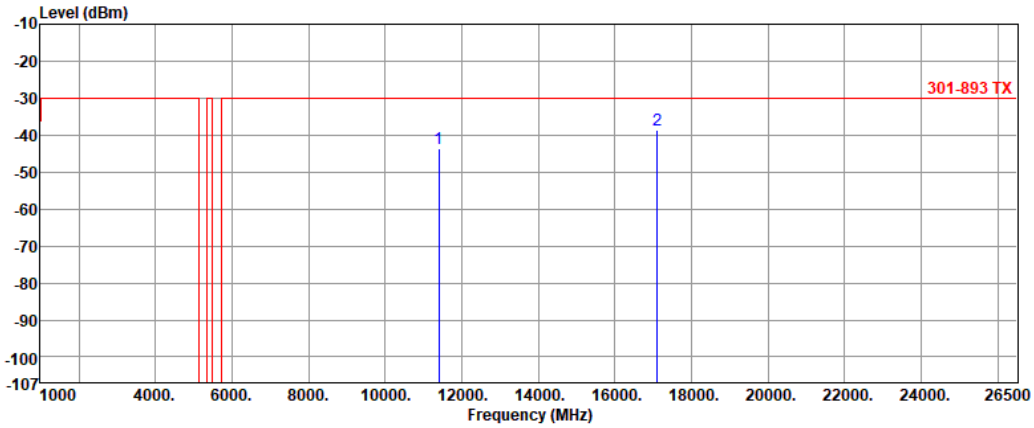


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11399.94	-41.90	-30.00	-11.90	22.67	-64.57
2	17099.85	-40.19	-30.00	-10.19	24.60	-64.79

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	**Test Freq. (MHz)**	5700
Polarization	Vertical		

Test By :Hugo Zhen Temperature:24 Humidity(%):65



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11400.00	-43.66	-30.00	-13.66	21.99	-65.65
2	17100.20	-38.73	-30.00	-8.73	26.40	-65.13

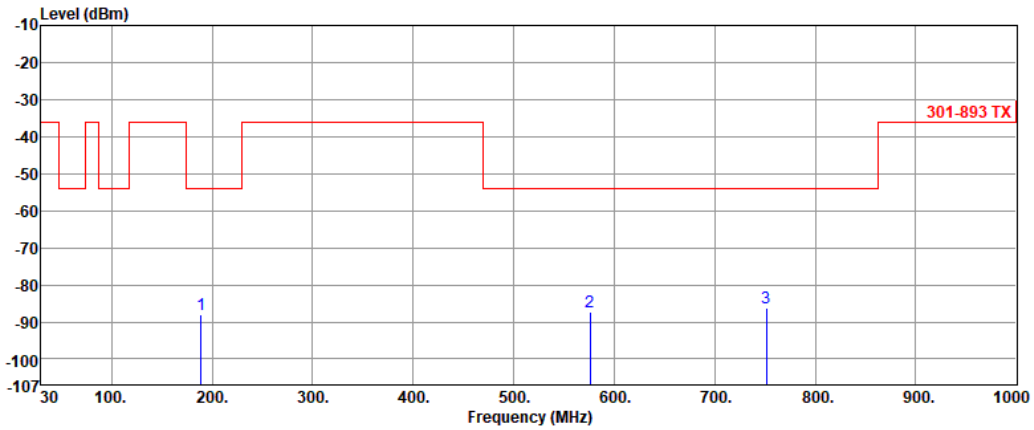
Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

partial RU configuration

Emissions (Below 1GHz)

Modulation	ax HE20-OFDMA RU106
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

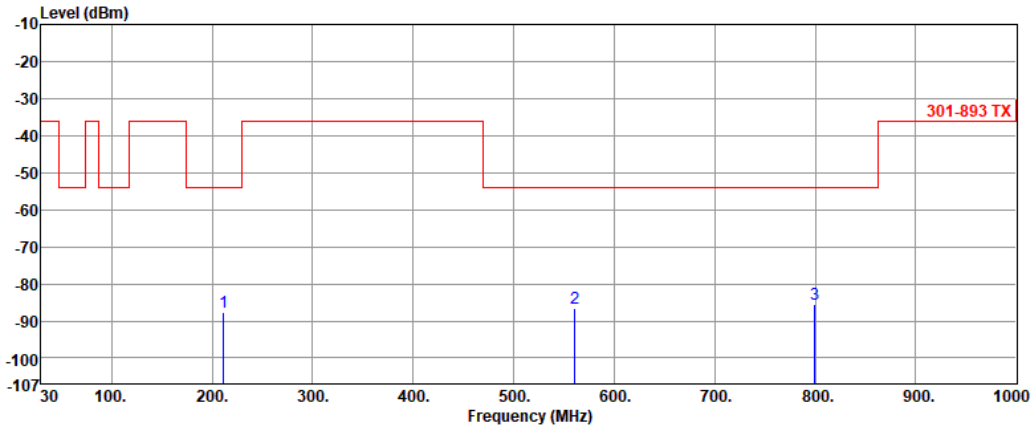


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	189.08	-88.01	-54.00	-34.01	0.00	-88.01
2	576.11	-87.17	-54.00	-33.17	0.00	-87.17
3	751.68	-86.37	-54.00	-32.37	0.00	-86.37

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA RU106
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65



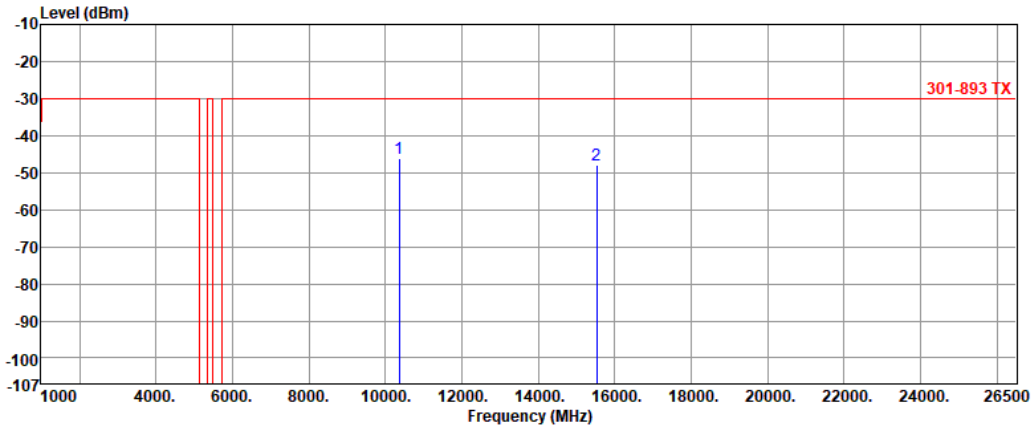
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	211.39	-87.71	-54.00	-33.71	0.00	-87.71
2	560.59	-86.59	-54.00	-32.59	0.00	-86.59
3	799.21	-85.37	-54.00	-31.37	0.00	-85.37

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Emissions (Above 1GHz)

Modulation	ax HE20-OFDMA RU106
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

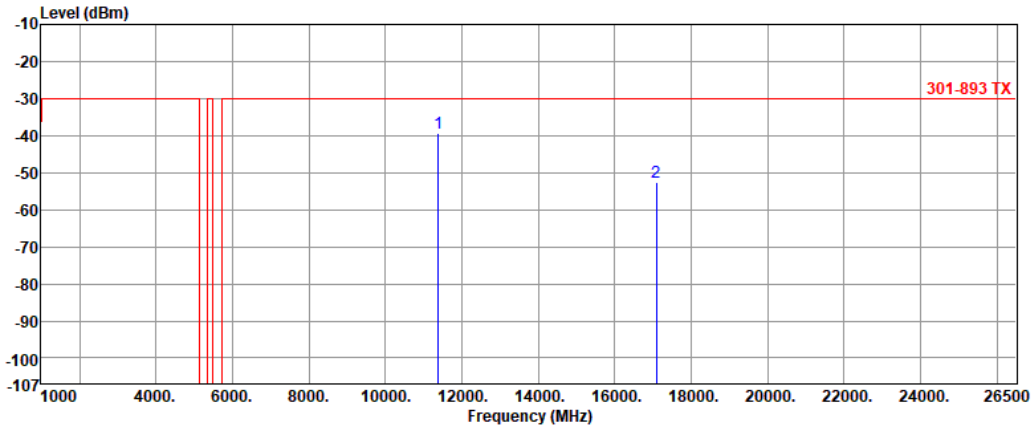


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10352.70	-46.10	-30.00	-16.10	0.00	-46.10
2	15523.79	-48.12	-30.00	-18.12	0.00	-48.12

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA RU106
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11388.70	-39.21	-30.00	-9.21	0.00	-39.21
2	17083.10	-52.61	-30.00	-22.61	0.00	-52.61

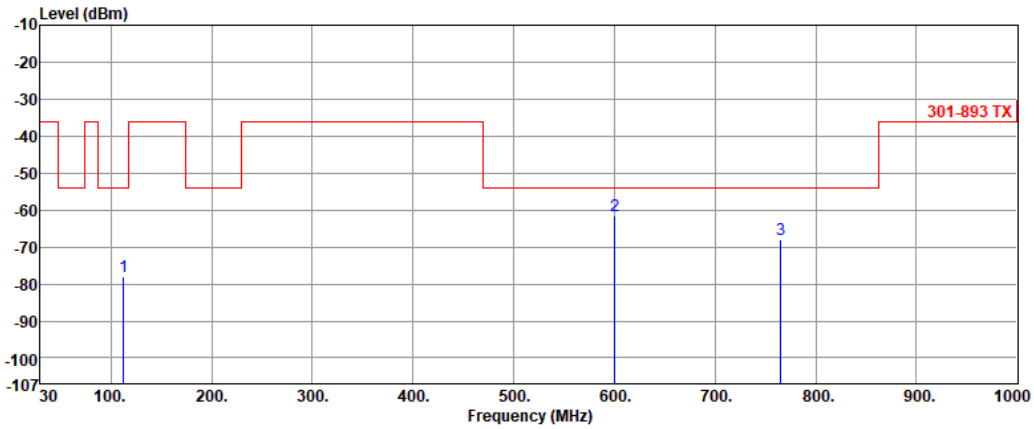
Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

partial RU configuration

Emissions (Below 1GHz)

Modulation	ax HE20-OFDMA RU106	**Test Freq. (MHz)**	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

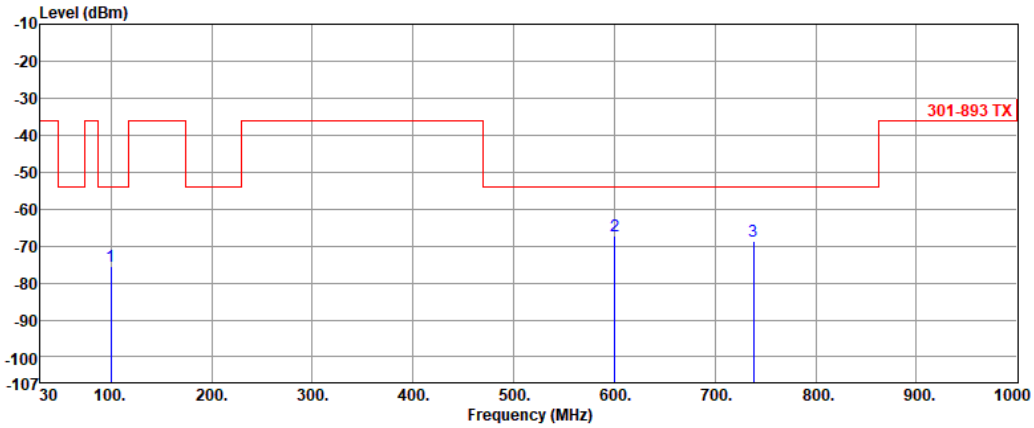


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	112.42	-77.98	-54.00	-23.98	-3.38	-74.60
2	600.14	-61.40	-54.00	-7.40	5.80	-67.20
3	765.19	-68.07	-54.00	-14.07	8.39	-76.46

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA RU106	**Test Freq. (MHz)**	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

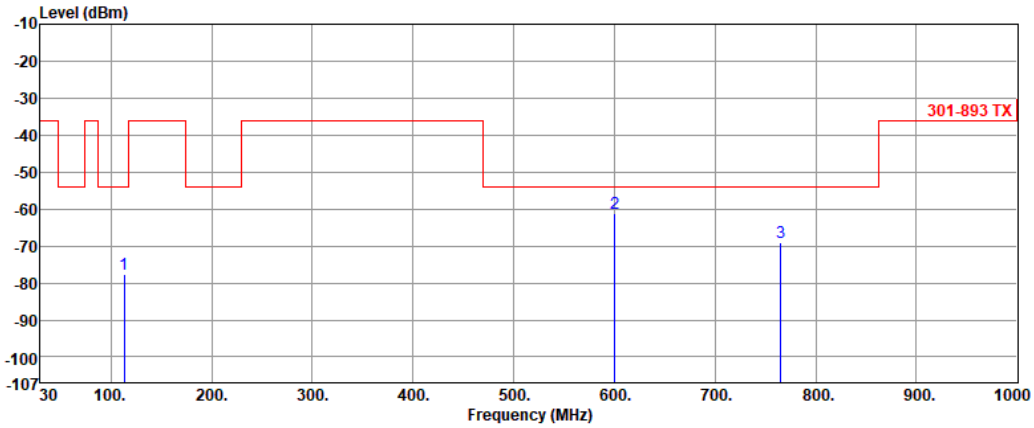


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	99.86	-75.51	-54.00	-21.51	-4.17	-71.34
2	600.51	-67.36	-54.00	-13.36	5.61	-72.97
3	738.08	-68.75	-54.00	-14.75	8.59	-77.34

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA RU106	**Test Freq. (MHz)**	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

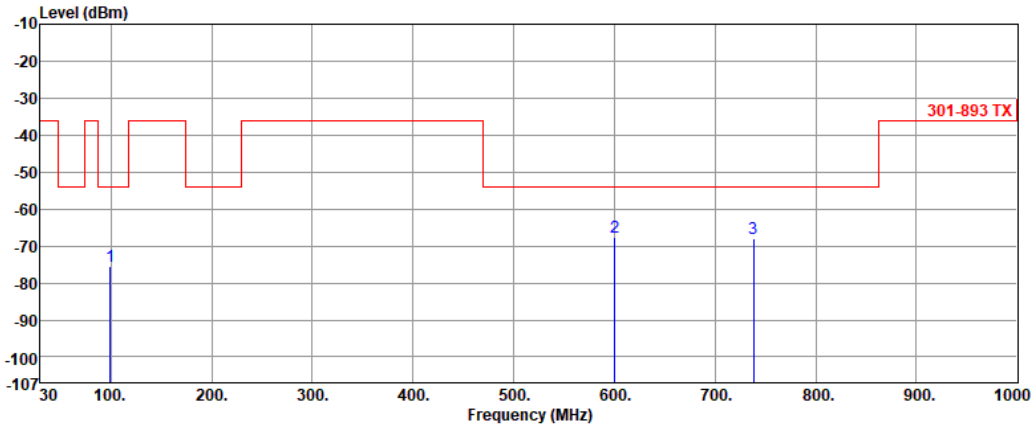


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	112.90	-77.65	-54.00	-23.65	-3.41	-74.24
2	600.62	-61.08	-54.00	-7.08	5.82	-66.90
3	765.44	-68.90	-54.00	-14.90	8.40	-77.30

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA RU106	**Test Freq. (MHz)**	5700
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65



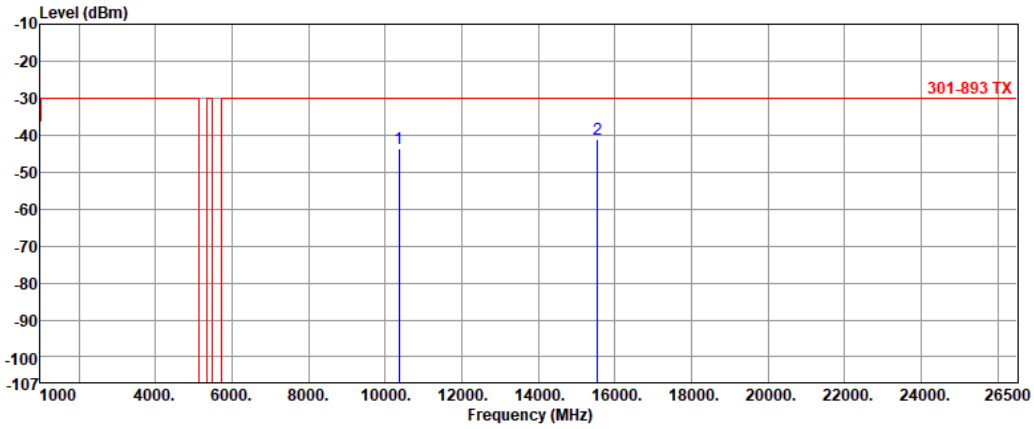
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	99.20	-75.47	-54.00	-21.47	-4.29	-71.18
2	600.09	-67.52	-54.00	-13.52	5.60	-73.12
3	738.30	-68.08	-54.00	-14.08	8.59	-76.67

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Emissions (Above 1GHz)

Modulation	ax HE20-OFDMA RU106	**Test Freq. (MHz)**	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

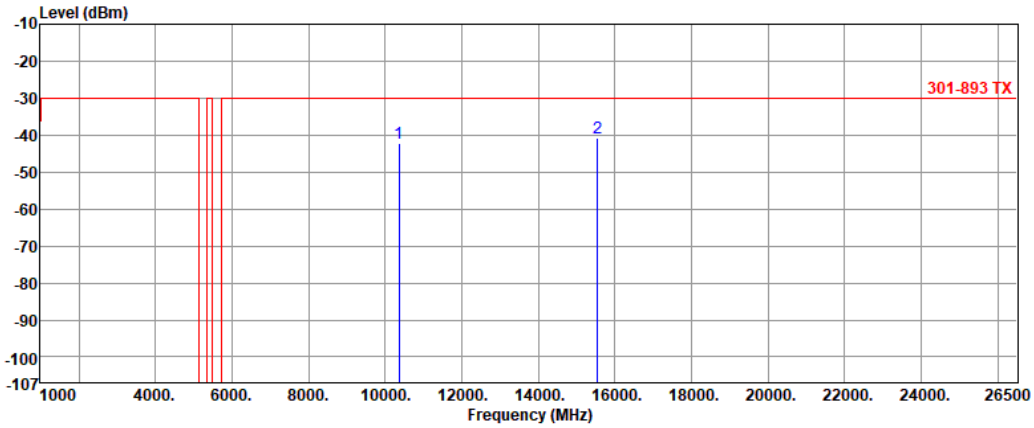


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10360.00	-43.65	-30.00	-13.65	22.66	-66.31
2	15539.59	-41.16	-30.00	-11.16	24.25	-65.41

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA RU106	**Test Freq. (MHz)**	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

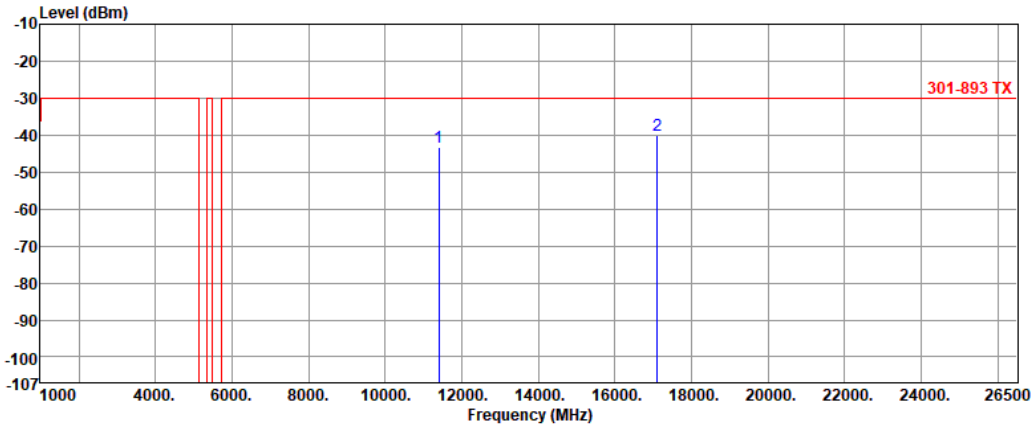


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10360.09	-42.16	-30.00	-12.16	23.08	-65.24
2	15540.44	-40.83	-30.00	-10.83	24.00	-64.83

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA RU106	**Test Freq. (MHz)**	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

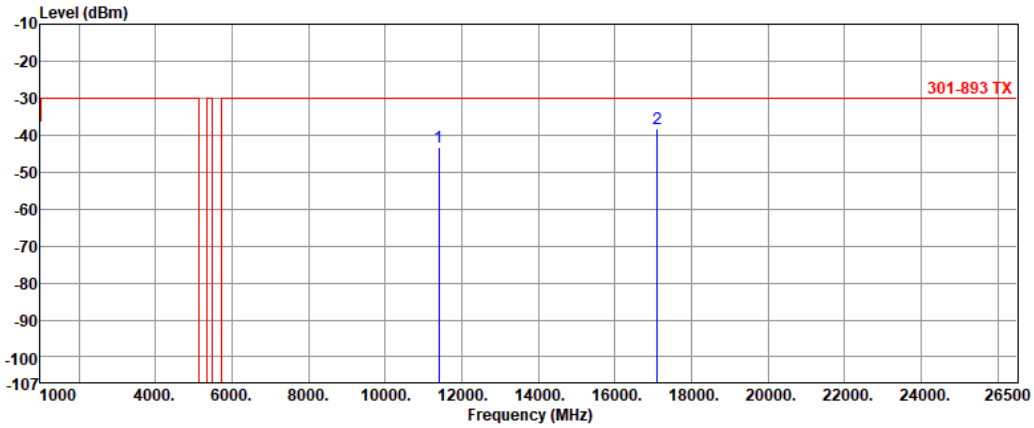


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11400.47	-43.13	-30.00	-13.13	22.67	-65.80
2	17100.43	-40.15	-30.00	-10.15	24.60	-64.75

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA RU106	**Test Freq. (MHz)**	5700
Polarization	Vertical		

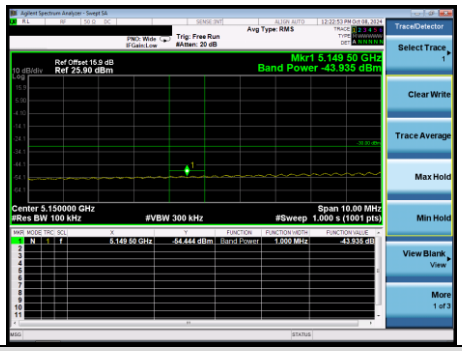
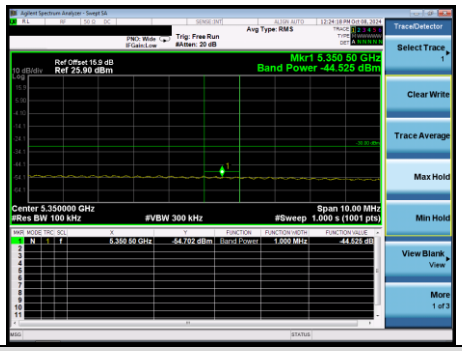
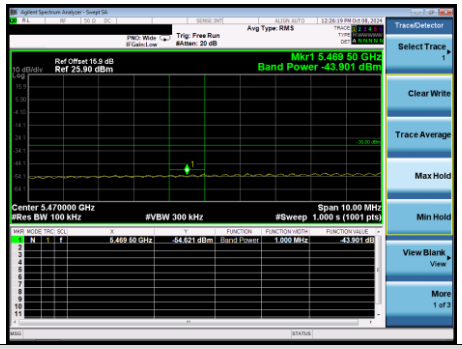
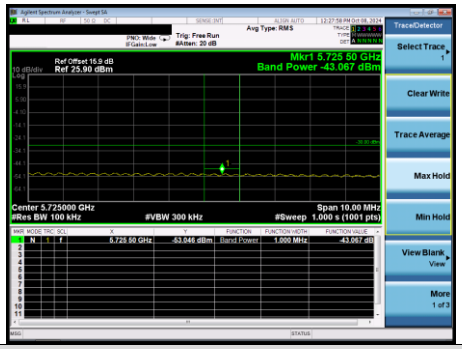
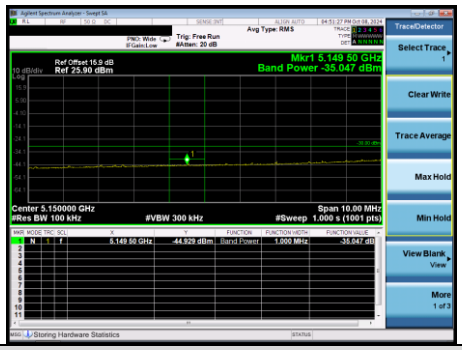
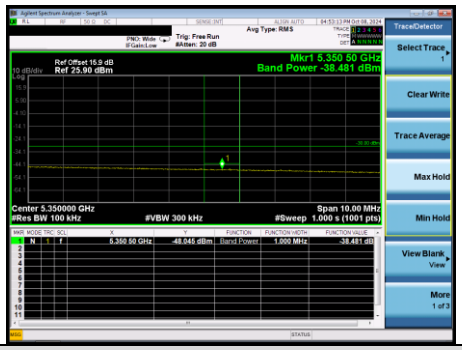
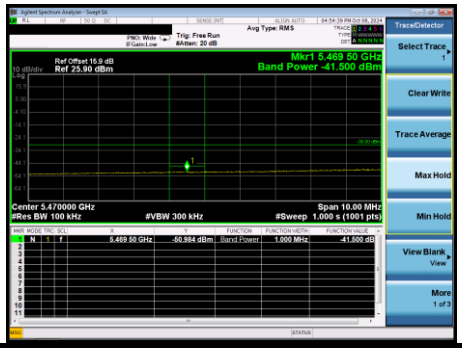
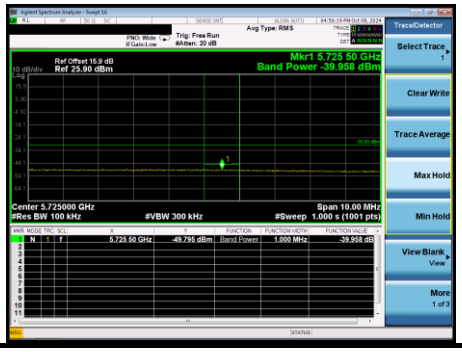
Test By :Hugo Zhen Temperature:24 Humidity(%):65



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11400.36	-43.28	-30.00	-13.28	21.99	-65.27
2	17100.27	-38.16	-30.00	-8.16	26.40	-64.56

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Radiated Band edge

11a	
5180MHz	5320MHz
	
5500MHz	5700MHz
	
ax HE20-OFDMA	
5180MHz	5320MHz
	
5500MHz	5700MHz
	

Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Freq (Hz)	Level (dBm)	Limit (dBm)	Margin (dB)	Port
5.15-5.25GHz	-	-	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	Pass	5.181481G	5.77	5.190998G	-23.00	-14.18	-8.82	1
ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX	Pass	5.181941G	5.45	5.205603G	-30.02	-26.72	-3.30	1
5.25-5.35GHz	-	-	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	Pass	5.318648G	5.58	5.308988G	-24.41	-14.43	-9.98	1
ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX	Pass	5.318878G	4.74	5.300478G	-24.45	-22.84	-1.61	1
5.47-5.725GHz	-	-	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX	Pass	5.698176G	5.64	5.688976G	-24.37	-14.38	-9.99	1
ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX	Pass	5.501296G	4.88	5.48327G	-22.85	-20.21	-2.64	1

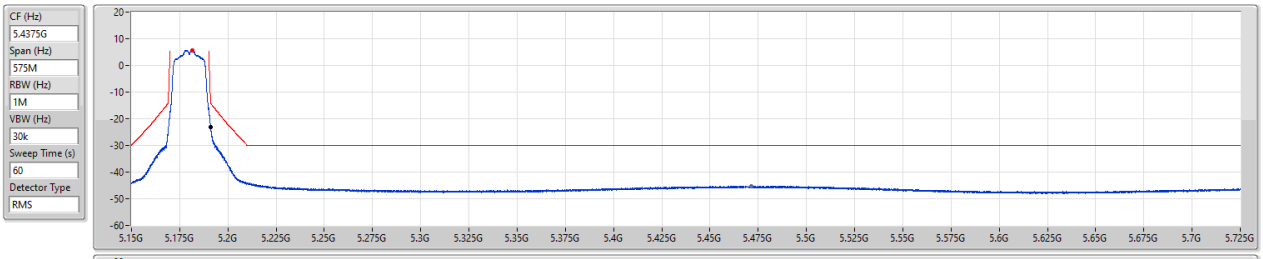
Result

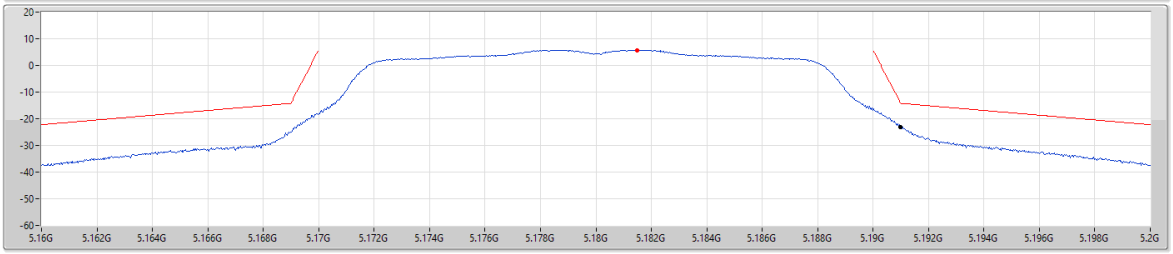
Mode	Result	Ref (Hz)	Ref (dBm)	Freq (Hz)	Level (dBm)	Limit (dBm)	Margin (dB)	Port
802.11a_Nss1,(6Mbps)_1TX	-	-	-	-	-	-	-	-
5180MHz_Tnom	Pass	5.181481G	5.77	5.190998G	-23.00	-14.18	-8.82	1
5180MHz_Tnom	Pass	5.181481G	5.77	5.471626G	-45.23	-30.00	-15.23	1
5320MHz_Tnom	Pass	5.318648G	5.58	5.308988G	-24.41	-14.43	-9.98	1
5320MHz_Tnom	Pass	5.318648G	5.58	5.470879G	-45.11	-30.00	-15.11	1
5500MHz_Tnom	Pass	5.49891G	5.74	5.510985G	-24.12	-13.96	-10.16	1
5500MHz_Tnom	Pass	5.49891G	5.74	5.467918G	-44.04	-30.00	-14.04	1
5700MHz_Tnom	Pass	5.698176G	5.64	5.688976G	-24.37	-14.38	-9.99	1
5700MHz_Tnom	Pass	5.698176G	5.64	5.462743G	-45.29	-30.00	-15.29	1
ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-	-
5180MHz_Tnom	Pass	5.181941G	5.45	5.205603G	-30.02	-26.72	-3.30	1
5180MHz_Tnom	Pass	5.181941G	5.45	5.458804G	-45.15	-30.00	-15.15	1
5320MHz_Tnom	Pass	5.318878G	4.74	5.300478G	-24.45	-22.84	-1.61	1
5320MHz_Tnom	Pass	5.318878G	4.74	5.35033G	-42.17	-30.00	-12.17	1
5500MHz_Tnom	Pass	5.501296G	4.88	5.48327G	-22.85	-20.21	-2.64	1
5500MHz_Tnom	Pass	5.501296G	4.88	5.469873G	-41.35	-30.00	-11.35	1
5700MHz_Tnom	Pass	5.697601G	4.62	5.680466G	-26.48	-22.97	-3.51	1
5700MHz_Tnom	Pass	5.697601G	4.62	5.466681G	-45.20	-30.00	-15.20	1

5.15-5.25GHz_802.11a_Nss1,(6Mbps)_1TX **MASK**

5180MHz_Tnom

11/10/2024



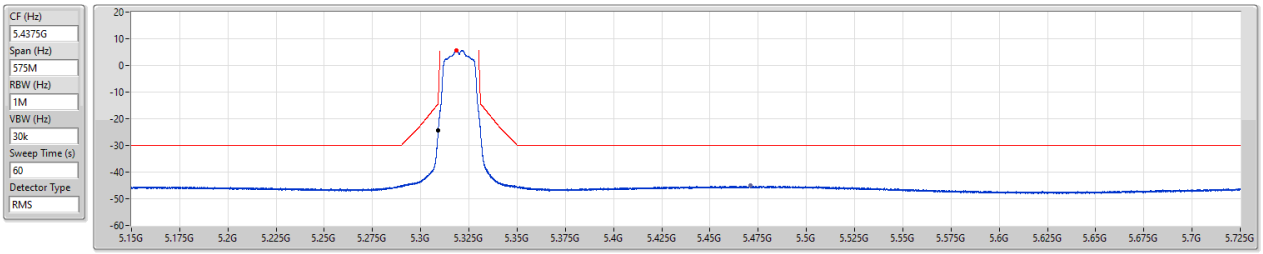


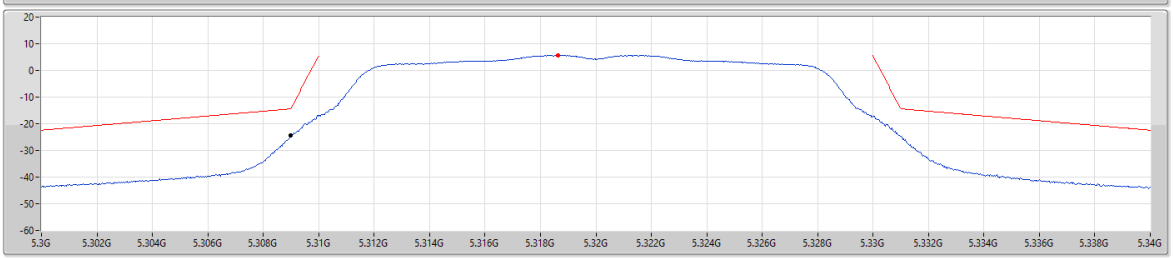
Ref(Hz)	Ref(dBm)	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Range
5.181481G	5.77	5.190998G	-23.00	-14.18	-8.82	1	In Sub-band
5.181481G	5.77	5.471626G	-45.23	-30.00	-15.23	1	OOB

5.25-5.35GHz_802.11a_Nss1,(6Mbps)_1TX **MASK**

5320MHz_Tnom

11/10/2024

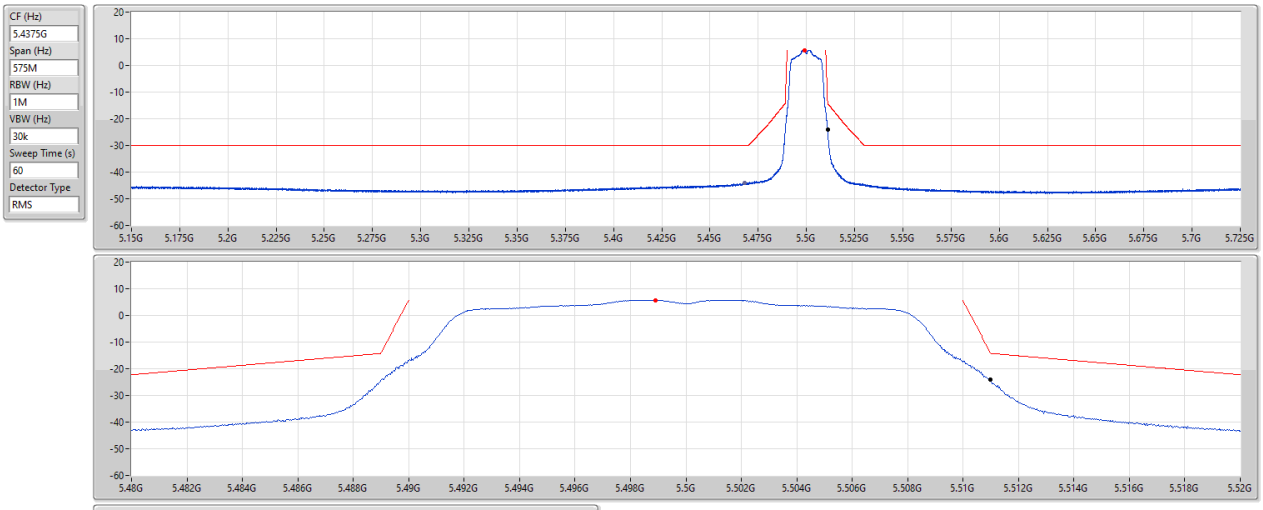




Ref(Hz)	Ref(dBm)	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Range
5.318648G	5.58	5.308988G	-24.41	-14.43	-9.98	1	In Sub-band
5.318648G	5.58	5.470879G	-45.11	-30.00	-15.11	1	OOB

5.47-5.725GHz_802.11a_Nss1,(6Mbps)_1TX **MASK**

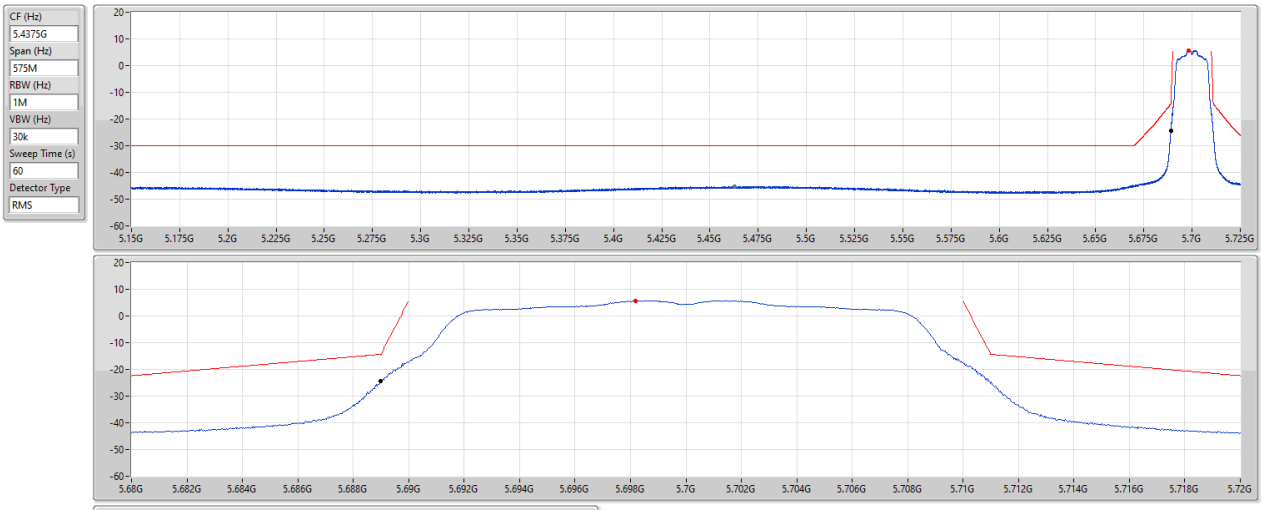
5500MHz_Tnom 11/10/2024



Ref(Hz)	Ref(dBm)	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Range
5.49891G	5.74	5.510985G	-24.12	-13.96	-10.16	1	In Sub-band
5.49891G	5.74	5.467918G	-44.04	-30.00	-14.04	1	OOB

5.47-5.725GHz_802.11a_Nss1,(6Mbps)_1TX **MASK**

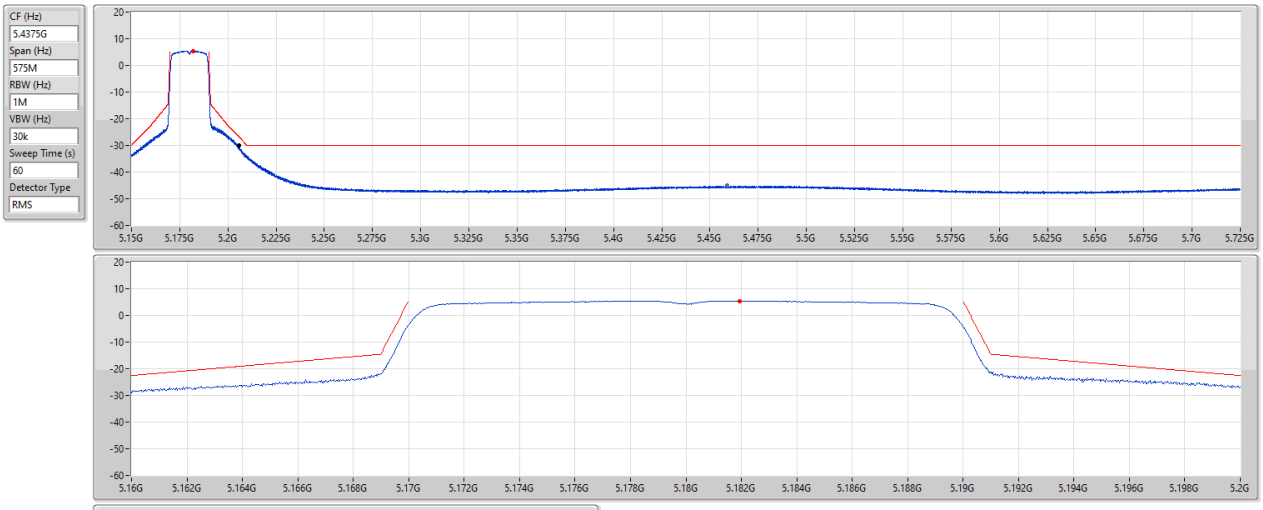
5700MHz_Tnom 11/10/2024



Ref(Hz)	Ref(dBm)	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Range
5.698176G	5.64	5.688976G	-24.37	-14.38	-9.99	1	In Sub-band
5.698176G	5.64	5.462743G	-45.29	-30.00	-15.29	1	OOB

5.15-5.25GHz_ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX **MASK**

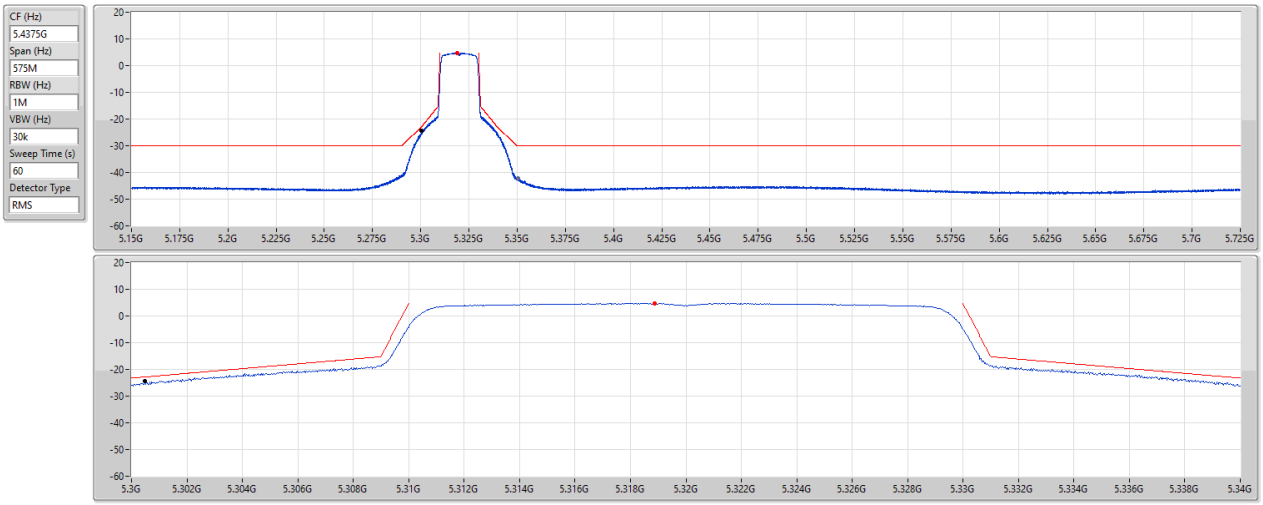
5180MHz_Tnom 11/10/2024



Ref(Hz)	Ref(dBm)	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Range
5.181941G	5.45	5.205603G	-30.02	-26.72	-3.30	1	In Sub-band
5.181941G	5.45	5.458804G	-45.15	-30.00	-15.15	1	OOB

5.25-5.35GHz_ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX **MASK**

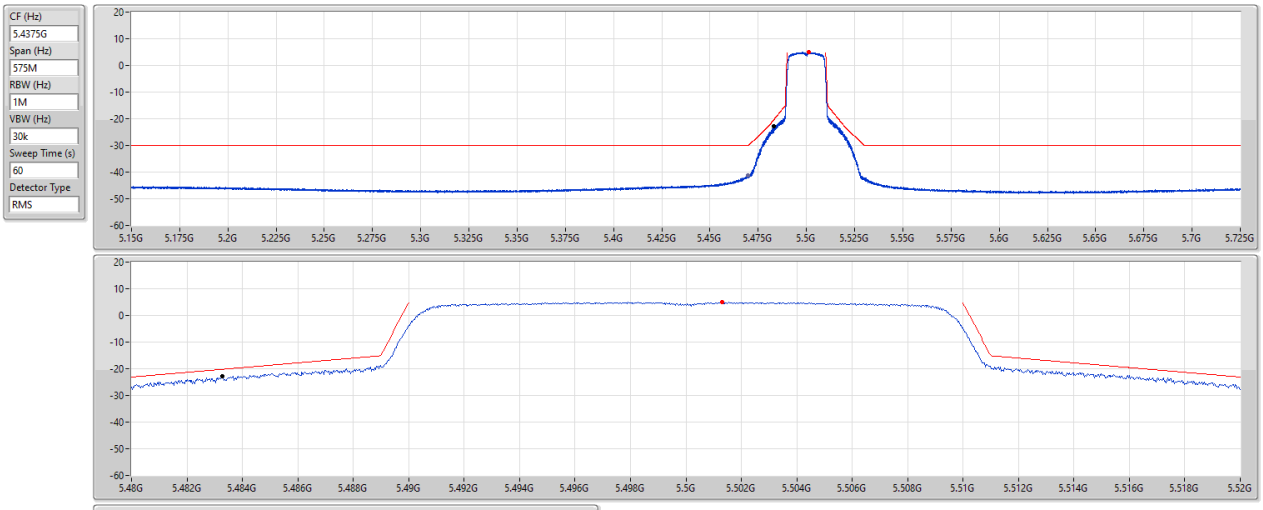
5320MHz_Tnom 11/10/2024



Ref(Hz)	Ref(dBm)	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Range
5.318878G	4.74	5.300478G	-24.45	-22.84	-1.61	1	In Sub-band
5.318878G	4.74	5.35033G	-42.17	-30.00	-12.17	1	OOB

5.47-5.725GHz_ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX **MASK**

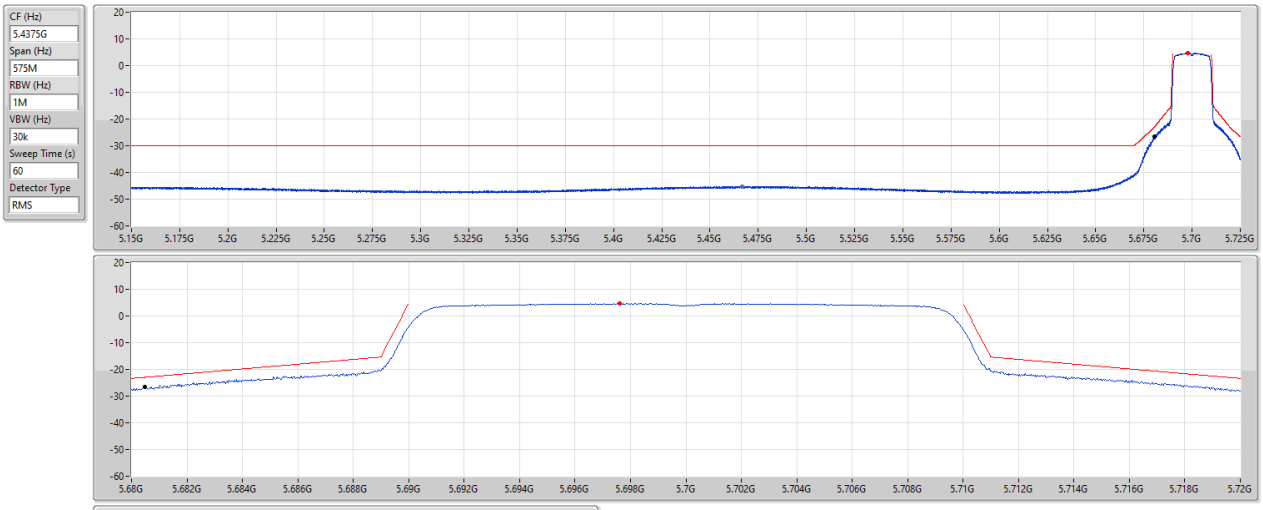
5500MHz_Tnom 11/10/2024



Ref(Hz)	Ref(dBm)	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Range
5.501296G	4.88	5.48327G	-22.85	-20.21	-2.64	1	In Sub-band
5.501296G	4.88	5.469873G	-41.35	-30.00	-11.35	1	OOB

5.47-5.725GHz_ax20 OFDMA_20MHz_Nss1,(MCS0)_1TX **MASK**

5700MHz_Tnom 11/10/2024

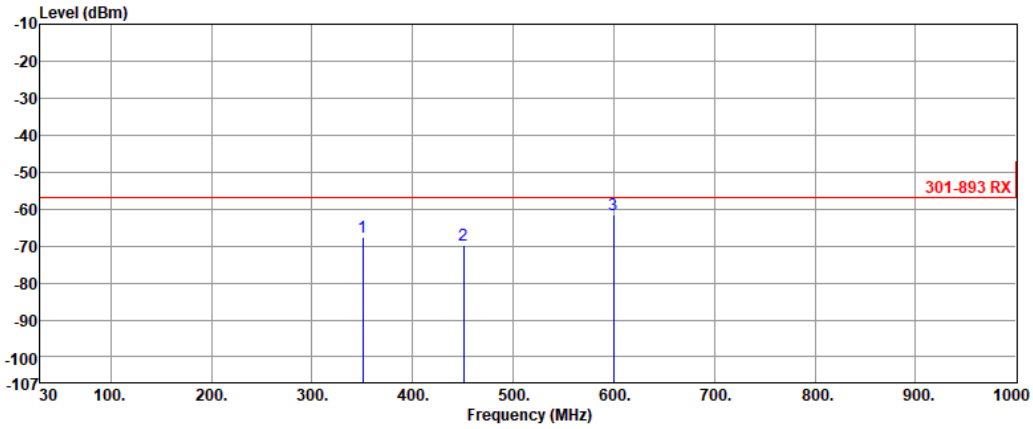


Ref(Hz)	Ref(dBm)	Freq(Hz)	Level(dBm)	Limit(dBm)	Margin(dB)	Port	Range
5.697601G	4.62	5.680466G	-26.48	-22.97	-3.51	1	In Sub-band
5.697601G	4.62	5.466681G	-45.20	-30.00	-15.20	1	OOB

Emissions (Below 1GHz)

Modulation	11a	**Test Freq. (MHz)**	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

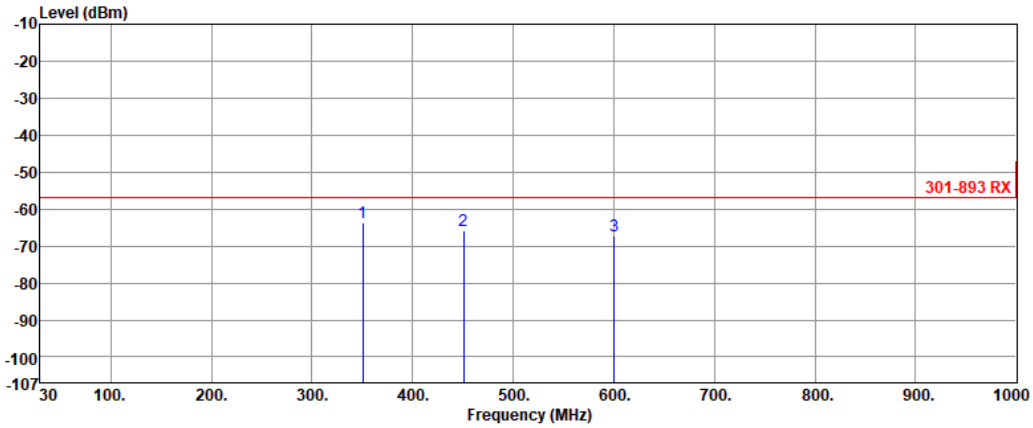


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	350.78	-67.55	-57.00	-10.55	0.00	-67.55
2	450.42	-69.89	-57.00	-12.89	3.01	-72.90
3	600.03	-61.62	-57.00	-4.62	5.79	-67.41

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	Test Freq. (MHz)	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

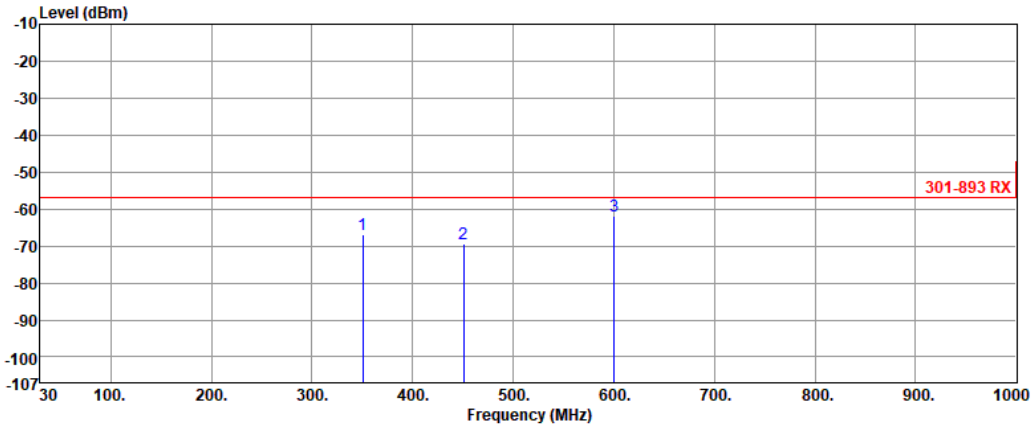


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	350.29	-63.72	-57.00	-6.72	0.07	-63.79
2	450.88	-65.88	-57.00	-8.88	2.42	-68.30
3	600.19	-67.23	-57.00	-10.23	5.60	-72.83

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	Test Freq. (MHz)	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

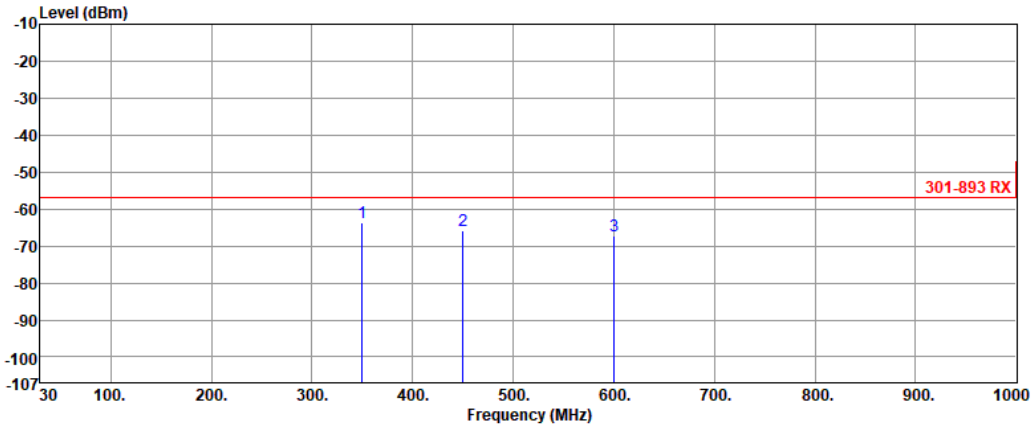


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	350.16	-67.07	-57.00	-10.07	-0.01	-67.06
2	450.62	-69.56	-57.00	-12.56	3.01	-72.57
3	600.35	-61.82	-57.00	-4.82	5.81	-67.63

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	Test Freq. (MHz)	5700
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

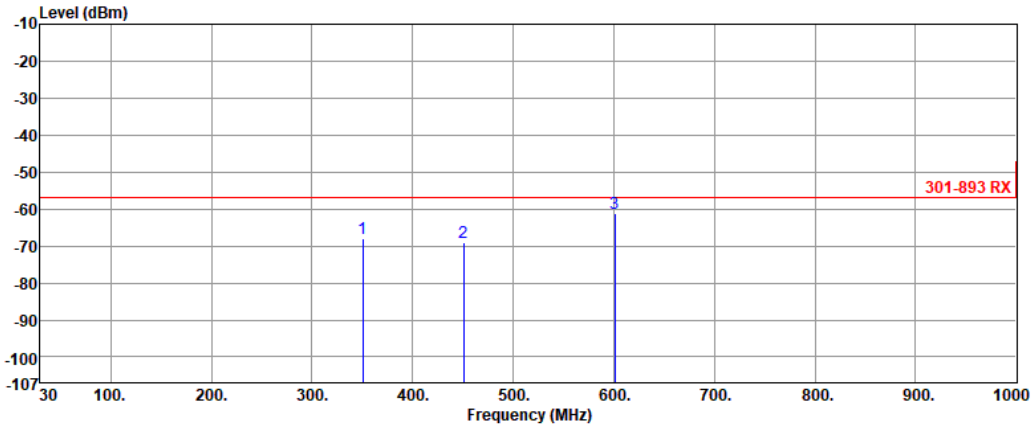


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	350.14	-63.65	-57.00	-6.65	0.06	-63.71
2	450.15	-65.86	-57.00	-8.86	2.40	-68.26
3	600.71	-67.14	-57.00	-10.14	5.62	-72.76

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	Test Freq. (MHz)	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

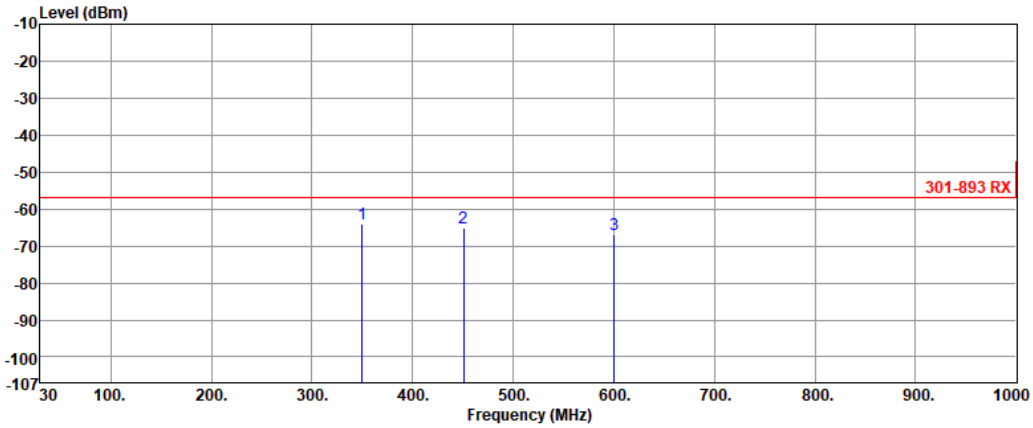


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	350.53	-68.00	-57.00	-11.00	-0.01	-67.99
2	450.48	-69.21	-57.00	-12.21	3.01	-72.22
3	600.82	-61.25	-57.00	-4.25	5.83	-67.08

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	Test Freq. (MHz)	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

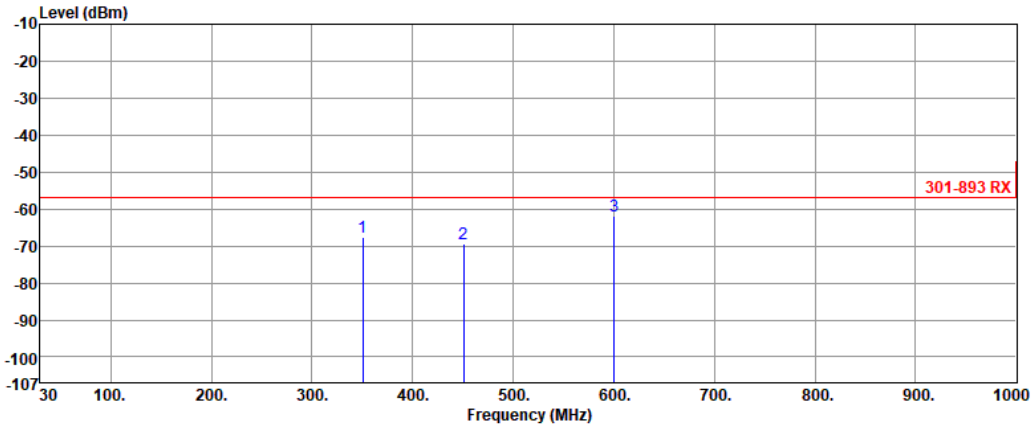


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	350.13	-63.89	-57.00	-6.89	0.06	-63.95
2	450.93	-65.30	-57.00	-8.30	2.42	-67.72
3	600.14	-67.02	-57.00	-10.02	5.60	-72.62

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	Test Freq. (MHz)	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:25 Humidity(%):65

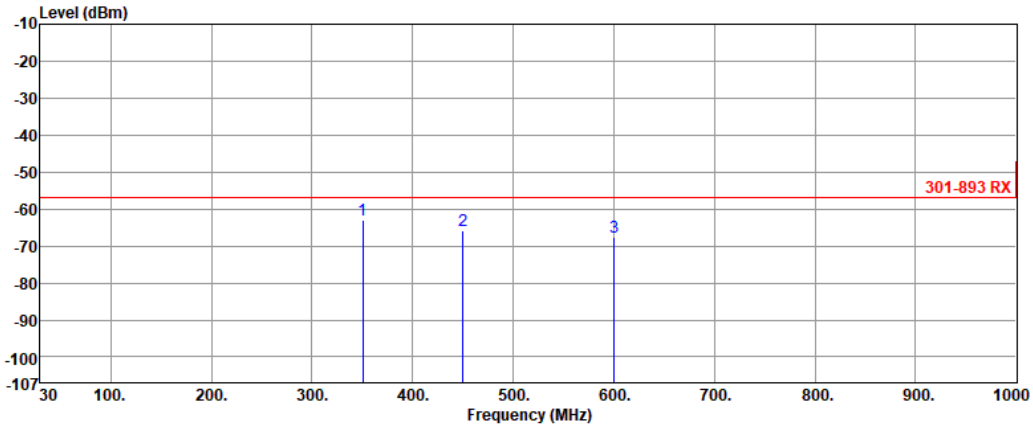


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	350.51	-67.73	-57.00	-10.73	-0.01	-67.72
2	450.44	-69.52	-57.00	-12.52	3.01	-72.53
3	600.53	-61.84	-57.00	-4.84	5.82	-67.66

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	Test Freq. (MHz)	5700
Polarization	Vertical		

Test By :Hugo Zhen Temperature:25 Humidity(%):65



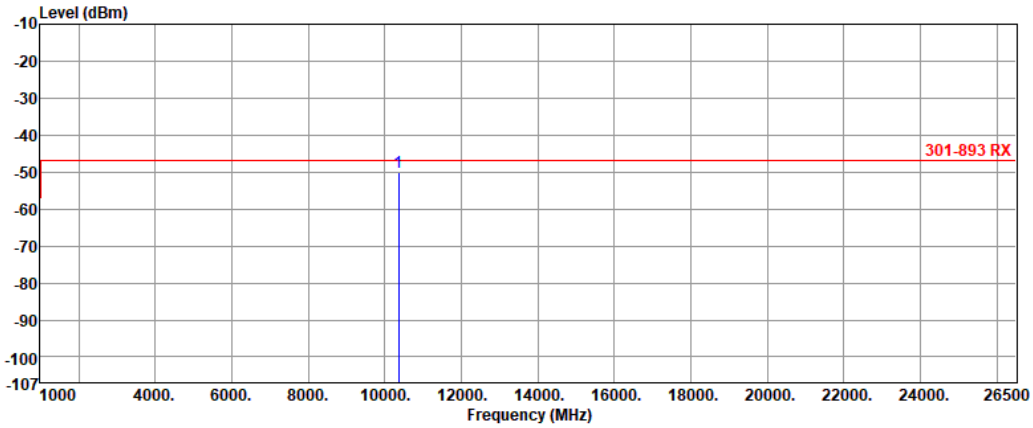
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	350.79	-63.13	-57.00	-6.13	0.10	-63.23
2	450.25	-65.69	-57.00	-8.69	2.40	-68.09
3	600.10	-67.79	-57.00	-10.79	5.60	-73.39

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Emissions (Above 1GHz)

Modulation	11a	**Test Freq. (MHz)**	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

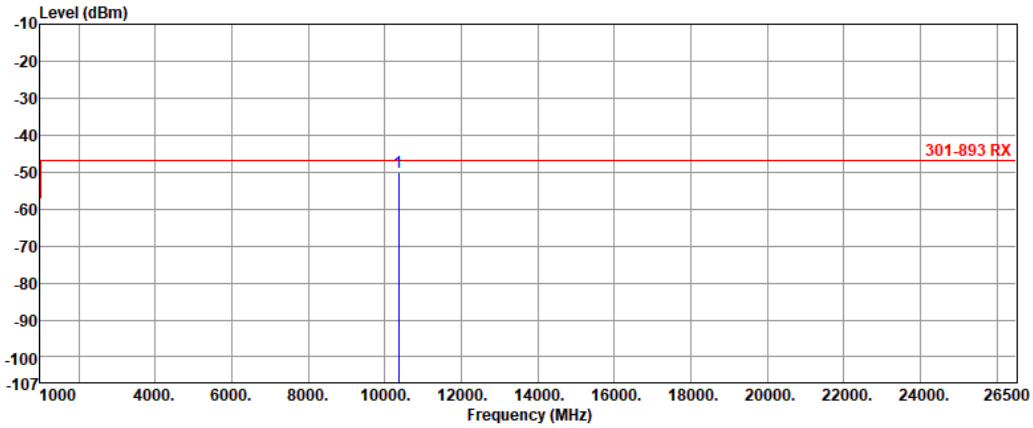


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10359.81	-50.23	-47.00	-3.23	22.66	-72.89

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	Test Freq. (MHz)	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

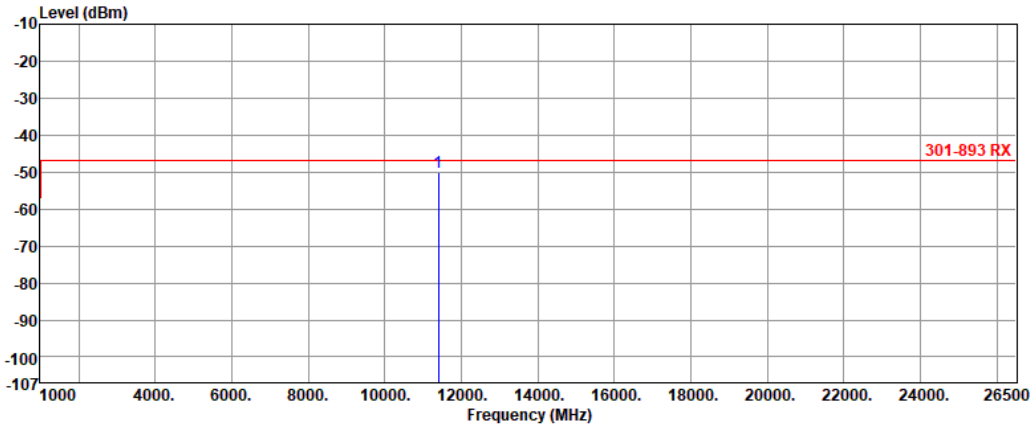


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10359.54	-50.14	-47.00	-3.14	23.08	-73.22

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	Test Freq. (MHz)	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

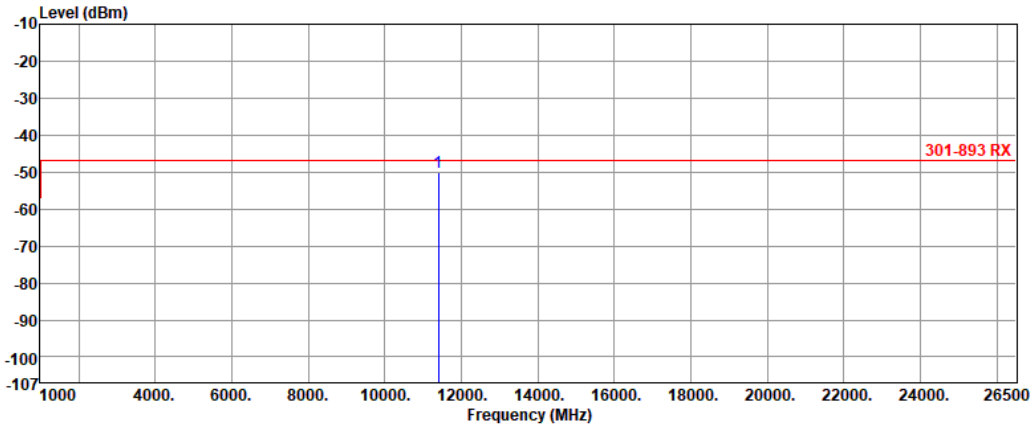


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11399.72	-50.21	-47.00	-3.21	22.67	-72.88

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a	Test Freq. (MHz)	5700
Polarization	Vertical		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

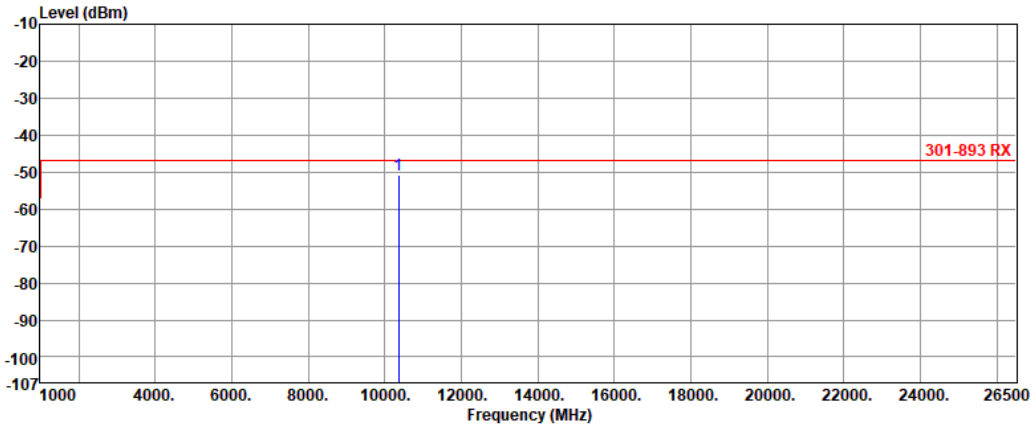


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11399.89	-50.21	-47.00	-3.21	22.00	-72.21

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	Test Freq. (MHz)	5180
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

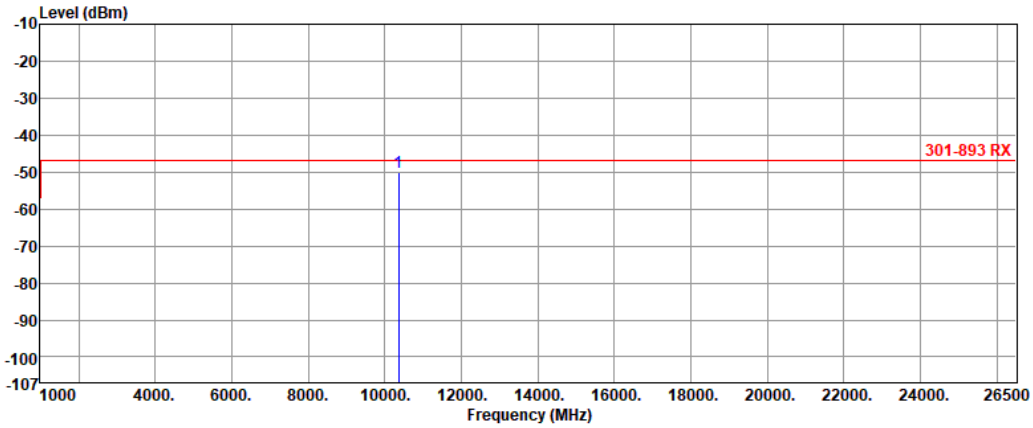


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10359.69	-50.82	-47.00	-3.82	22.66	-73.48

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	Test Freq. (MHz)	5180
Polarization	Vertical		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

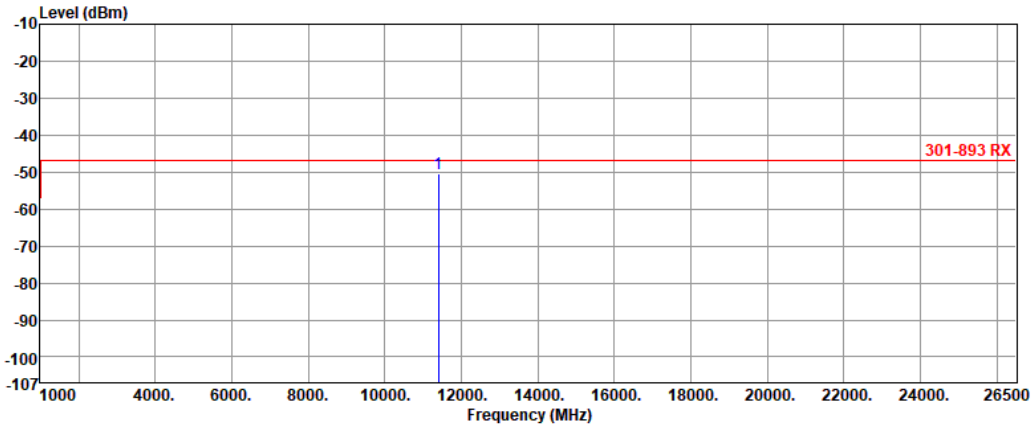


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	10360.02	-50.11	-47.00	-3.11	23.08	-73.19

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	Test Freq. (MHz)	5700
Polarization	Horizontal		

Test By :Hugo Zhen Temperature:24 Humidity(%):65

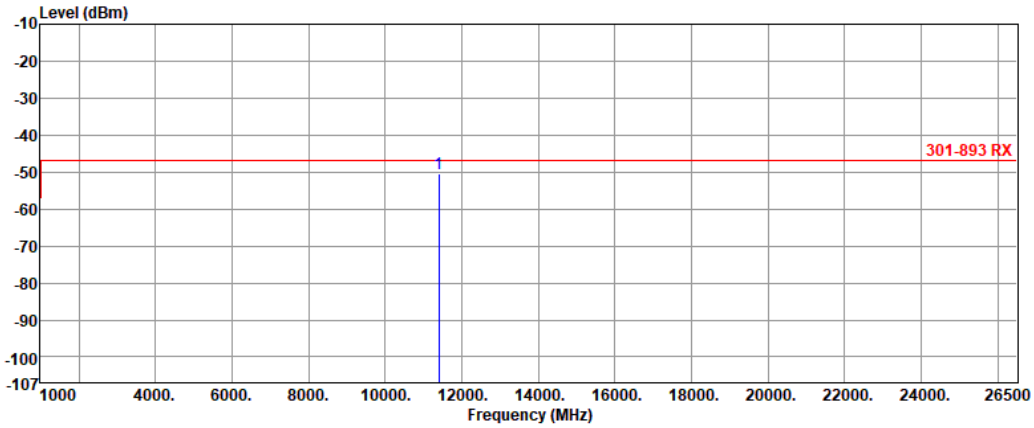


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11399.58	-50.36	-47.00	-3.36	22.67	-73.03

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA	Test Freq. (MHz)	5700
Polarization	Vertical		

Test By :Hugo Zhen Temperature:24 Humidity(%):65



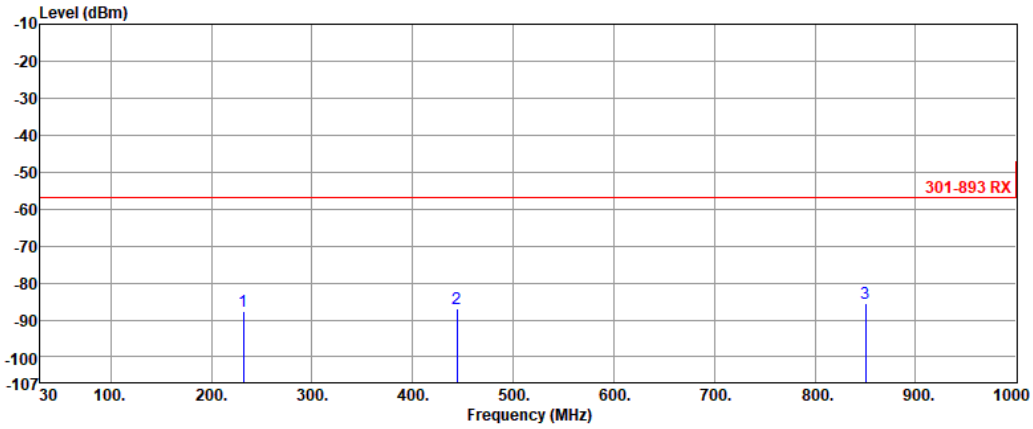
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	11400.14	-50.30	-47.00	-3.30	21.99	-72.29

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Emissions (Below 1GHz)

Modulation	11a
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

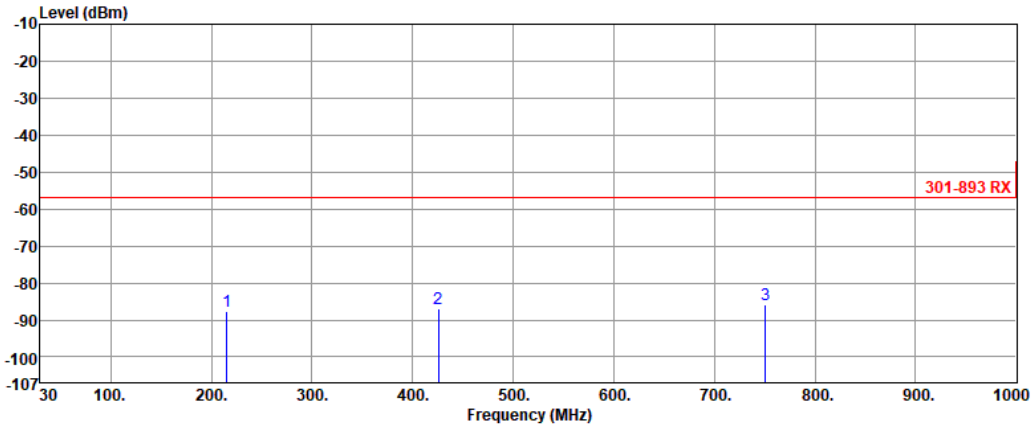


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	231.76	-87.84	-57.00	-30.84	0.00	-87.84
2	444.19	-87.10	-57.00	-30.10	0.00	-87.10
3	850.62	-85.50	-57.00	-28.50	0.00	-85.50

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65

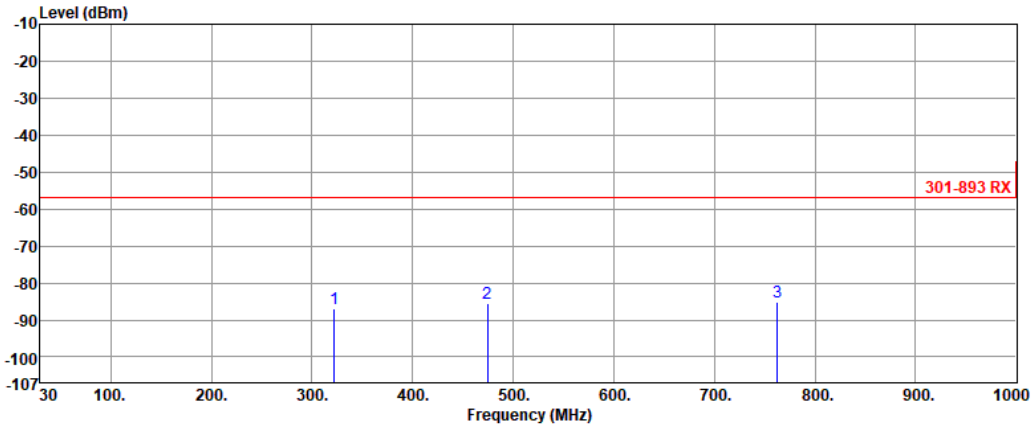


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	215.27	-87.71	-57.00	-30.71	0.00	-87.71
2	425.76	-86.80	-57.00	-29.80	0.00	-86.80
3	750.71	-85.75	-57.00	-28.75	0.00	-85.75

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

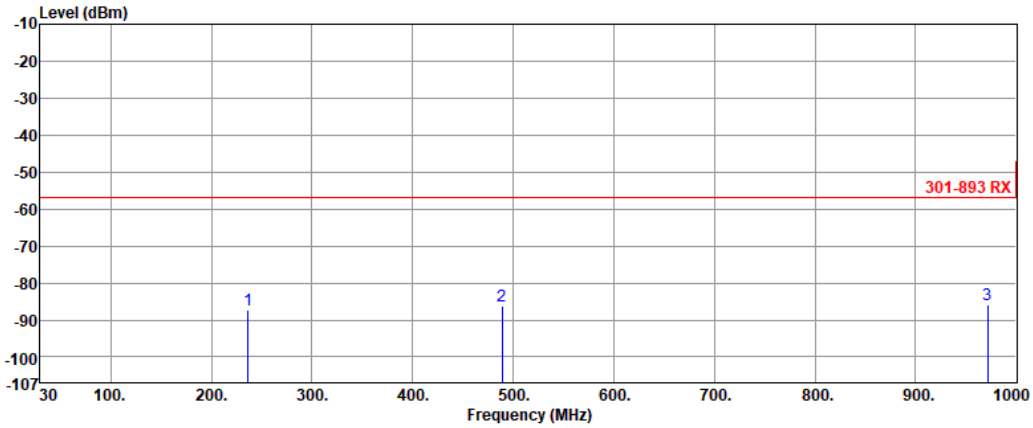


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	321.97	-87.05	-57.00	-30.05	0.00	-87.05
2	474.26	-85.45	-57.00	-28.45	0.00	-85.45
3	762.35	-85.02	-57.00	-28.02	0.00	-85.02

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65



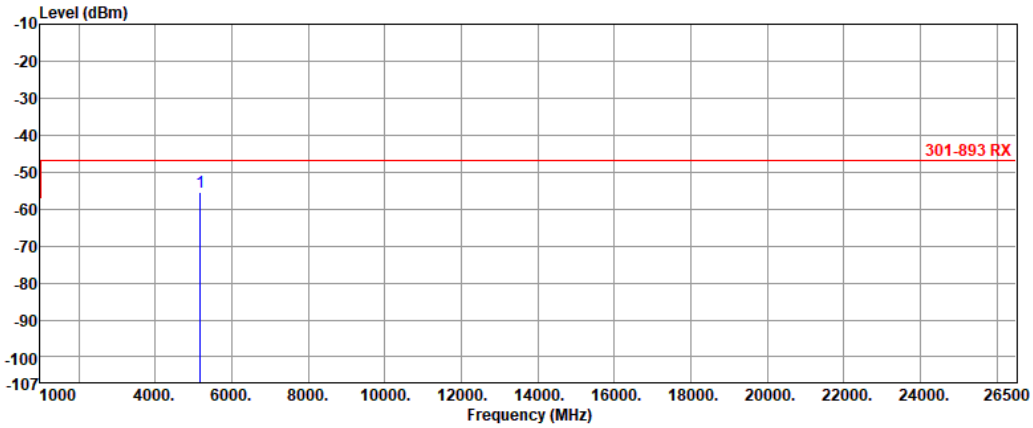
	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	236.61	-87.17	-57.00	-30.17	0.00	-87.17
2	488.81	-86.29	-57.00	-29.29	0.00	-86.29
3	971.87	-85.72	-57.00	-28.72	0.00	-85.72

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Emissions (Above 1GHz)

Modulation	11a
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

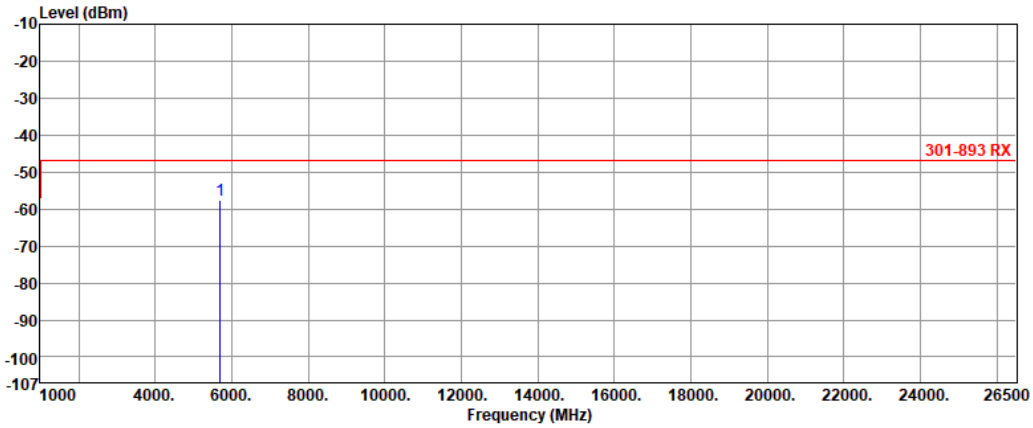


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	5179.99	-55.49	-47.00	-8.49	0.00	-55.49

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	11a
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65

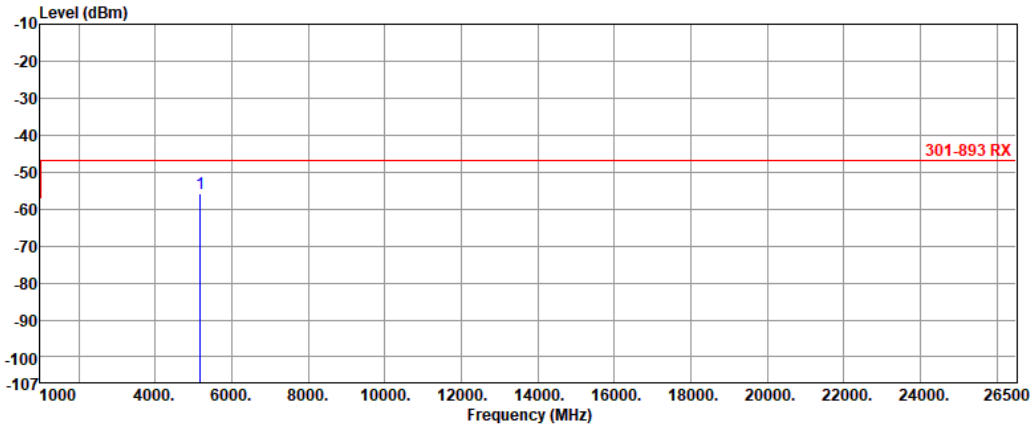


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	5700.03	-57.57	-47.00	-10.57	0.00	-57.57

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA
Test Freq. (MHz)	5180

Test By :Hugo Zhen Temperature:24 Humidity(%):65

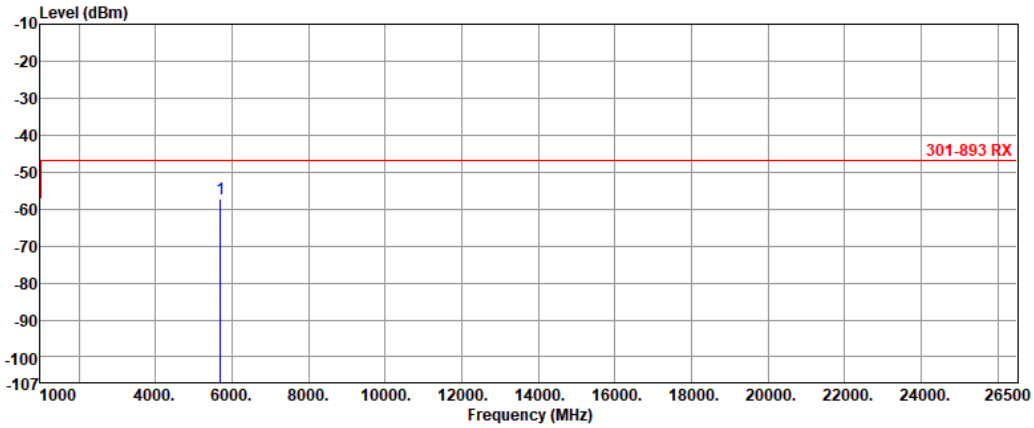


	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	5180.06	-55.85	-47.00	-8.85	0.00	-55.85

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

Modulation	ax HE20-OFDMA
Test Freq. (MHz)	5700

Test By :Hugo Zhen Temperature:24 Humidity(%):65



	Freq.	Measured value	Limit	Margin	Factor	Reading
	MHz	dBm	dBm	dB	dB	dBm
1	5700.02	-57.36	-47.00	-10.36	0.00	-57.36

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

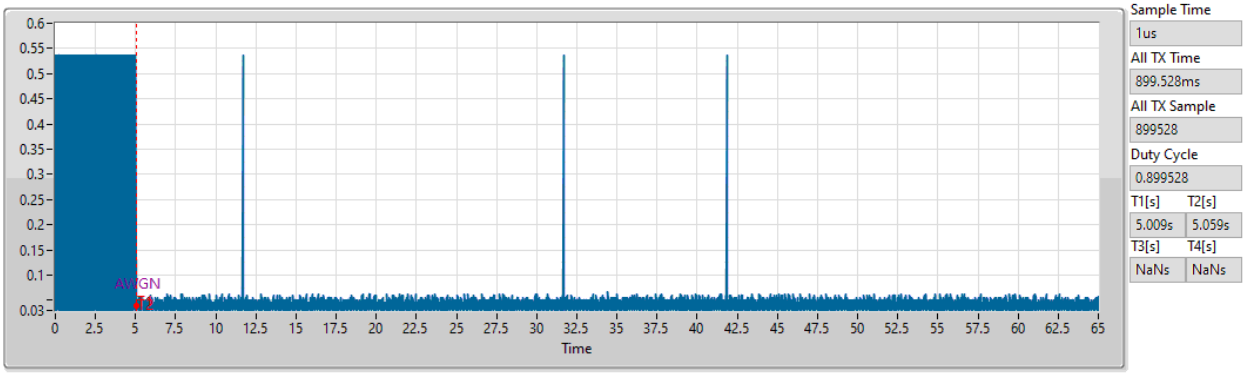
Test Result of Adaptivity and Short Control Signalling Transmissions

Adaptivity Result						
Equipment / Device type		Load Based Equipment / Supervised Device				
Energy Detect Threshold Level (dBm)		-71.2				
Modulation Mode	**Freq. (MHz)**	**Interference Signal Frequency (MHz)**	**Interference Signal Type**	**Short Control Signalling Transmissions (ms)/period Numbers**	**Channel Occupancy Time (ms)**	**Adaptivity**
802.11ax (HE20)	5500	5500	AWGN	0.132 / 2	5.44	PASS
802.11ax (HE20)	5500	5500	OFDM	0.046 / 1		
802.11ax (HE20)	5500	5500	LTE	0.046 / 1		
Limit				< 2.5 ms / 50	6ms	N/A

Adaptivity Result Plots

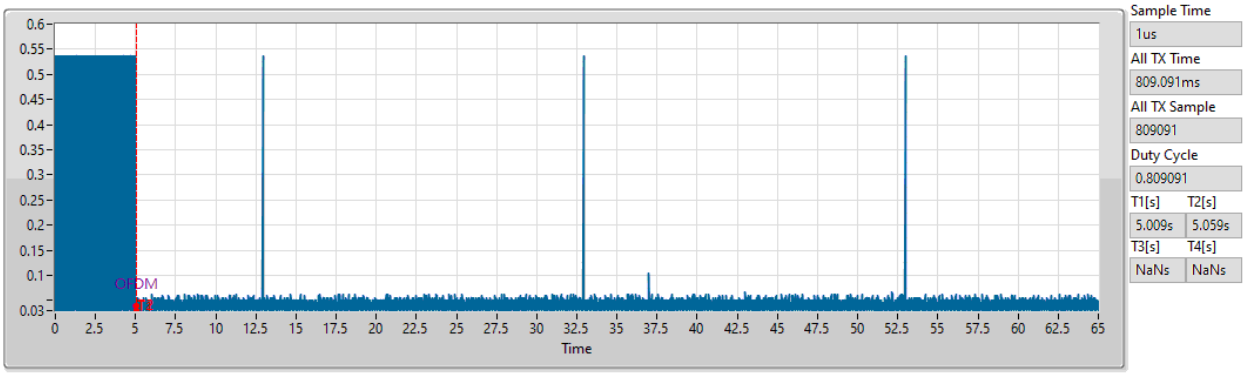
802.11ax (HE20) - 5500MHz (AWGN)

Time Analysis



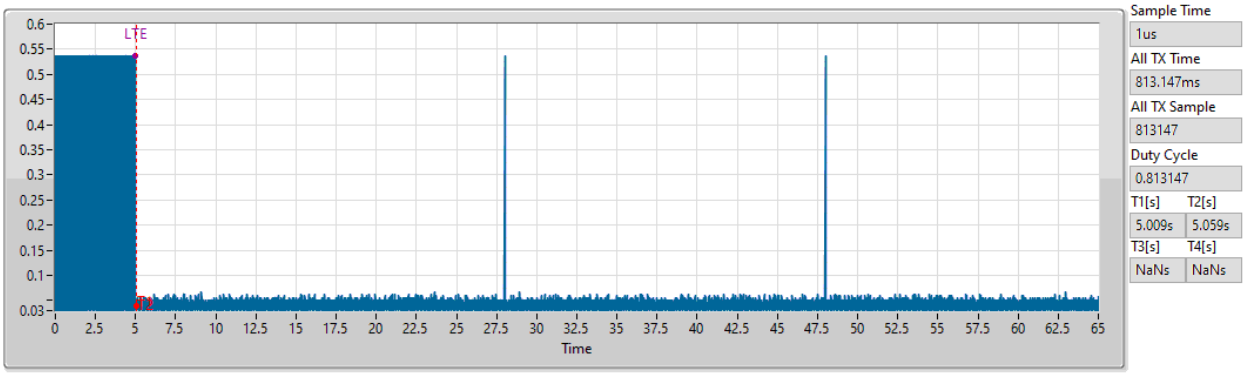
802.11ax (HE20) - 5500MHz (OFDM)

Time Analysis

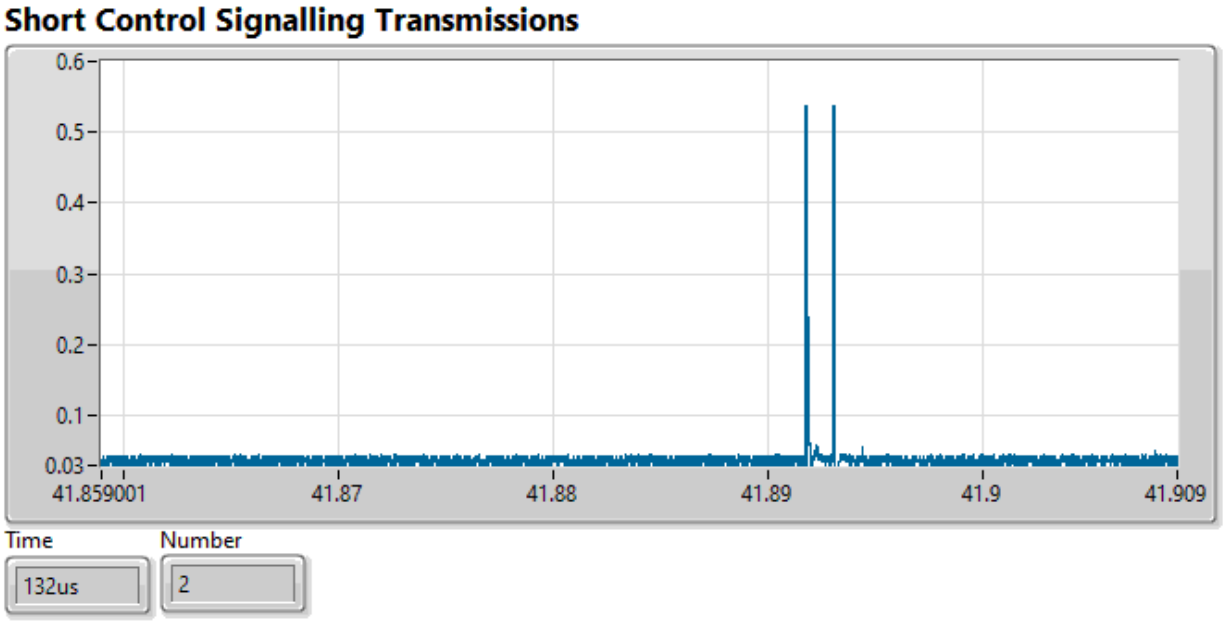


802.11ax (HE20) - 5500MHz (LTE)

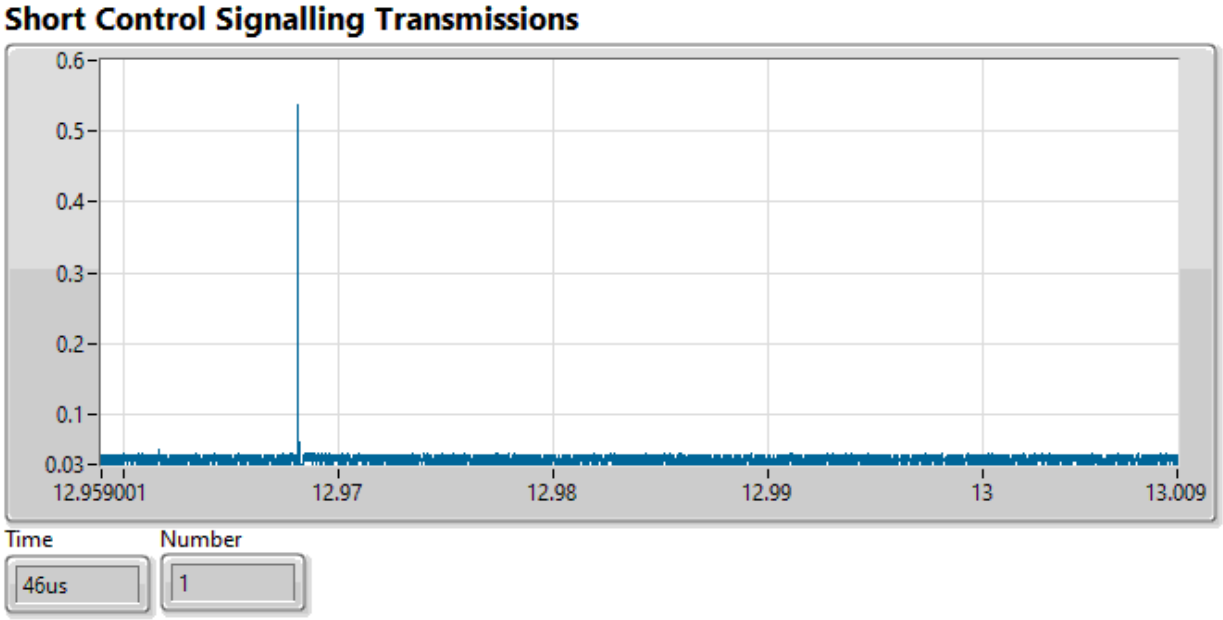
Time Analysis



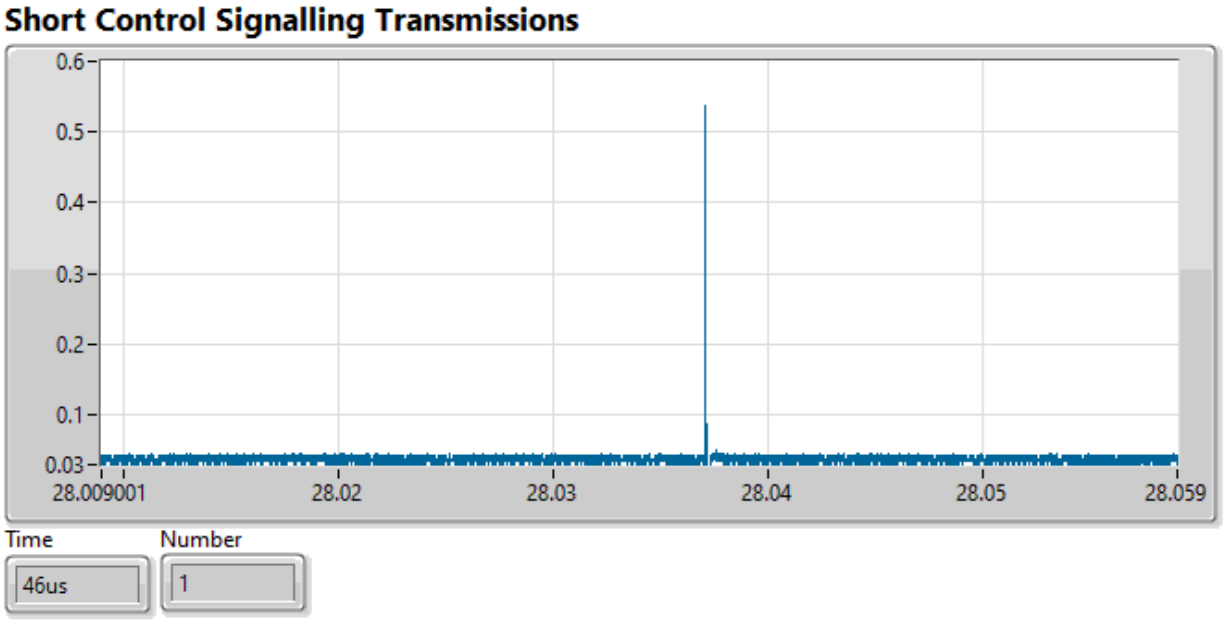
Short Control Signalling Transmissions Plots
802.11ax (HE20) - 5500MHz (AWGN)



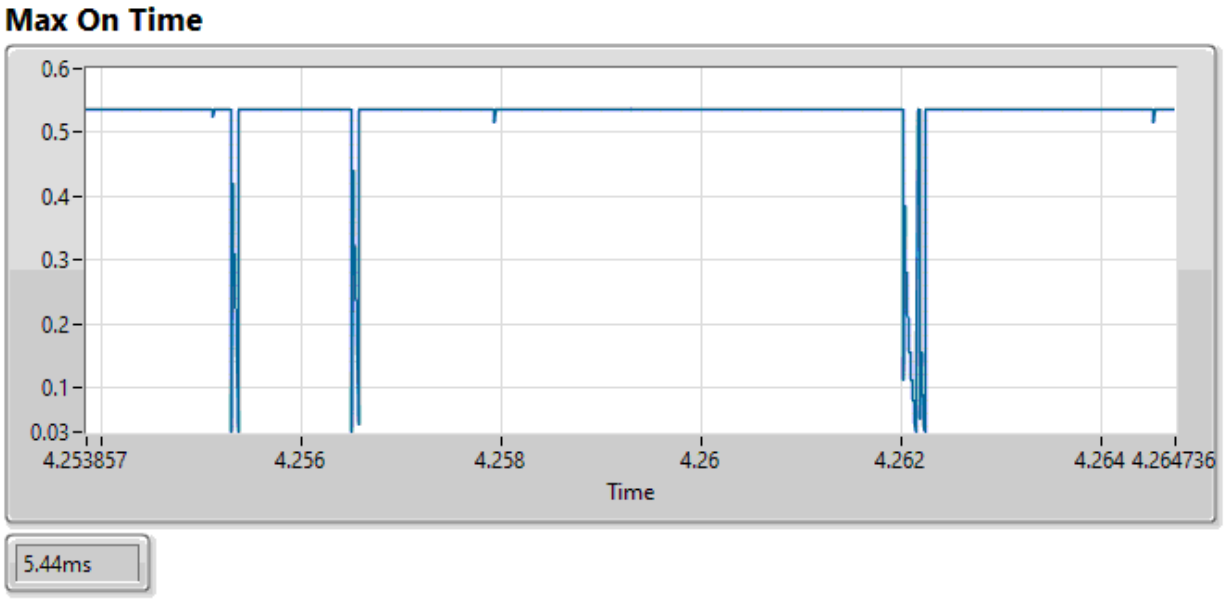
Short Control Signalling Transmissions Plots
802.11ax (HE20) - 5500MHz (OFDM)



802.11ax (HE20) - 5500MHz (LTE)



Channel Occupancy Time
802.11ax (HE20) - 5500MHz



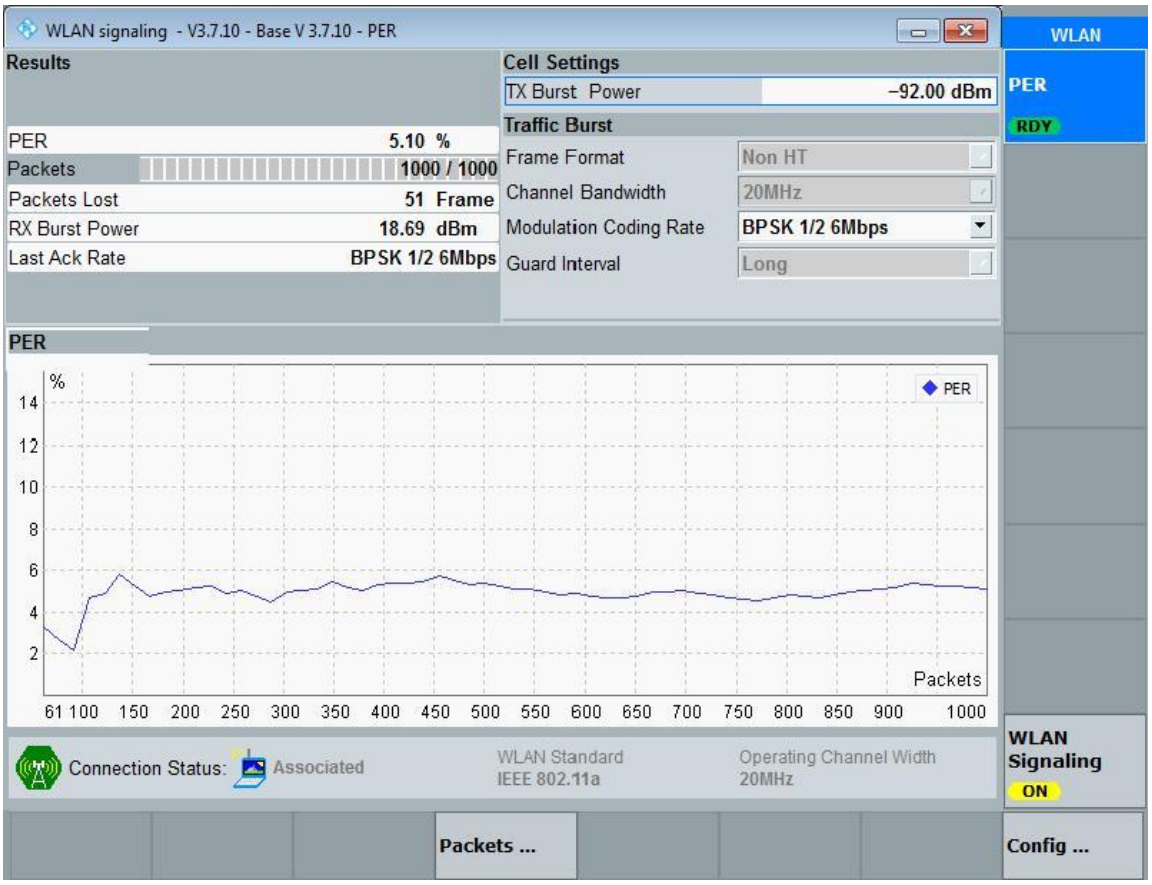
Idle Period probability evaluation

Priority Class	Class 2
Operating Type	Supervised Device
Test condition	11ax HE20 / 5500MHz

n	H(Bn)	Pn	Pn Limit	Result
0	0	0.00000	0.05000	Pass
1	0	0.00000	0.12000	Pass
2	372	0.03606	0.18250	Pass
3	33	0.03926	0.24500	Pass
4	2224	0.25482	0.30750	Pass
5	30	0.25773	0.37000	Pass
6	1155	0.36968	0.43250	Pass
7	163	0.38548	0.49500	Pass
8	232	0.40797	0.55750	Pass
9	200	0.42735	0.62000	Pass
10	217	0.44839	0.68250	Pass
11	208	0.46855	0.74500	Pass
12	160	0.48406	0.80750	Pass
13	217	0.50509	0.87000	Pass
14	194	0.52389	0.93250	Pass
15	204	0.54367	0.99500	Pass
16	4708	1.00000	1.00000	Pass

11a / 5180 MHz

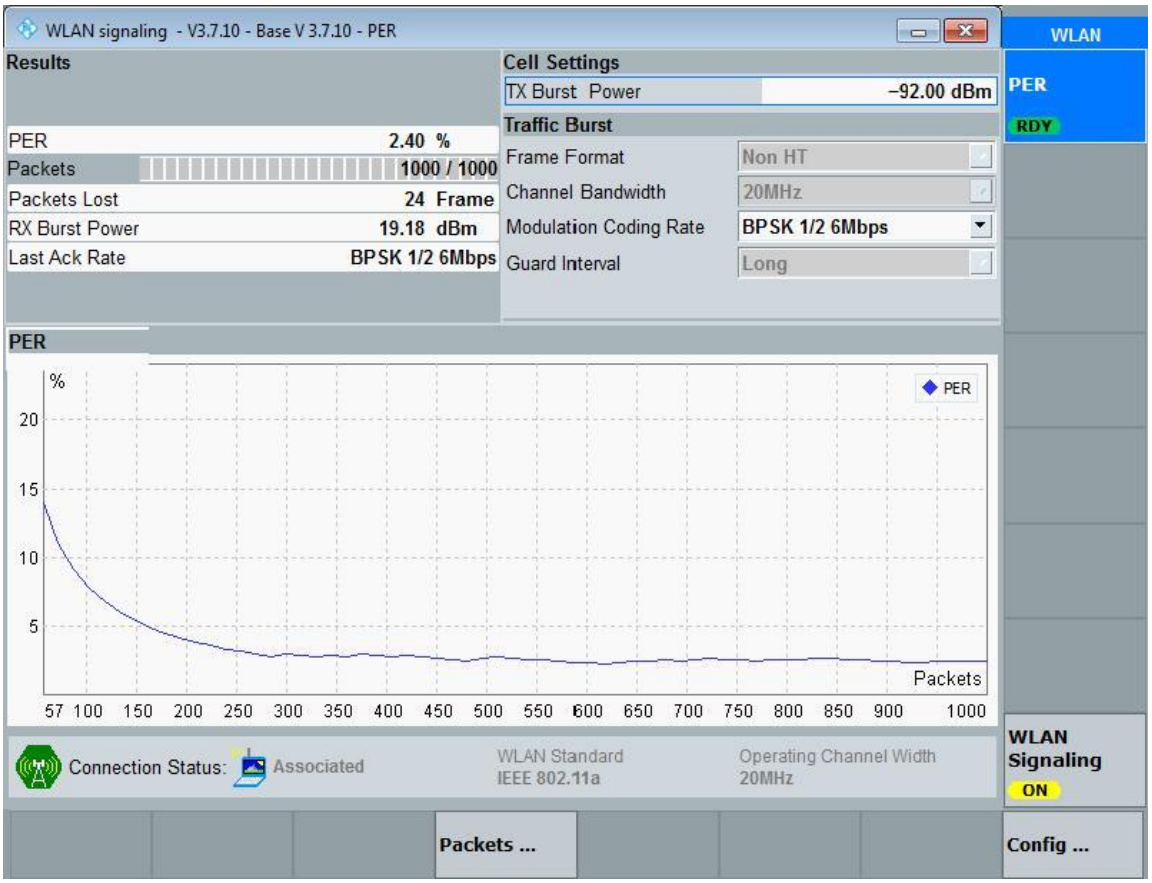
Without Interference Signal Sensitivity Level



Minimum Level of the Wanted Signal (dBm)	-92		
Wanted Signal Mean Power from Companion Device (dBm)	**Blocking Signal Frequency (MHz)**	**Blocking Signal Power (dBm)**	**Test Result**
-86.00	5100	-59	Pass
-86.00	4900	-53	Pass
-86.00	5000		Pass
-86.00	5975		Pass

11a / 5700 MHz

Without Interference Signal Sensitivity Level



Minimum Level of the Wanted Signal (dBm)	-92		
Wanted Signal Mean Power from Companion Device (dBm)	**Blocking Signal Frequency (MHz)**	**Blocking Signal Power (dBm)**	**Test Result**
-86.00	5100	-59	Pass
-86.00	4900	-53	Pass
-86.00	5000		Pass
-86.00	5975		Pass

Configuration 2: Laird part number: 453-00193

full RU configuration

RF Output Power at the Highest Power

Maximum Transmit Power (dBm)				
Condition	**Freq. (MHz)**	**802.11a**	**ax HE20-OFDMA**	**Limit (dBm)**
TnomVnom	5180	20.10	20.62	23
TnomVnom	5320	20.00	20.69	23
TnomVnom	5500	19.87	20.65	23
TnomVnom	5700	20.00	20.50	23

RF Output Power at the Lowest Power

Maximum Transmit Power (dBm)				
Condition	**Freq. (MHz)**	**802.11a**	**ax HE20-OFDMA**	**Limit (dBm)**
TnomVnom	5320	14.00	14.69	17
TnomVnom	5500	13.87	14.65	17
TnomVnom	5700	14.00	14.50	17

Power Density

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz) e.i.r.p.	Limit (dBm/1MHz) e.i.r.p.	Results
11a	5180	9.91	10	Pass
11a	5320	9.79	10	Pass
11a	5500	9.59	10	Pass
11a	5700	9.78	10	Pass
ax HE20-OFDMA	5180	9.71	10	Pass
ax HE20-OFDMA	5320	9.77	10	Pass
ax HE20-OFDMA	5500	9.80	10	Pass
ax HE20-OFDMA	5700	9.60	10	Pass

partial RU configuration

RF Output Power (dBm)						
Condition	Freq. (MHz)	ax HE20-OFDMA			Limit (dBm)	Results
		RU26	RU52	RU106		
$T_{nom}V_{nom}$	5180	12.82	15.76	18.69	23	Pass
$T_{nom}V_{nom}$	5320	12.63	15.73	18.50	23	Pass
$T_{nom}V_{nom}$	5500	12.77	15.88	18.67	23	Pass
$T_{nom}V_{nom}$	5700	12.88	15.76	18.55	23	Pass

Power Density

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz) e.i.r.p.	Limit (dBm/1MHz) e.i.r.p.	Results
ax HE20-OFDMA RU26	5180	9.72	10	Pass
ax HE20-OFDMA RU26	5320	9.52	10	Pass
ax HE20-OFDMA RU26	5500	9.72	10	Pass
ax HE20-OFDMA RU26	5700	9.79	10	Pass
ax HE20-OFDMA RU52	5180	9.75	10	Pass
ax HE20-OFDMA RU52	5320	9.73	10	Pass
ax HE20-OFDMA RU52	5500	9.85	10	Pass
ax HE20-OFDMA RU52	5700	9.75	10	Pass
ax HE20-OFDMA RU106	5180	9.86	10	Pass
ax HE20-OFDMA RU106	5320	9.71	10	Pass
ax HE20-OFDMA RU106	5500	9.84	10	Pass
ax HE20-OFDMA RU106	5700	9.80	10	Pass

Configuration 3: Laird part number: 453-00213

full RU configuration

RF Output Power at the Highest Power

Maximum Transmit Power (dBm)				
Condition	**Freq. (MHz)**	**802.11a**	**ax HE20-OFDMA**	**Limit (dBm)**
TnomVnom	5180	20.01	20.65	23
TnomVnom	5320	19.95	20.63	23
TnomVnom	5500	19.82	20.65	23
TnomVnom	5700	20.00	20.60	23

RF Output Power at the Lowest Power

Maximum Transmit Power (dBm)				
Condition	**Freq. (MHz)**	**802.11a**	**ax HE20-OFDMA**	**Limit (dBm)**
TnomVnom	5320	13.95	14.63	17
TnomVnom	5500	13.82	14.65	17
TnomVnom	5700	14.00	14.60	17

Power Density

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz) e.i.r.p.	Limit (dBm/1MHz) e.i.r.p.	Results
11a	5180	9.73	10	Pass
11a	5320	9.66	10	Pass
11a	5500	9.64	10	Pass
11a	5700	9.76	10	Pass
ax HE20-OFDMA	5180	9.76	10	Pass
ax HE20-OFDMA	5320	9.78	10	Pass
ax HE20-OFDMA	5500	9.77	10	Pass
ax HE20-OFDMA	5700	9.73	10	Pass

partial RU configuration

RF Output Power (dBm)						
Condition	Freq. (MHz)	ax HE20-OFDMA			Limit (dBm)	Results
		RU26	RU52	RU106		
$T_{nom}V_{nom}$	5180	12.80	15.72	18.55	23	Pass
$T_{nom}V_{nom}$	5320	12.52	15.65	18.52	23	Pass
$T_{nom}V_{nom}$	5500	12.77	15.82	18.65	23	Pass
$T_{nom}V_{nom}$	5700	12.82	15.88	18.51	23	Pass

Power Density

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz) e.i.r.p.	Limit (dBm/1MHz) e.i.r.p.	Results
ax HE20-OFDMA RU26	5180	9.79	10	Pass
ax HE20-OFDMA RU26	5320	9.51	10	Pass
ax HE20-OFDMA RU26	5500	9.70	10	Pass
ax HE20-OFDMA RU26	5700	9.77	10	Pass
ax HE20-OFDMA RU52	5180	9.65	10	Pass
ax HE20-OFDMA RU52	5320	9.69	10	Pass
ax HE20-OFDMA RU52	5500	9.85	10	Pass
ax HE20-OFDMA RU52	5700	9.86	10	Pass
ax HE20-OFDMA RU106	5180	9.79	10	Pass
ax HE20-OFDMA RU106	5320	9.79	10	Pass
ax HE20-OFDMA RU106	5500	9.76	10	Pass
ax HE20-OFDMA RU106	5700	9.76	10	Pass

Configuration 4: Laird part number: 453-00214

full RU configuration

RF Output Power at the Highest Power

Maximum Transmit Power (dBm)				
Condition	**Freq. (MHz)**	**802.11a**	**ax HE20-OFDMA**	**Limit (dBm)**
TnomVnom	5180	20.00	20.50	23
TnomVnom	5320	19.91	20.48	23
TnomVnom	5500	19.86	20.50	23
TnomVnom	5700	19.92	20.62	23

RF Output Power at the Lowest Power

Maximum Transmit Power (dBm)				
Condition	**Freq. (MHz)**	**802.11a**	**ax HE20-OFDMA**	**Limit (dBm)**
TnomVnom	5320	13.91	14.48	17
TnomVnom	5500	13.86	14.50	17
TnomVnom	5700	13.92	14.62	17

Power Density

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz) e.i.r.p.	Limit (dBm/1MHz) e.i.r.p.	Results
11a	5180	9.80	10	Pass
11a	5320	9.58	10	Pass
11a	5500	9.56	10	Pass
11a	5700	9.69	10	Pass
ax HE20-OFDMA	5180	9.72	10	Pass
ax HE20-OFDMA	5320	9.51	10	Pass
ax HE20-OFDMA	5500	9.63	10	Pass
ax HE20-OFDMA	5700	9.63	10	Pass

partial RU configuration

RF Output Power (dBm)						
Condition	Freq. (MHz)	ax HE20-OFDMA			Limit (dBm)	Results
		RU26	RU52	RU106		
$T_{nom}V_{nom}$	5180	12.77	15.65	18.50	23	Pass
$T_{nom}V_{nom}$	5320	12.32	15.59	18.47	23	Pass
$T_{nom}V_{nom}$	5500	12.55	15.72	18.62	23	Pass
$T_{nom}V_{nom}$	5700	12.71	15.63	18.38	23	Pass

Power Density

Modulation Mode	Freq. (MHz)	Power Density (dBm/1MHz) e.i.r.p.	Limit (dBm/1MHz) e.i.r.p.	Results
ax HE20-OFDMA RU26	5180	9.73	10	Pass
ax HE20-OFDMA RU26	5320	9.26	10	Pass
ax HE20-OFDMA RU26	5500	9.58	10	Pass
ax HE20-OFDMA RU26	5700	9.75	10	Pass
ax HE20-OFDMA RU52	5180	9.67	10	Pass
ax HE20-OFDMA RU52	5320	9.62	10	Pass
ax HE20-OFDMA RU52	5500	9.82	10	Pass
ax HE20-OFDMA RU52	5700	9.62	10	Pass
ax HE20-OFDMA RU106	5180	9.76	10	Pass
ax HE20-OFDMA RU106	5320	9.79	10	Pass
ax HE20-OFDMA RU106	5500	9.88	10	Pass
ax HE20-OFDMA RU106	5700	9.57	10	Pass