

FCC UNII RF TEST REPORT



Test Report Number.....	GBX-19011401-LC-RF-FCC-UNII
Applicant.....	MyGnar, Inc.
Applicant Address.....	2525 MAIN ST, SUITE 300, Santa Monica, CA 90405 US
Product Name.....	GNARBOX 2.0 SSD
Model Number.....	GNAR128V2
Family Product/Model.....	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2
Date of EUT received.....	01/21/2019
Date of Test.....	01/23/2019 – 02/12/2019
Report Issue Date.....	02/13/2019
Test Standards.....	47CFR Part 15.407: 2018
Test Result.....	Pass

Issued By:

Vista Laboratories

1261 Puerta Del Sol, San Clemente, CA 92673 USA

www.vista-compliance.com

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report. This report is not to be reproduced by any means except in full and in any case not without the written approval of Vista Laboratories.

Tested by:

Sherwin Lee/Test Engineer

Approved By:

David Zhang/Technical Manager

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



Laboratory Introduction

Vista Labs is an A2LA accredited 17025 compliant regulatory compliance testing laboratories (Cert. number: 4848-01) strategically located in Orange County, providing services in the electrical and telecommunication industries. Vista labs is also recognized testing facility for Australia (ACMA), Chinese Taipei (BSMI), Chinese Taipei (NCC), Hong Kong (OFCA), Israel (MOC), Korea (RRA), Singapore (IMDA), Vietnam (MIC), etc.

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Accredited Laboratory

A2LA has accredited

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San Clemente, CA

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This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 21st day of June 2018.

President and CEO
For the Accreditation Council
Certificate Number 4848.01
Valid to July 31, 2020

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

17025 Product Testing Accreditation Certificate

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REVISION HISTORY

Revision	Issue Date	Description	Note
Original	02/13/2019	Original release	N/A

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
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1 General Information

1.1 Applicant

Applicant:	MyGnar, Inc.
Applicant address:	2525 MAIN ST, SUITE 300, Santa Monica, CA 90405 US
Manufacturer:	MyGnar, Inc.
Manufacturer Address:	2525 MAIN ST, SUITE 300, Santa Monica, CA 90405 US

1.2 Product information

Product Name	GNARBOX 2.0 SSD
Model Number	GNAR128V2
Family Model Number	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2
Serial Number	N/A
Frequency Band	FCC: - 802.11b/g/n-20MHz: 2412-2462MHz - 802.11n-40MHz: 2422-2452MHz - 802.11a/n-20MHz: 5180-5320MHz, 5500-5720MHz, 5725-5825MHz - 802.11n-40MHz: 5190-5310MHz, 5510-5710MHz, 5755-5795MHz - 802.11ac: 5210-5290MHz, 5530-5690MHz, 5775MHz
Type of modulation	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM) 802.11a/n/ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Equipment Class/ Category	DTS, UNII
Maximum output power	See test result
Antenna Information	PCB antenna (-10 dBi – 2.4GHz, -5 dBi – 5GHz)
Clock Frequencies	2.40GHZ (CPU)
Port/Connectors	2x USB-C, SD & Micro HDMI ports
Input Power	Battery powered: DC 7.8V, 2.5A
Power Adapter Manu/Model	KYTW40P01
Power Adapter SN	N/A
Hardware version	GNAR128V2, GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2
Software version	v2.0.0
Simultaneous Transmission	N/A
Additional Info	1. EUT is DFS client device without radar detection capability. 2. The family models include GNAR128V2, GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2. The only difference between these models are the capacity of the SSD which varies from 128GB to 2048GB while the electrical parameters of the SSD including read/write speed, etc, are identical in different models. Hence the difference on SSD capacity does not affect any product Radio or EMC performance. Only the worst case representative testing result on model GNAR128V2 is presented in current report.

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1.3 Test standard and method

Test standard	47CFR Part 15.407: 2018
Test method	ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v02r01

1.4 Test Purpose and statement

The purpose of this test report is intended to demonstrate the compliance of product listed in section 1.2, received from company listed in section 1.1, to the requirements of standard and method listed in section 1.3. Based on our test results, we conclude that the product tested complies with the requirements of the standards indicated.

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2 Test site information

Lab performing tests	Vista Laboratories
Lab Address	1261 Puerta Del Sol, San Clemente, CA 92673 USA
Phone Number	+1 (949) 393-1123
Website	www.Vista-compliance.com

Test condition	Test Engineer	Test Environment	Test Date
RF conducted	Sherwin Lee	23.5°C / 58.2%/996 mbar	01/23/2019 – 02/12/2019
Radiated	Sherwin Lee	23.5°C / 58.2%/996 mbar	01/23/2019 – 02/12/2019

3 Modification of EUT

The EUT is an engineering test sample loaded with RF testing software specifically designed to support the RF TX/RX measurement in different aspects.

4 Test configuration and operation

4.1 EUT test configuration

EUT is powered by removable battery or external power supply through USB-C cables. EUT's RF antenna port can be connected to spectrum analyzer or signal generator through IPEX MHF4 RF cable for RF conducted measurement. The operation, control and display are done by the built-in buttons and OLED display.

4.2 EUT test channel

Radio	Channel	Radio	Channel
802.11-a	5180	802.11-a	5260
802.11-a	5200	802.11-a	5280
802.11-a	5240	802.11-a	5320
802.11-n-20	5180	802.11-n-20	5260
802.11-n-20	5200	802.11-n-20	5280
802.11-n-20	5240	802.11-n-20	5320
802.11-n-40	5190	802.11-n-40	5270
802.11-n-40	5230	802.11-n-40	5310
802.11-ac-80	5210	802.11-ac-80	5290

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Radio	Channel	Radio	Channel
802.11-a	5500	802.11-a	5745
802.11-a	5600	802.11-a	5785
802.11-a	5700	802.11-a	5825
802.11-n-20	5500	802.11-n-20	5745
802.11-n-20	5600	802.11-n-20	5785
802.11-n-20	5700	802.11-n-20	5825
802.11-n-40	5510	802.11-n-40	5755
802.11-n-40	5590	802.11-n-40	5795
802.11-n-40	5670	802.11-ac-80	5775
802.11-ac-80	5530		

Radio	Channel		
802.11-a	5720		
802.11-n-20	5720		
802.11-n-40	5710		
802.11-ac-80	5690		

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4.3 Supporting Equipment

Index	Description	Model	S/N	Brand	Remark
1	AC/DC adapter	KYTW40P01	N/A	Keyuantai	N/A

4.4 EUT setup diagram



4.5 EUT operation

The operation, control and display are done by the built-in buttons and OLED display.

4.6 Test software

Index	Description	Remark
1	Built-in RF test software	To set EUT into continuous TX and RX mode under different modulation, data rate and channel, etc.
2	EMISoft Vasona 6.0049	EMC/Spurious emission test software used during testing

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5 EUT and test setup pictures

5.1 EUT pictures



EUT Top View



EUT Bottom View



EUT Front View



EUT Rear View

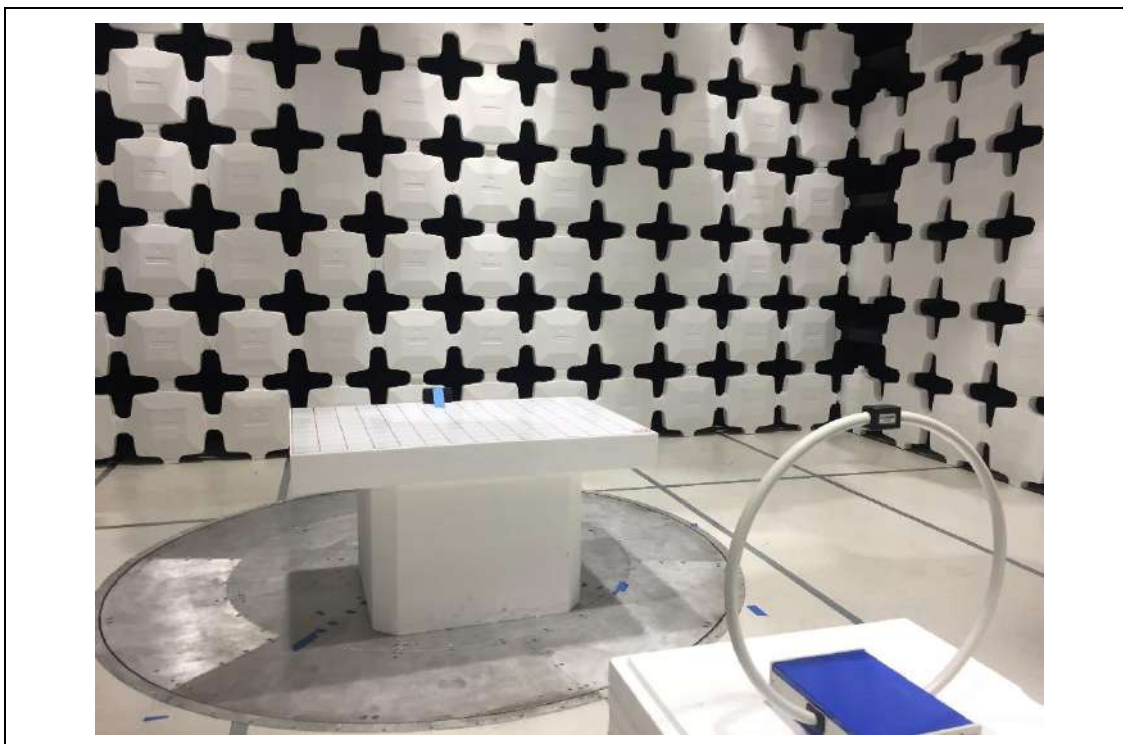


EUT Left View

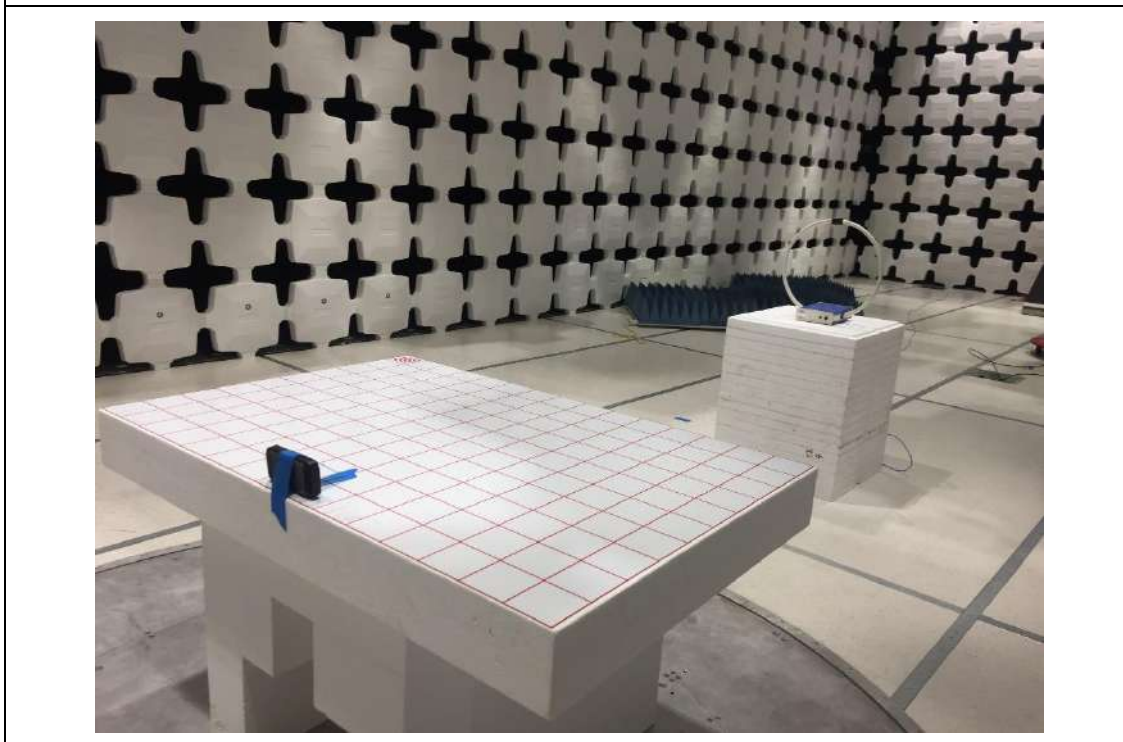


EUT Right View

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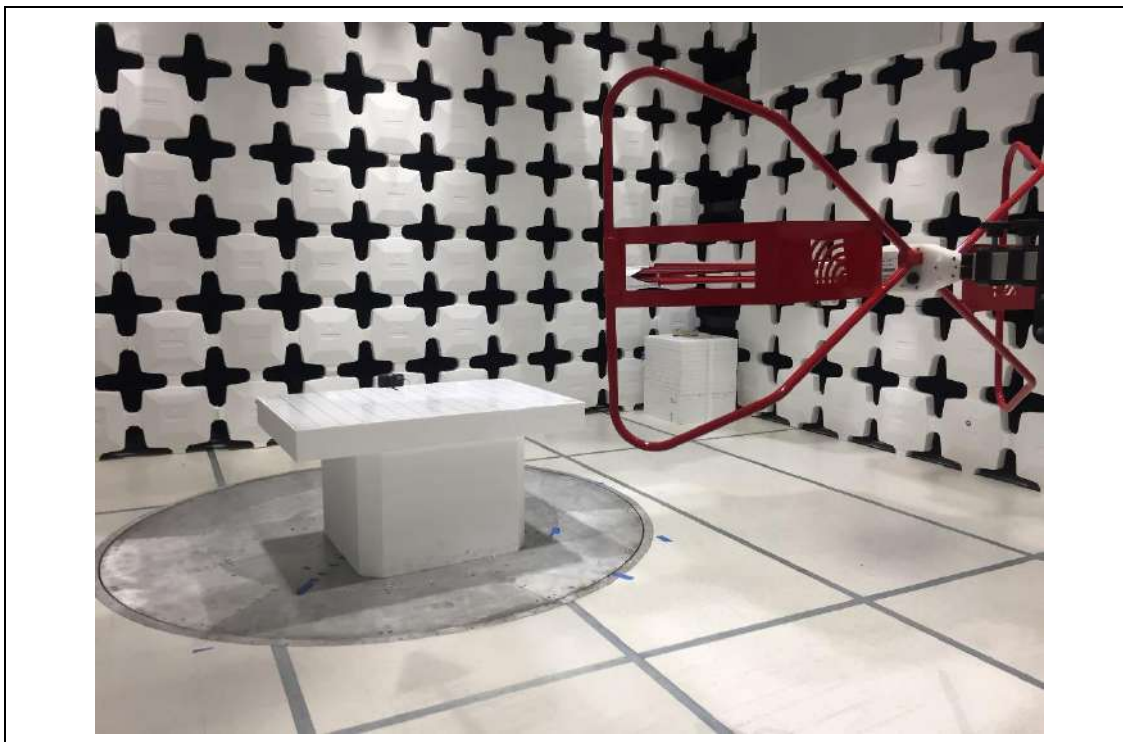


Radiated Emissions Below 30MHz setup – Front

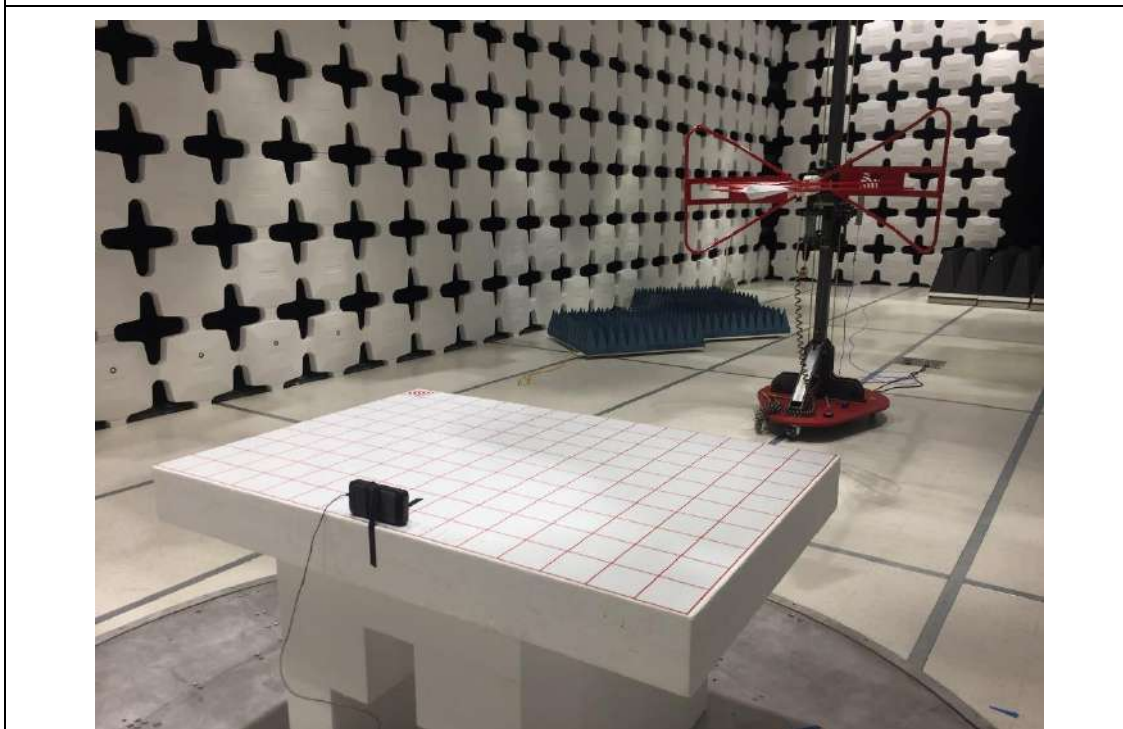


Radiated Emissions Below 30MHz setup – Rear

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Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2

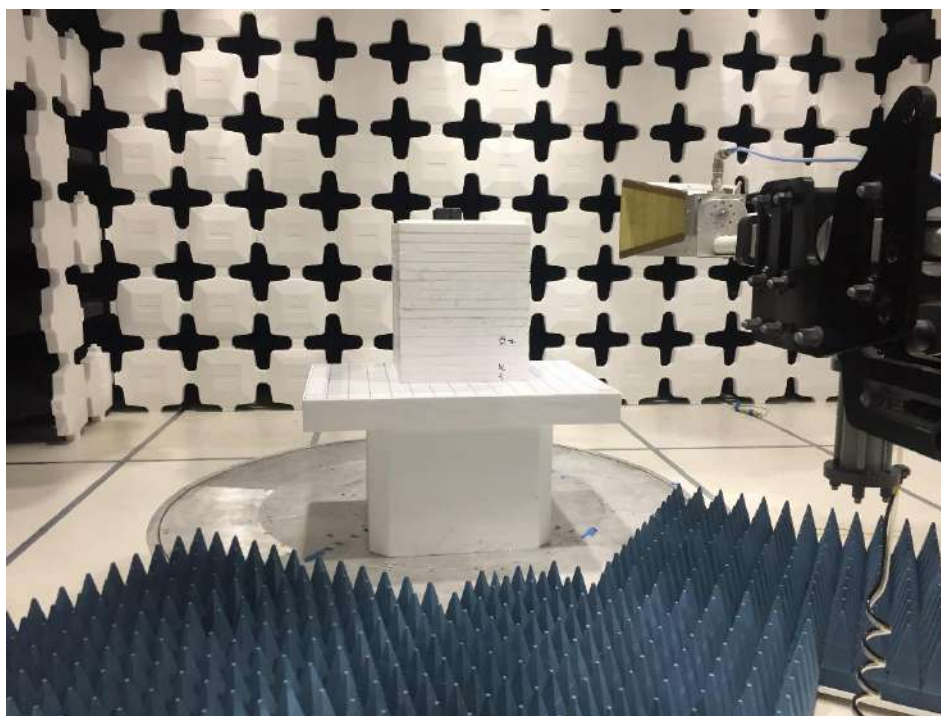


Radiated Emissions Below 1GHz setup – Front

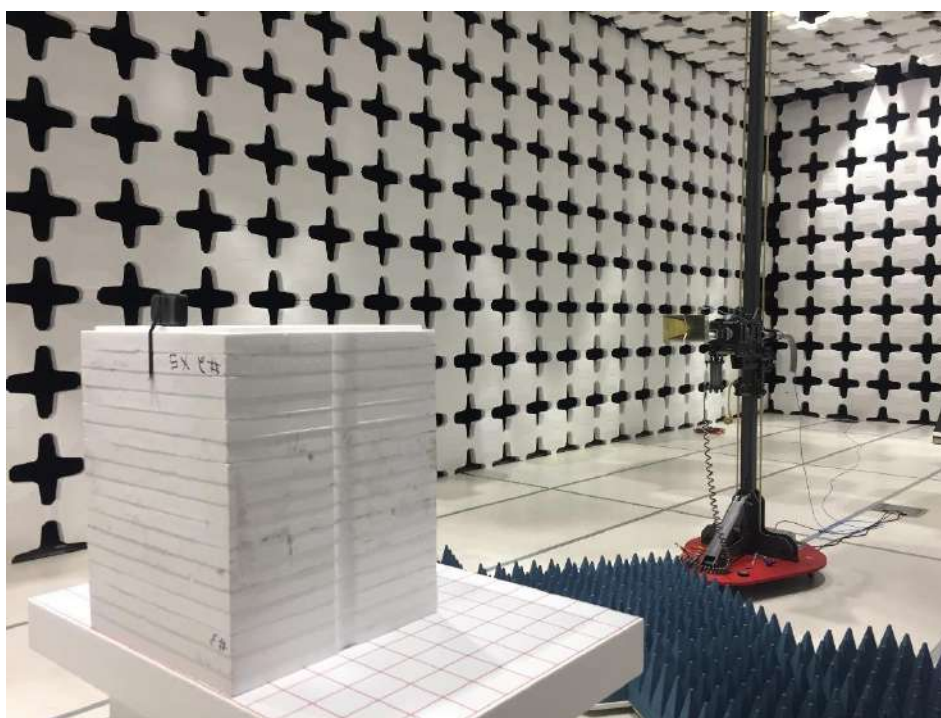


Radiated Emissions Below 1GHz setup – Rear

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



Radiated Emissions Above 1GHz setup – Front



Radiated Emissions Above 1GHz setup – Rear

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Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



6 Test Summary

FCC Rules	Test Item	Section	Verdict
§15.203	Antenna Requirement	8.1	Pass
§15.407(e)	6 dB Bandwidth	8.2	Pass
§15.407(a)	26 dB Bandwidth	8.3	Pass
§15.407(a)	Conducted Maximum Output Power	8.5	Pass
§15.407(a)	Power Spectral Density	8.6	Pass
§15.407(c)	Automatically Discontinue Transmission	8.7	Pass
§15.205, §15.209, §15.407(b)	Radiated Emissions & Unwanted Emissions into Restricted Frequency Bands	8.8	Pass
§15.207 (a)	AC Power Line Conducted Emissions	8.9	Pass

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7 Uncertainty of Measurement

Test item	Measurement Uncertainty (dB)
RF Output Power (Conducted)	±1.2 dB
Power Spectral Density	±0.9 dB
Unwanted Emission (conducted)	±2.6 dB
Occupied Channel Bandwidth	±5 %
Radiated Emission (9KHz-30MHz)	±3.5 dB
Radiated Emission (30MHz-1GHz)	±4.6 dB
Radiated Emission (1-18GHz)	±4.9 dB
Radiated Emission (18-40GHz)	±3.5 dB

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8 Test summary and result

8.1 Antenna Requirement

8.1.1 Requirement

Per § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

8.1.2 Result

Analysis:

- EUT has two removable PCB trace antennas which connect to the main board through unique IPEX MHF4 RF connectors.
- Both main board and antenna are equipped with IPEX MHF4 connector. No standard RF connector is used.

Conclusion:

EUT complies with antenna requirement in § 15.203.

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8.2 6 d Bandwidth

8.2.1 Requirement

§ 15.407 (e)

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

8.2.2 Test setup



8.2.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01, Section C) Emission bandwidth.

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW $\geq 3 \times$ RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Use automatic bandwidth measurement capability on instrument to obtain BW result.

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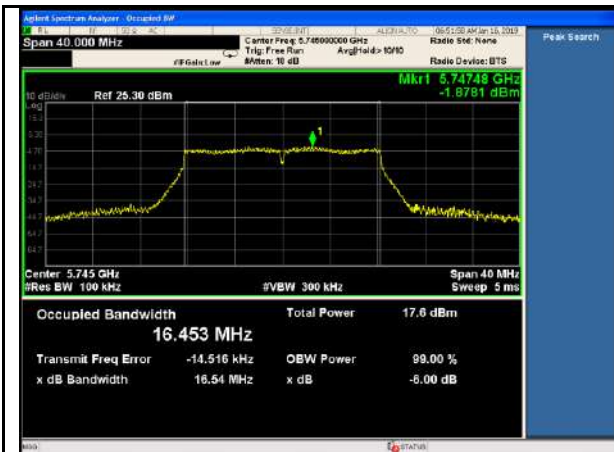


8.2.4 Test Result

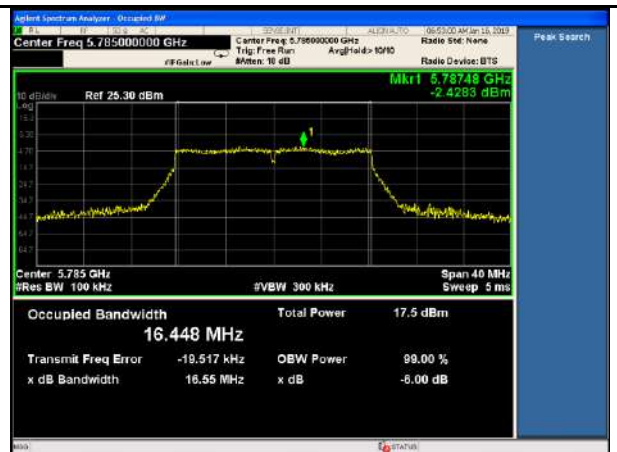
For 5.7GHz band

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	149	5745	6Mbps	16540	500	Pass
11a	157	5785	6Mbps	16550	500	Pass
11a	165	5825	6Mbps	16540	500	Pass
11n-20M	149	5745	MCS1	17770	500	Pass
11n-20M	157	5785	MCS1	17760	500	Pass
11n-20M	165	5825	MCS1	17730	500	Pass
11n-40M	155	5755	MCS1	36420	500	Pass
11n-40M	159	5795	MCS1	36410	500	Pass
11ac-80M	155	5775	VHC-MCS1	76570	500	Pass

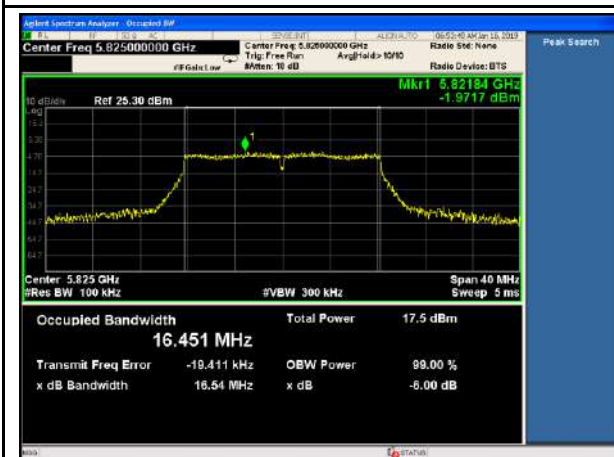
8.2.5 Test Plots



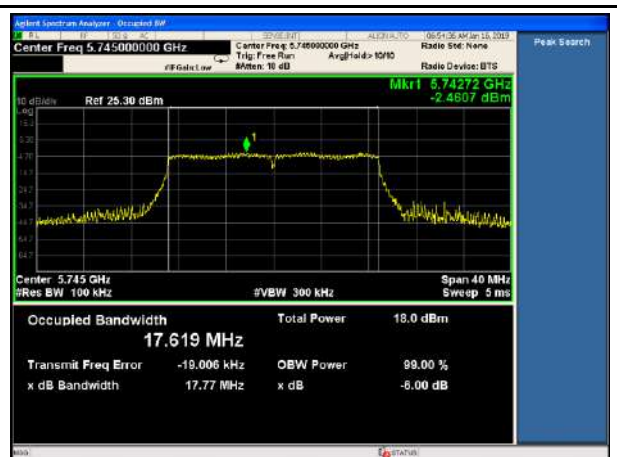
6dB BW 802.11a 5745MHz



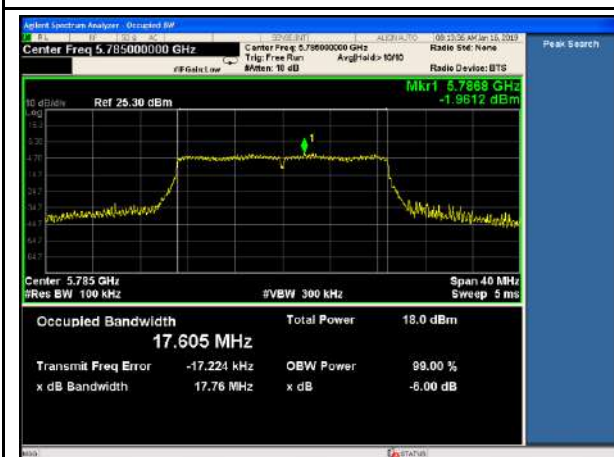
6dB BW 802.11a 5785MHz



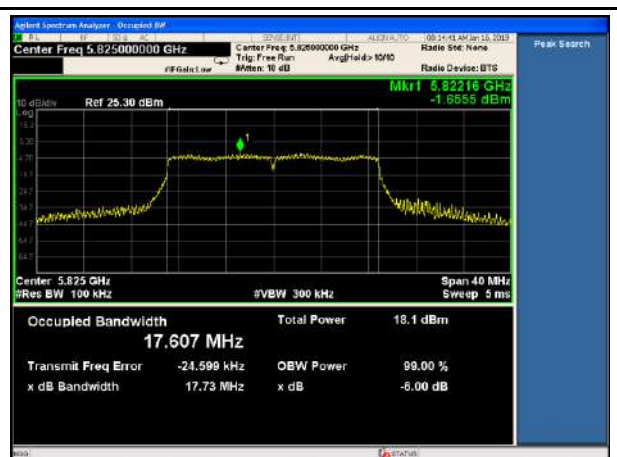
6dB BW 802.11a 5825MHz



6dB BW 802.11n-20M 5745MHz

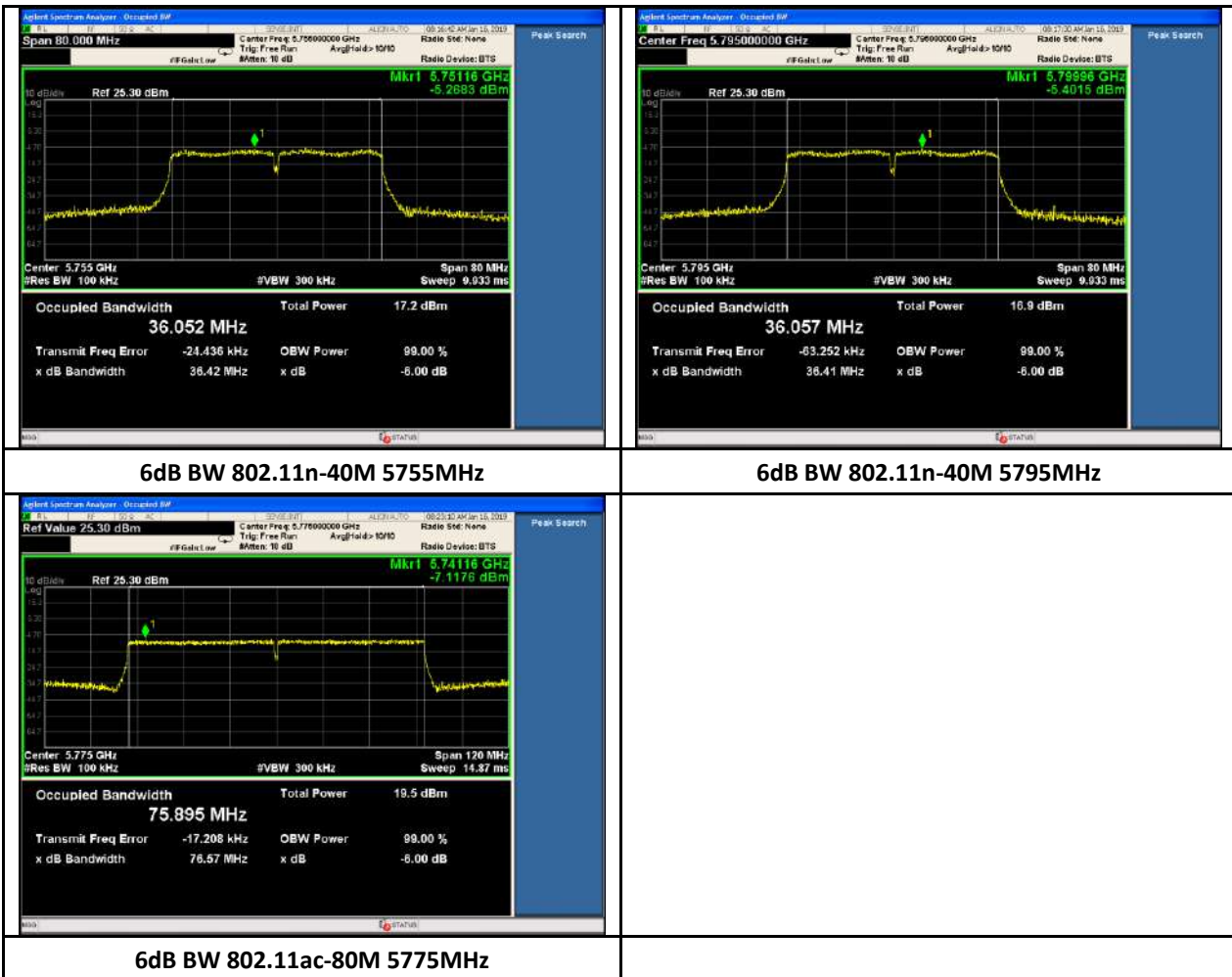


6dB BW 802.11n-20M 5785MHz



6dB BW 802.11n-20M 5825MHz

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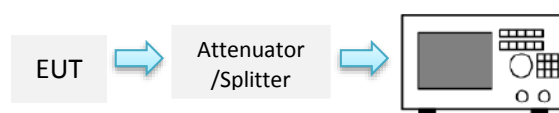
8.3 26 d Bandwidth

8.3.1 Requirement

§ 15.407 (a)

This section is for reporting purpose only. There are no restriction limits for bandwidth.

8.3.2 Test setup



8.3.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01, Section C) Emission bandwidth.

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 26 dB, if the functionality described above (i.e., RBW , VBW $\geq 3 \times$ RBW, peak detector with maximum hold) is implemented by the instrumentation function.

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Use automatic bandwidth measurement capability on instrument to obtain BW result.

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8.3.4 Test Result

For 5.2GHz band

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured 26 dB Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	36	5180	6Mbps	19580	N/A	N/A
11a	44	5220	6Mbps	19480	N/A	N/A
11a	48	5240	6Mbps	19330	N/A	N/A
11n-20M	36	5180	MCS1	19860	N/A	N/A
11n-20M	44	5220	MCS1	19820	N/A	N/A
11n-20M	48	5240	MCS1	19850	N/A	N/A
11n-40M	38	5190	MCS1	39770	N/A	N/A
11n-40M	46	5230	MCS1	39700	N/A	N/A
11ac-80M	42	5210	VHC-MCS1	81350	N/A	N/A

For 5.3GHz band

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured 26 dB Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	52	5260	6Mbps	19510	N/A	N/A
11a	60	5300	6Mbps	19390	N/A	N/A
11a	64	5320	6Mbps	19550	N/A	N/A
11n-20M	52	5260	MCS1	19880	N/A	N/A
11n-20M	60	5300	MCS1	19870	N/A	N/A
11n-20M	64	5320	MCS1	19880	N/A	N/A
11n-40M	54	5270	MCS1	40130	N/A	N/A
11n-40M	62	5310	MCS1	39800	N/A	N/A
11ac-80M	58	5290	VHC-MCS1	81340	N/A	N/A

For 5.5GHz band

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured 26 dB Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	100	5500	6Mbps	19210	N/A	N/A
11a	120	5600	6Mbps	19560	N/A	N/A
11a	140	5700	6Mbps	19560	N/A	N/A
11n-20M	100	5500	MCS1	19880	N/A	N/A
11n-20M	120	5600	MCS1	19680	N/A	N/A
11n-20M	140	5700	MCS1	19710	N/A	N/A
11n-40M	102	5510	MCS1	39720	N/A	N/A
11n-40M	110	5590	MCS1	39560	N/A	N/A
11n-40M	134	5670	MCS1	39520	N/A	N/A
11ac-80M	106	5530	VHC-MCS1	81080	N/A	N/A
11ac-80M	136	5610	VHC-MCS1	81840	N/A	N/A

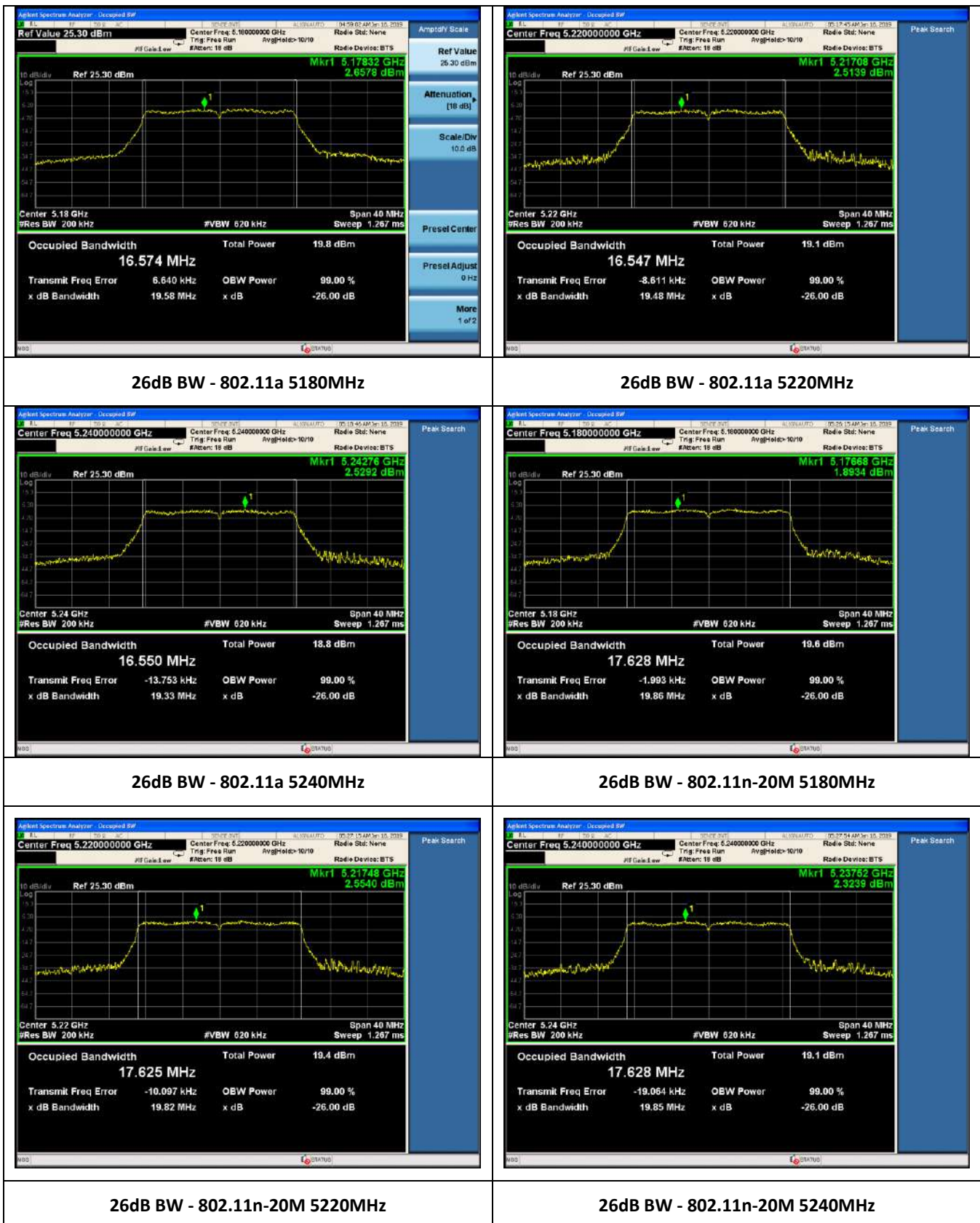
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Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



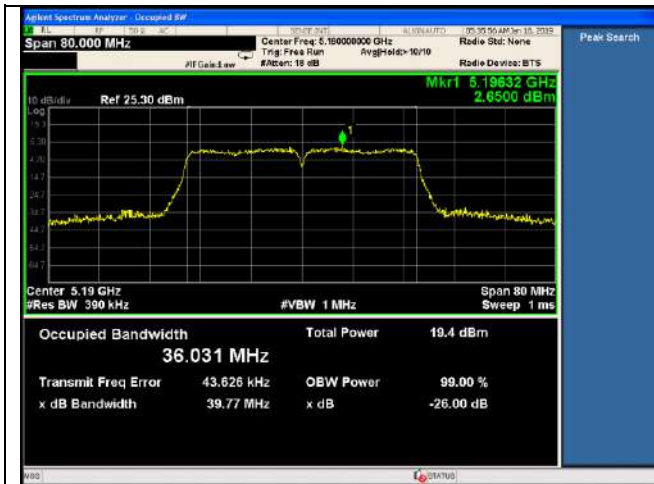
For 5.5GHz band Cross-band channel

Mode/ Bandwidth	Channel	Frequency (MHz)	Data rate	Measured 26 dB Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11a	144	5720	6Mbps	19600	N/A	N/A
11n	144	5720	MCS1	19730	N/A	N/A
11n-40M	144	5710	MCS1	39860	N/A	N/A
11ac-80M	136	5690	VHC-MCS1	81500	N/A	N/A

8.3.5 Test Plots



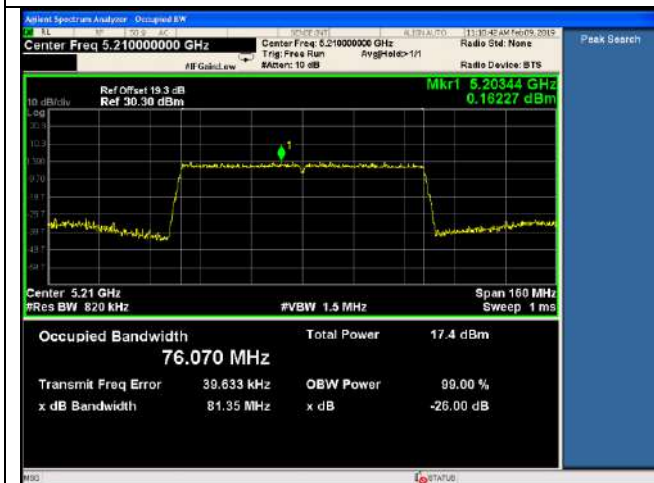
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Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



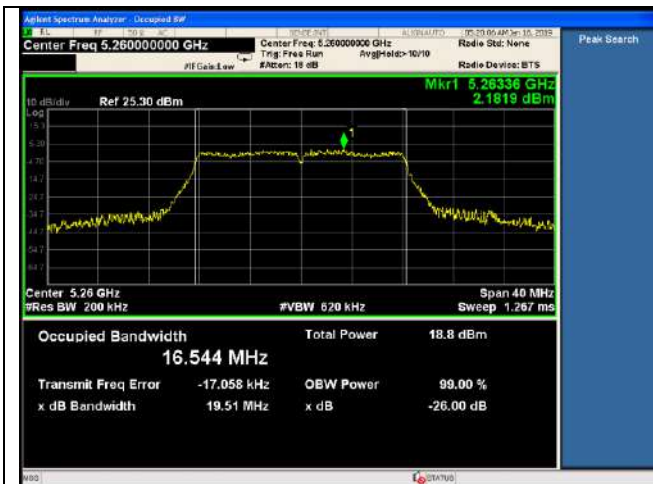
26dB BW - 802.11n-40M 5190MHz



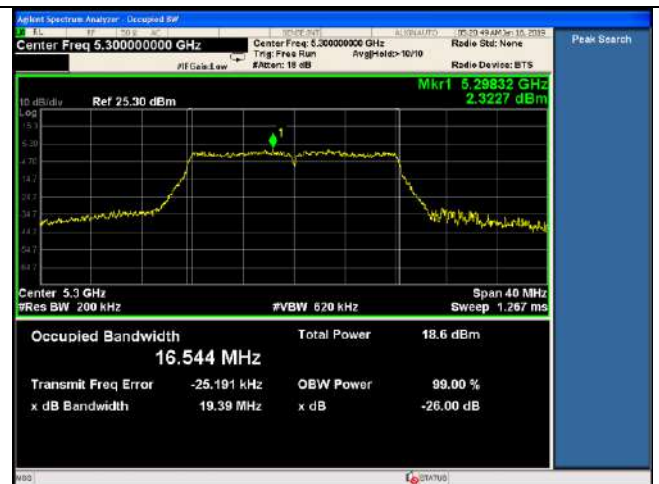
26dB BW - 802.11n-40M 5230MHz



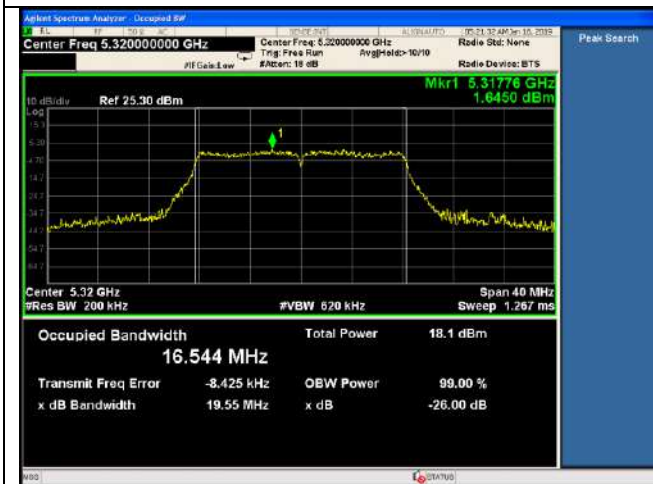
26dB BW - 802.11ac-80M 5210MHz



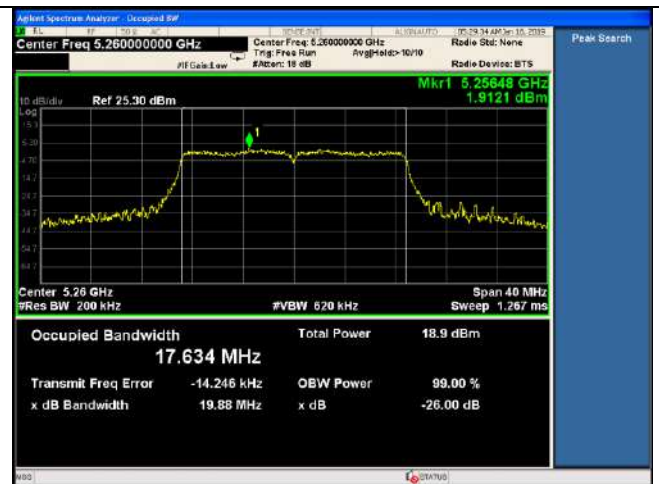
26dB BW -802.11a 5260MHz



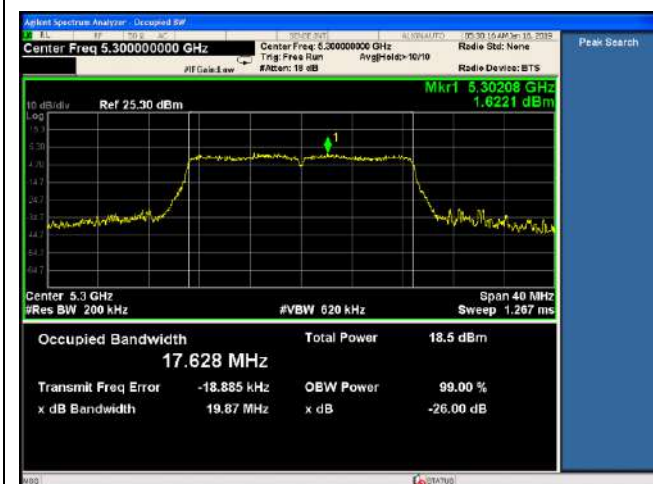
26dB BW -802.11a 5300MHz



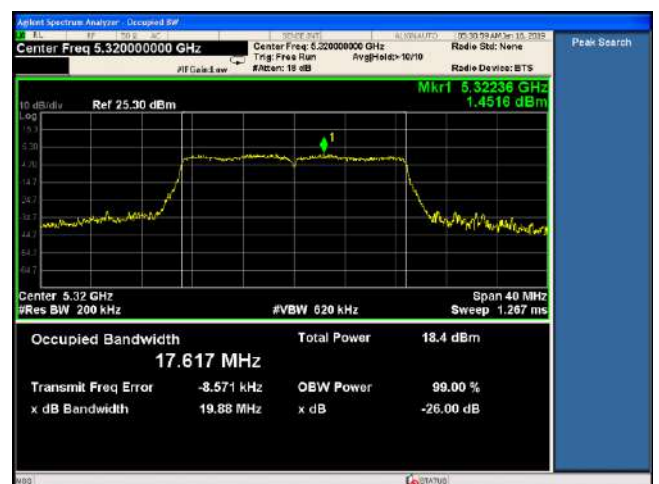
26dB BW -802.11a 5320MHz



26dB BW -802.11n-20M 5260MHz

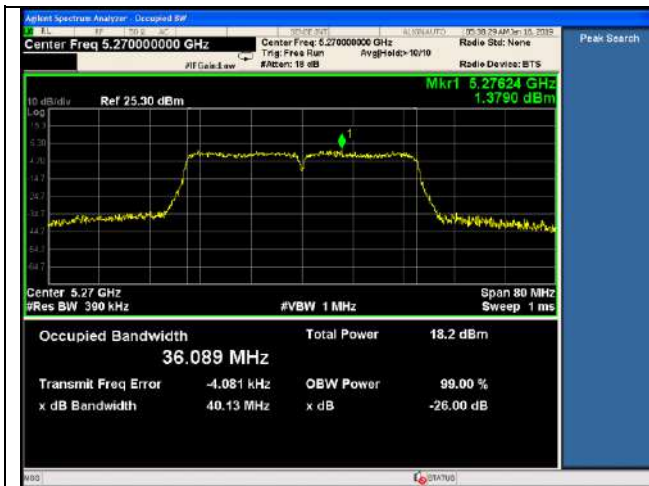


26dB BW -802.11n-20M 5300MHz



26dB BW -802.11n-20M 5320MHz

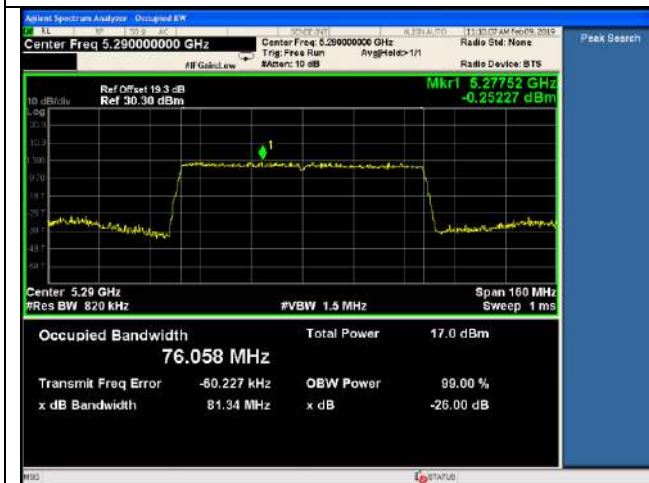
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Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



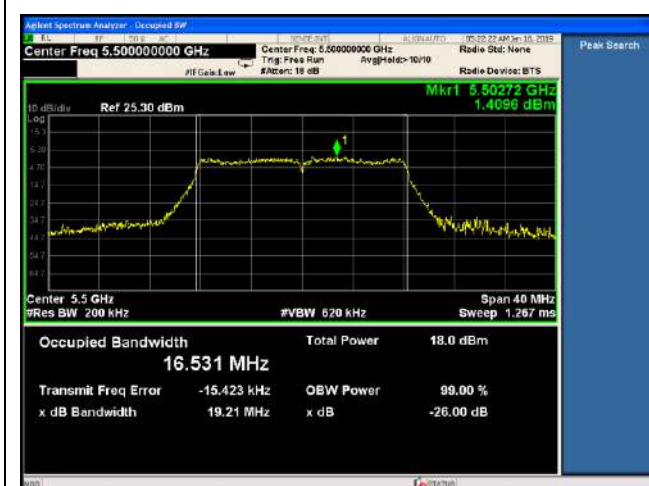
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26dB BW -802.11n-40M 5310MHz



26dB BW -802.11ac-80M 5290MHz



26dB BW -802.11a 5500MHz

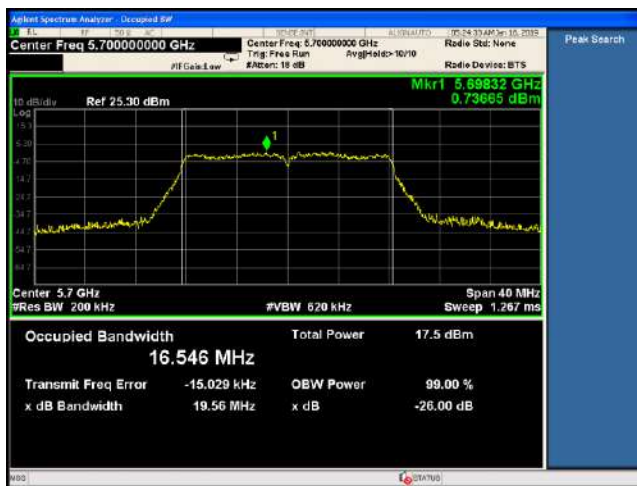


26dB BW -802.11a 5600MHz

Report Number: GBX-19011401-LC-RF-FCC-UNII
Product: GNARBOX 2.0 SSD
Model Number: GNAR128V2
Family Model: GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



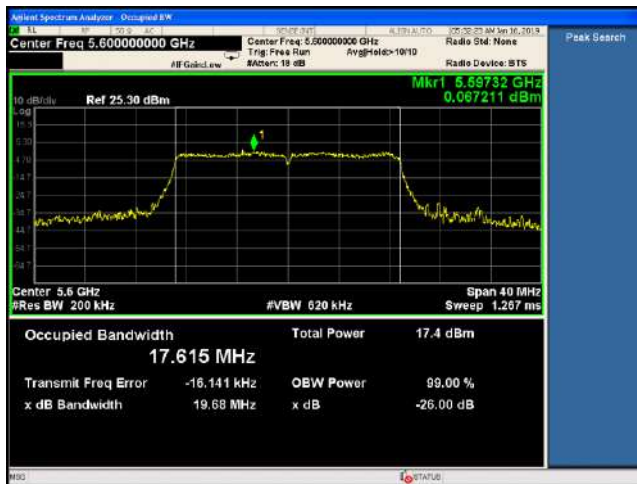
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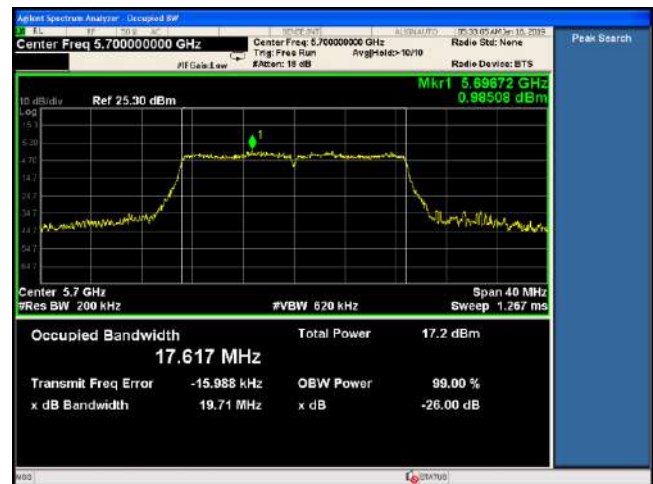
26dB BW -802.11a 5700MHz



26dB BW -802.11n-20M 5500MHz



26dB BW -802.11n-20M 5600MHz



26dB BW -802.11n-20M 5700MHz



Electromagnetic Compatibility
Radio Frequency
Product Certification
International Approval

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Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2

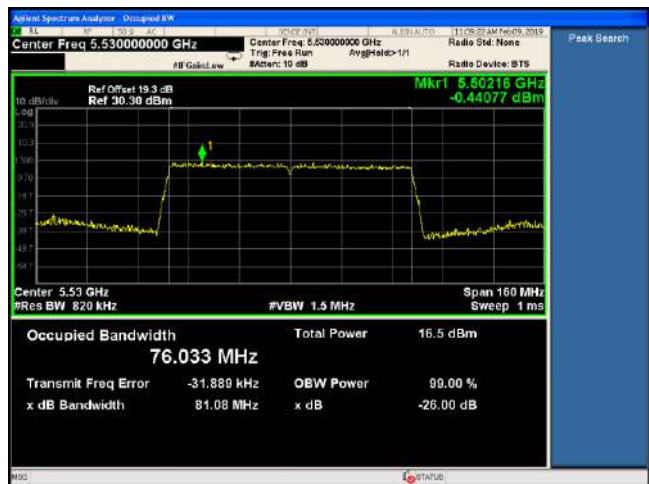


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26dB BW -802.11n-40M 5510MHz



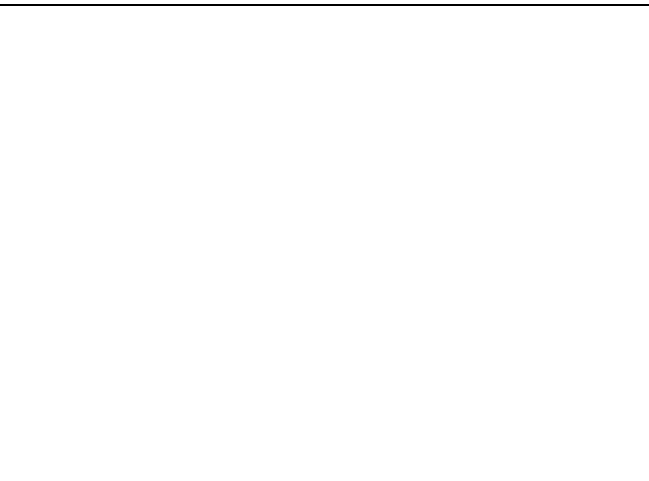
26dB BW -802.11n-40M 5590MHz



26dB BW -802.11n-40M 5670MHz



26dB BW -802.11ac-80M 5530MHz



26dB BW -802.11ac-80M 5610MHz



Report Number: GBX-19011401-LC-RF-FCC-UNII
Product: GNARBOX 2.0 SSD
Model Number: GNAR128V2
Family Model: GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2

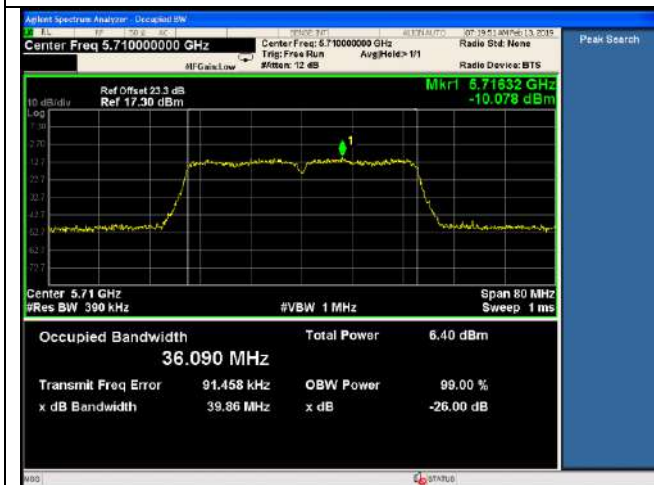


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26dB BW -802.11a-20M 5720MHz

26dB BW -802.11n-20M 5720MHz



26dB BW -802.11n-40M 5710MHz

26dB BW -802.11ac-80M 5690MHz



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Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.4 Maximum Output Power

8.4.1 Requirement

§ 15.407 (a)

For the 5.15–5.25 GHz bands:

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

For the 5.25–5.725 GHz bands:

The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm+10 log B, where B is the 26 dB emission bandwidth in megahertz.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

For the band 5.725-5.85 GHz:

The maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.4.2 Test setup



Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.4.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01, Section E) Maximum conducted output power, 2, b), method SA-1

1. Set span to encompass the entire emission bandwidth (EBW)(or, alternatively, the entire 99% occupied bandwidth) of the signal.
2. Set RBW=1MHz
3. Set VBW $\geq 3 \times$ RBW
4. Number of points in sweep $\geq 2 \times$ span/ RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto couple.
6. Detector = Power averaging (RMS)
7. Trace average at least 100 traces in power averaging(rms)mode.
8. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges.

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.4.4 Test Result

For 5.2GHz band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5180	6Mbps	15.44	15.36	15.44	24	Pass
11a	5220	6Mbps	15.49	15.07	15.49	24	Pass
11a	5240	6Mbps	15.40	14.74	15.40	24	Pass
11n-20M	5180	MCS1	15.72	15.38	18.56	24	Pass
11n-20M	5220	MCS1	15.68	15.21	18.46	24	Pass
11n-20M	5240	MCS1	15.63	14.88	18.28	24	Pass
11n-40M	5190	MCS1	15.14	14.76	17.96	24	Pass
11n-40M	5230	MCS1	15.14	14.51	17.85	24	Pass
11ac-80M	5210	VHC-MCS1	9.84	10.19	13.03	24	Pass

For 5.3GHz band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5260	6Mbps	15.15	14.48	15.15	23.90	Pass
11a	5300	6Mbps	14.97	14.28	14.97	23.88	Pass
11a	5320	6Mbps	14.68	14.08	14.68	23.91	Pass
11n-20M	5260	MCS1	15.28	14.60	17.96	23.98	Pass
11n-20M	5300	MCS1	14.98	14.34	17.68	23.98	Pass
11n-20M	5320	MCS1	14.71	14.16	17.45	23.98	Pass
11n-40M	5270	MCS1	14.77	13.93	17.38	24	Pass
11n-40M	5310	MCS1	14.59	13.73	17.19	24	Pass
11ac-80M	5290	VHC-MCS1	9.75	10.19	12.99	24	Pass

For 5.5GHz band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5500	6Mbps	14.71	13.33	14.71	23.84	Pass
11a	5600	6Mbps	13.95	13.33	13.95	23.96	Pass
11a	5700	6Mbps	13.83	14.00	14.00	23.91	Pass
11n-20M	5500	MCS1	14.83	14.42	17.64	23.98	Pass
11n-20M	5600	MCS1	14.03	13.45	16.76	24	Pass
11n-20M	5700	MCS1	13.98	13.96	16.98	23.95	Pass
11n-40M	5510	MCS1	14.43	13.67	17.08	24	Pass
11n-40M	5590	MCS1	13.54	13.04	16.31	24	Pass
11n-40M	5670	MCS1	13.54	13.58	16.57	24	Pass
11ac-80M	5530	VHC-MCS1	9.11	9.25	12.19	24	Pass

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
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11ac-80M	5610	VHC-MCS1	8.51	8.56	11.55	24	Pass
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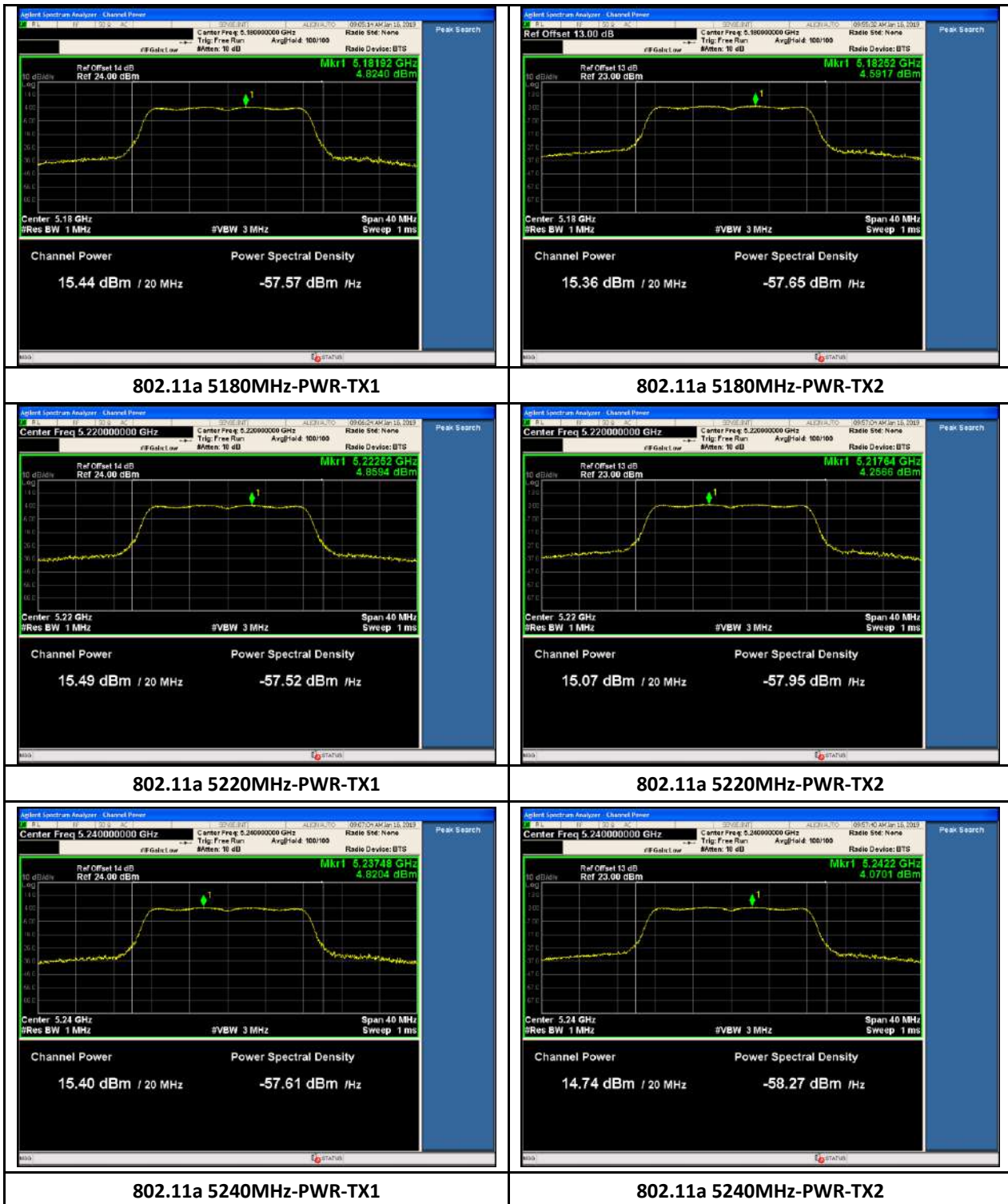
For 5.7GHz band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5745	6Mbps	15.02	14.72	15.02	30	Pass
11a	5785	6Mbps	14.80	14.39	14.80	30	Pass
11a	5825	6Mbps	14.76	14.25	14.76	30	Pass
11n-20M	5745	MCS1	15.10	14.94	18.03	30	Pass
11n-20M	5785	MCS1	14.87	14.39	17.65	30	Pass
11n-20M	5825	MCS1	14.87	14.20	17.56	30	Pass
11n-40M	5755	MCS1	14.65	14.39	17.53	30	Pass
11n-40M	5795	MCS1	14.37	13.77	17.09	30	Pass
11ac-80M	5775	VHC-MCS1	9.61	9.99	12.81	30	Pass

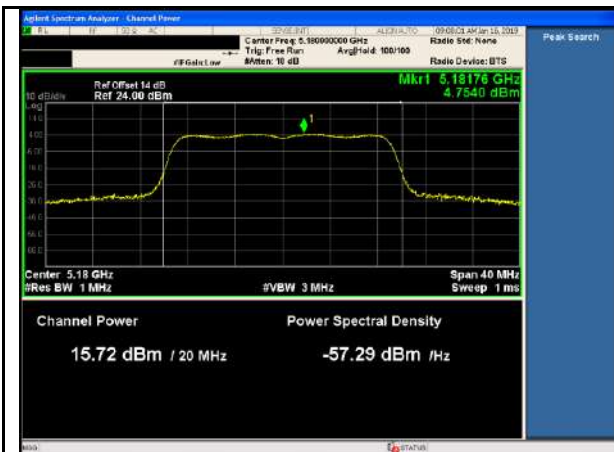
For 5.5GHz band Cross-band channel

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 power (dBm)	TX2 power (dBm)	Highest or Total power (dBm)	Max Output Power (dBm)	Result
11a	5720	6Mbps	-1.10	-1.11	-1.10	24	Pass
11n	5720	MCS1	-1.08	-1.06	1.940	24	Pass
11n-40M	5710	MCS1	-1.66	-1.68	1.340	24	Pass
11ac-80M	5690	VHC-MCS1	8.26	9.01	11.661	24	Pass

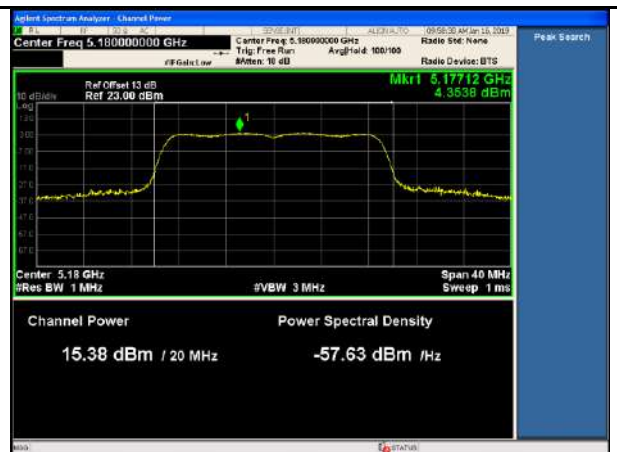
8.4.5 Test Plots



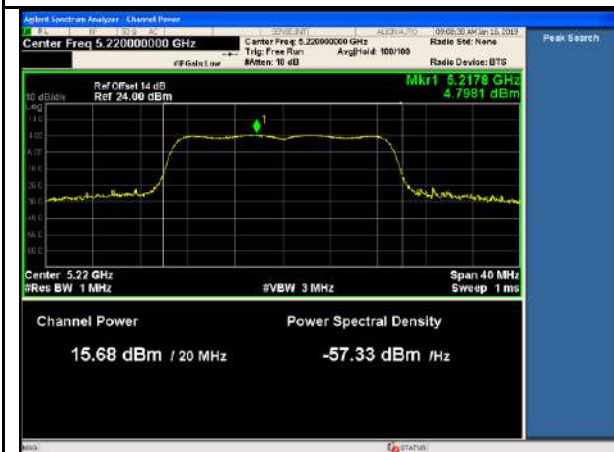
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Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



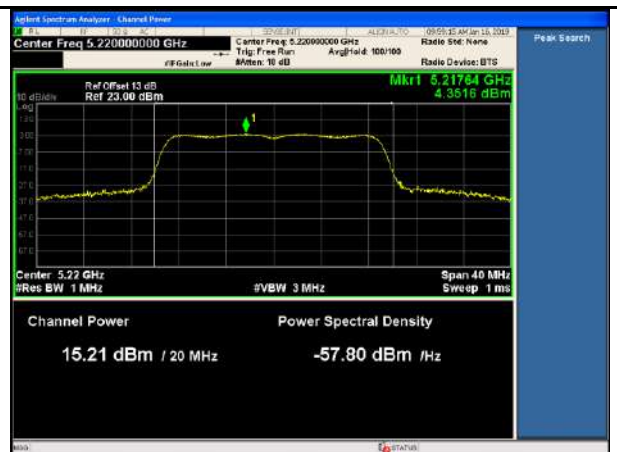
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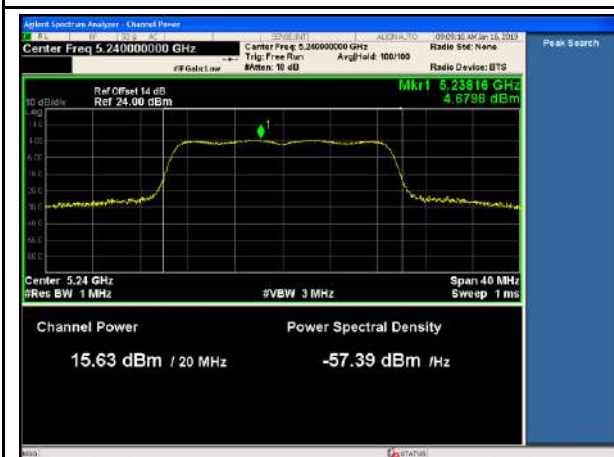
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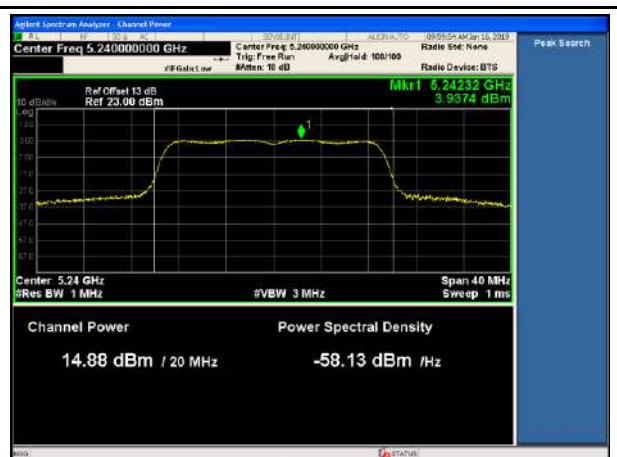
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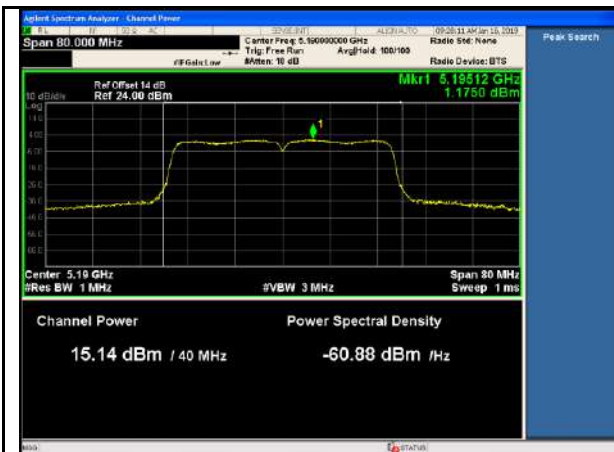


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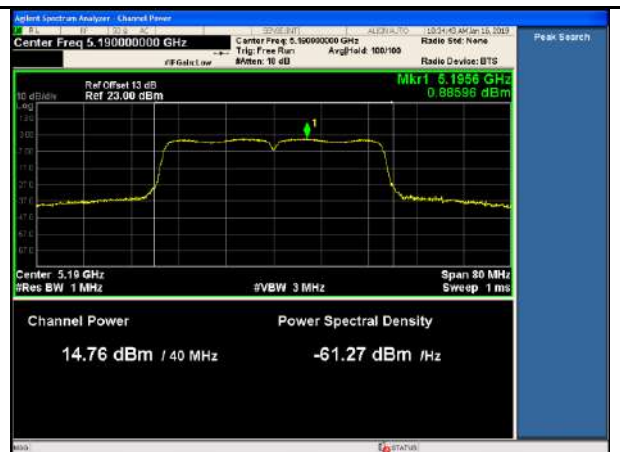
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Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



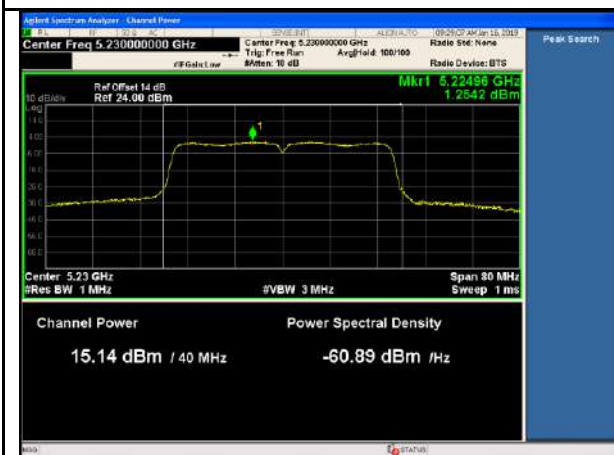
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802.11n-40MHz- 5190MHz-PWR-TX1



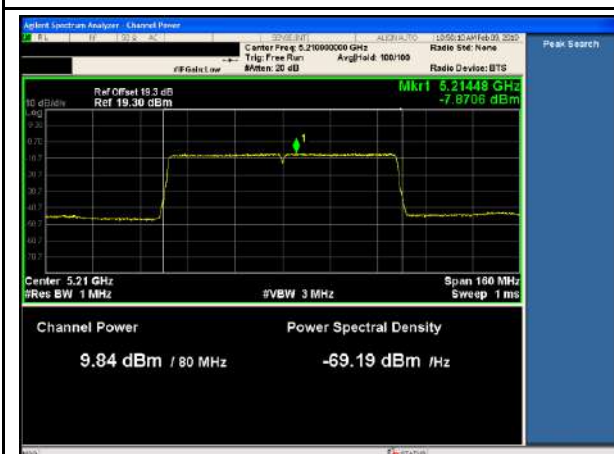
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802.11n-40MHz- 5230MHz-PWR-TX1



802.11n-40MHz- 5230MHz-PWR-TX2



802.11ac-80MHz- 5210MHz-PWR-TX1



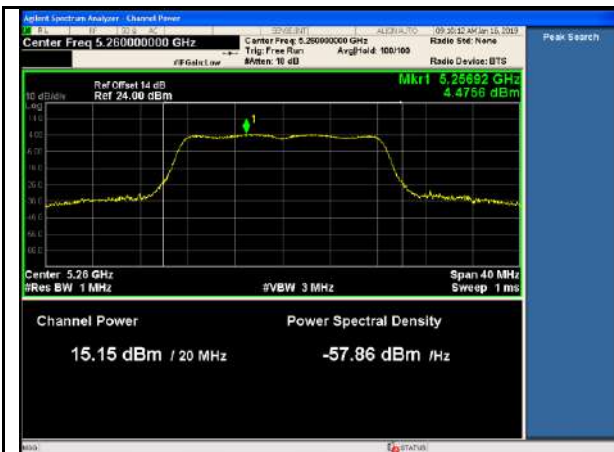
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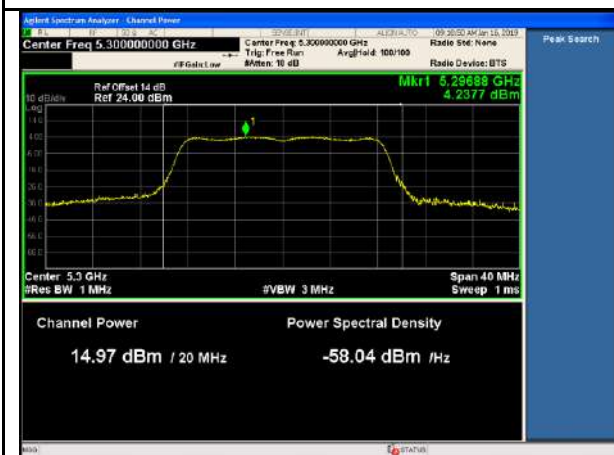
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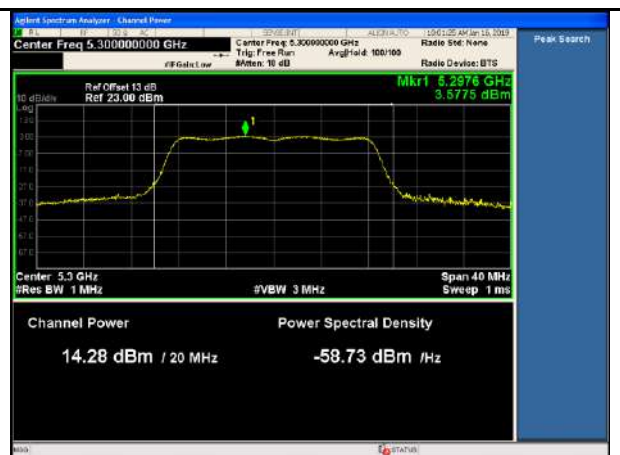
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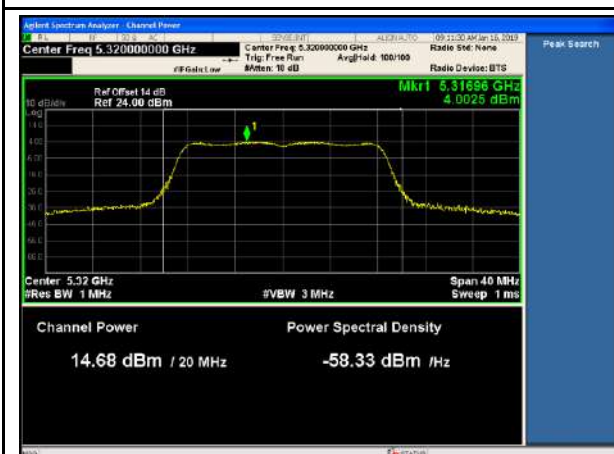
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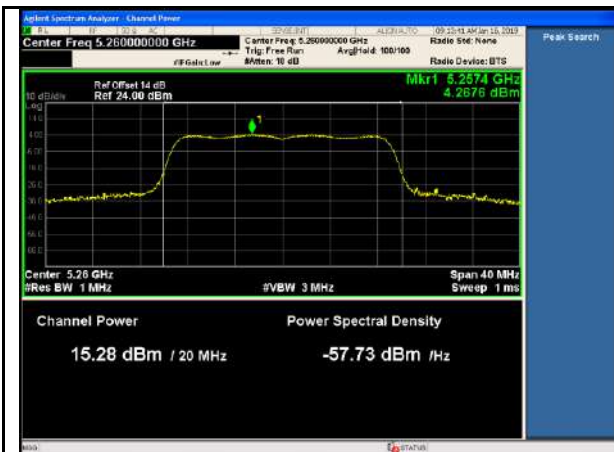
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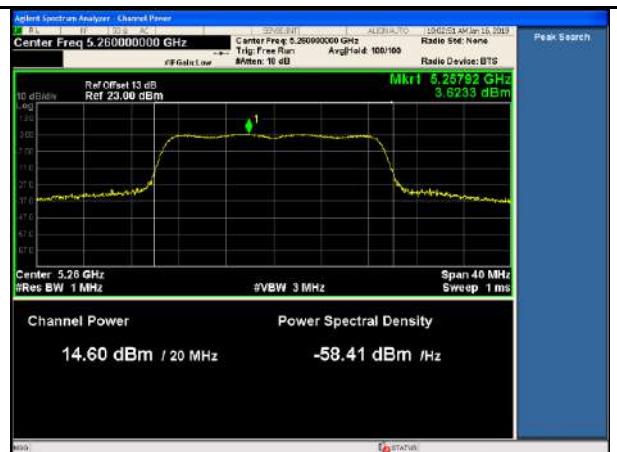
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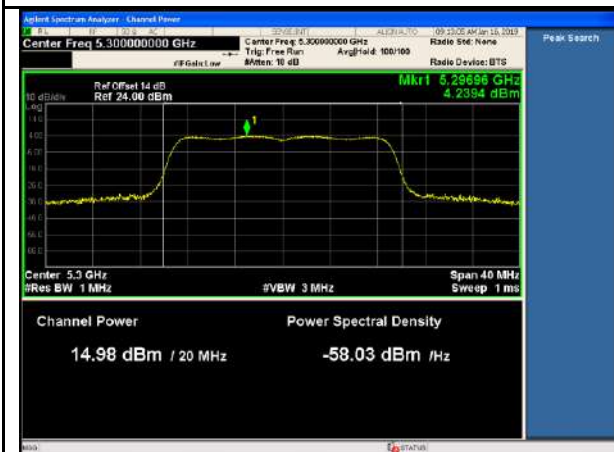
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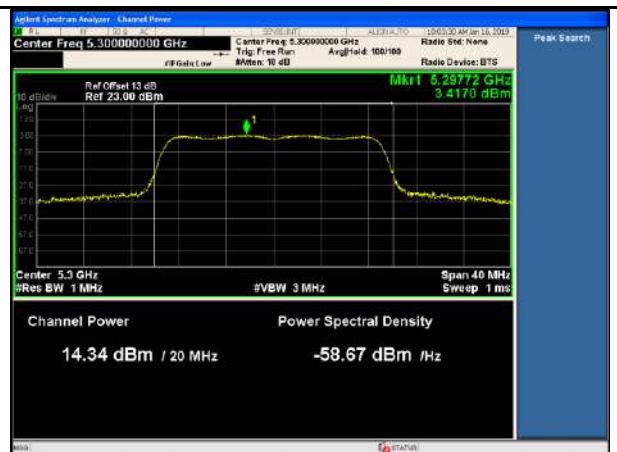
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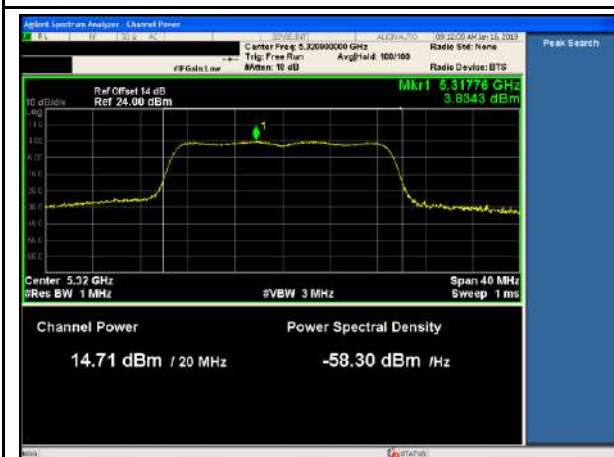
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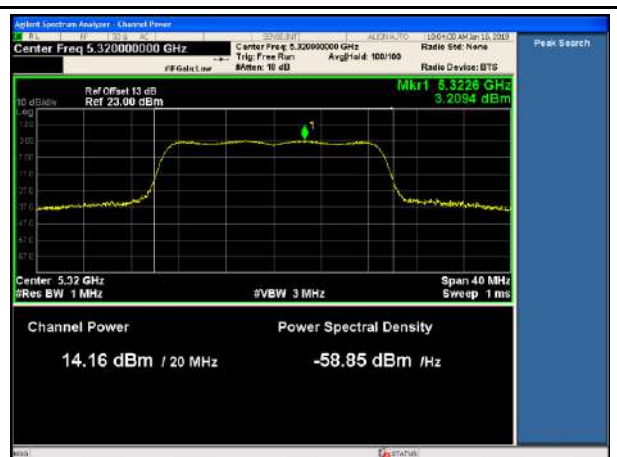
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802.11n-20MHz- 5300MHz-PWR-TX2



802.11n-20MHz- 5320MHz-PWR-TX1

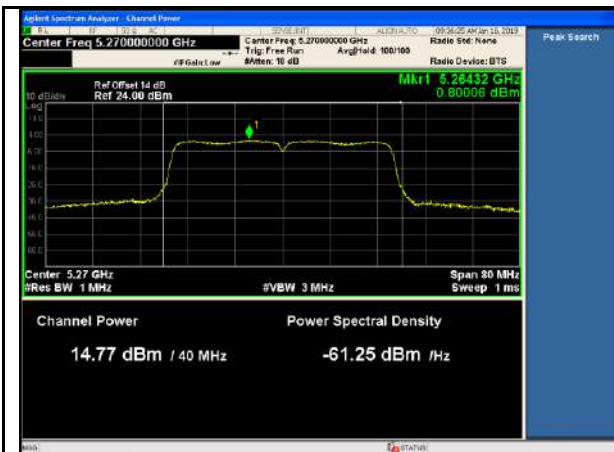


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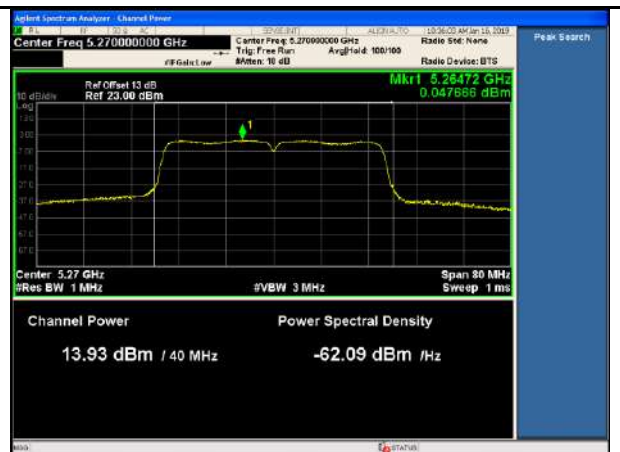
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Product:	GNARBOX 2.0 SSD
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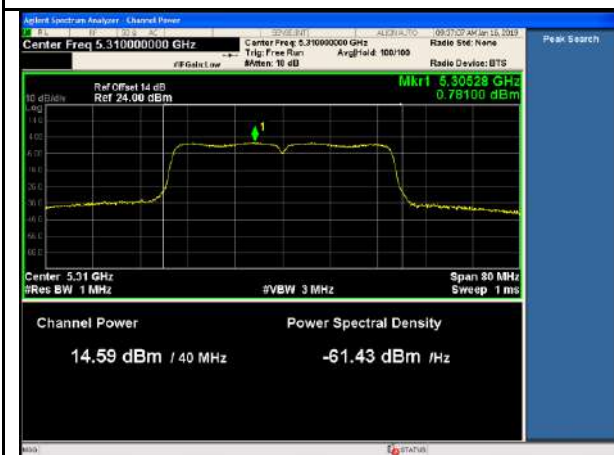
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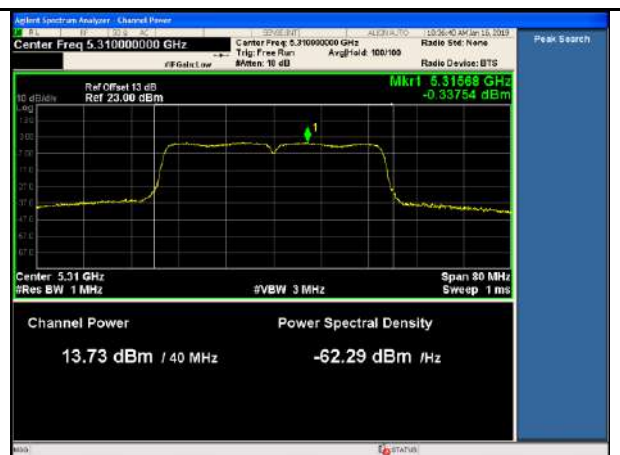
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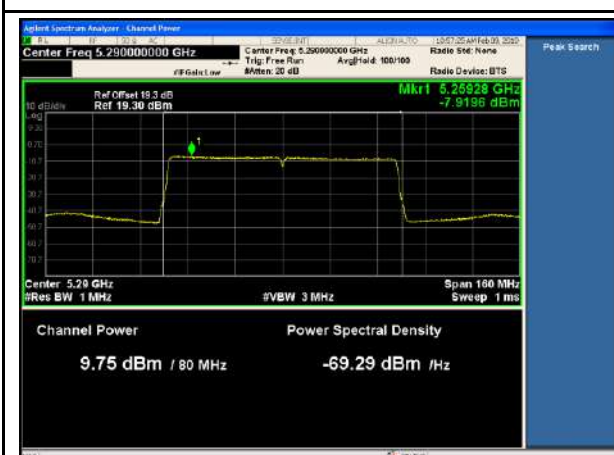
802.11n-40MHz- 5270MHz-PWR-TX2



802.11n-40MHz- 5310MHz-PWR-TX1



802.11n-40MHz- 5310MHz-PWR-TX2



802.11ac-80MHz- 5290MHz-PWR-TX1



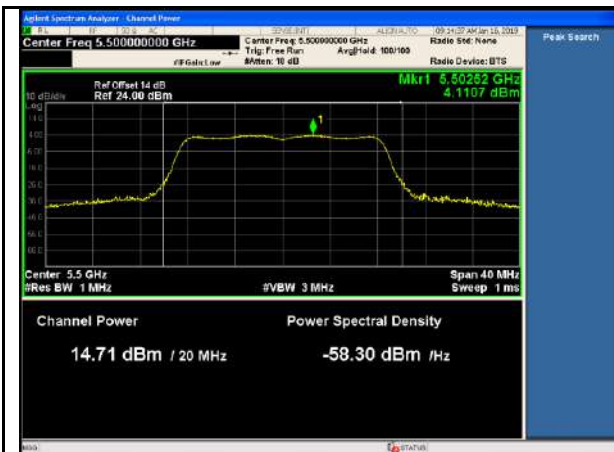
802.11ac-80MHz- 5290MHz-PWR-TX2



Electromagnetic Compatibility
Radio Frequency
Product Certification
International Approval

1261 Puerta Del Sol
San Clemente, CA, 92673
+1 (949) 393-1123
www.vista-compliance.com

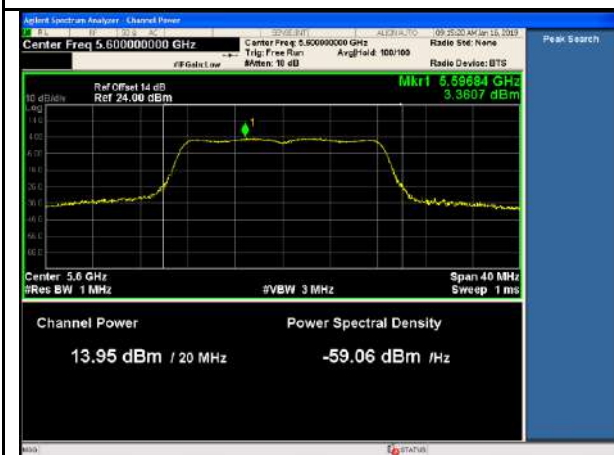
Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



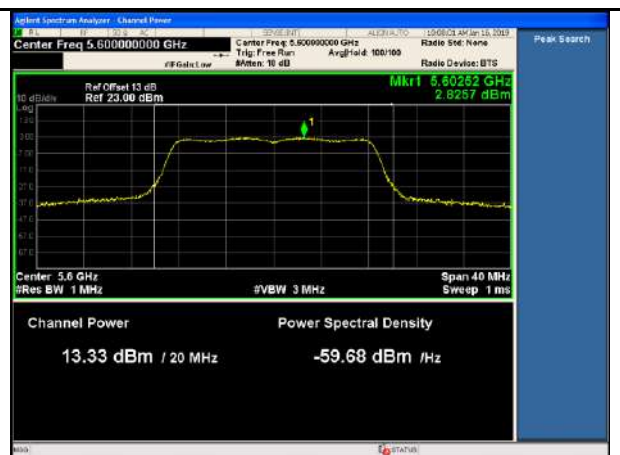
802.11a 5500MHz-PWR-TX1



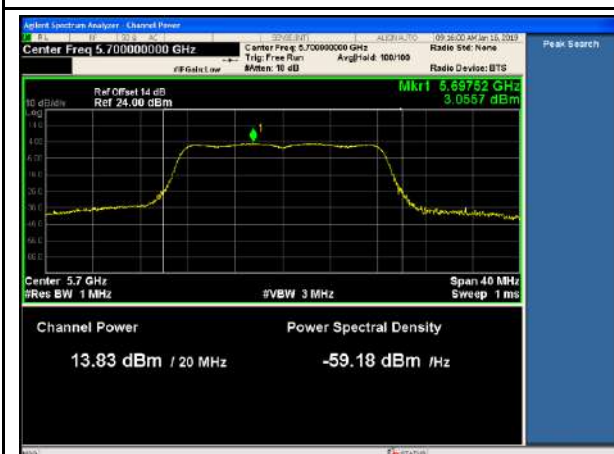
802.11a 5500MHz-PWR-TX2



802.11a 5600MHz-PWR-TX1



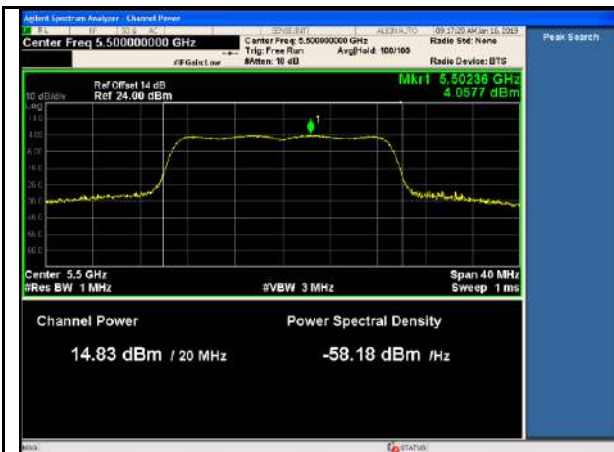
802.11a 5600MHz-PWR-TX2



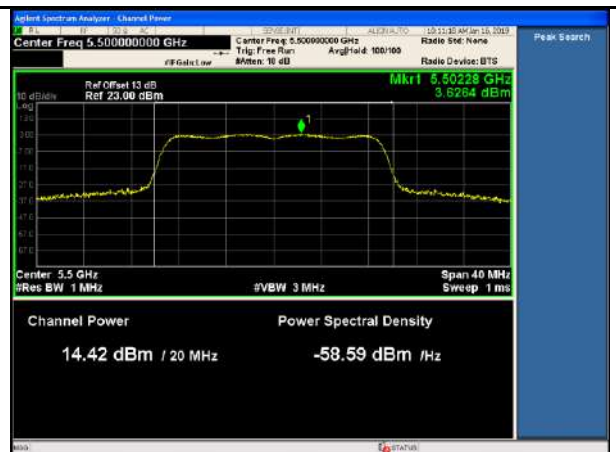
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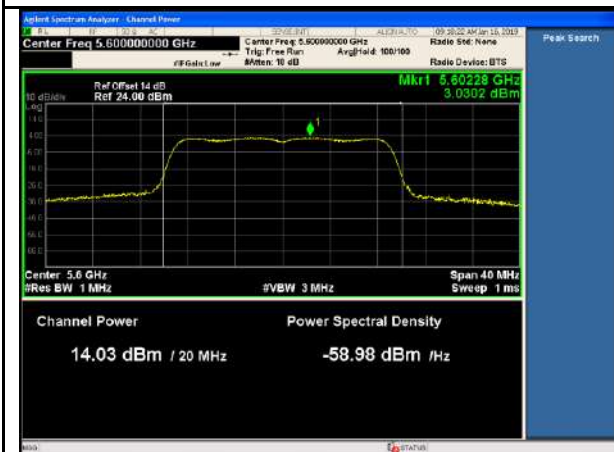
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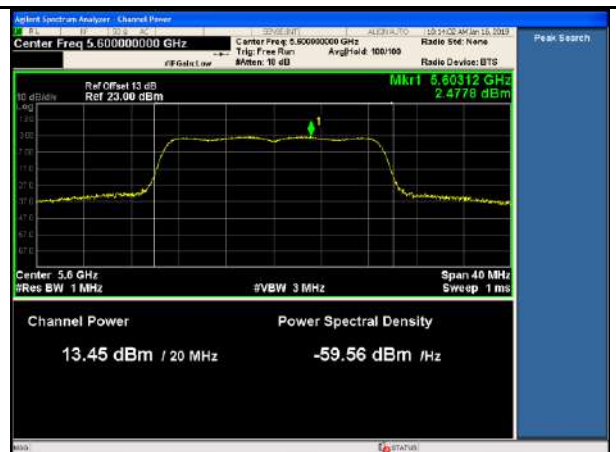
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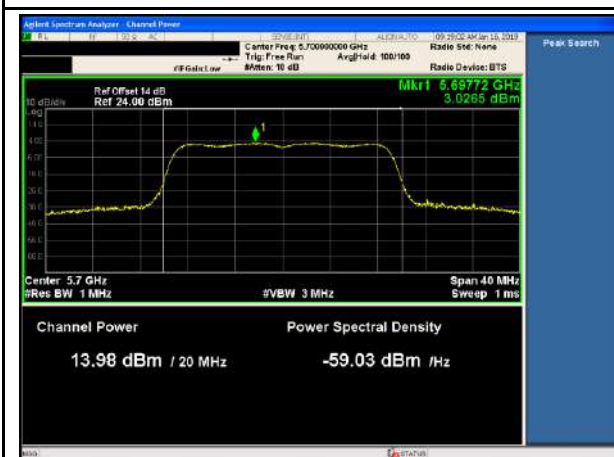
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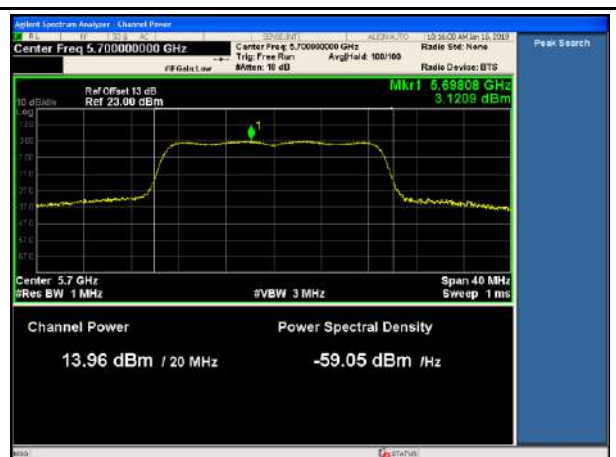
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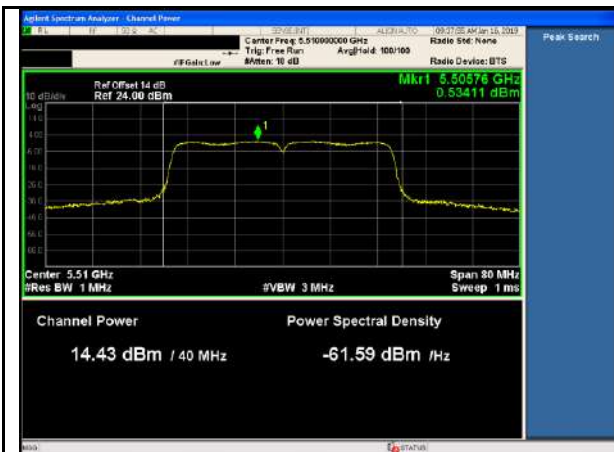
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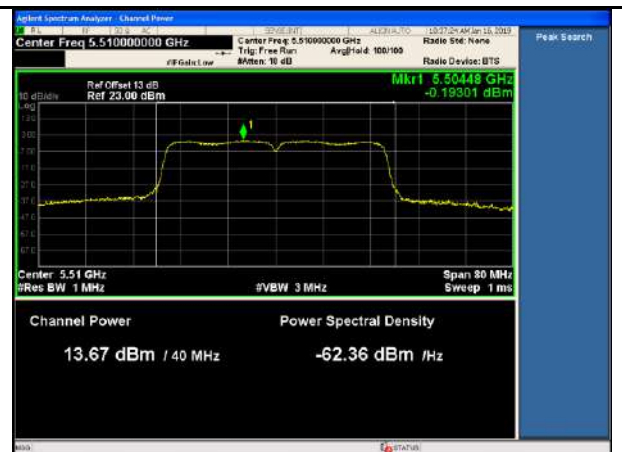
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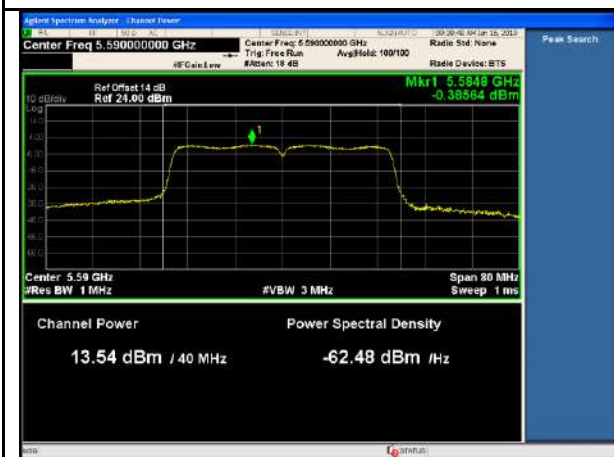
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802.11n-40MHz- 5510MHz-PWR-TX1



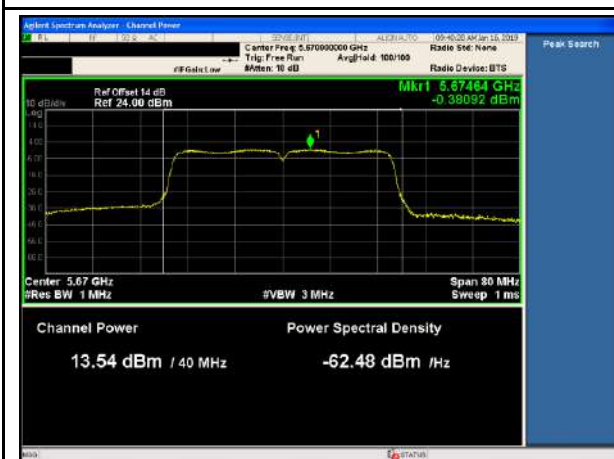
802.11n-40MHz- 5510MHz-PWR-TX2



802.11n-40MHz- 5590MHz-PWR-TX1



802.11n-40MHz- 5590MHz-PWR-TX2



802.11n-40MHz- 5670MHz-PWR-TX1

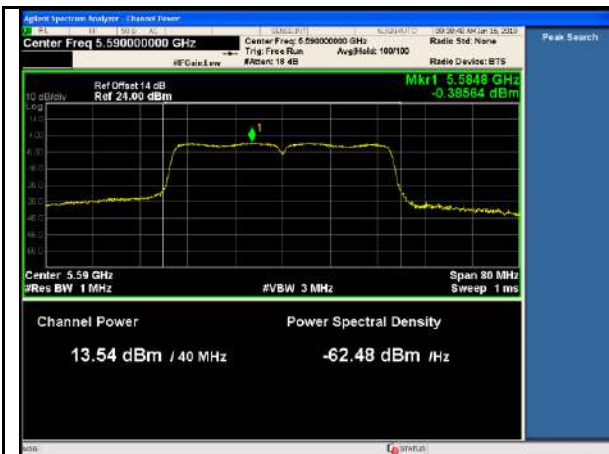


802.11n-40MHz- 5670MHz-PWR-TX2

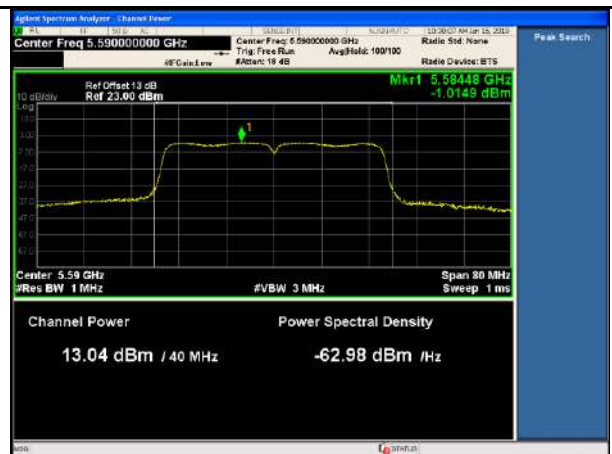
Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



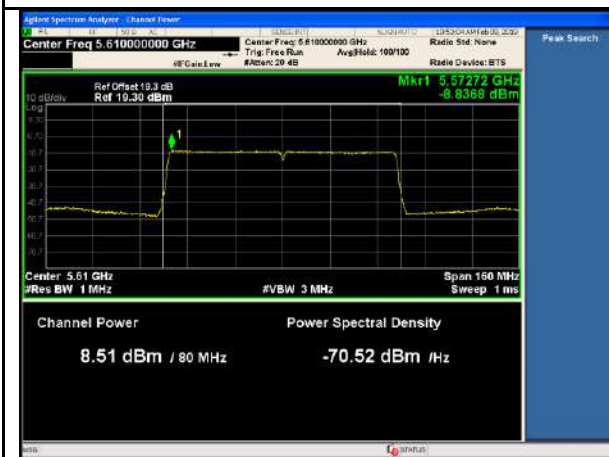
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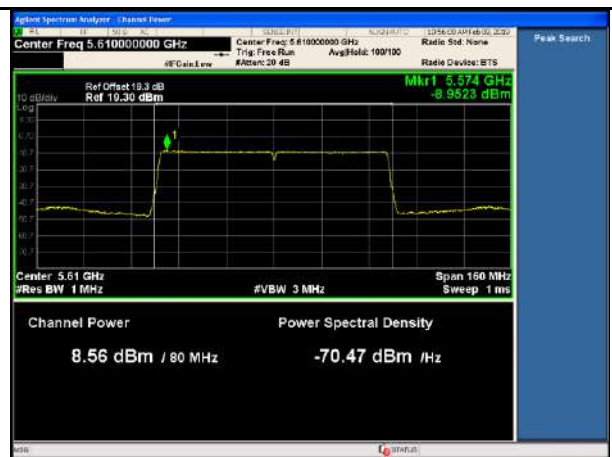
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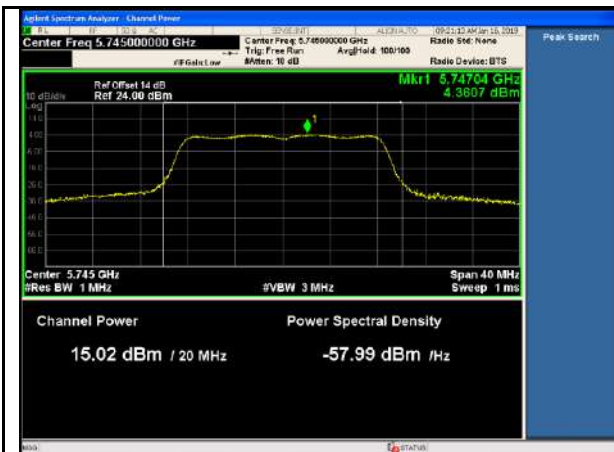
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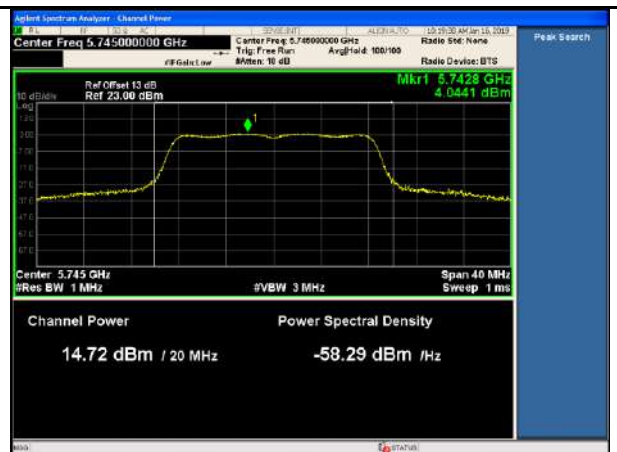
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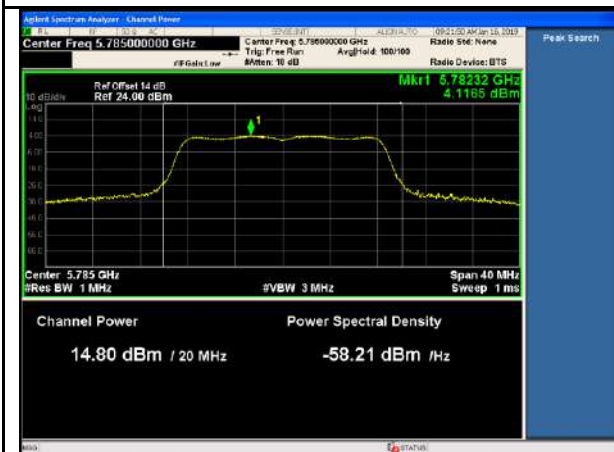
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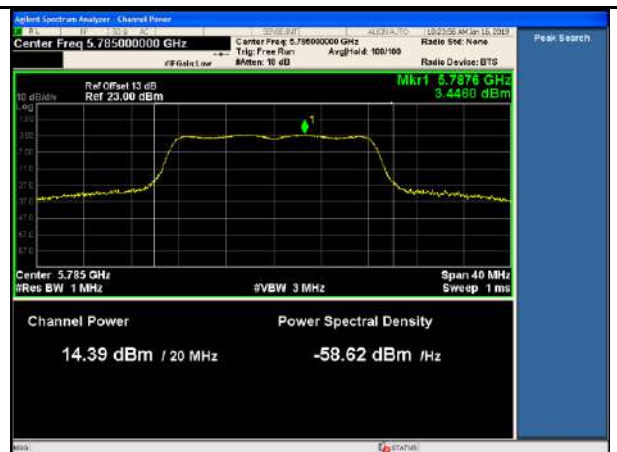
802.11a 5745MHz-PWR-TX1



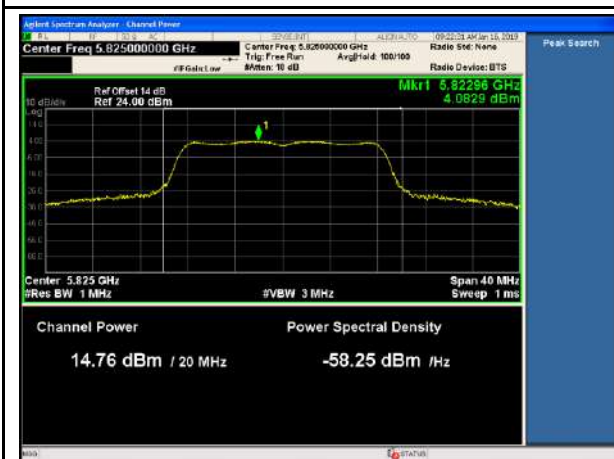
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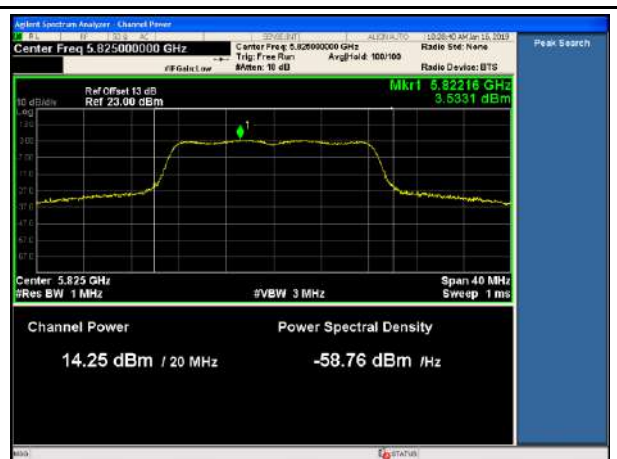
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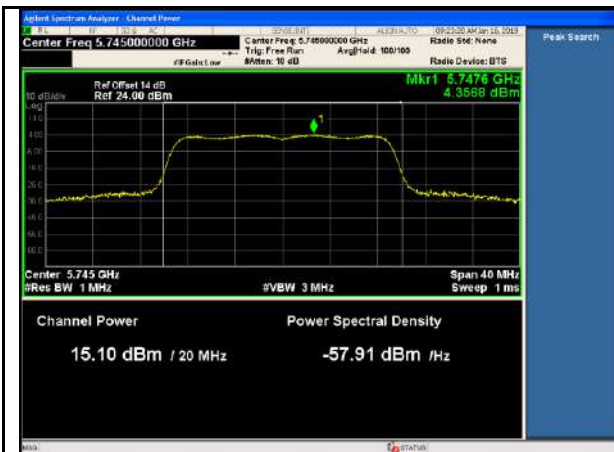
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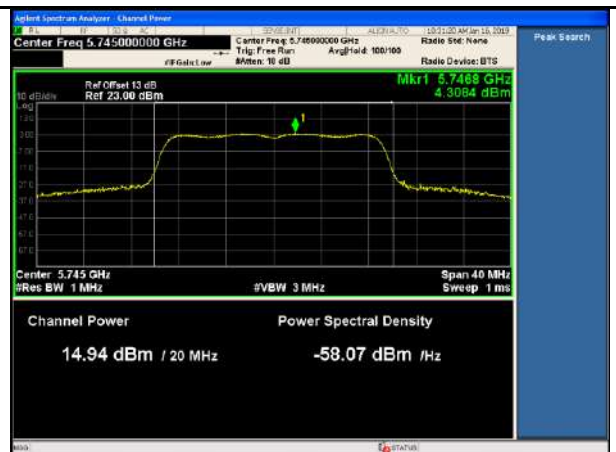
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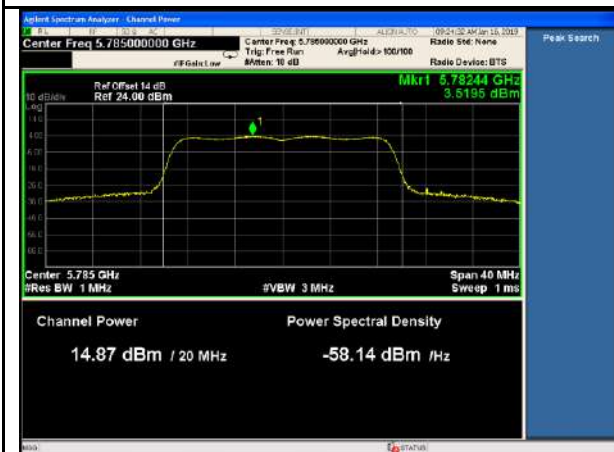
802.11a 5825MHz-PWR-TX2



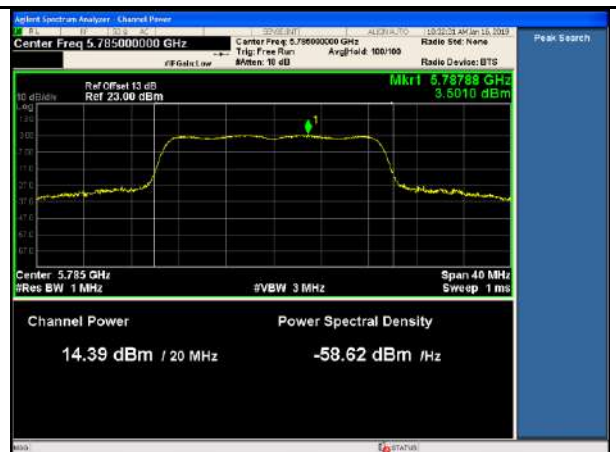
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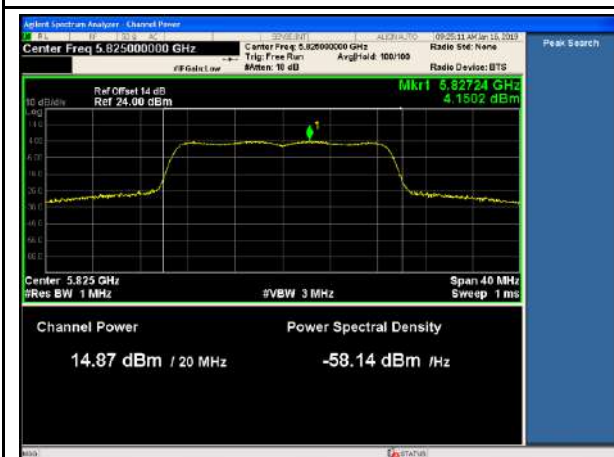
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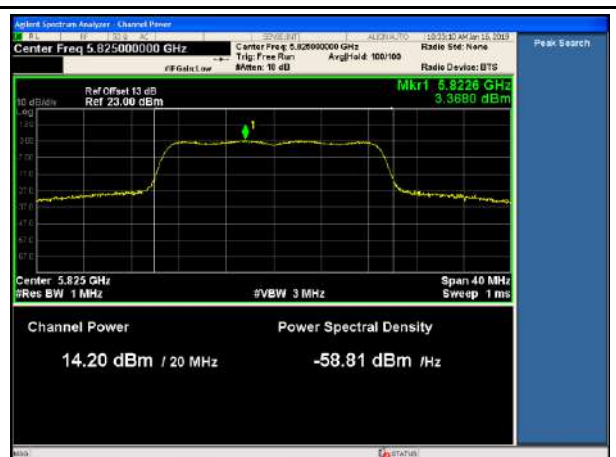
802.11n-20MHz- 5785MHz-PWR-TX1



802.11n-20MHz- 5785MHz-PWR-TX2



802.11n-20MHz- 5825MHz-PWR-TX1

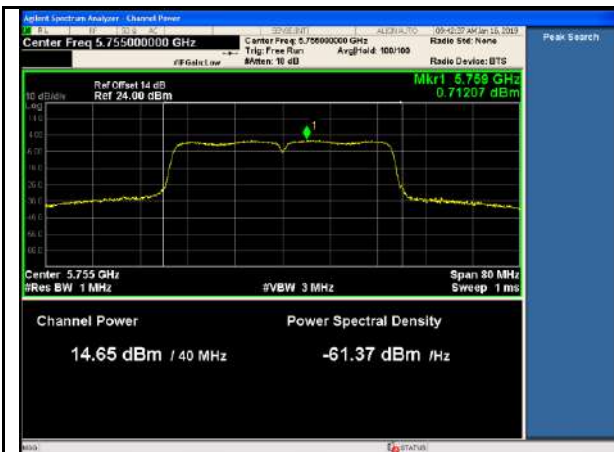


802.11n-20MHz- 5825MHz-PWR-TX2

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



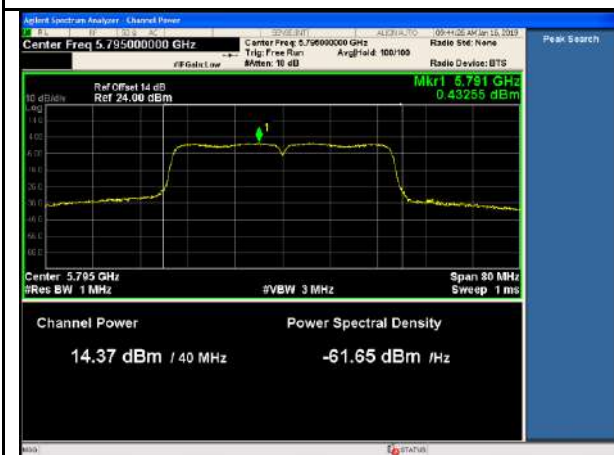
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802.11n-40MHz- 5755MHz-PWR-TX1



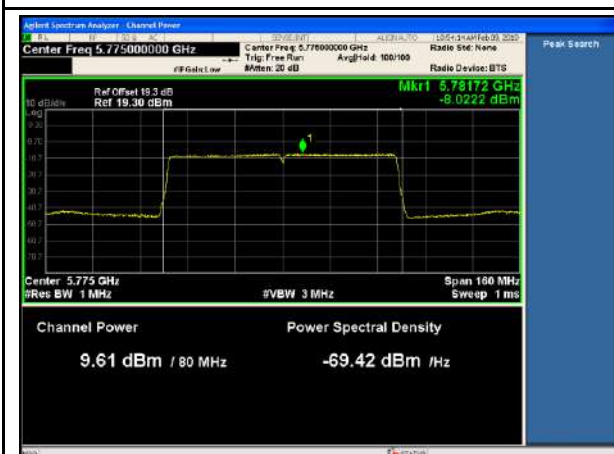
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802.11n-40MHz- 5795MHz-PWR-TX1



802.11n-40MHz- 5795MHz-PWR-TX2



802.11ac-80MHz- 5775MHz-PWR-TX1



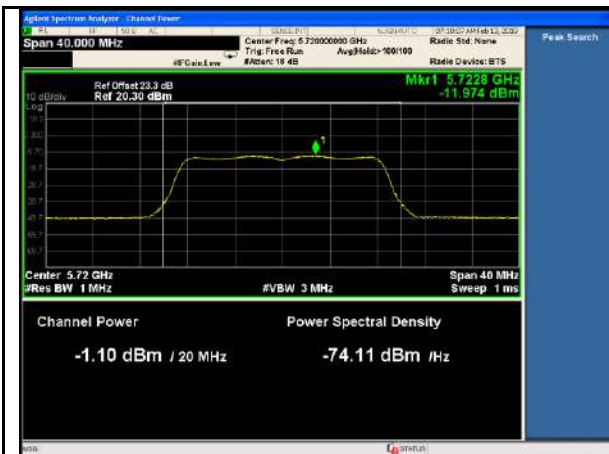
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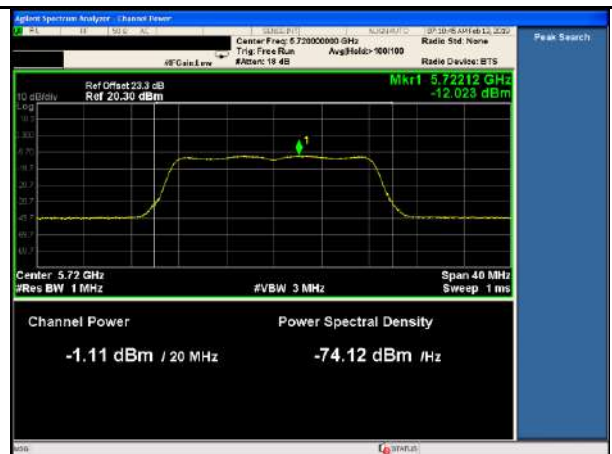
Electromagnetic Compatibility
Radio Frequency
Product Certification
International Approval

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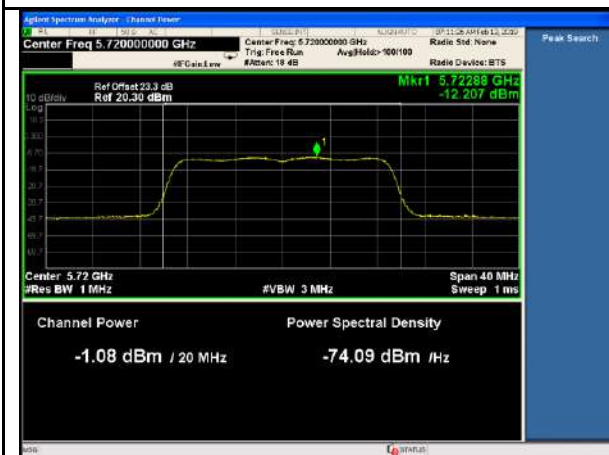
Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



802.11a-20MHz- 5720MHz-PWR-TX1



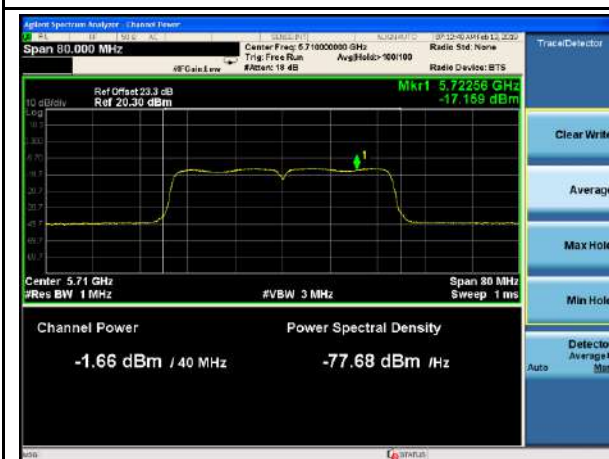
802.11a-20MHz- 5720MHz-PWR-TX2



802.11n-20MHz- 5720MHz-PWR-TX1



802.11n-20MHz- 5720MHz-PWR-TX2

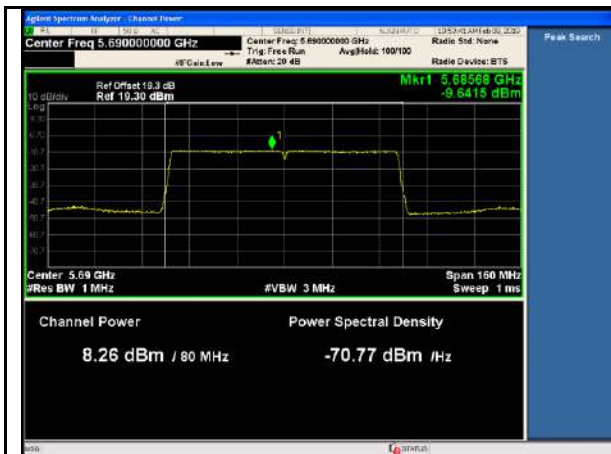


802.11n-40MHz- 5710MHz-PWR-TX1

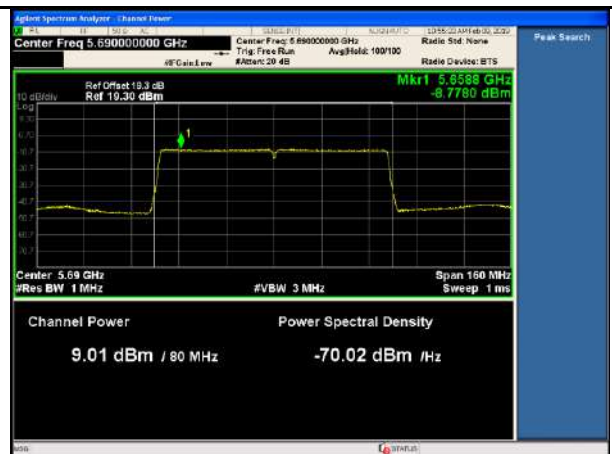


802.11n-40MHz- 5710MHz-PWR-TX2

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



802.11ac-80MHz- 5690MHz-PWR-TX1



802.11ac-80MHz- 5690MHz-PWR-TX2

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.5 Power Spectral Density

8.5.1 Requirement

§ 15.407 (a)

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

For the 5.25–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.5.2 Test setup



8.5.3 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, section F) Maximum power spectral density. Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW)(or, alternatively, the entire 99% occupied bandwidth)of the signal.
2. Set RBW=1MHz
3. Set VBW $\geq 3 \times$ RBW
4. Number of points in sweep $\geq 2 \times$ span/ RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto couple.
6. Detector = Power averaging (RMS)
7. Trace average at least 100 traces in power averaging(rms)mode.
8. Use the peak marker function to determine the maximum amplitude level within the RBW.

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.5.4 Test Result

For 5.2GHz band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Max PSD (dBm/MHz)	Result
11a	5180	6Mbps	4.8240	4.5917	4.824	11	Pass
11a	5220	6Mbps	4.8594	4.2566	4.8594	11	Pass
11a	5240	6Mbps	4.8204	4.0701	4.8204	11	Pass
11n-20M	5180	MCS1	4.7540	4.3538	7.569	11	Pass
11n-20M	5220	MCS1	4.7981	4.3516	7.591	11	Pass
11n-20M	5240	MCS1	4.6798	3.9374	7.335	11	Pass
11n-40M	5190	MCS1	1.1750	0.8860	4.043	11	Pass
11n-40M	5230	MCS1	1.2542	0.6405	3.968	11	Pass
11ac-80M	5210	VHC-MCS1	-7.8706	-7.7596	-4.804	11	Pass

For 5.3GHz band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Max PSD (dBm/MHz)	Result
11a	5260	6Mbps	4.4756	3.4612	4.4756	11	Pass
11a	5300	6Mbps	4.2377	3.5775	4.2377	11	Pass
11a	5320	6Mbps	4.0025	3.3931	4.0025	11	Pass
11n-20M	5260	MCS1	4.2676	3.6233	6.968	11	Pass
11n-20M	5300	MCS1	4.2394	3.4170	6.858	11	Pass
11n-20M	5320	MCS1	3.8343	3.2094	6.543	11	Pass
11n-40M	5270	MCS1	0.8001	0.0477	3.450	11	Pass
11n-40M	5310	MCS1	0.7810	-0.3375	3.268	11	Pass
11ac-80M	5290	VHC-MCS1	-7.9196	-7.7596	-4.829	11	Pass

For 5.5GHz band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Max PSD (dBm/MHz)	Result
11a	5500	6Mbps	4.1107	2.8257	4.1107	11	Pass
11a	5600	6Mbps	3.3607	2.8257	3.3607	11	Pass
11a	5700	6Mbps	3.0557	3.2605	3.2605	11	Pass
11n-20M	5500	MCS1	4.0577	3.6264	6.858	11	Pass
11n-20M	5600	MCS1	3.0302	2.4778	5.773	11	Pass
11n-20M	5700	MCS1	3.0265	3.1209	6.084	11	Pass
11n-40M	5510	MCS1	0.5341	-0.1930	3.196	11	Pass
11n-40M	5590	MCS1	-0.3856	-1.0149	2.321	11	Pass
11n-40M	5670	MCS1	-0.3809	-0.3262	2.657	11	Pass
11ac-80M	5530	VHC-MCS1	-8.6070	-7.9159	-5.24	11	Pass

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



11ac-80M	5610	VHC-MCS1	-8.8368	-8.9523	-5.24	11	Pass
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For 5.7GHz band

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Corrected PSD (dBm/500KHz)	Max PSD (dBm/500KHz)	Result
11a	5745	6Mbps	4.3607	4.0441	4.3607	1.35	30	Pass
11a	5785	6Mbps	4.1165	3.4460	4.1165	1.11	30	Pass
11a	5825	6Mbps	4.0829	3.5331	4.0829	1.07	30	Pass
11n-20M	5745	MCS1	4.3568	4.3084	7.569	4.56	30	Pass
11n-20M	5785	MCS1	3.5195	3.5010	7.591	4.58	30	Pass
11n-20M	5825	MCS1	4.1502	3.3680	7.335	4.32	30	Pass
11n-40M	5755	MCS1	0.7121	0.5058	4.043	1.03	30	Pass
11n-40M	5795	MCS1	0.4326	-0.0269	3.968	0.96	30	Pass
11ac-80M	5775	VHC-MCS1	-8.0222	-7.7094	-4.804	-7.81	30	Pass

Note: If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

For 5.5GHz band Cross-band channel

Mode/ Bandwidth	Frequency (MHz)	Data rate	TX1 PSD (dBm/MHz)	TX2 PSD (dBm/MHz)	Highest or Total PSD (dBm/MHz)	Max PSD (dBm/MHz)	Result
11a	5720	6Mbps	-11.974	-12.023	-8.988	11	Pass
11n	5720	MCS1	-12.207	-12.253	-9.220	11	Pass
11n-40M	5710	MCS1	-17.159	-15.950	-13.502	11	Pass
11ac-80M	5690	VHC-MCS1	-9.6415	-8.7780	-6.18	11	Pass

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.5.5 Test Plots

Refer to test plots in conducted peak output power

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.6 Automatically Discontinue Transmission

8.6.1 Requirement

§ 15.407 (c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

8.6.2 Test setup



8.6.3 Test Result

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.7 Radiated Spurious Emissions into Restricted Frequency Bands

8.7.1 Requirement

§ 15.205, 15.209, 15.407(b)

- (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
- (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.
- (5) Restricted band, emission must also comply with the radiated emission limits specified in 15.209

Attenuation below the general limits specified in §15.209(a) and RSS-Gen is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

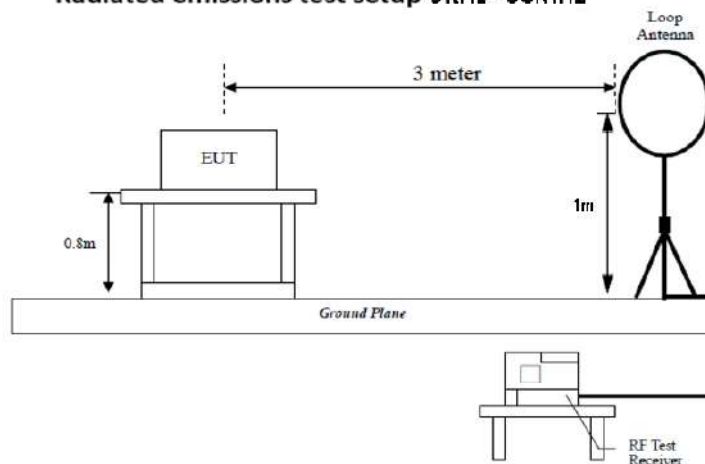
Frequency range (MHz)	Field Strength (μV/m)
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0.490~1.705	24000/F(KHz)
1.705~30.0	30
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.7.2 Test setup

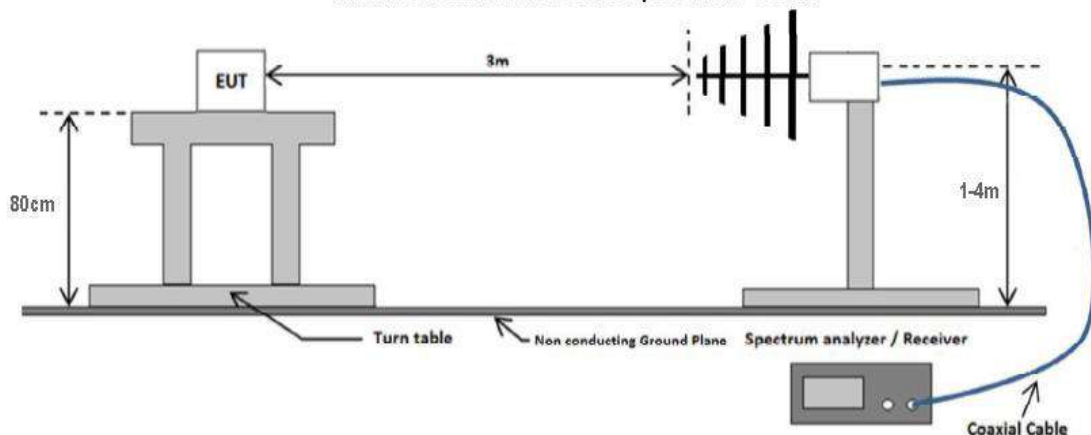
Radiated emissions test setup 9KHz - 30MHz



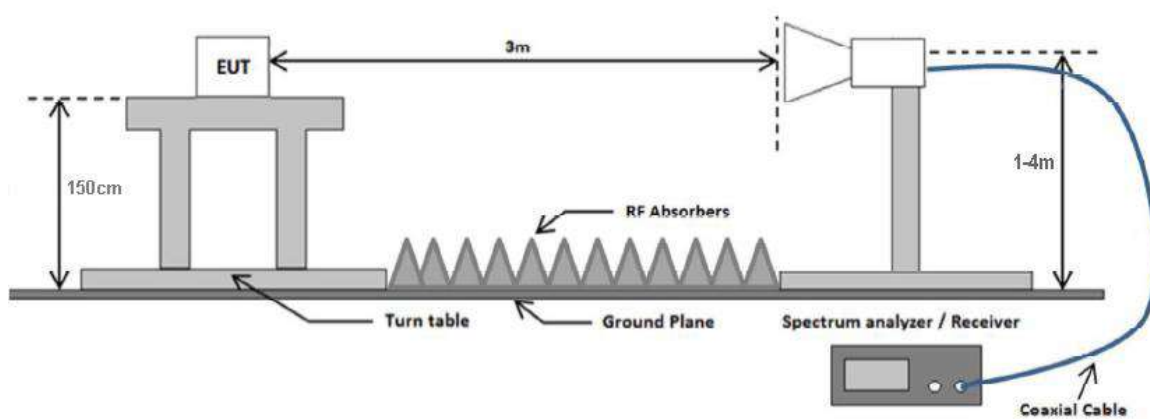
Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.7.3 Test Procedure

According to FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement. And subclause 12.7 Radiated spurious emission measurements in ANSI C62.10-2013 as well as the procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 was followed. Boresight antenna mast was used during the scanning to point to EUT to maximize the emission. The process will be repeated in 3 EUT orientations.

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 300 Hz for frequency below 150KHz.
4. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 10 kHz for frequency between 150KHz – 30MHz.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-Peak detection at frequency between 30MHz - 1GHz.
6. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak and average measurement at frequency above 1GHz.
7. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.

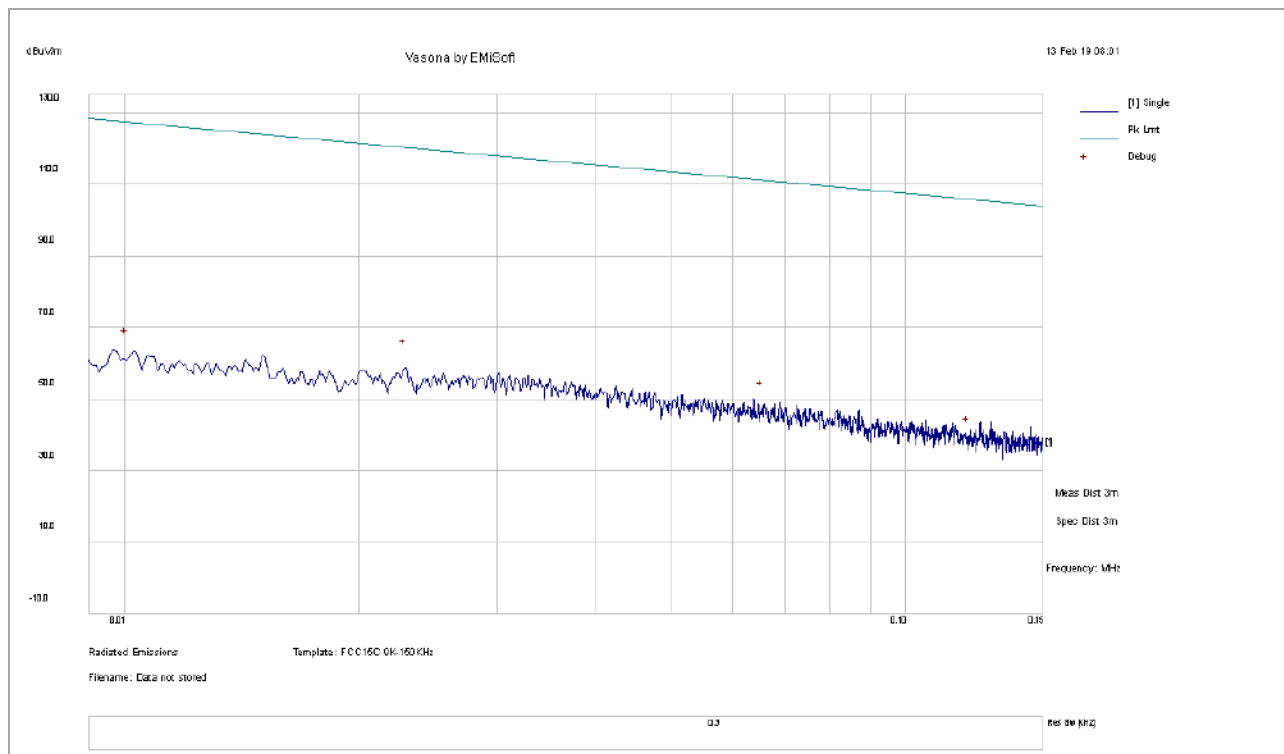
Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.7.4 Test Result

9KHz – 150KHz test result

Test Standard:	15.209	Mode:	11a-5500MHz
Frequency Range:	Below 150KHz	Test Date:	02/12/2019
Antenna Type/Polarity:	Loop / 0 deg & 90 deg	Test Personnel:	Sherwin Lee
Remark:	Internal antenna	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
0.010	50.56	0.31	10.18	61.05	PK	0	100	98	127.57	-66.52
0.023	45.49	0.39	12.17	58.06	PK	0	100	121	120.44	-62.38
0.065	33.28	0.50	12.63	46.41	PK	0	100	172	111.30	-64.89
0.120	24.84	0.56	11.00	36.40	PK	0	100	11	106.03	-69.63

Note: 1) Both 0 deg and 90 deg setup of the loop antenna have been verified and the worst case result is presented here.

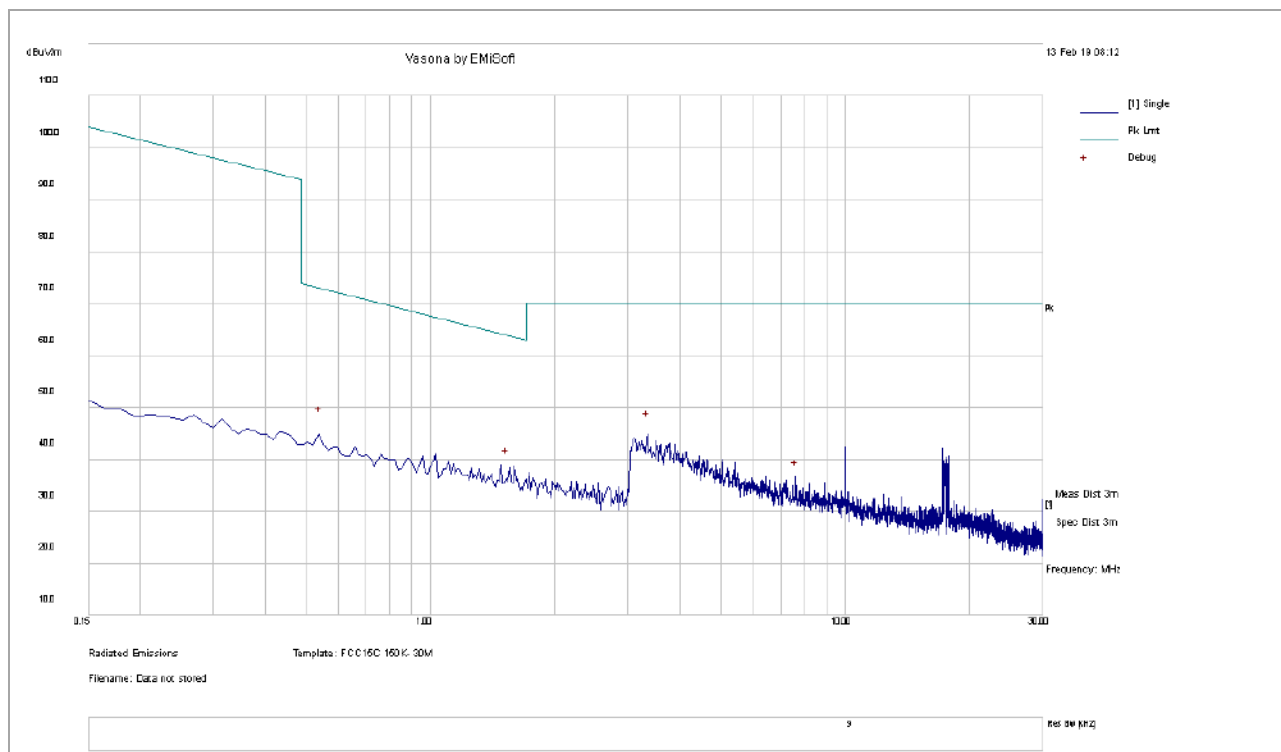
2) EUT was tested in 3 orientations.

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



150KHz – 30MHz test result

Test Standard:	15.209	Mode:	11a-5500MHz
Frequency Range:	150KHz – 30MHz	Test Date:	02/12/2019
Antenna Type/Polarity:	Loop / 0 deg & 90 deg	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table deg	Limit dBuV/m	Margin dB
3.337	29.23	0.89	13.06	43.18	PK	0	100	192	70.00	-26.82
0.542	31.10	0.71	12.39	44.20	PK	0	100	19	72.92	-28.72
7.606	19.55	0.97	13.26	33.78	PK	0	100	128	70.00	-36.22
1.527	22.24	0.81	13.08	36.14	PK	0	100	142	63.92	-27.78

Note: 1) Both 0 deg and 90 deg setup of the loop antenna have been verified and the worst case result is presented here.

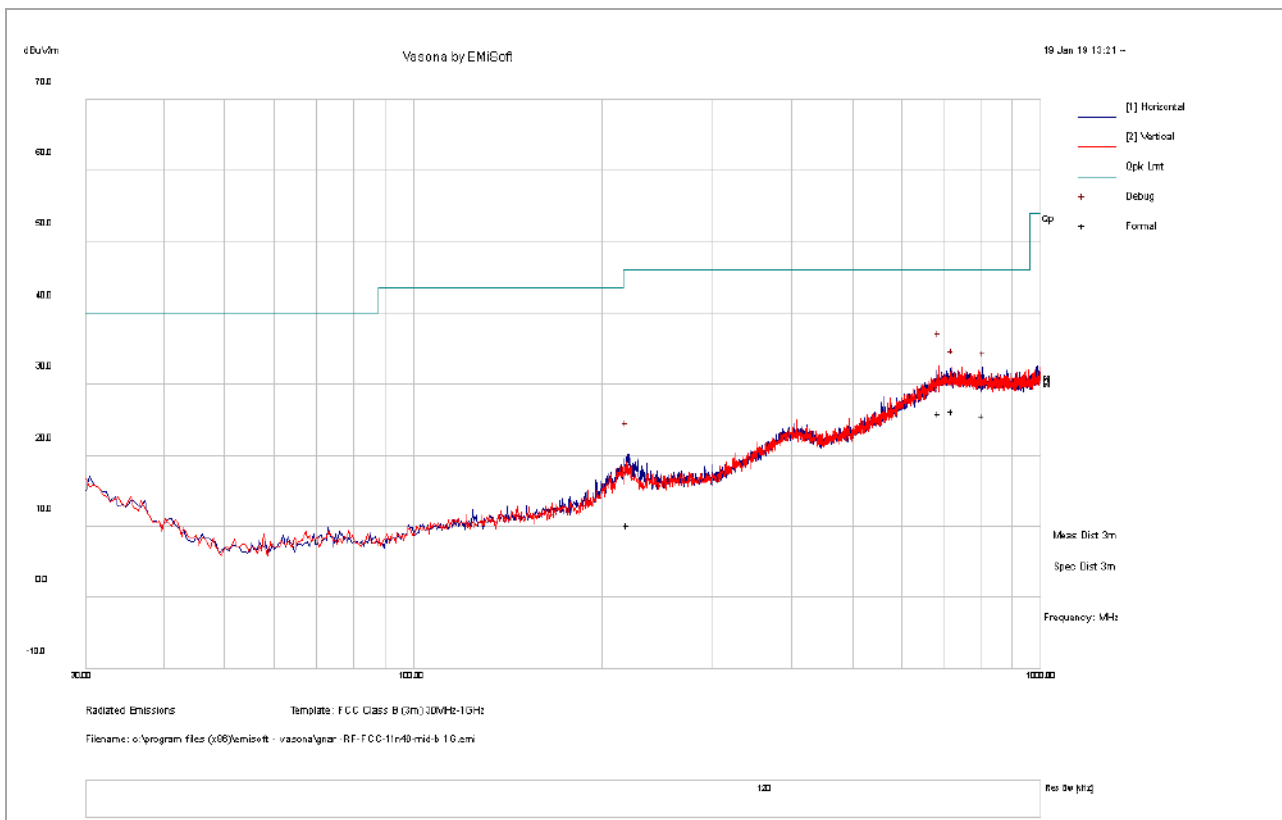
2) EUT was tested in 3 orientations.

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



30-1000MHz test result

Test Standard:	15.209	Mode:	11a-5180MHz
Frequency Range:	30-1000MHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
219.17	26.06	4.94	-20.76	10.24	QP	H	355	15	46.00	-35.76
687.48	25.57	7.30	-6.84	26.02	QP	V	253	165	46.00	-19.98
721.55	25.53	7.30	-6.51	26.32	QP	H	324	186	46.00	-19.68
810.04	25.24	7.28	-6.81	25.71	QP	H	253	67	46.00	-20.29

Note:

- 1) For below 1GHz, all different channel and modes were verified but only the worst case result is shown here.



Electromagnetic Compatibility
Radio Frequency
Product Certification
International Approval

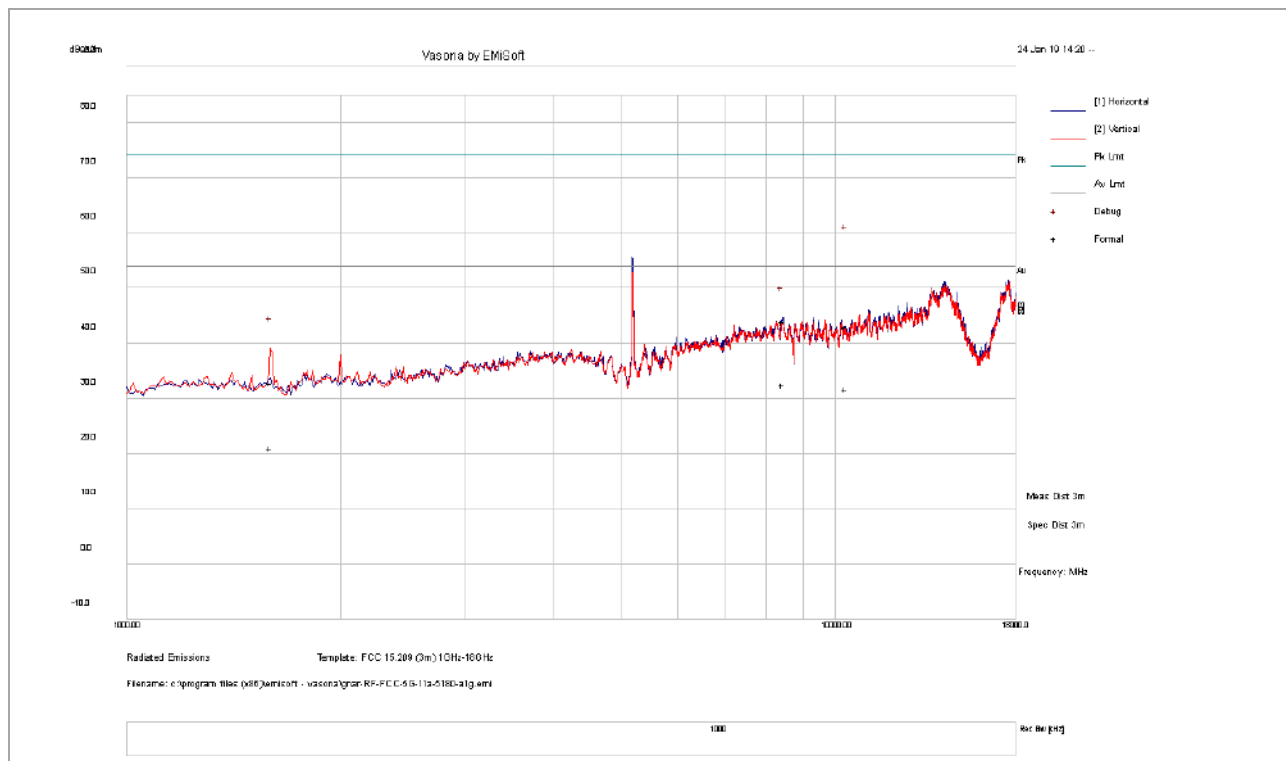
1261 Puerta Del Sol
San Clemente, CA, 92673
+1 (949) 393-1123
www.vista-compliance.com

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5180MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



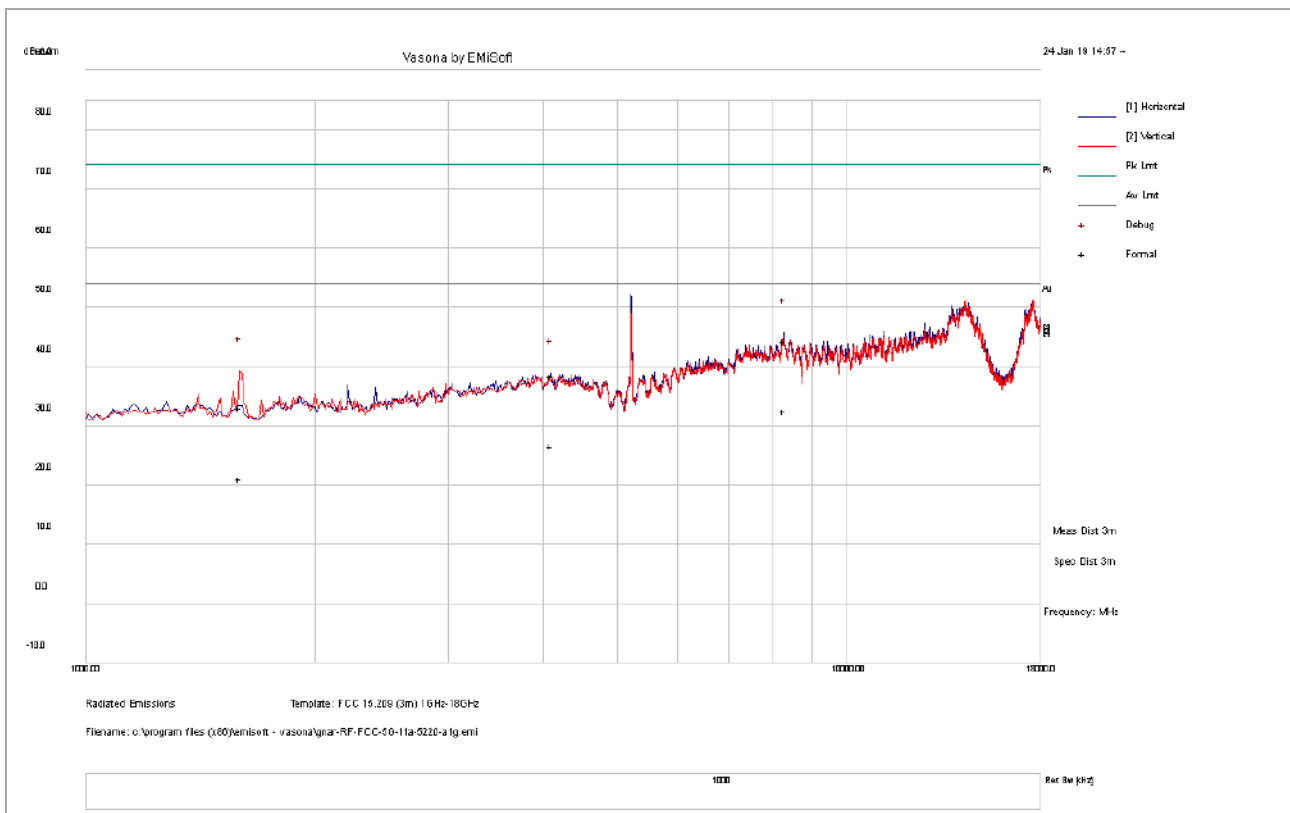
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
1593.24	34.32	10.45	-11.80	32.97	PK	V	194	51	74.00	-41.03
8428.77	28.10	15.85	-0.06	43.90	PK	H	390	36	74.00	-30.10
10360.99	23.83	17.74	1.42	42.99	PK	H	400	203	74.00	-31.01
1593.24	22.45	10.45	-11.80	21.10	AV	V	194	51	54.00	-32.90
8428.77	16.63	15.85	-0.06	32.43	AV	H	390	36	54.00	-21.57
10360.99	12.68	17.74	1.42	31.84	AV	H	400	203	54.00	-22.16

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5220MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



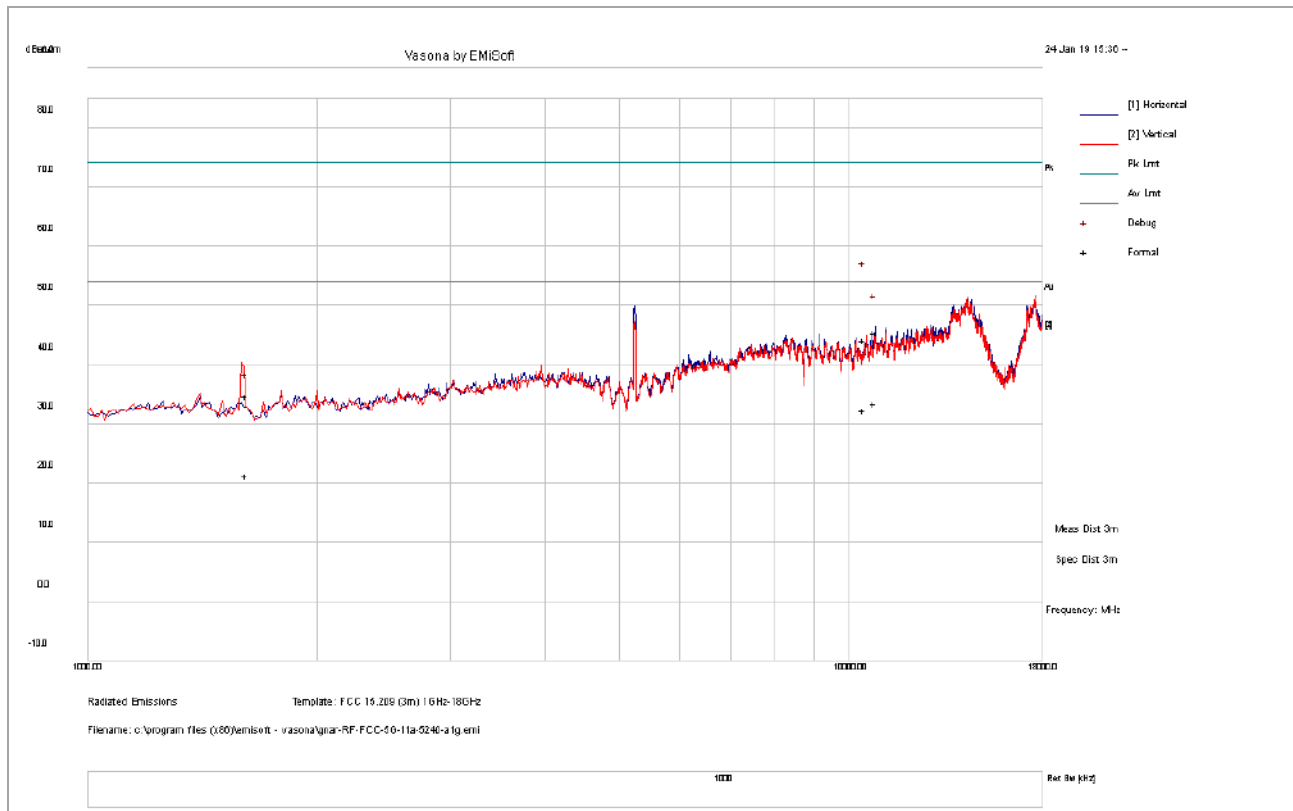
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8265.77	28.74	15.83	-0.24	44.33	PK	H	364	310	74.00	-29.67
1595.92	34.42	10.45	-11.80	33.07	PK	V	173	238	74.00	-40.93
4090.25	32.49	12.49	-6.56	38.42	PK	H	381	171	74.00	-35.58
8265.77	16.97	15.83	-0.24	32.56	AV	H	364	310	54.00	-21.44
1595.92	22.49	10.45	-11.80	21.15	AV	V	173	238	54.00	-32.86
4090.25	20.75	12.49	-6.56	26.67	AV	H	381	171	54.00	-27.33

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5240MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



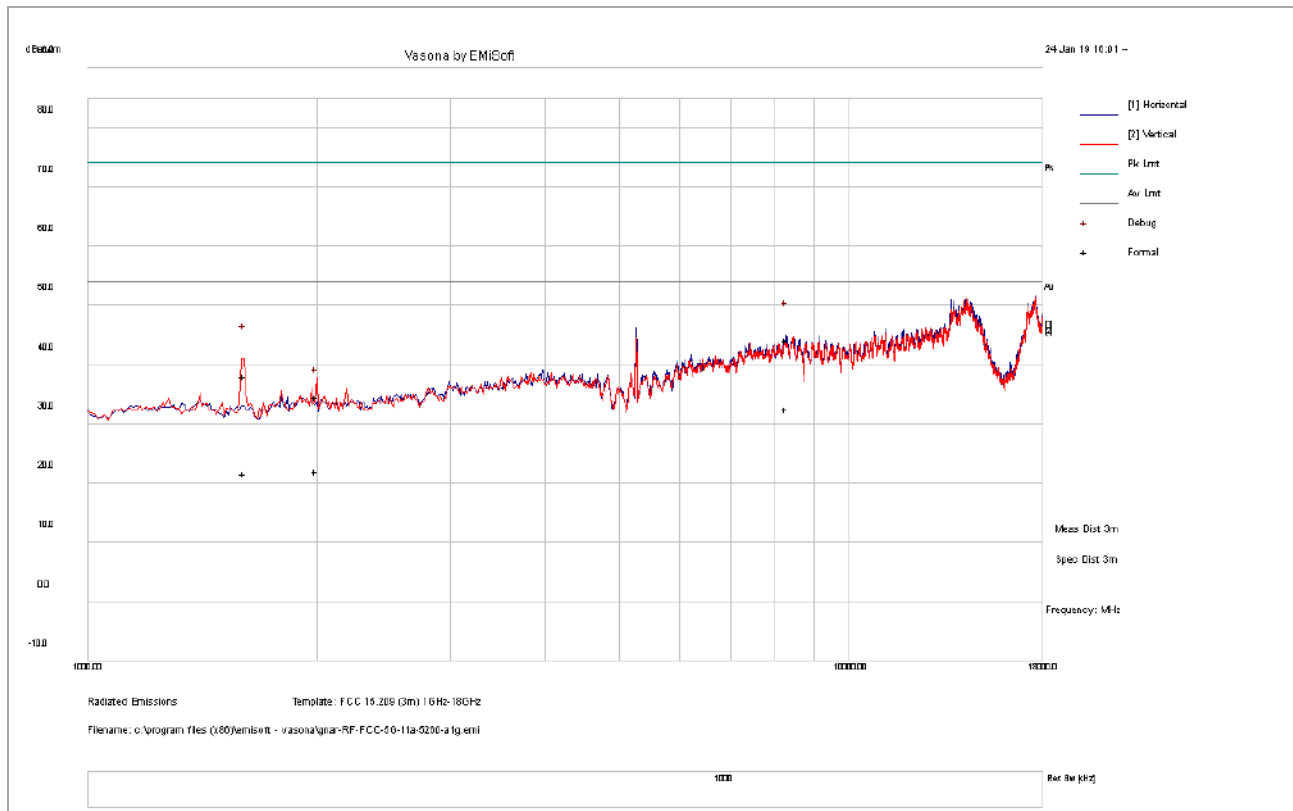
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
10481.15	24.50	17.89	1.66	44.05	PK	H	100	131	74.00	-29.95
10830.39	25.04	18.32	1.98	45.34	PK	V	202	30	74.00	-28.66
1616.24	36.14	10.45	-11.85	34.74	PK	V	247	168	74.00	-39.26
10481.15	12.78	17.89	1.66	32.33	AV	H	100	131	54.00	-21.67
10830.39	13.13	18.32	1.98	33.44	AV	V	202	30	54.00	-20.57
1616.24	22.68	10.45	-11.85	21.28	AV	V	247	168	54.00	-32.72

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5260MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



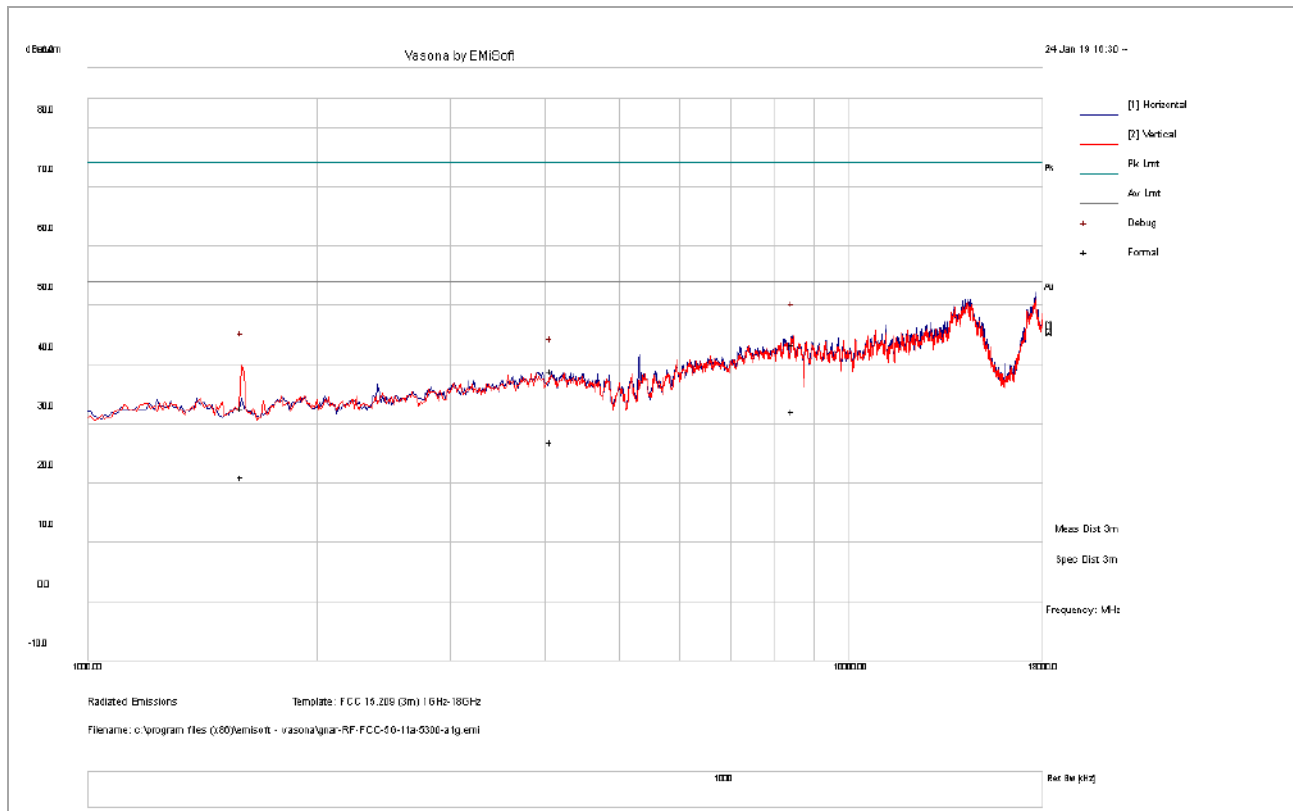
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8278.52	28.57	15.83	-0.21	44.19	PK	H	285	94	74.00	-29.81
1604.16	39.38	10.45	-11.81	38.03	PK	V	276	180	74.00	-35.97
1998.14	34.76	10.44	-10.60	34.60	PK	V	262	138	74.00	-39.40
8278.52	16.84	15.83	-0.21	32.46	AV	H	285	94	54.00	-21.54
1604.16	22.94	10.45	-11.81	21.59	AV	V	276	180	54.00	-32.42
1998.14	22.19	10.44	-10.60	22.04	AV	V	262	138	54.00	-31.96

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5300MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



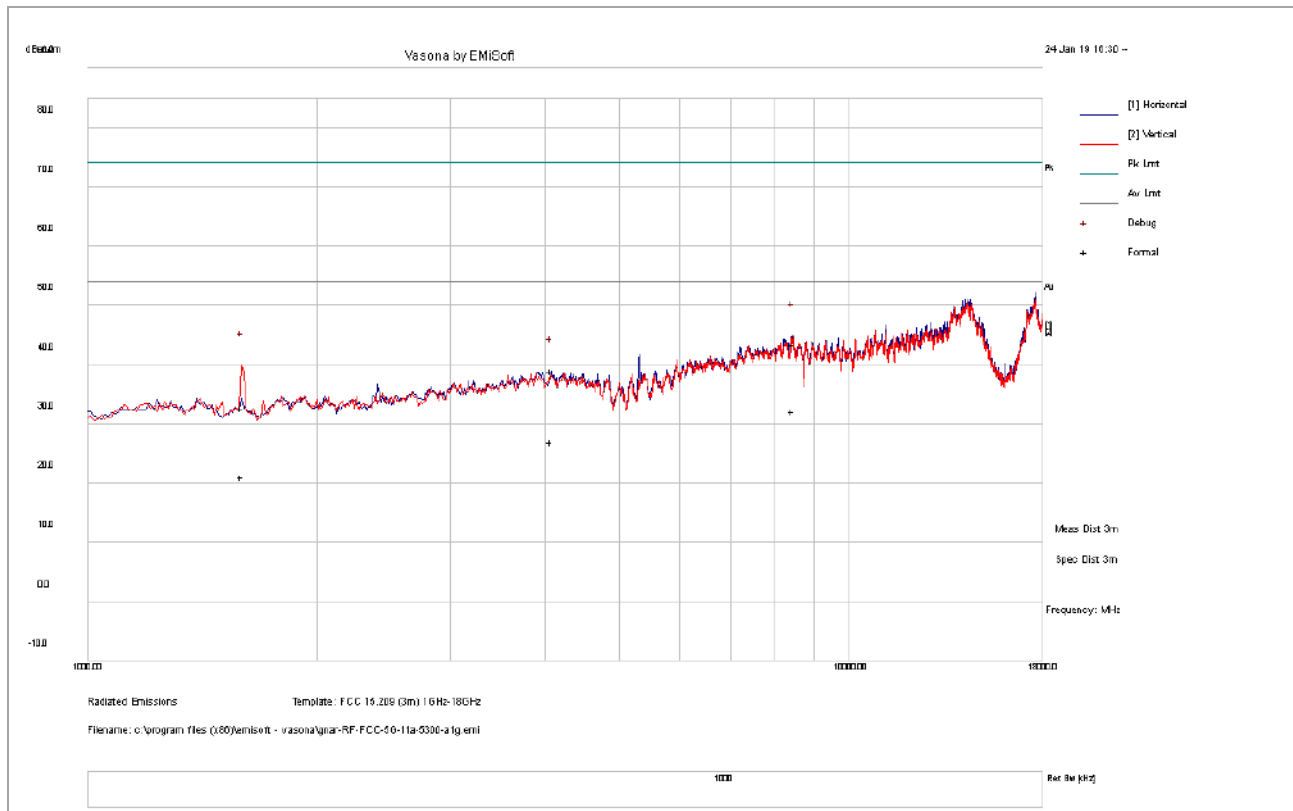
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8449.19	27.66	15.86	-0.04	43.48	PK	V	271	151	74.00	-30.52
1595.08	34.01	10.45	-11.80	32.67	PK	V	264	74	74.00	-41.33
4069.10	32.99	12.47	-6.54	38.92	PK	H	140	46	74.00	-35.08
8449.19	16.26	15.86	-0.04	32.07	AV	V	271	151	54.00	-21.93
1595.08	22.36	10.45	-11.80	21.01	AV	V	264	74	54.00	-32.99
4069.10	20.98	12.47	-6.54	26.91	AV	H	140	46	54.00	-27.09

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5300MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



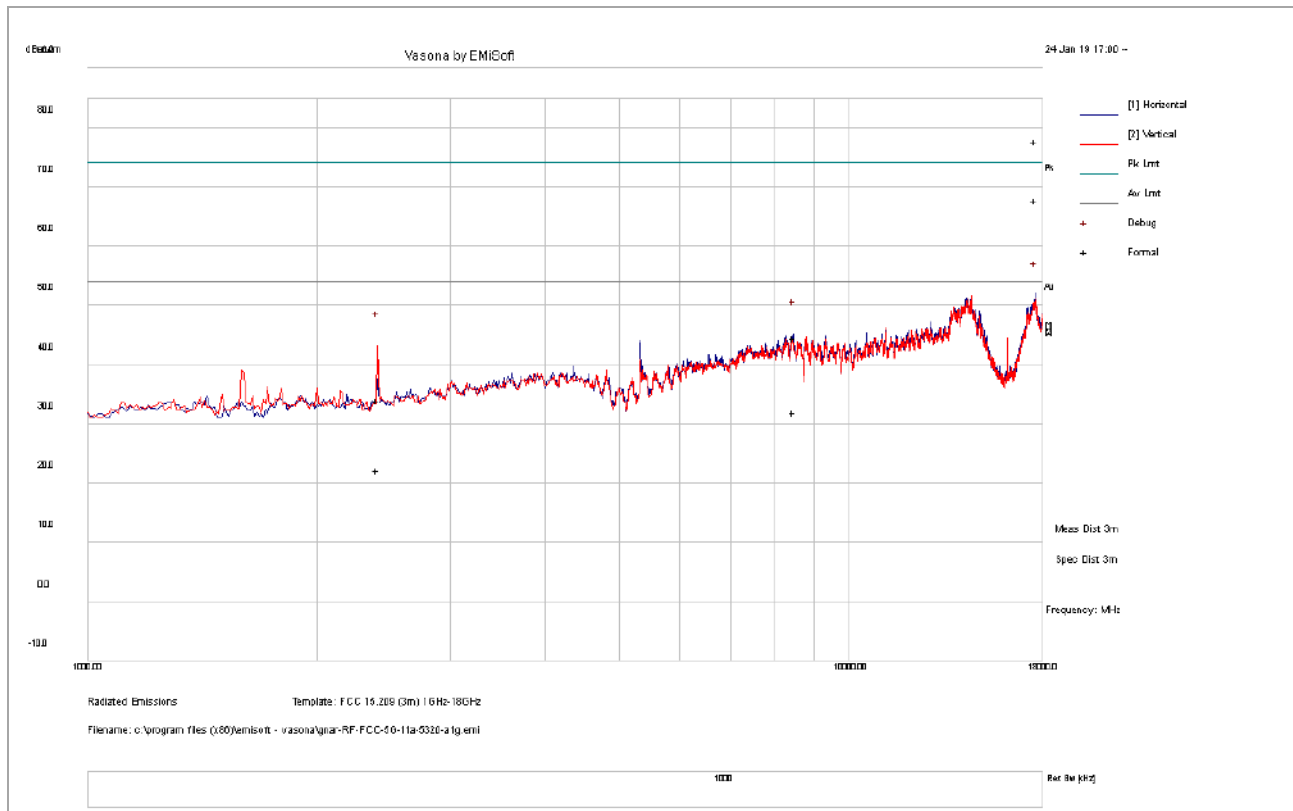
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8449.19	27.66	15.86	-0.04	43.48	PK	V	271	151	74.00	-30.52
1595.08	34.01	10.45	-11.80	32.67	PK	V	264	74	74.00	-41.33
4069.10	32.99	12.47	-6.54	38.92	PK	H	140	46	74.00	-35.08
8449.19	16.26	15.86	-0.04	32.07	AV	V	271	151	54.00	-21.93
1595.08	22.36	10.45	-11.80	21.01	AV	V	264	74	54.00	-32.99
4069.10	20.98	12.47	-6.54	26.91	AV	H	140	46	54.00	-27.09

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5320MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



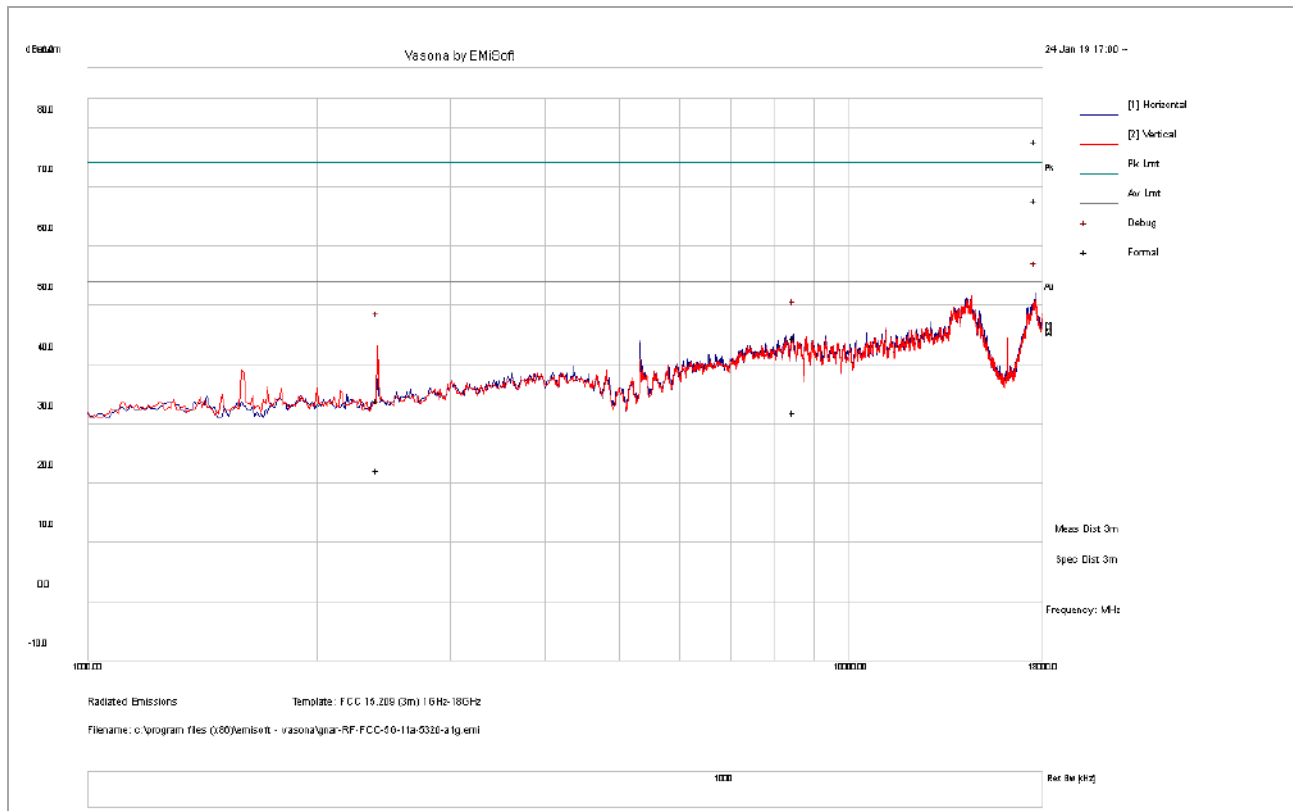
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
17571.68	22.85	23.26	11.62	57.73	PK	V	144	270	74.00	-16.27
8456.85	28.64	15.86	-0.04	44.47	PK	H	181	178	74.00	-29.53
2403.38	33.03	10.83	-9.85	34.01	PK	V	128	7	74.00	-39.99
17571.68	12.81	23.26	11.62	47.69	AV	V	144	270	54.00	-6.31
8456.85	16.22	15.86	-0.04	32.05	AV	H	181	178	54.00	-21.96
2403.38	21.22	10.83	-9.85	22.19	AV	V	128	7	54.00	-31.81

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5500MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



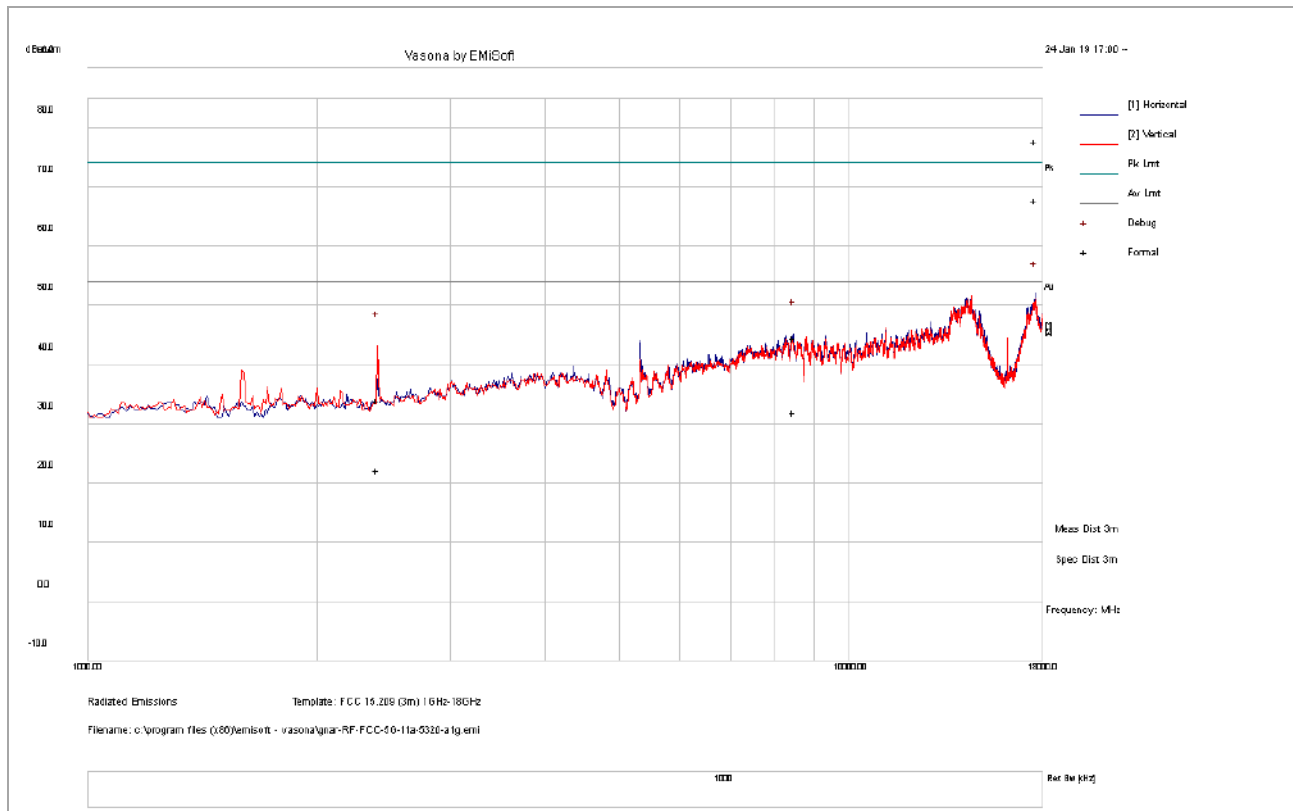
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14407.81	28.91	20.66	8.18	57.75	PK	V	137	264	74.00	-16.25
3805.66	32.17	12.22	-6.29	38.10	PK	H	120	350	74.00	-35.90
1595.60	34.28	10.45	-11.80	32.94	PK	V	266	288	74.00	-41.07
14407.81	12.89	20.66	8.18	41.73	AV	V	137	264	54.00	-12.27
3805.66	20.08	12.22	-6.29	26.01	AV	H	120	350	54.00	-27.99
1595.60	22.28	10.45	-11.80	20.93	AV	V	266	288	54.00	-33.07

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5600MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



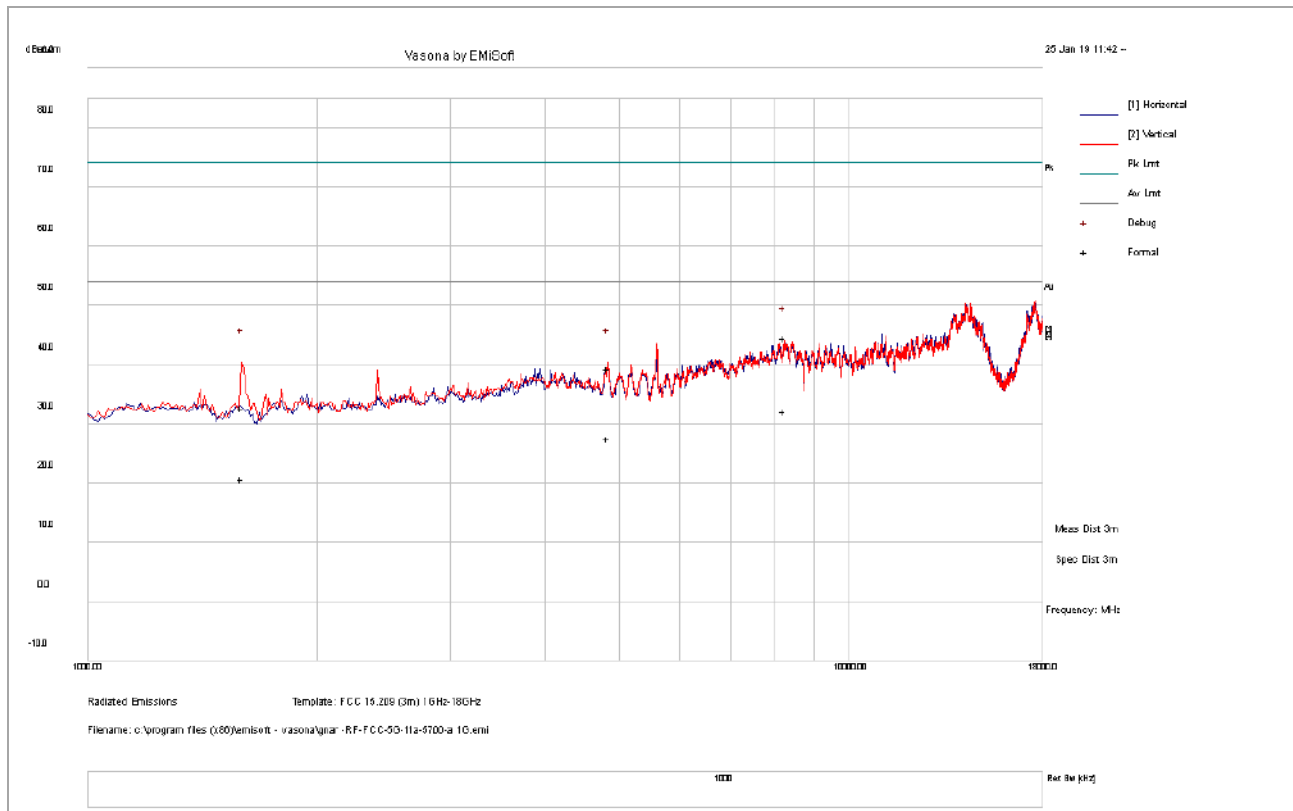
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
9329.36	26.41	16.40	0.12	42.94	PK	H	201	17	74.00	-31.06
5602.13	37.29	13.08	-5.91	44.46	PK	H	154	280	74.00	-29.55
1594.48	34.45	10.45	-11.80	33.10	PK	V	285	155	74.00	-40.90
9329.36	14.92	16.40	0.12	31.44	AV	H	201	17	54.00	-22.56
5602.13	27.68	13.08	-5.91	34.85	AV	H	154	280	54.00	-19.15
1594.48	22.82	10.45	-11.80	21.47	AV	V	285	155	54.00	-32.53

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5700MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



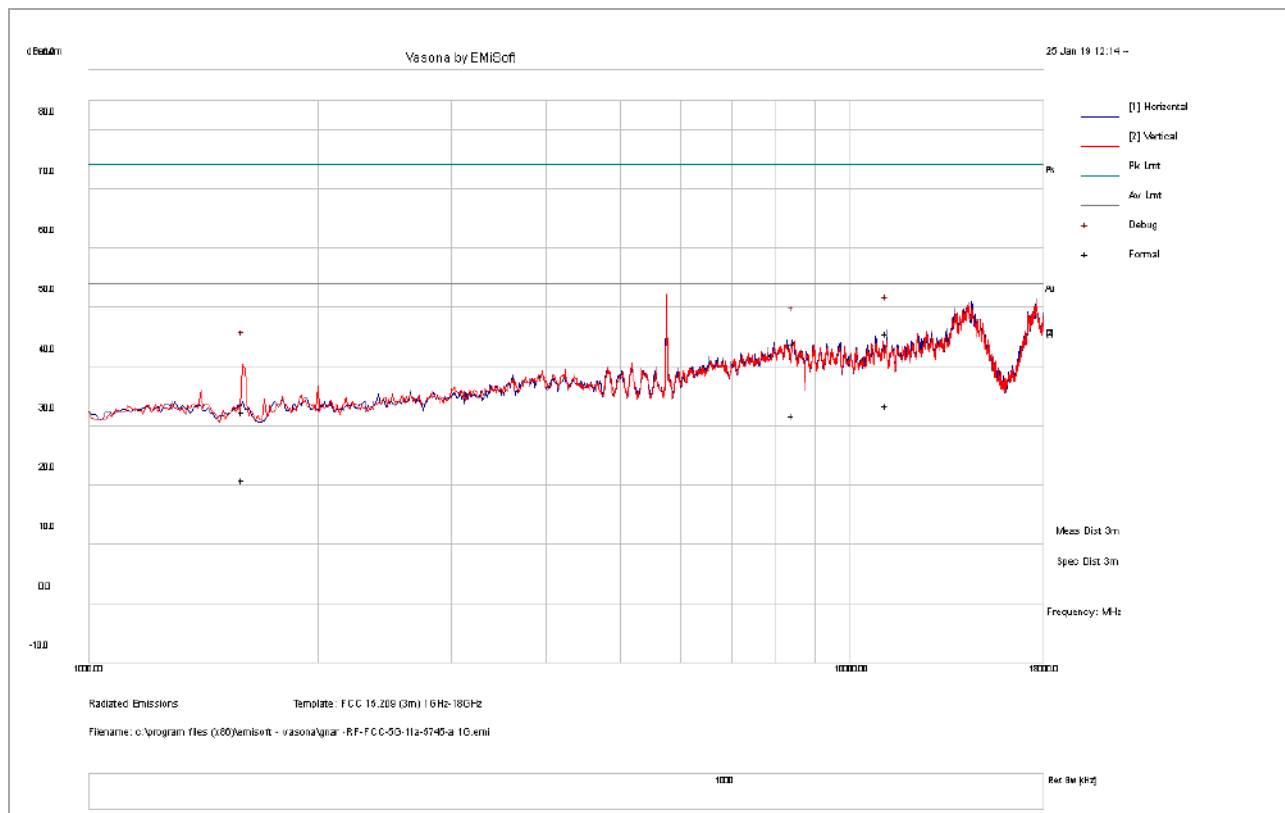
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8233.66	29.00	15.82	-0.33	44.49	PK	V	247	245	74.00	-29.51
4826.68	32.05	12.88	-5.52	39.41	PK	V	308	293	74.00	-34.59
1594.81	34.00	10.45	-11.80	32.65	PK	V	332	74	74.00	-41.35
8233.66	16.69	15.82	-0.33	32.18	AV	V	247	245	54.00	-21.82
4826.68	20.18	12.88	-5.52	27.54	AV	V	308	293	54.00	-26.46
1594.81	22.13	10.45	-11.80	20.78	AV	V	332	74	54.00	-33.22

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5745MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



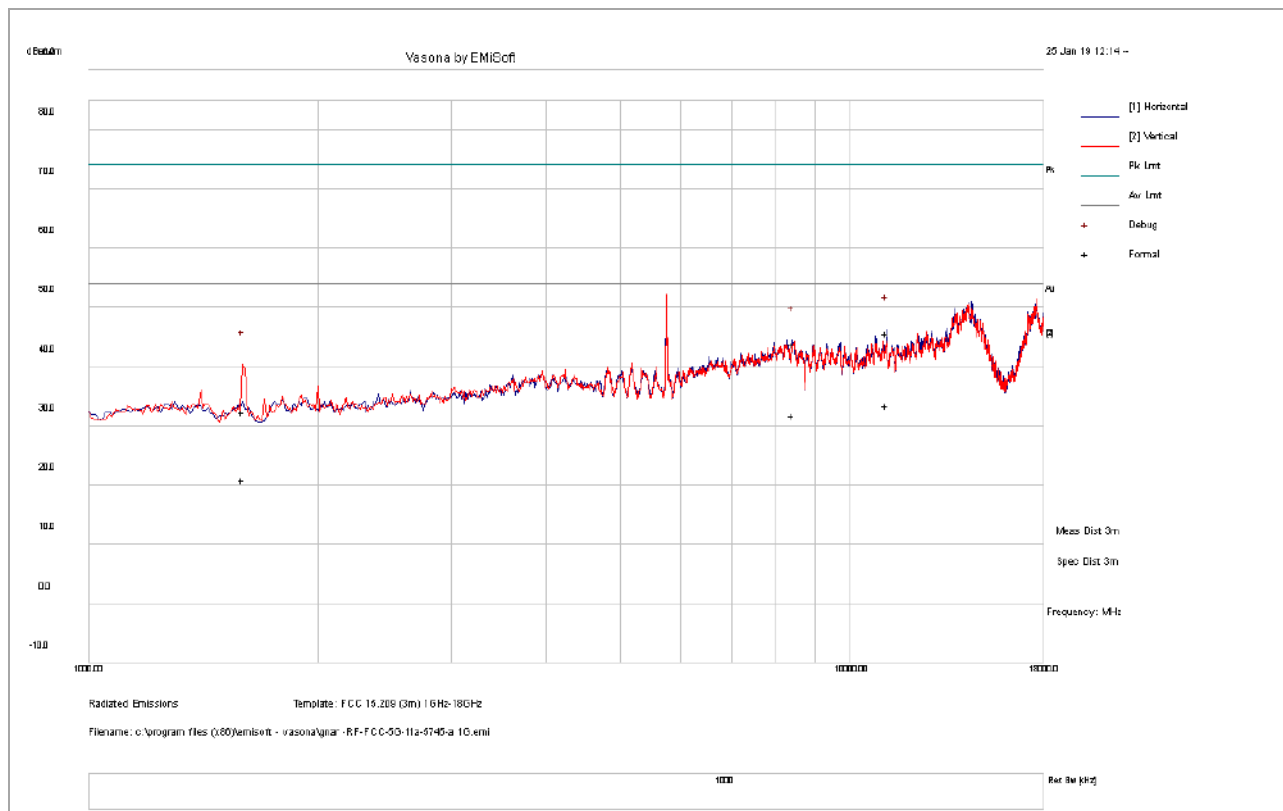
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
11179.25	24.48	18.69	2.53	45.70	PK	H	103	0	74.00	-28.30
8404.69	28.05	15.85	-0.07	43.83	PK	H	312	136	74.00	-30.17
1596.71	33.75	10.45	-11.80	32.40	PK	V	299	100	74.00	-41.60
11179.25	12.26	18.69	2.53	33.48	AV	H	103	0	54.00	-20.52
8404.69	15.92	15.85	-0.07	31.70	AV	H	312	136	54.00	-22.30
1596.71	22.24	10.45	-11.80	20.90	AV	V	299	100	54.00	-33.10

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5745MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



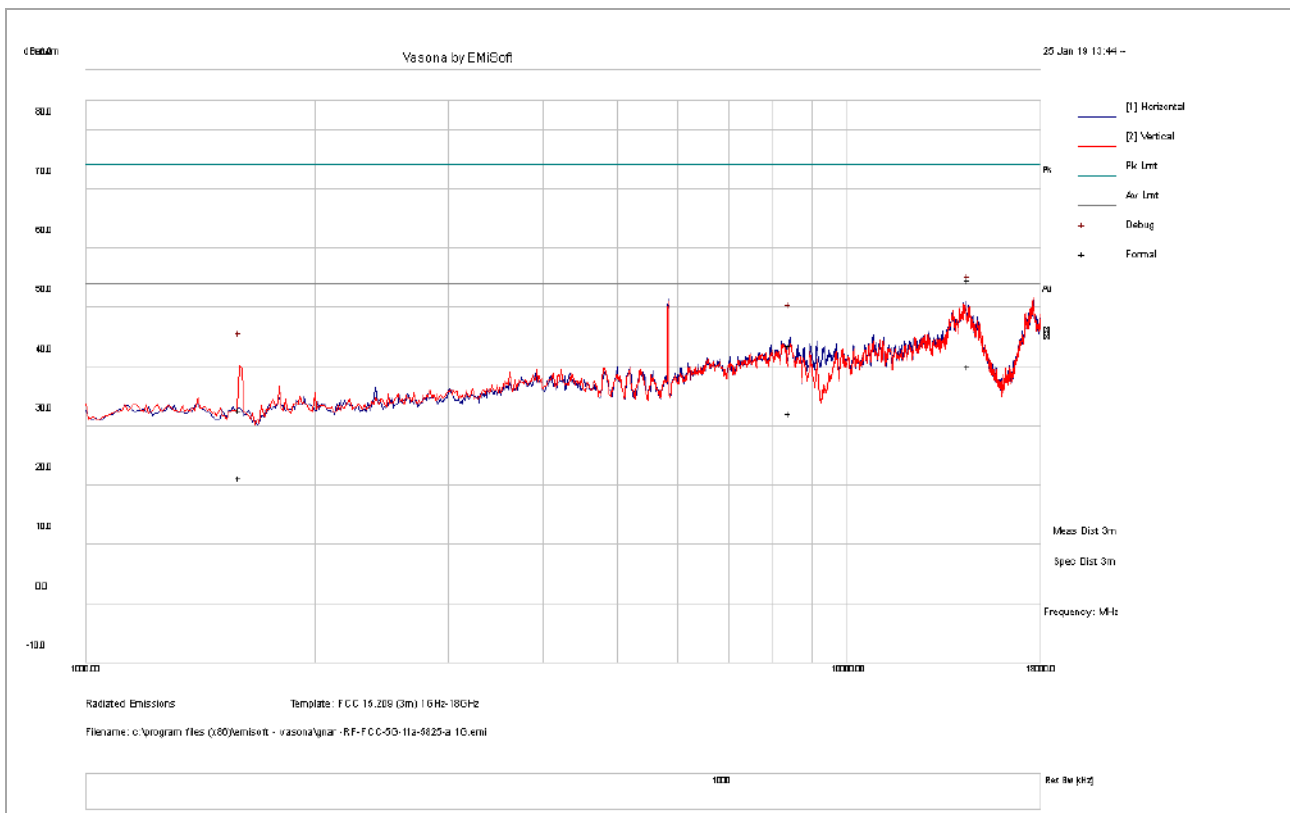
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14280.67	27.11	20.35	8.18	55.64	PK	H	157	149	74.00	-18.36
2404.15	33.44	10.83	-9.85	34.42	PK	H	387	93	74.00	-39.58
1593.54	36.63	10.45	-11.80	35.28	PK	V	134	147	74.00	-38.72
14280.67	16.73	20.35	8.18	45.26	AV	H	157	149	54.00	-8.74
2404.15	21.38	10.83	-9.85	22.36	AV	H	387	93	54.00	-31.64
1593.54	22.92	10.45	-11.80	21.57	AV	V	134	147	54.00	-32.43

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11a-5825MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



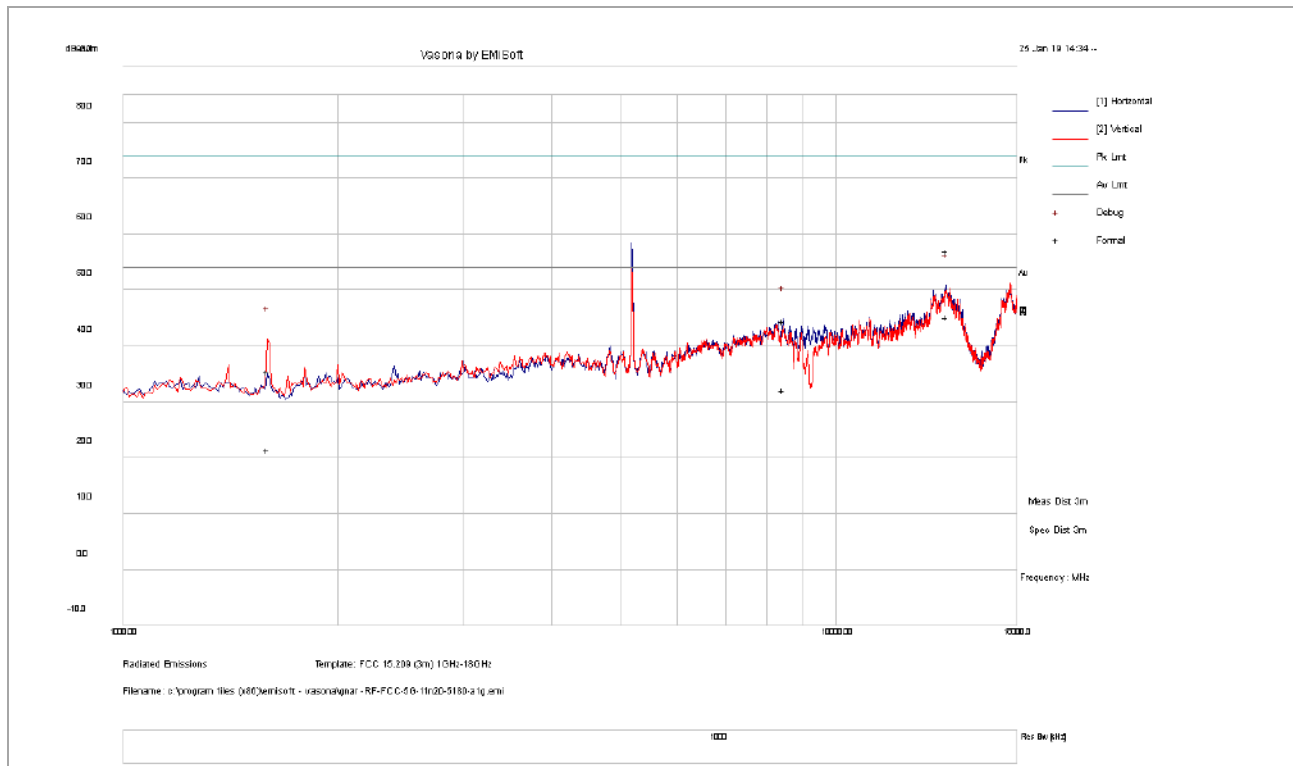
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14490.61	26.20	20.86	7.64	54.70	PK	V	339	89	74.00	-19.30
8425.56	27.76	15.85	-0.06	43.56	PK	H	346	78	74.00	-30.44
1594.50	34.13	10.45	-11.80	32.78	PK	V	280	213	74.00	-41.22
14490.61	11.58	20.86	7.64	40.08	AV	V	339	89	54.00	-13.92
8425.56	16.37	15.85	-0.06	32.16	AV	H	346	78	54.00	-21.84
1594.50	22.55	10.45	-11.80	21.20	AV	V	280	213	54.00	-32.80

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5180MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass

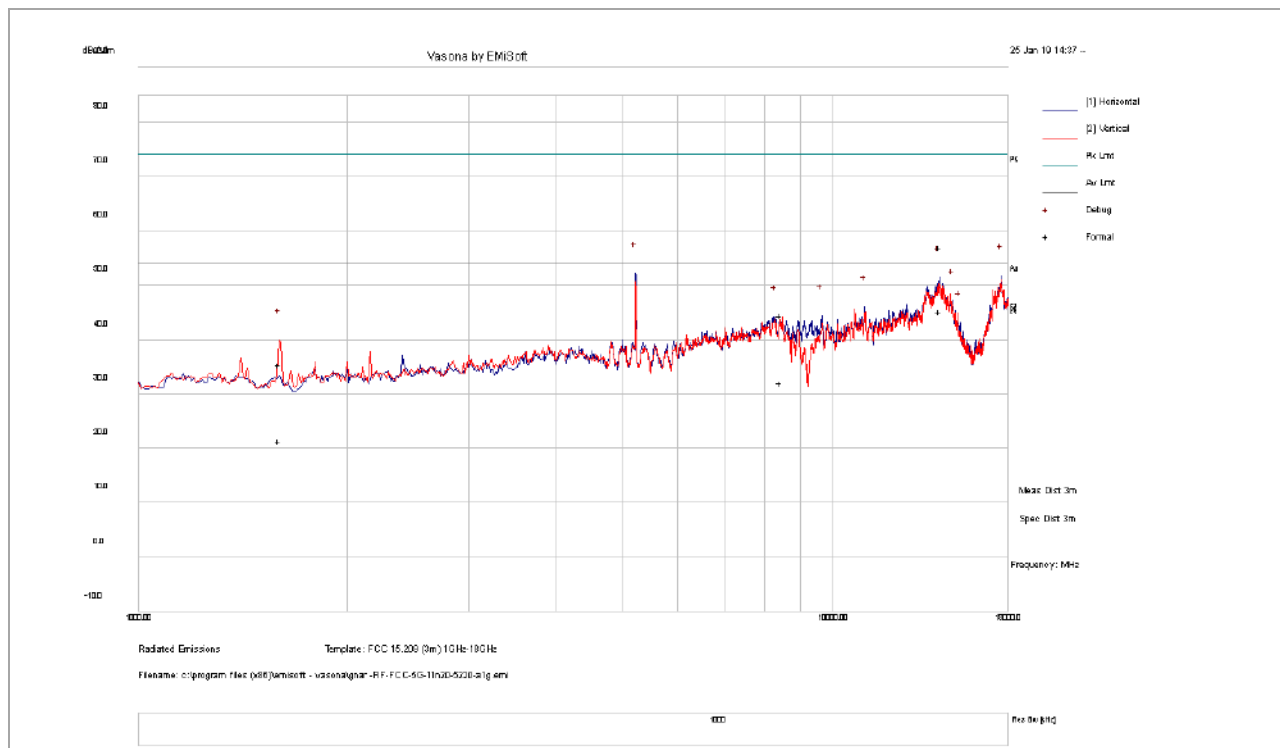


Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14312.26	28.36	20.43	8.28	57.07	PK	H	271	199	74.00	-16.93
8437.25	28.63	15.85	-0.05	44.44	PK	H	185	229	74.00	-29.56
1596.20	36.77	10.45	-11.80	35.42	PK	V	177	211	74.00	-38.58
14312.26	16.61	20.43	8.28	45.32	AV	H	271	199	54.00	-8.68
8437.25	16.33	15.85	-0.05	32.14	AV	H	185	229	54.00	-21.86
1596.20	22.79	10.45	-11.80	21.44	AV	V	177	211	54.00	-32.56

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2

**1GHz – 18GHz test result**

Test Standard:	15.209	Mode:	11n-5220MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



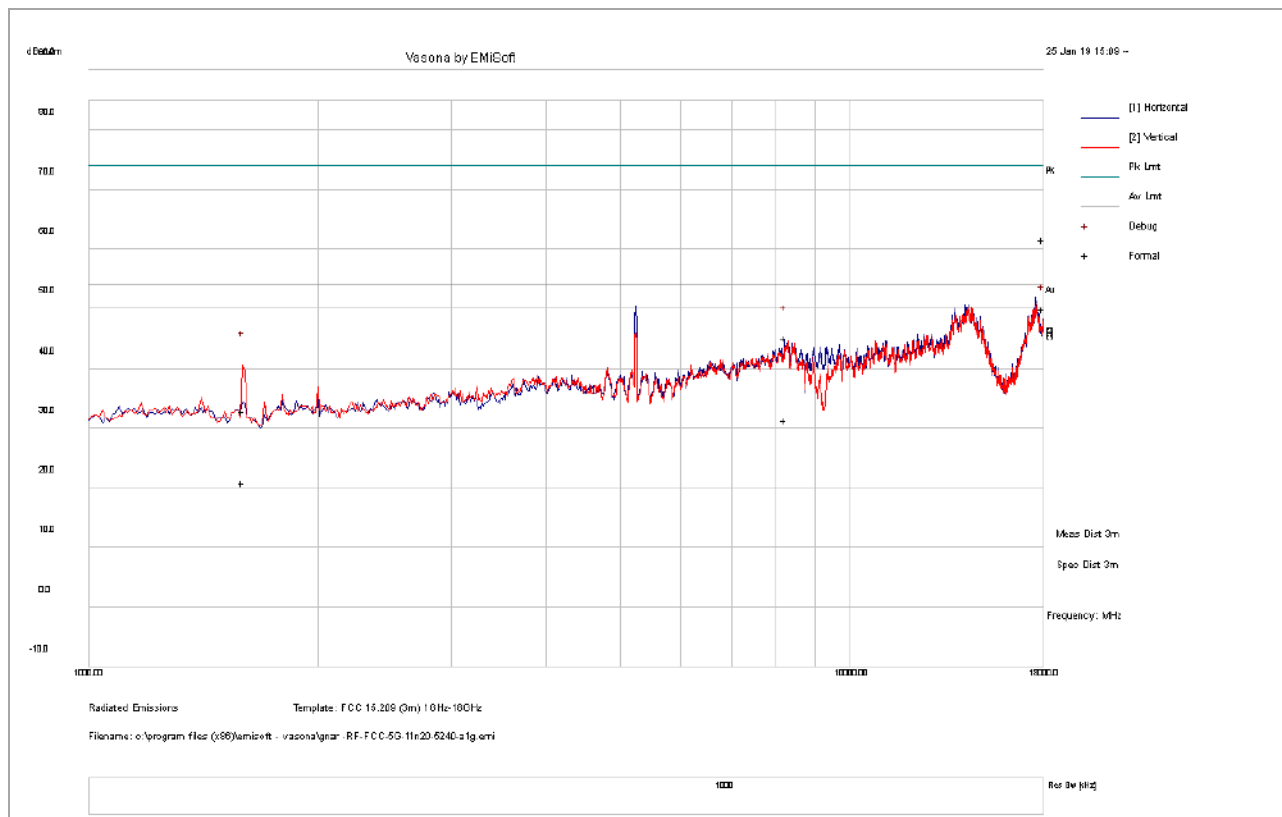
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14281.97	28.71	20.35	8.19	57.25	PK	H	179	219	74.00	-16.75
2402.37	33.70	10.83	-9.86	34.68	PK	H	286	54	74.00	-39.32
1592.76	34.44	10.45	-11.80	33.09	PK	V	208	256	74.00	-40.91
1593.63	35.62	10.45	-11.80	34.27	PK	V	285	160	74.00	-39.73
2405.63	34.01	10.83	-9.85	34.99	PK	H	109	154	74.00	-39.01
14281.97	15.27	20.35	8.19	43.81	AV	H	179	219	54.00	-10.19
2402.37	21.59	10.83	-9.86	22.57	AV	H	286	54	54.00	-31.44
1592.76	22.40	10.45	-11.80	21.05	AV	V	208	256	54.00	-32.95
1593.63	22.96	10.45	-11.80	21.61	AV	V	285	160	54.00	-32.39
2405.63	21.53	10.83	-9.85	22.52	AV	H	109	154	54.00	-31.48

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5240MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



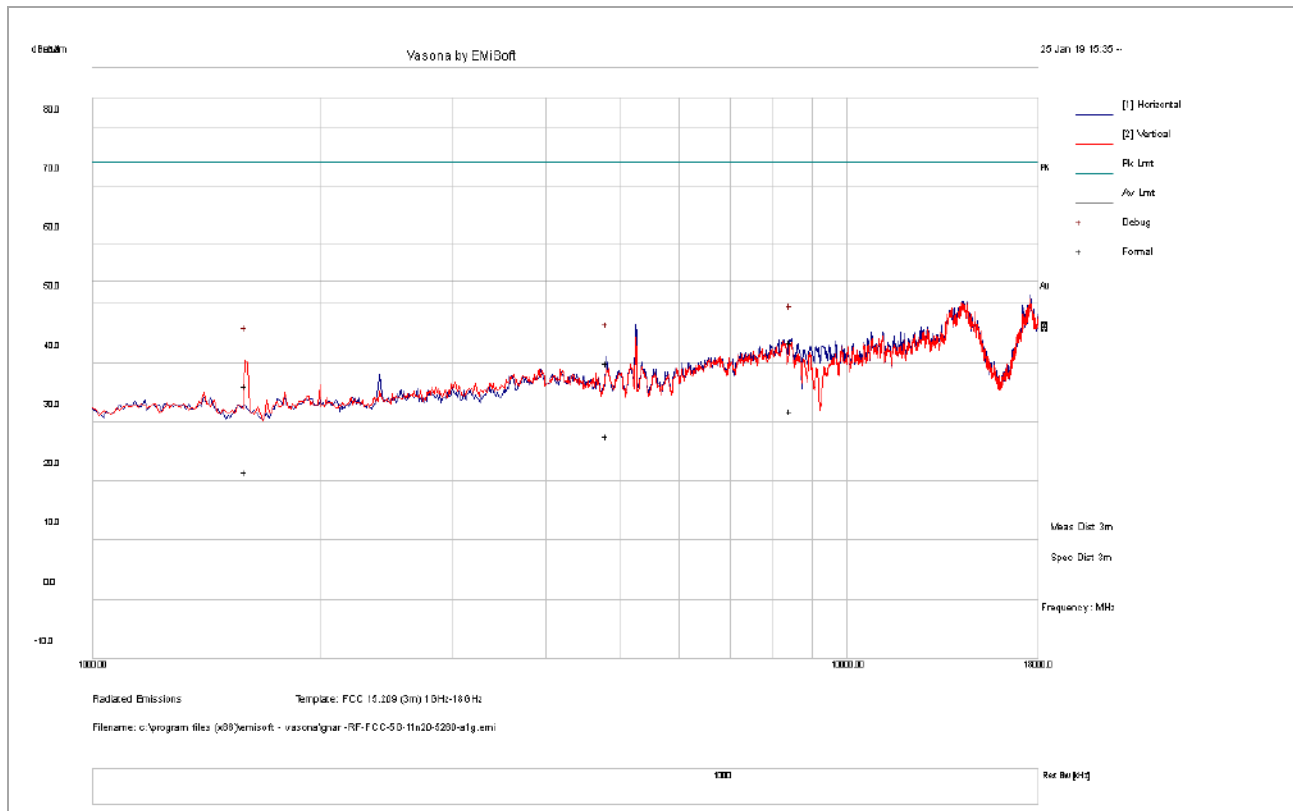
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
17935.05	28.38	23.69	9.61	61.69	PK	H	213	0	74.00	-12.32
8212.59	29.82	15.82	-0.41	45.23	PK	H	307	306	74.00	-28.77
1596.06	34.32	10.45	-11.80	32.98	PK	V	400	121	74.00	-41.03
17935.05	16.76	23.69	9.61	50.06	AV	H	213	0	54.00	-3.94
8212.59	16.07	15.82	-0.41	31.48	AV	H	307	306	54.00	-22.52
1596.06	22.20	10.45	-11.80	20.85	AV	V	400	121	54.00	-33.15

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5260MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



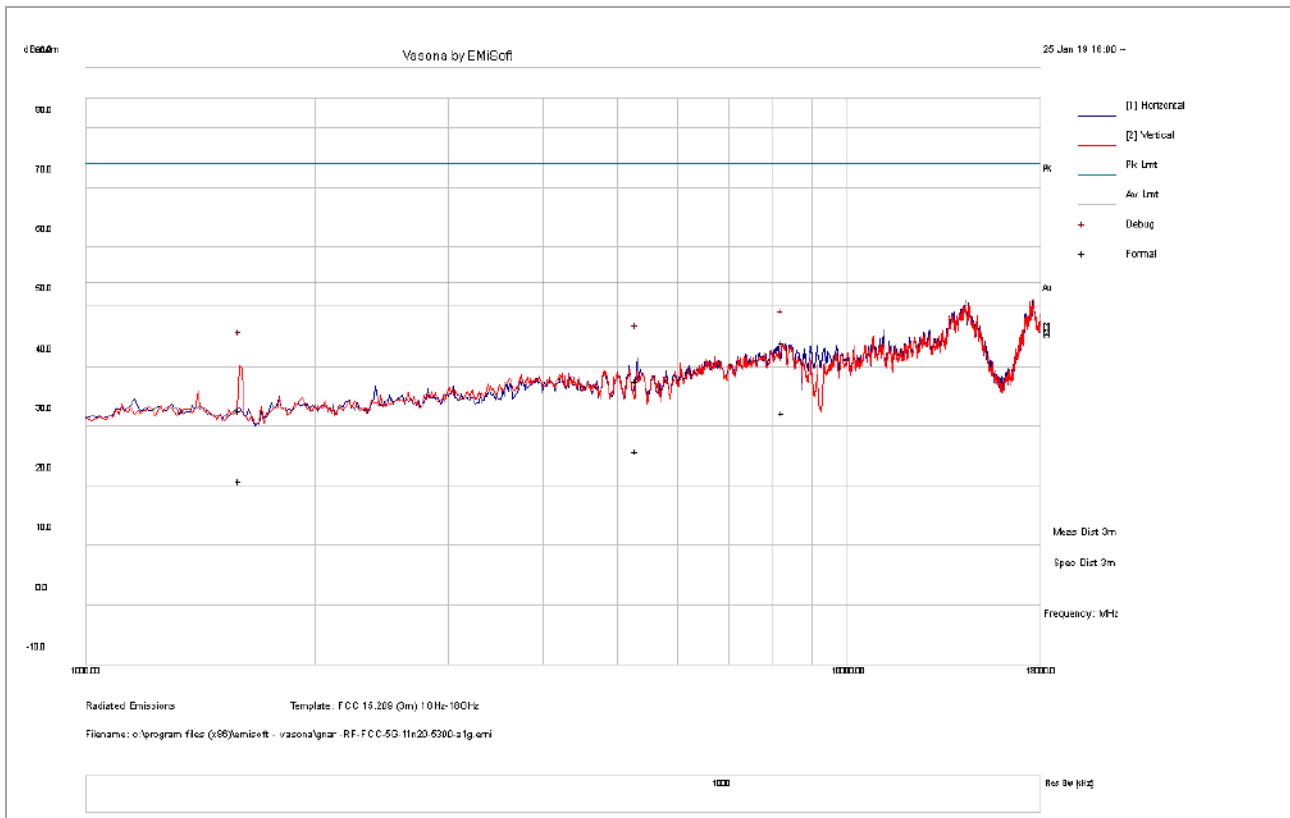
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8446.66	27.75	15.86	-0.04	43.57	PK	H	145	16	74.00	-30.43
4814.40	32.77	12.87	-5.53	40.12	PK	H	196	8	74.00	-33.88
1596.53	37.52	10.45	-11.80	36.17	PK	V	100	181	74.00	-37.83
8446.66	16.20	15.86	-0.04	32.02	AV	H	145	16	54.00	-21.98
4814.40	20.47	12.87	-5.53	27.81	AV	H	196	8	54.00	-26.19
1596.53	22.91	10.45	-11.80	21.57	AV	V	100	181	54.00	-32.44

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5300MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



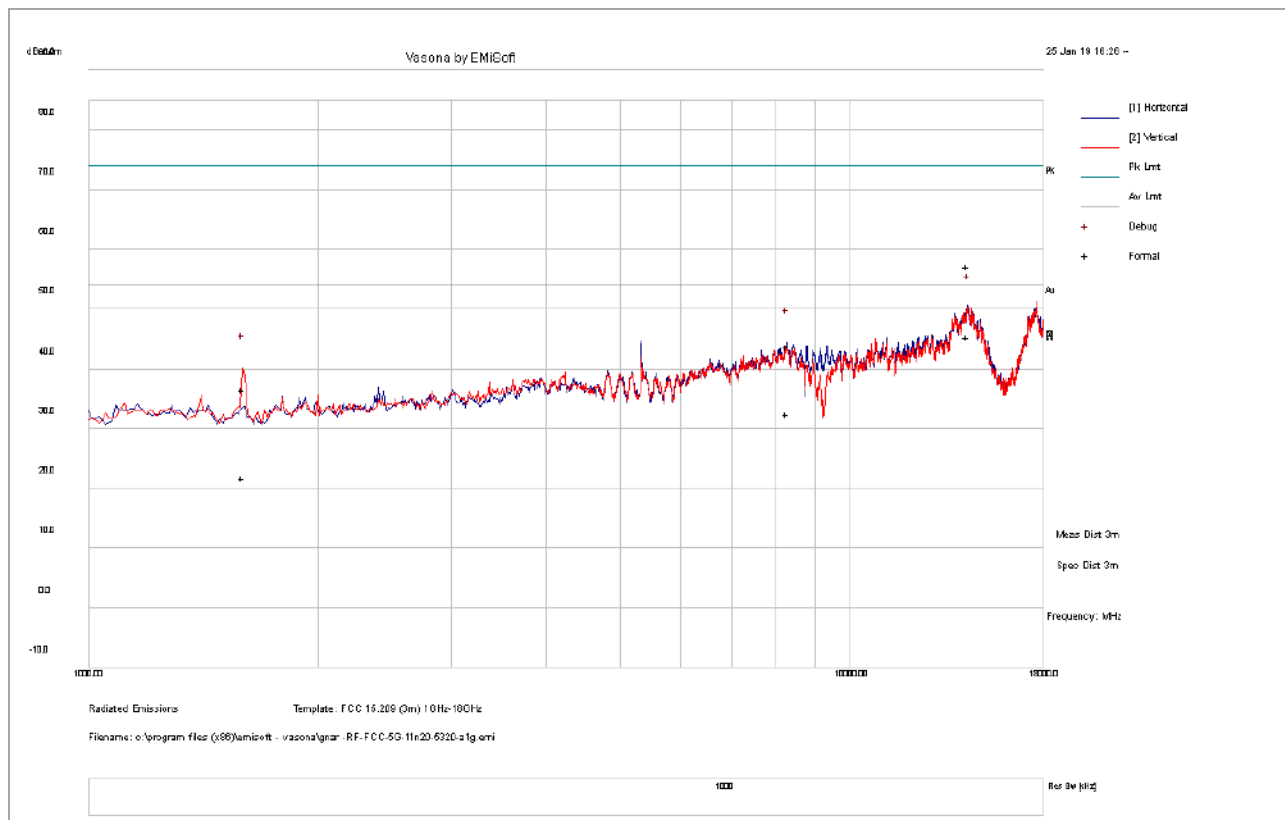
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8237.46	28.70	15.82	-0.32	44.20	PK	V	345	112	74.00	-29.80
5302.11	30.55	12.88	-5.80	37.64	PK	H	340	321	74.00	-36.36
1593.80	34.04	10.45	-11.80	32.70	PK	V	200	130	74.00	-41.31
8237.46	16.78	15.82	-0.32	32.29	AV	V	345	112	54.00	-21.71
5302.11	18.81	12.88	-5.80	25.90	AV	H	340	321	54.00	-28.10
1593.80	22.32	10.45	-11.80	20.98	AV	V	200	130	54.00	-33.03

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5320MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



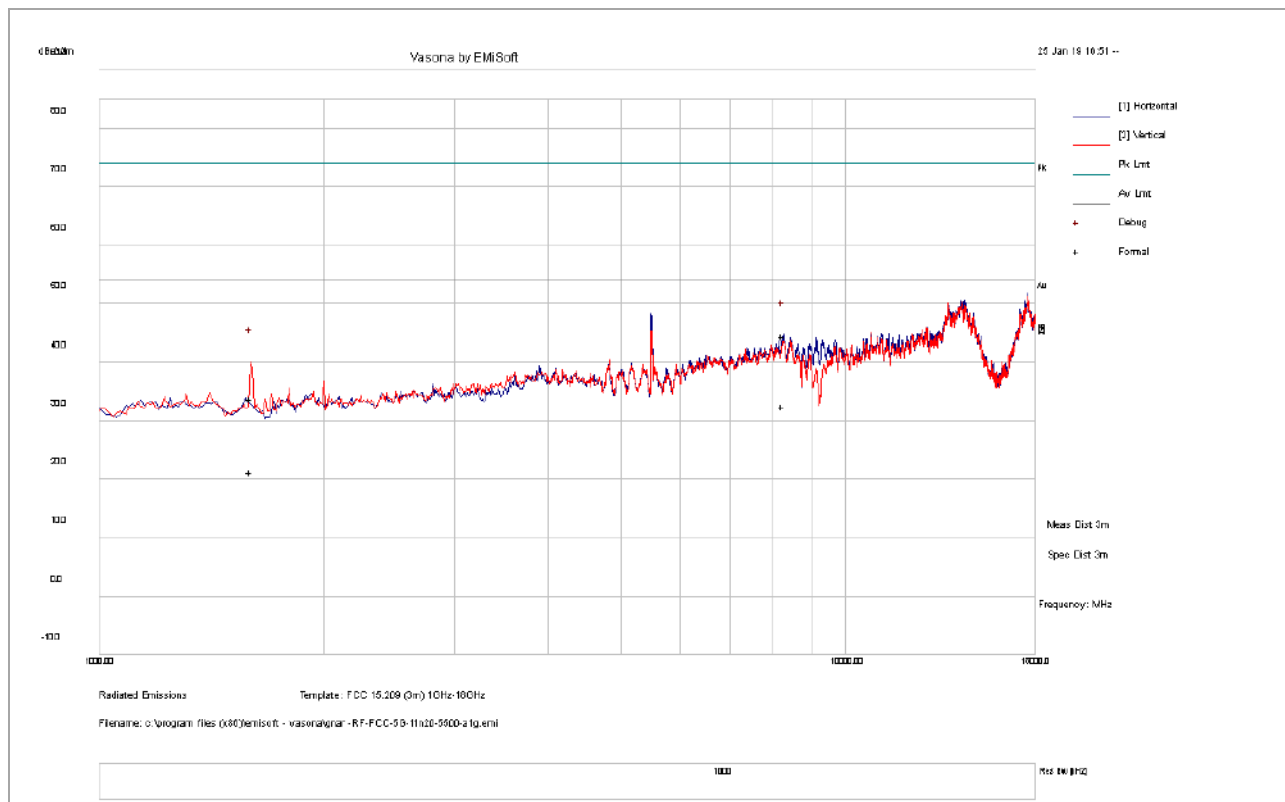
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14303.11	28.65	20.41	8.26	57.31	PK	V	139	174	74.00	-16.69
8267.75	28.25	15.83	-0.23	43.84	PK	H	178	236	74.00	-30.16
1596.81	37.99	10.45	-11.80	36.65	PK	V	241	183	74.00	-37.35
14303.11	16.69	20.41	8.26	45.35	AV	V	139	174	54.00	-8.65
8267.75	16.87	15.83	-0.23	32.47	AV	H	178	236	54.00	-21.53
1596.81	23.15	10.45	-11.80	21.81	AV	V	241	183	54.00	-32.19

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5500MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



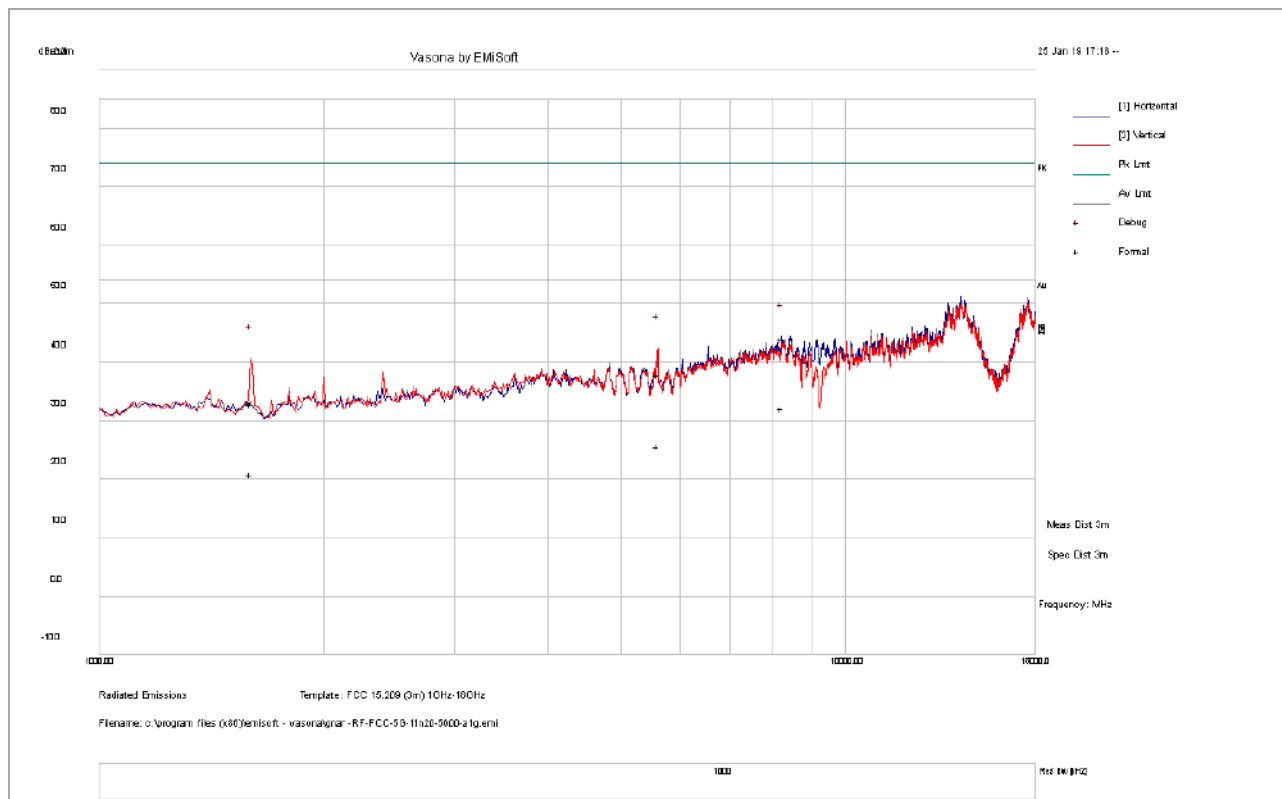
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8255.97	28.87	15.82	-0.26	44.44	PK	H	304	260	74.00	-29.56
1595.63	35.14	10.45	-11.80	33.79	PK	V	160	226	74.00	-40.21
8255.97	16.94	15.82	-0.26	32.51	AV	H	304	260	54.00	-21.49
1595.63	22.55	10.45	-11.80	21.20	AV	V	160	226	54.00	-32.80

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5600MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



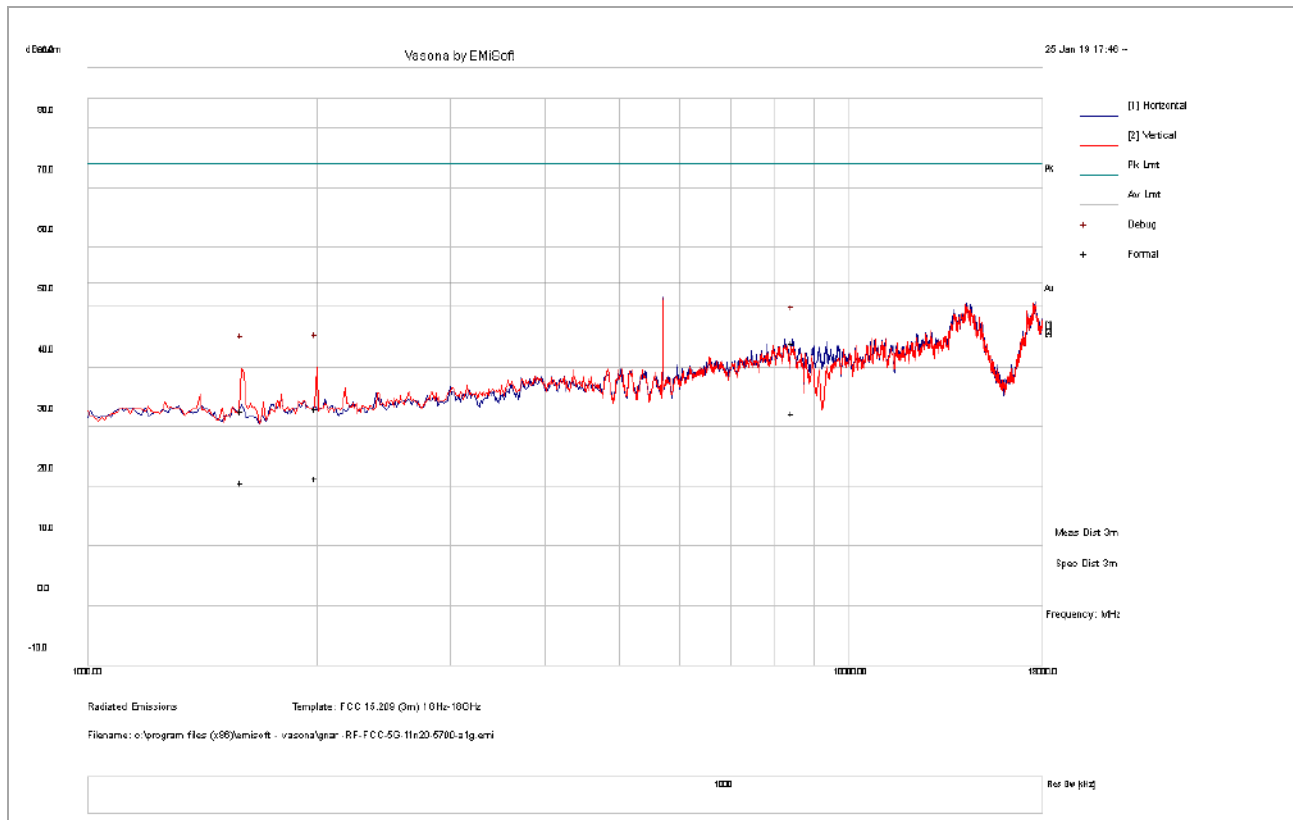
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8226.33	28.47	15.82	-0.36	43.94	PK	H	294	71	74.00	-30.06
5612.66	30.65	13.10	-5.85	37.89	PK	V	314	87	74.00	-36.11
1593.77	34.32	10.45	-11.80	32.97	PK	V	104	128	74.00	-41.03
8226.33	16.65	15.82	-0.36	32.12	AV	H	294	71	54.00	-21.89
5612.66	18.45	13.10	-5.85	25.69	AV	V	314	87	54.00	-28.31
1593.77	22.27	10.45	-11.80	20.92	AV	V	104	128	54.00	-33.08

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5700MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



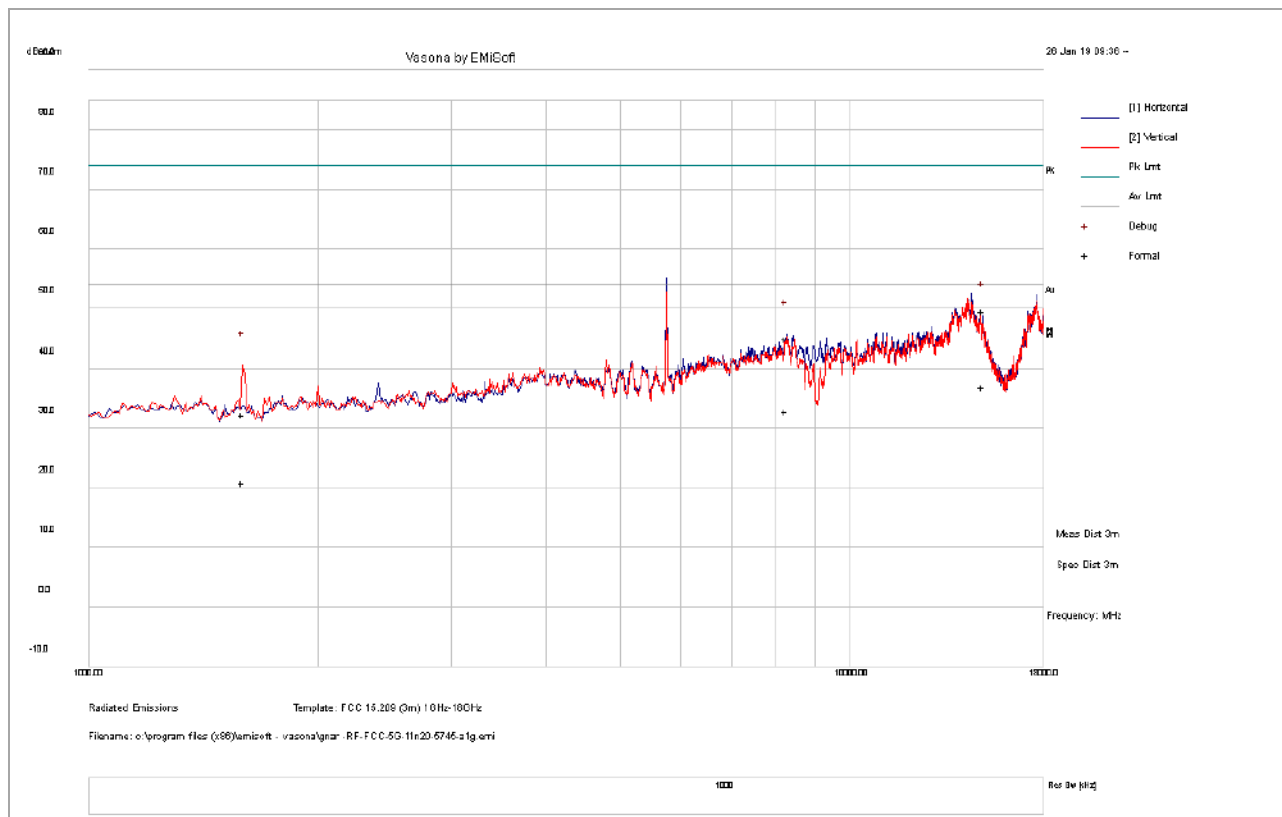
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
2000.71	33.25	10.44	-10.60	33.09	PK	V	234	89	74.00	-40.91
8436.42	28.29	15.85	-0.05	44.09	PK	H	269	222	74.00	-29.91
1593.66	33.99	10.45	-11.80	32.64	PK	V	266	108	74.00	-41.36
1593.66	22.10	10.45	-11.80	20.75	AV	V	266	108	54.00	-33.25
8436.42	16.45	15.85	-0.05	32.25	AV	H	269	222	54.00	-21.75
2000.71	21.62	10.44	-10.60	21.46	AV	V	234	89	54.00	-32.54

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5745MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



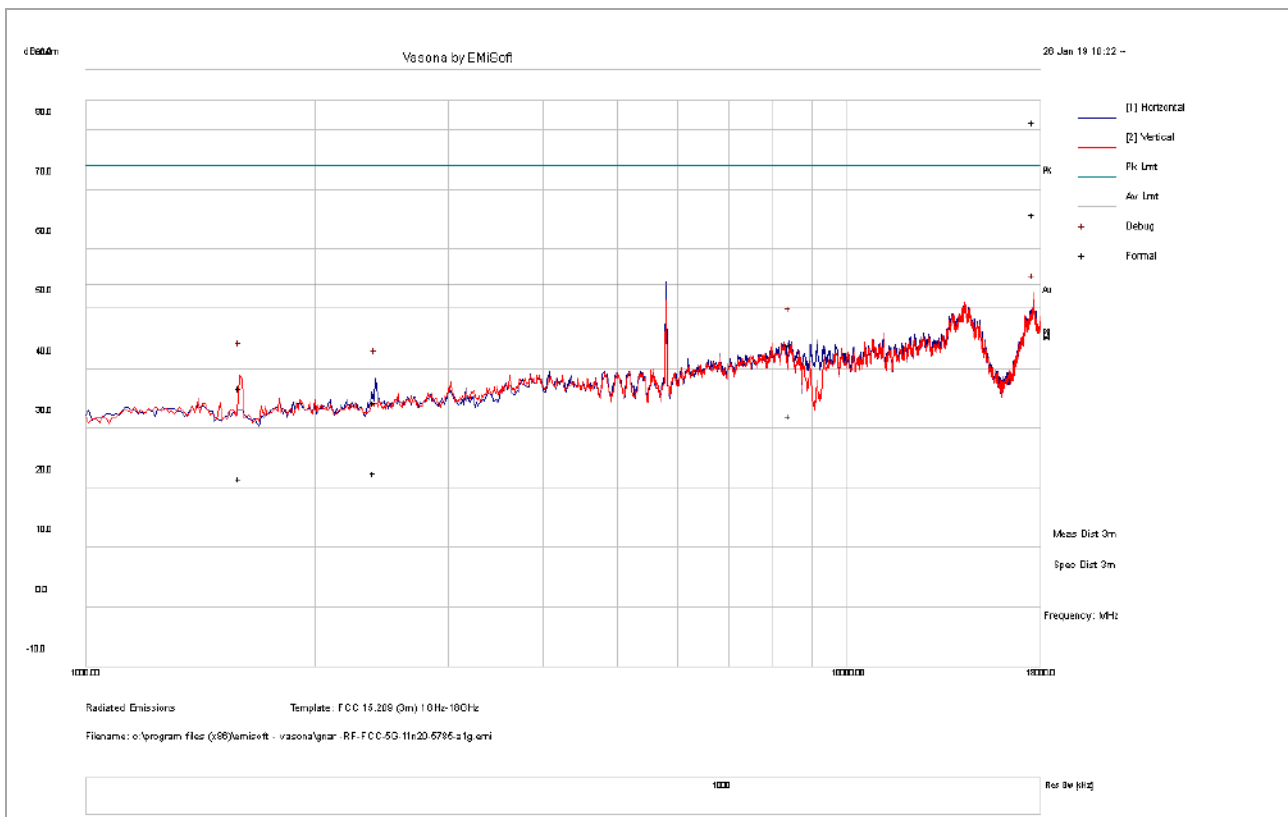
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14940.70	22.28	21.93	5.51	49.72	PK	H	308	48	74.00	-24.28
8257.22	29.45	15.82	-0.26	45.02	PK	H	180	296	74.00	-28.98
1593.94	33.76	10.45	-11.80	32.41	PK	V	281	318	74.00	-41.59
14940.70	9.46	21.93	5.51	36.91	AV	H	308	48	54.00	-17.09
8257.22	17.34	15.82	-0.26	32.91	AV	H	180	296	54.00	-21.09
1593.94	22.31	10.45	-11.80	20.96	AV	V	281	318	54.00	-33.04

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5785MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



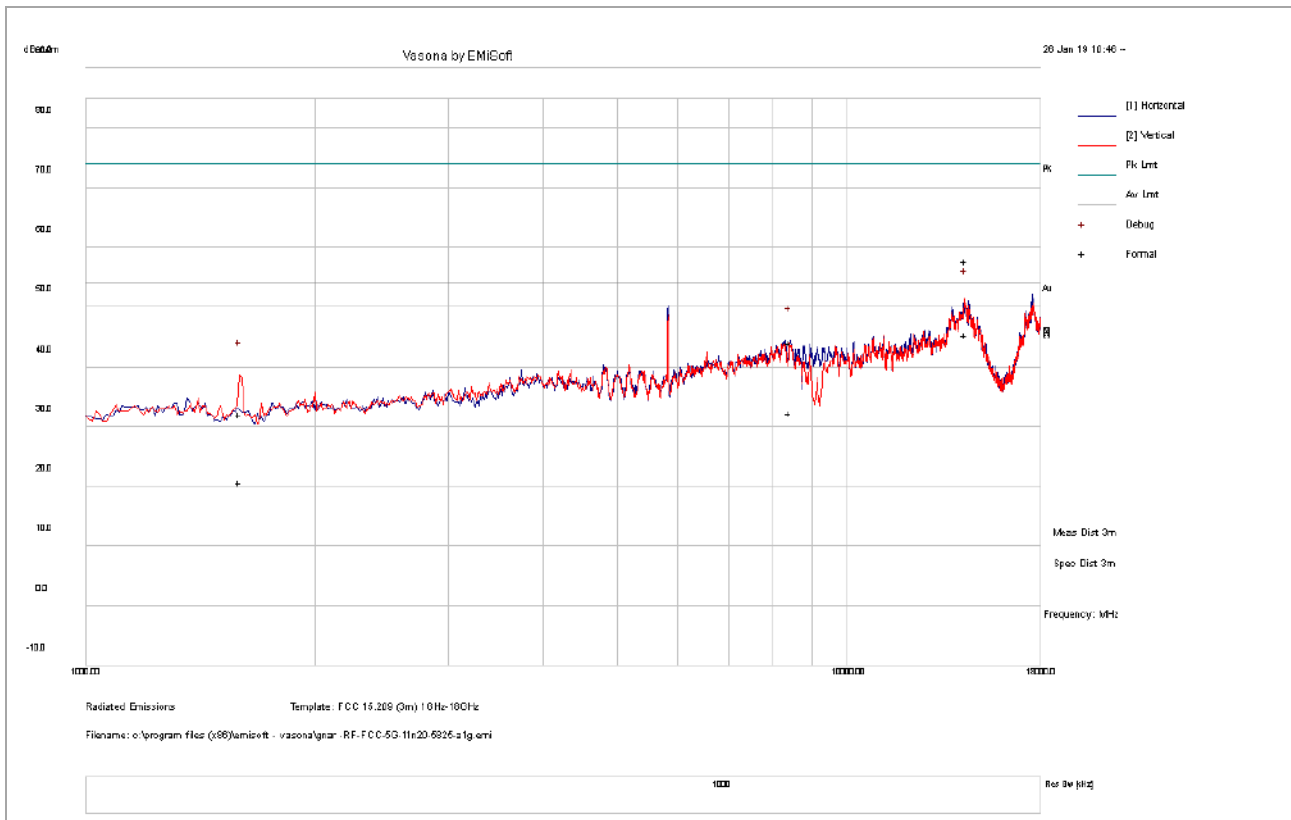
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8415.70	28.33	15.85	-0.06	44.12	PK	H	329	13	74.00	-29.88
1596.40	38.18	10.45	-11.80	36.84	PK	V	205	149	74.00	-37.16
2399.97	33.34	10.83	-9.86	34.30	PK	V	248	110	74.00	-39.70
8415.70	16.41	15.85	-0.06	32.20	AV	H	329	13	54.00	-21.80
1596.40	22.96	10.45	-11.80	21.61	AV	V	205	149	54.00	-32.39
2399.97	21.61	10.83	-9.86	22.57	AV	V	248	110	54.00	-31.43

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n-5825MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



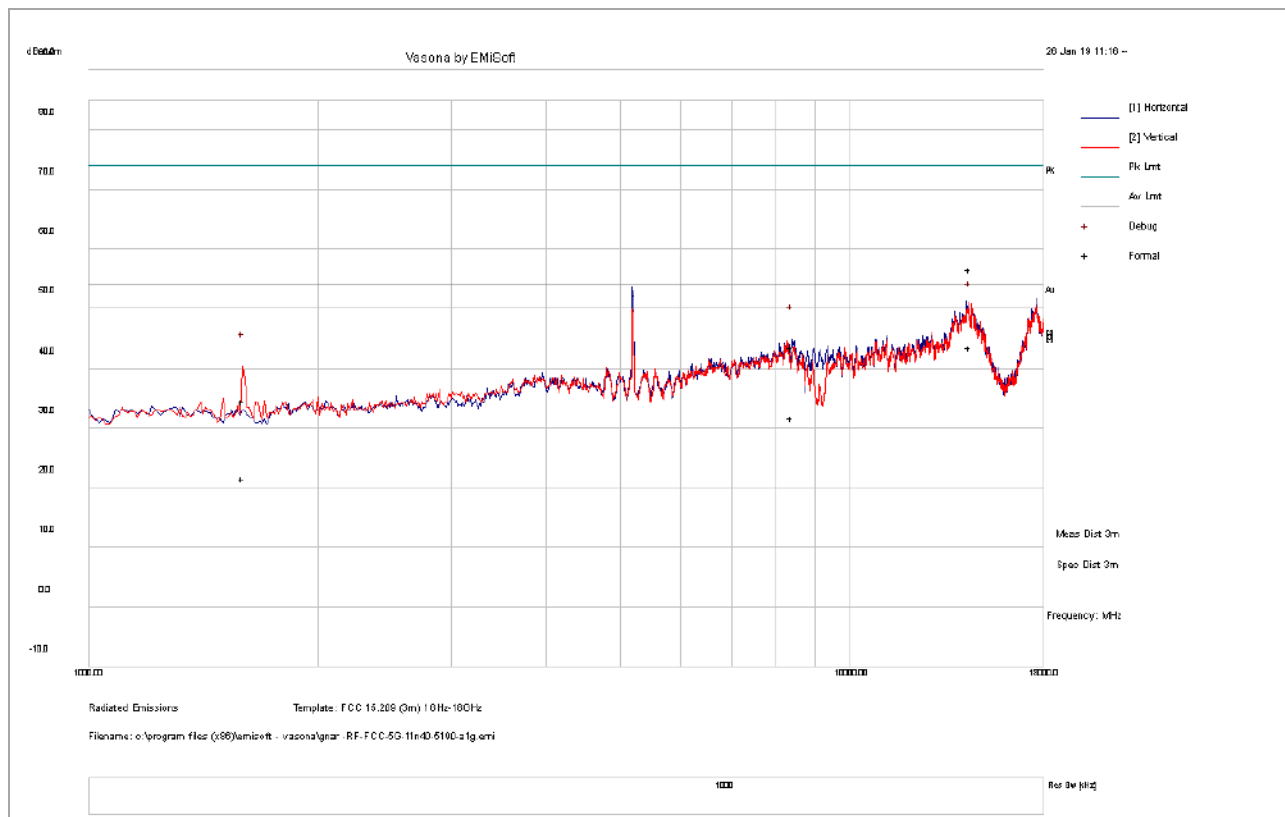
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14304.66	29.18	20.41	8.26	57.85	PK	V	217	2	74.00	-16.15
8425.18	28.42	15.85	-0.06	44.22	PK	H	383	40	74.00	-29.78
1594.64	33.52	10.45	-11.80	32.17	PK	V	383	118	74.00	-41.83
14304.66	16.76	20.41	8.26	45.43	AV	V	217	2	54.00	-8.57
8425.18	16.53	15.85	-0.06	32.33	AV	H	383	40	54.00	-21.68
1594.64	22.15	10.45	-11.80	20.80	AV	V	383	118	54.00	-33.20

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5190MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



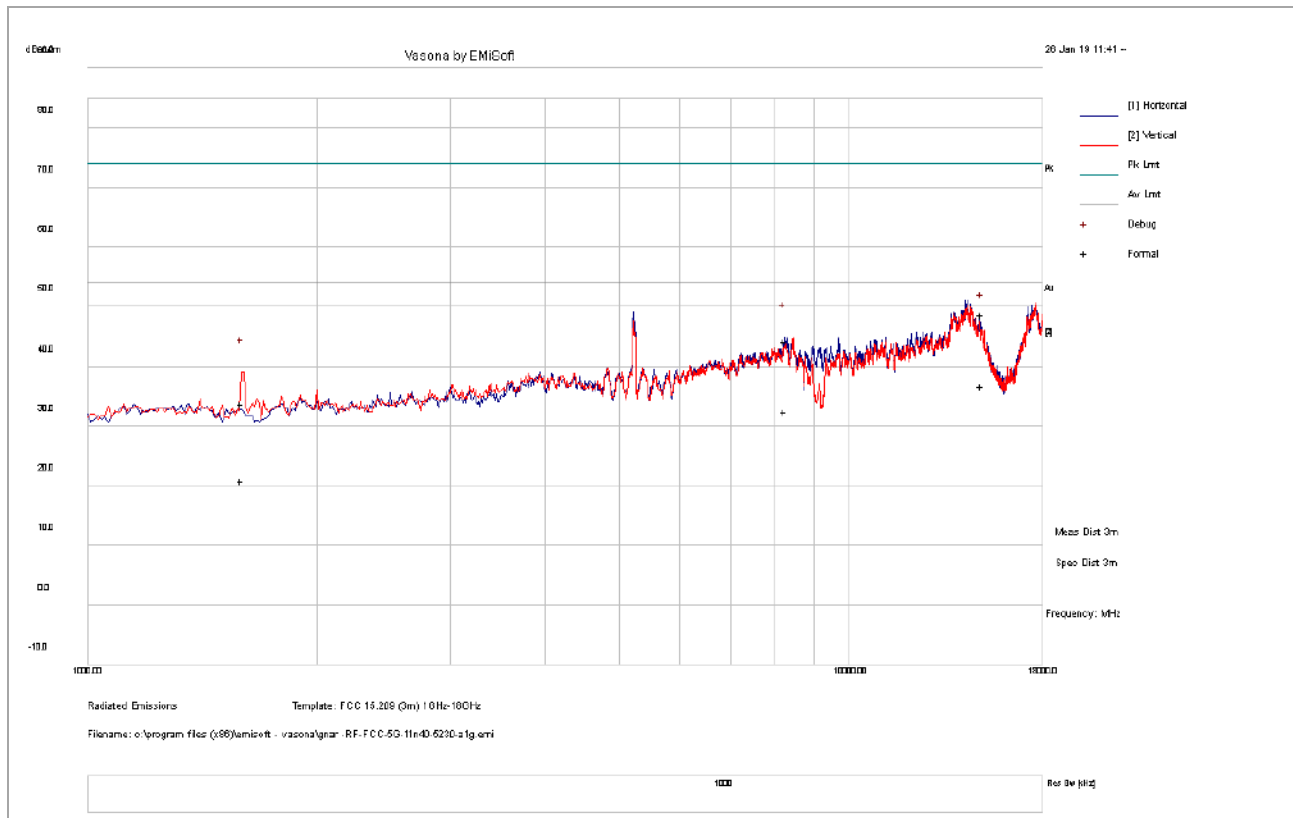
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14365.50	27.84	20.56	8.34	56.74	PK	V	274	273	74.00	-17.26
8394.38	27.84	15.85	-0.08	43.61	PK	H	359	54	74.00	-30.39
1595.83	35.97	10.45	-11.80	34.63	PK	V	240	188	74.00	-39.37
14365.50	14.60	20.56	8.34	43.50	AV	V	274	273	54.00	-10.50
8394.38	15.94	15.85	-0.08	31.70	AV	H	359	54	54.00	-22.30
1595.83	22.97	10.45	-11.80	21.62	AV	V	240	188	54.00	-32.38

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5230MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



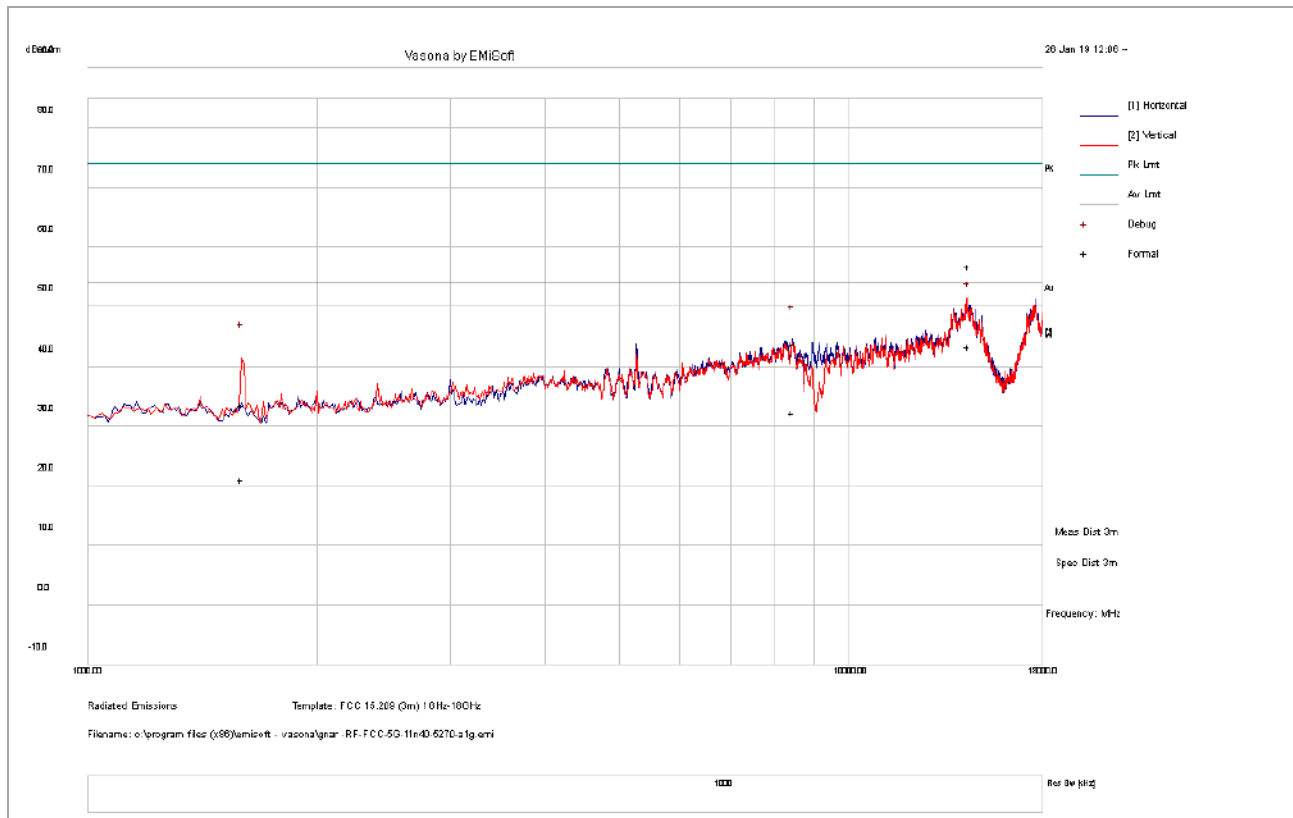
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14941.84	21.34	21.93	5.51	48.79	PK	H	400	172	74.00	-25.21
8237.56	28.86	15.82	-0.32	44.37	PK	H	254	12	74.00	-29.64
1595.11	35.21	10.45	-11.80	33.86	PK	V	215	292	74.00	-40.14
14941.84	9.31	21.93	5.51	36.75	AV	H	400	172	54.00	-17.25
8237.56	17.06	15.82	-0.32	32.56	AV	H	254	12	54.00	-21.44
1595.11	22.31	10.45	-11.80	20.96	AV	V	215	292	54.00	-33.04

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5270MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



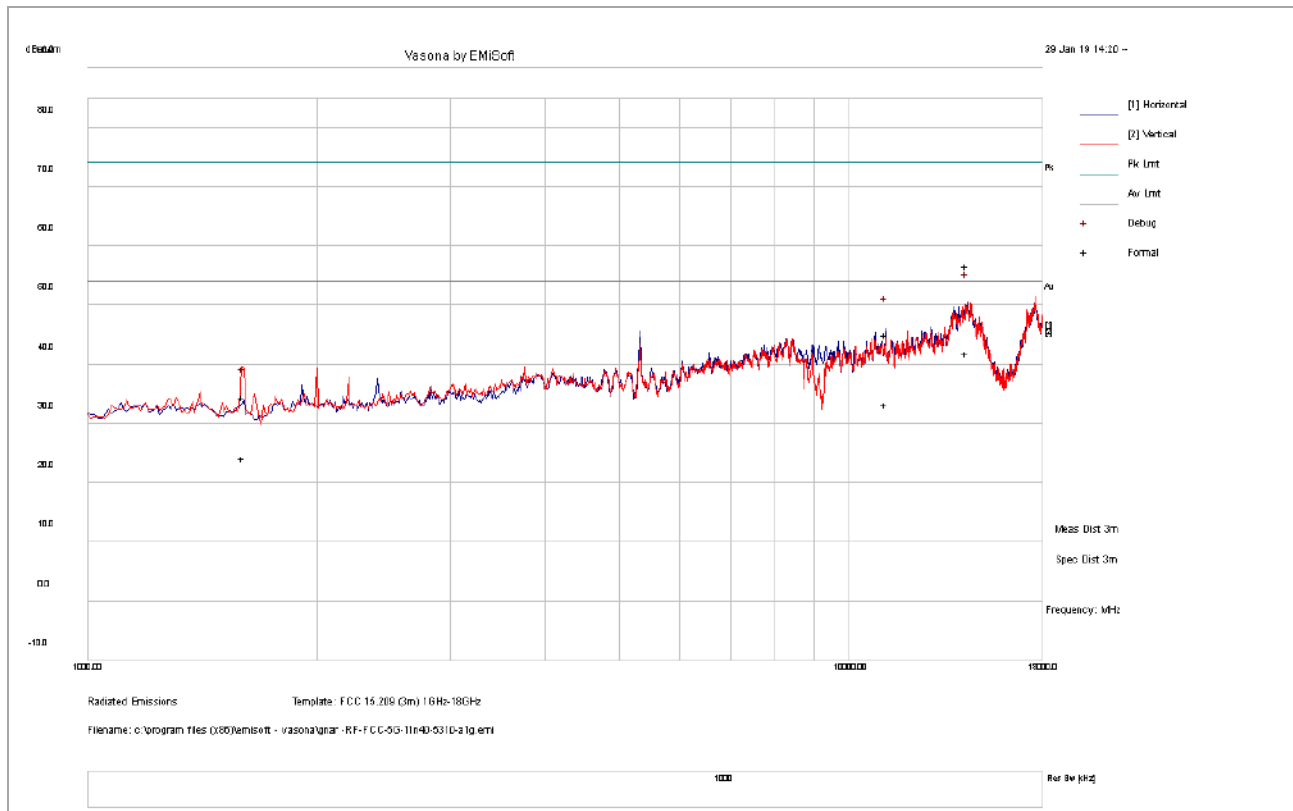
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14365.05	27.99	20.56	8.34	56.88	PK	V	275	24	74.00	-17.12
8438.40	28.13	15.86	-0.05	43.94	PK	H	400	272	74.00	-30.06
1596.20	34.91	10.45	-11.80	33.57	PK	V	129	238	74.00	-40.44
14365.05	14.55	20.56	8.34	43.45	AV	V	275	24	54.00	-10.55
8438.40	16.52	15.86	-0.05	32.33	AV	H	400	272	54.00	-21.67
1596.20	22.43	10.45	-11.80	21.09	AV	V	129	238	54.00	-32.92

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5310MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



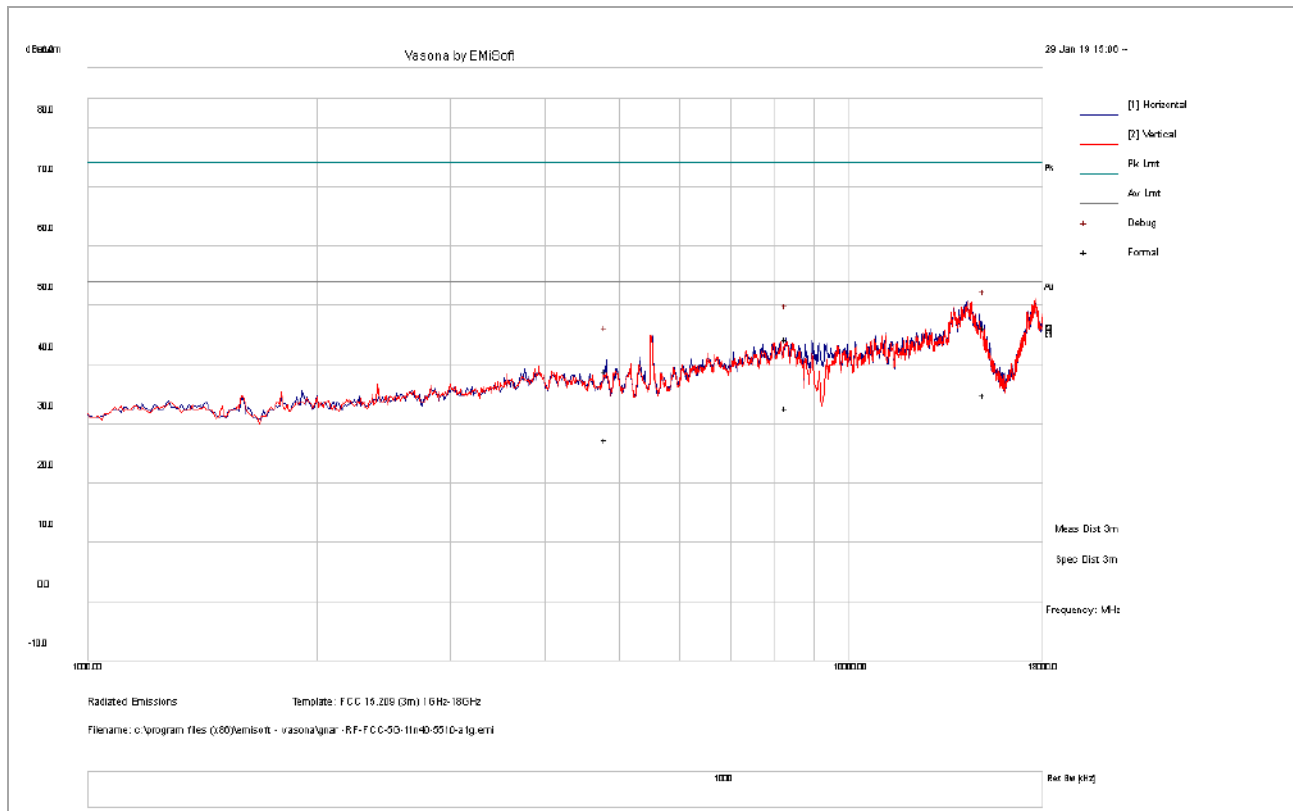
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14262.85	28.24	20.31	8.12	56.67	PK	V	392	126	74.00	-17.33
11171.61	23.89	18.68	2.54	45.11	PK	V	289	29	74.00	-28.89
1599.94	35.91	10.45	-11.79	34.57	PK	H	310	292	74.00	-39.43
14262.85	13.48	20.31	8.12	41.91	AV	V	392	126	54.00	-12.09
11171.61	12.02	18.68	2.54	33.24	AV	V	289	29	54.00	-20.76
1599.94	25.52	10.45	-11.79	24.18	AV	H	310	292	54.00	-29.82

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5510MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



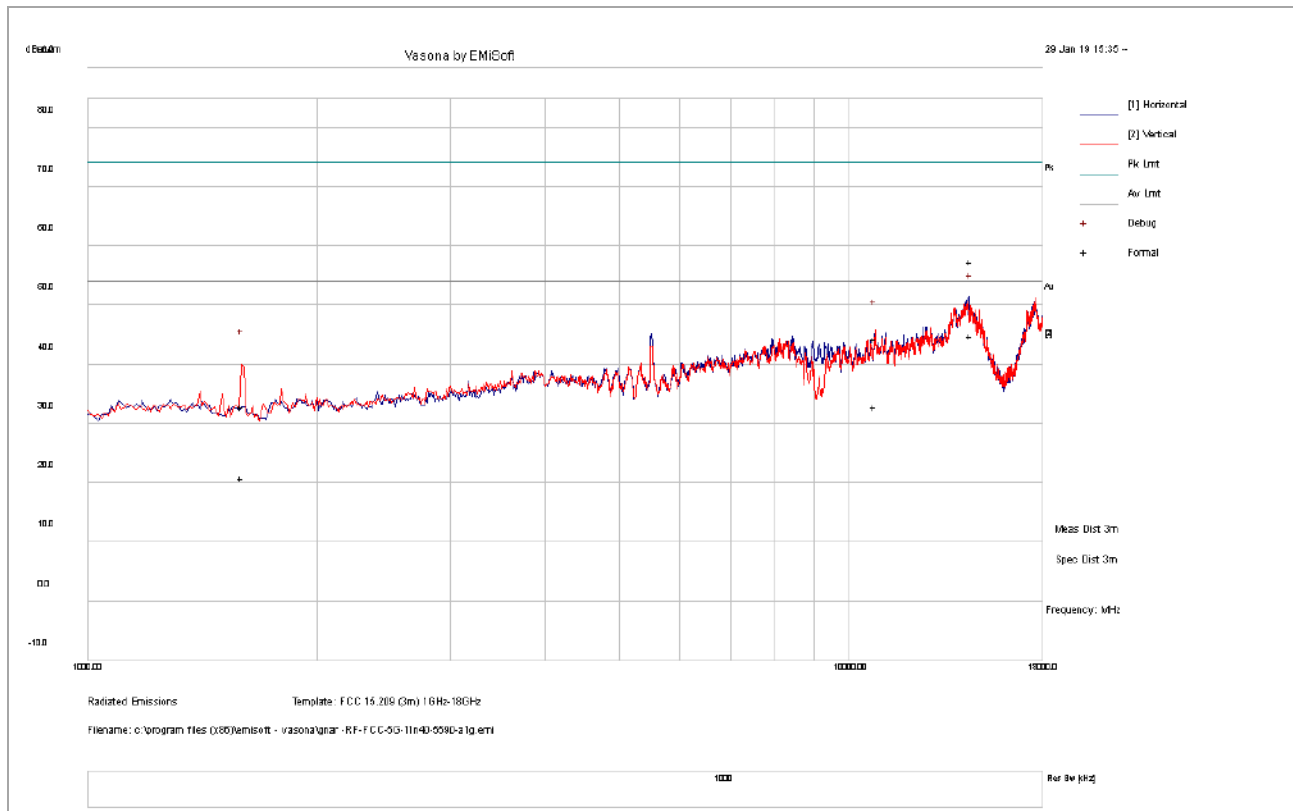
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
15078.30	19.42	22.07	4.84	46.33	PK	H	284	179	74.00	-27.68
8276.53	28.75	15.83	-0.21	44.37	PK	H	269	36	74.00	-29.63
4804.15	31.71	12.87	-5.54	39.05	PK	V	211	178	74.00	-34.95
15078.30	8.06	22.07	4.84	34.96	AV	H	284	179	54.00	-19.04
8276.53	17.04	15.83	-0.21	32.65	AV	H	269	36	54.00	-21.35
4804.15	20.10	12.87	-5.54	27.44	AV	V	211	178	54.00	-26.57

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5590MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



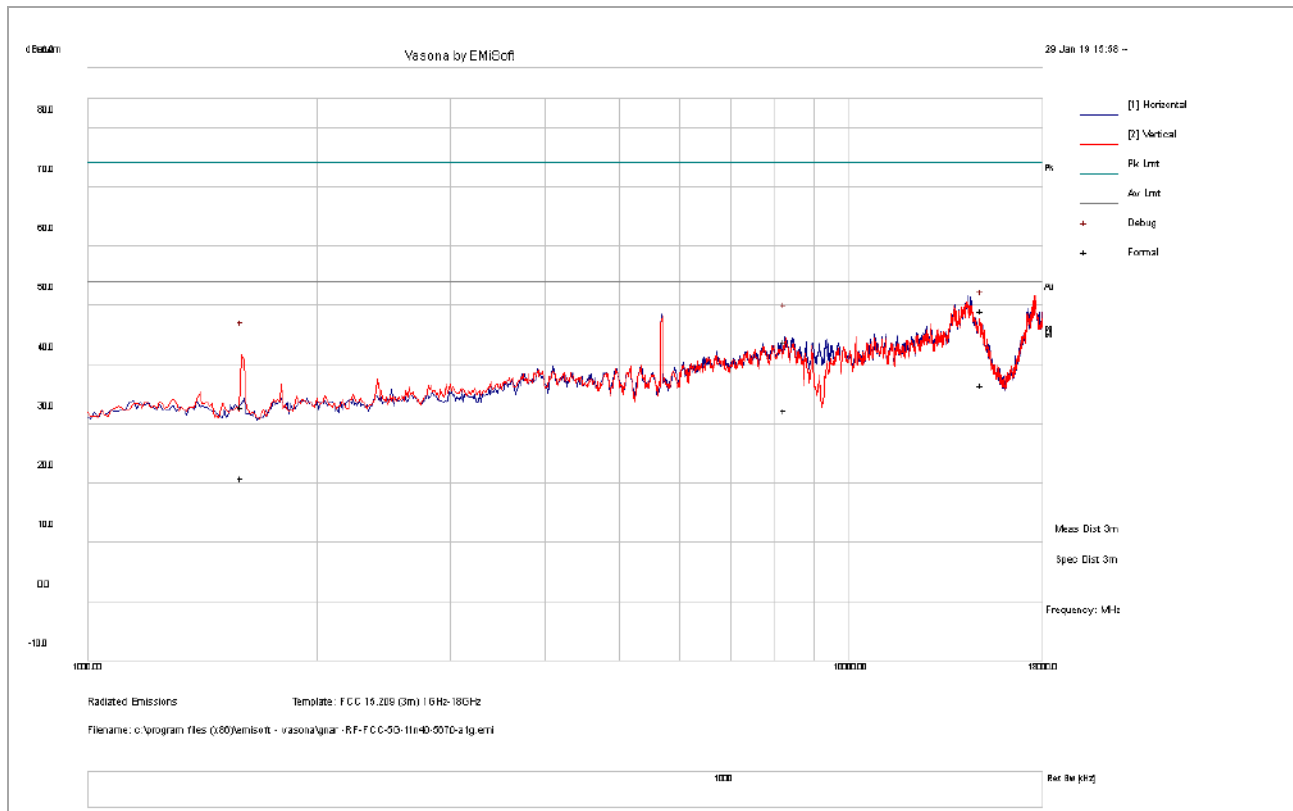
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14449.95	28.78	20.76	7.92	57.46	PK	V	165	197	74.00	-16.55
10817.67	24.08	18.30	1.95	44.34	PK	V	218	134	74.00	-29.66
1596.97	34.24	10.45	-11.80	32.90	PK	V	160	27	74.00	-41.10
14449.95	16.24	20.76	7.92	44.92	AV	V	165	197	54.00	-9.08
10817.67	12.68	18.30	1.95	32.94	AV	V	218	134	54.00	-21.06
1596.97	22.28	10.45	-11.80	20.94	AV	V	160	27	54.00	-33.06

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5670MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



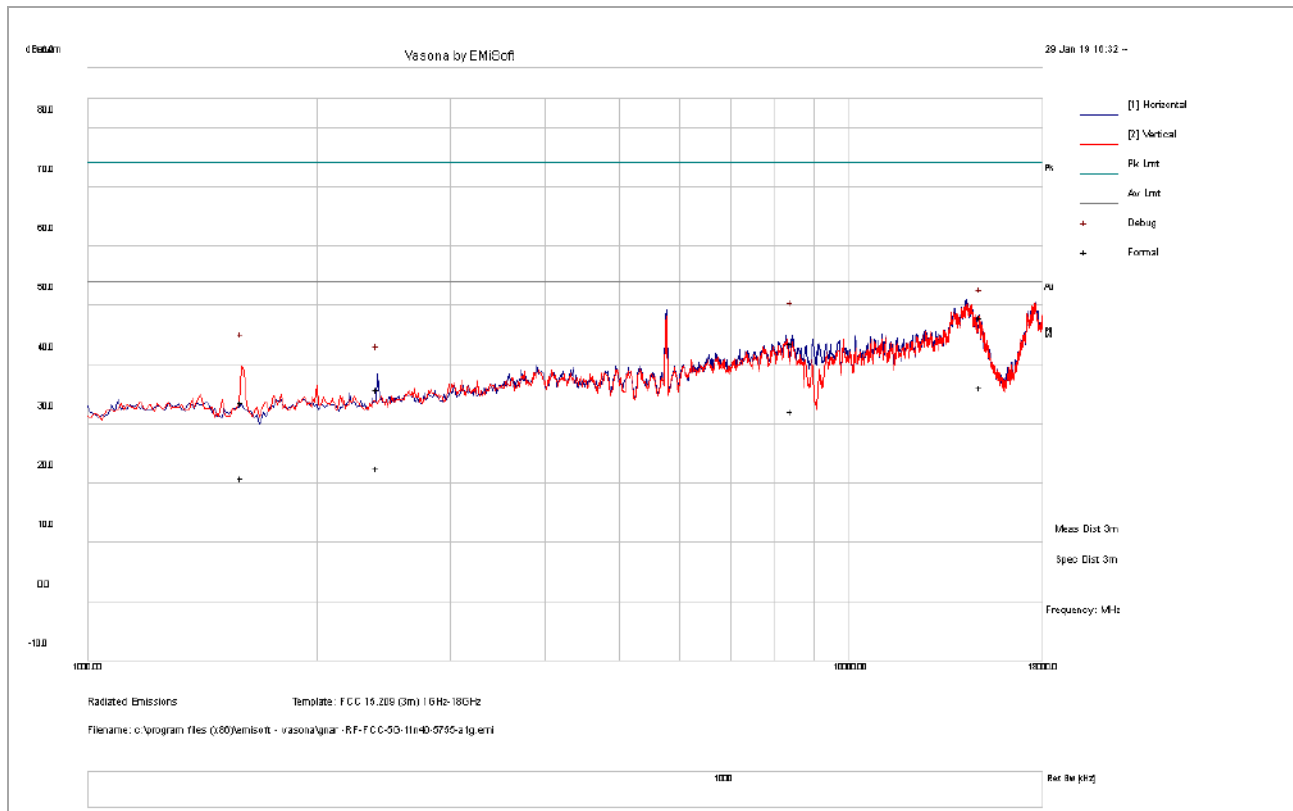
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14941.34	21.70	21.93	5.51	49.14	PK	H	342	229	74.00	-24.86
8245.01	28.41	15.82	-0.29	43.94	PK	H	248	106	74.00	-30.06
1593.96	34.29	10.45	-11.80	32.94	PK	V	342	129	74.00	-41.06
14941.34	9.08	21.93	5.51	36.52	AV	H	342	229	54.00	-17.48
8245.01	16.76	15.82	-0.29	32.30	AV	H	248	106	54.00	-21.71
1593.96	22.21	10.45	-11.80	20.86	AV	V	342	129	54.00	-33.14

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5755MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



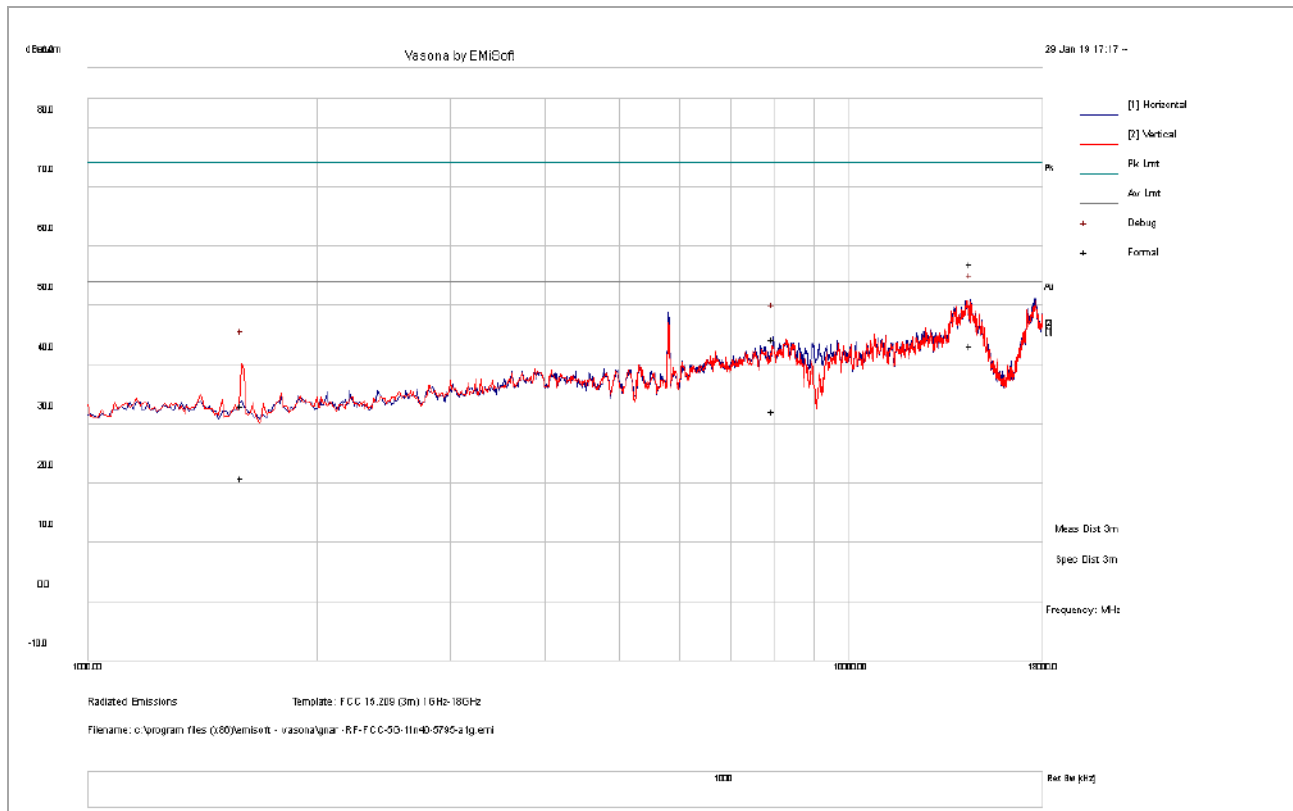
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14929.76	20.52	21.90	5.53	47.96	PK	H	224	270	74.00	-26.05
8427.20	27.87	15.85	-0.06	43.66	PK	H	100	348	74.00	-30.34
1596.61	34.96	10.45	-11.80	33.61	PK	V	103	85	74.00	-40.39
2401.62	34.88	10.83	-9.86	35.85	PK	V	210	118	74.00	-38.15
14929.76	8.82	21.90	5.53	36.26	AV	H	224	270	54.00	-17.74
8427.20	16.38	15.85	-0.06	32.18	AV	H	100	348	54.00	-21.82
1596.61	22.23	10.45	-11.80	20.89	AV	V	103	85	54.00	-33.11
2401.62	21.61	10.83	-9.86	22.58	AV	V	210	118	54.00	-31.42

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11n40-5795MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



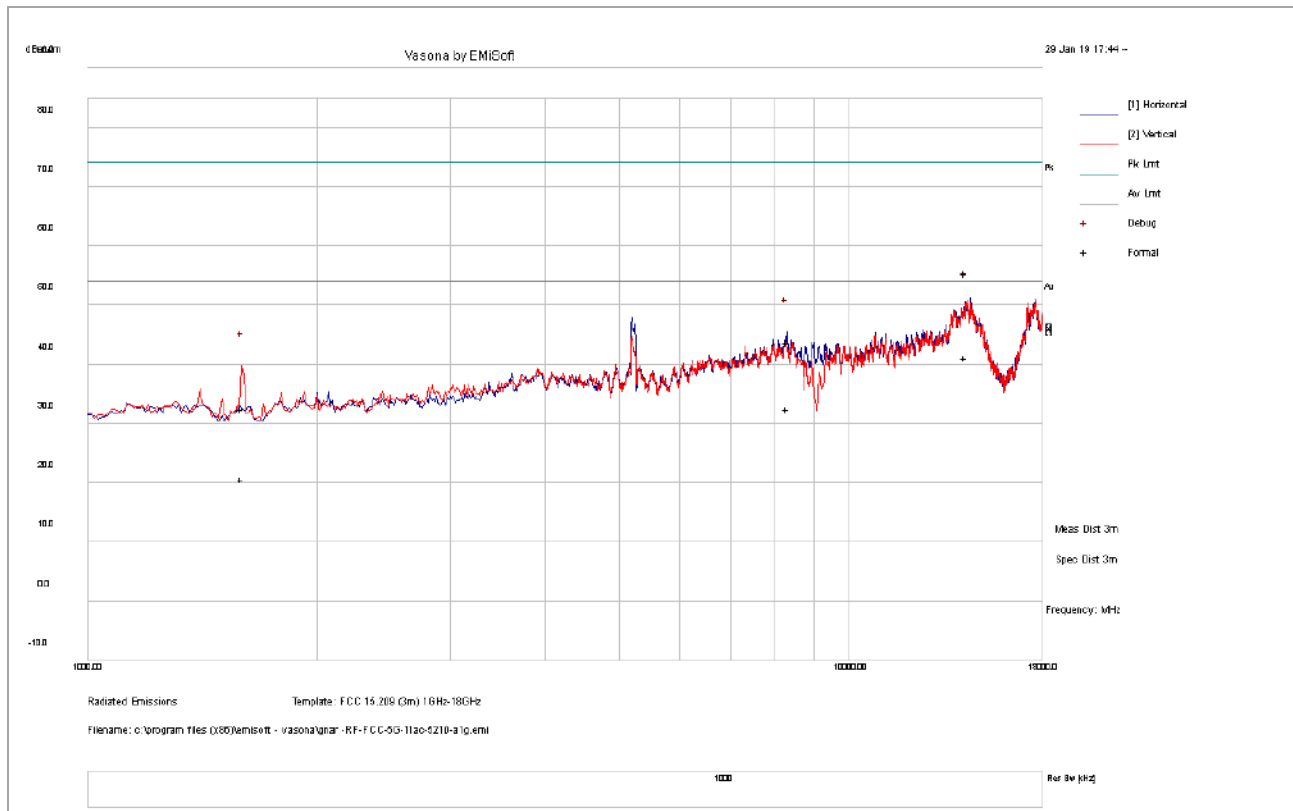
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14449.59	28.43	20.76	7.92	57.11	PK	V	182	122	74.00	-16.89
7950.30	29.48	15.78	-0.90	44.36	PK	H	225	152	74.00	-29.64
1596.41	34.45	10.45	-11.80	33.10	PK	V	159	114	74.00	-40.90
14449.59	14.57	20.76	7.92	43.25	AV	V	182	122	54.00	-10.75
7950.30	17.35	15.78	-0.90	32.23	AV	H	225	152	54.00	-21.77
1596.41	22.28	10.45	-11.80	20.94	AV	V	159	114	54.00	-33.06

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11ac80-5210MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



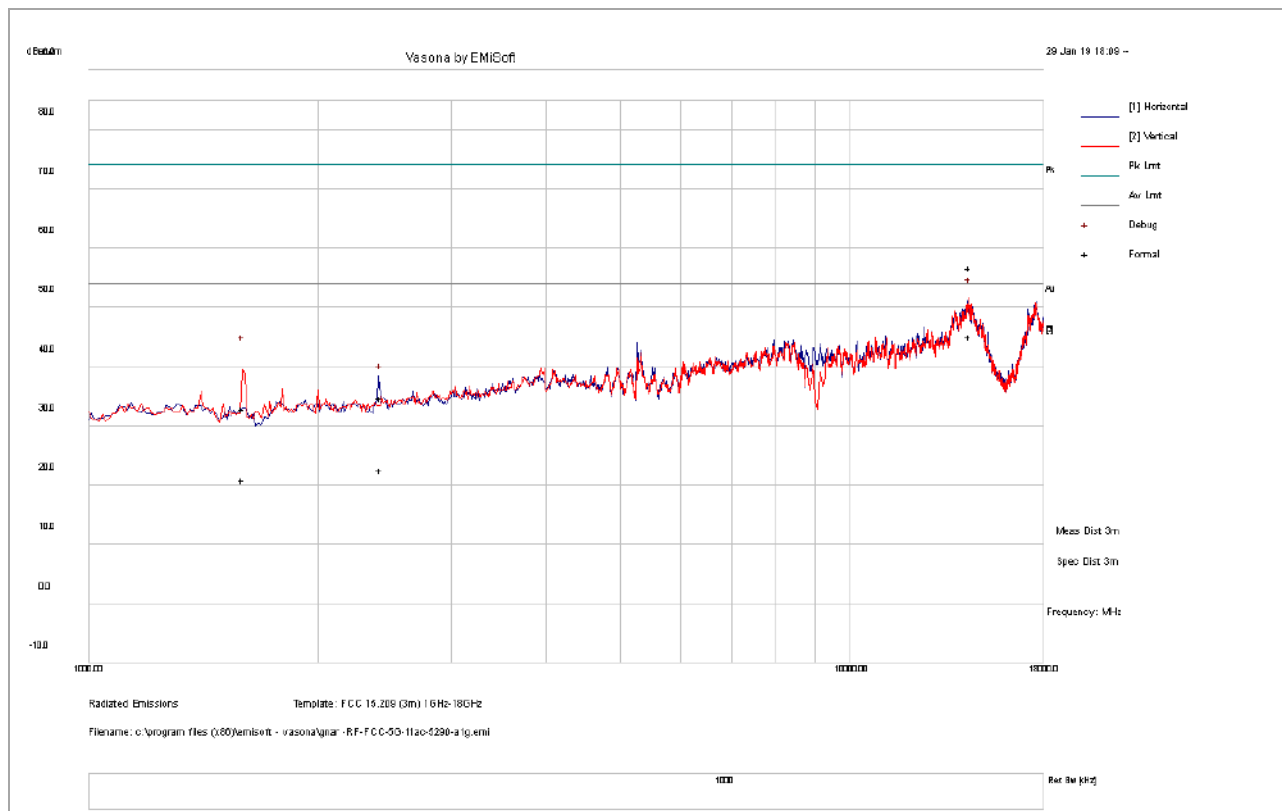
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14220.32	27.18	20.20	7.94	55.33	PK	V	385	8	74.00	-18.67
8290.51	28.10	15.83	-0.19	43.75	PK	H	306	339	74.00	-30.25
1595.75	33.84	10.45	-11.80	32.49	PK	V	299	105	74.00	-41.51
14220.32	13.09	20.20	7.94	41.24	AV	V	385	8	54.00	-12.76
8290.51	16.79	15.83	-0.19	32.44	AV	H	306	339	54.00	-21.56
1595.75	22.12	10.45	-11.80	20.77	AV	V	299	105	54.00	-33.23

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11ac80-5290MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



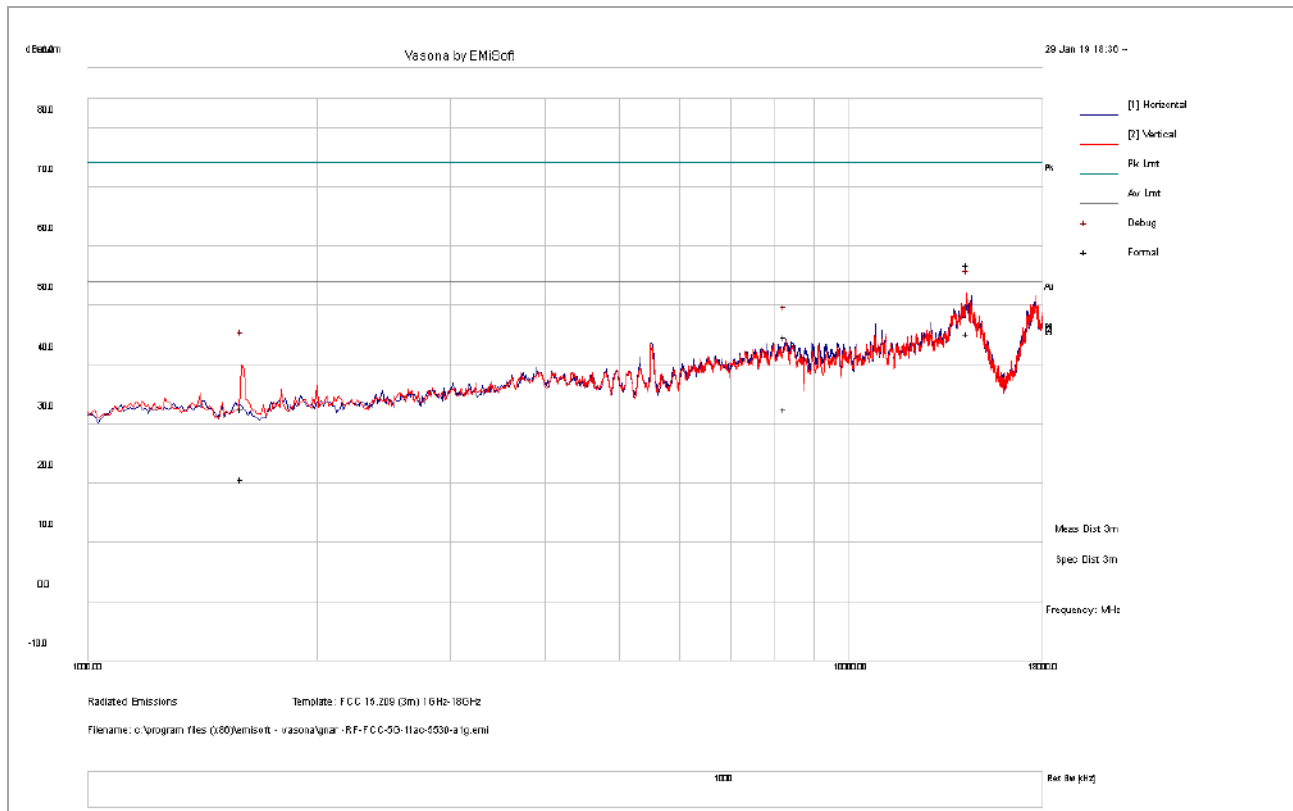
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14366.87	27.85	20.56	8.33	56.74	PK	V	344	308	74.00	-17.26
1596.71	34.24	10.45	-11.80	32.90	PK	V	233	56	74.00	-41.10
2418.89	33.70	10.85	-9.81	34.73	PK	V	400	262	74.00	-39.27
14366.87	16.19	20.56	8.33	45.09	AV	V	344	308	54.00	-8.91
1596.71	22.18	10.45	-11.80	20.84	AV	V	233	56	54.00	-33.16
2418.89	21.53	10.85	-9.81	22.56	AV	V	400	262	54.00	-31.44

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11ac80-5530MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



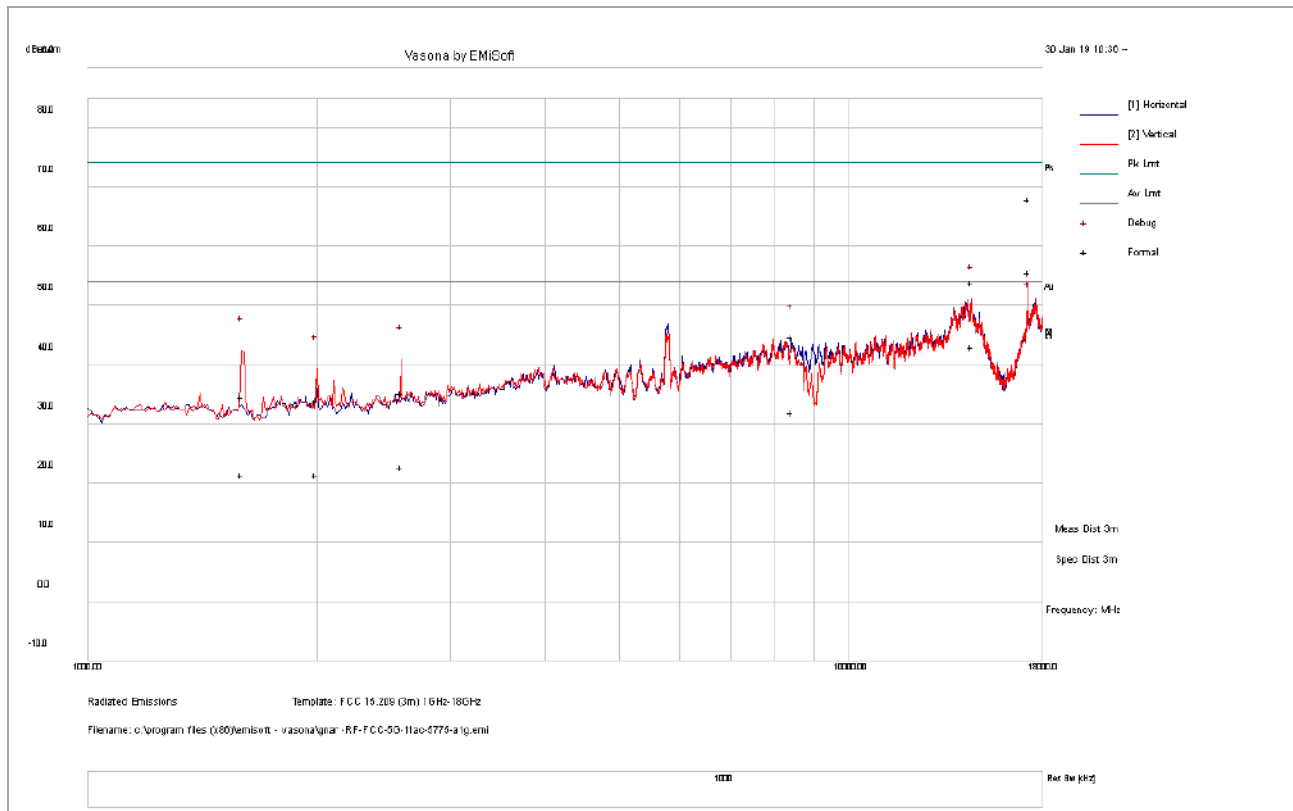
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14306.10	28.16	20.41	8.26	56.84	PK	V	134	318	74.00	-17.16
8258.67	29.08	15.82	-0.25	44.65	PK	H	164	218	74.00	-29.35
1593.18	33.89	10.45	-11.80	32.54	PK	V	133	312	74.00	-41.47
14306.10	16.66	20.41	8.26	45.33	AV	V	134	318	54.00	-8.67
8258.67	16.89	15.82	-0.25	32.46	AV	H	164	218	54.00	-21.54
1593.18	22.16	10.45	-11.80	20.81	AV	V	133	312	54.00	-33.19

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11ac80-5775MHz
Frequency Range:	1GHz-18GHz	Test Date:	01/24/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



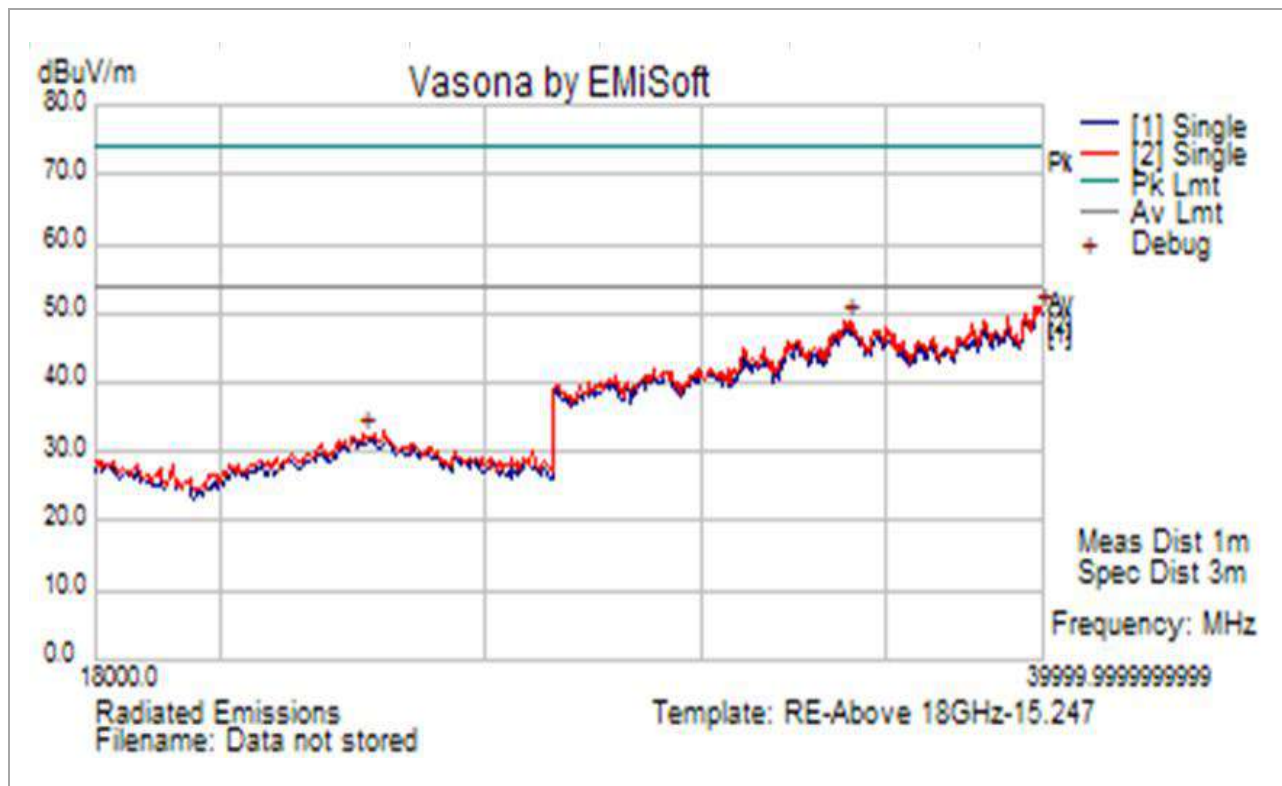
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
8414.43	28.94	15.85	-0.07	44.73	PK	H	114	236	74.00	-29.27
1596.04	35.87	10.45	-11.80	34.52	PK	V	143	146	74.00	-39.48
2584.24	33.21	11.00	-9.00	35.21	PK	V	344	169	74.00	-38.79
2000.57	33.98	10.44	-10.60	33.82	PK	V	292	40	74.00	-40.18
8414.43	16.10	15.85	-0.07	31.89	AV	H	114	236	54.00	-22.12
1596.04	22.80	10.45	-11.80	21.46	AV	V	143	146	54.00	-32.54
2584.24	20.82	11.00	-9.00	22.81	AV	V	344	169	54.00	-31.19
2000.57	21.63	10.44	-10.60	21.47	AV	V	292	40	54.00	-32.53

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



18GHz – 40GHz test result

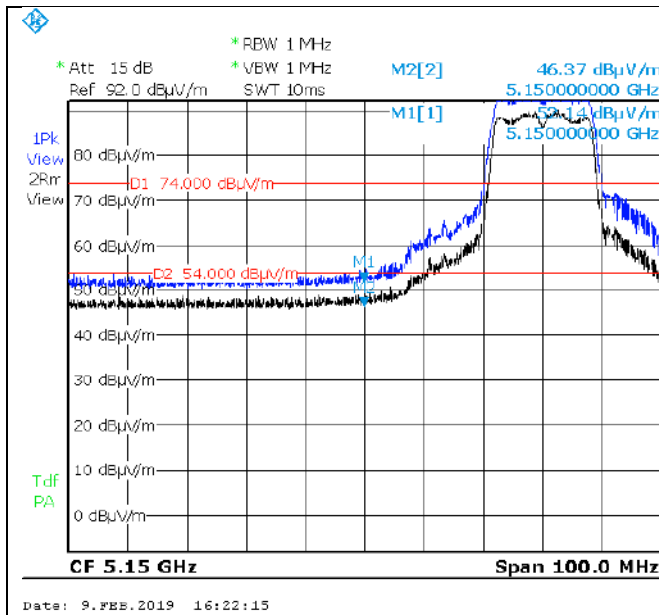
Test Standard:	15.209	Mode:	11a-5500MHz
Frequency Range:	18GHz-40GHz	Test Date:	01/23/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Sherwin Lee
Remark:	N/A	Test Result:	Pass



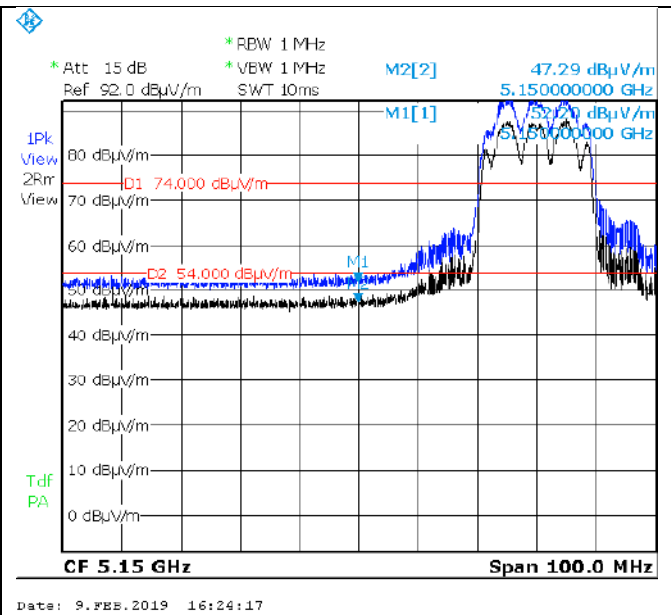
Note: no substantial emission is found other than the noise floor.

S

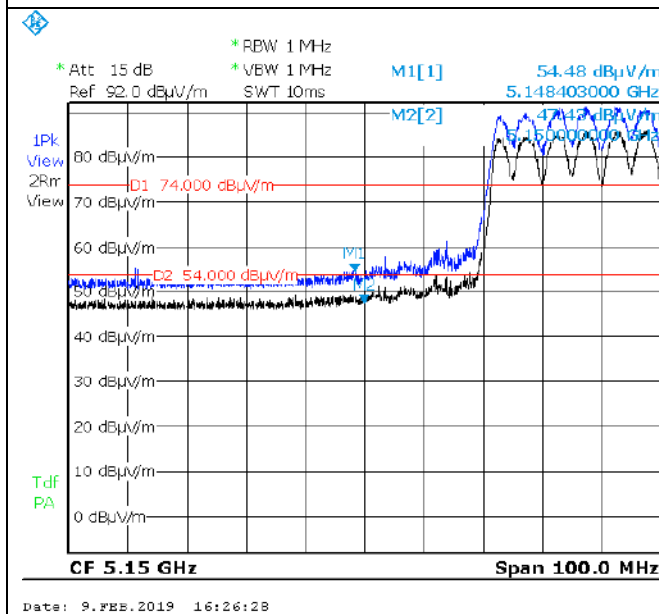
Radiated Band Edge measurement result



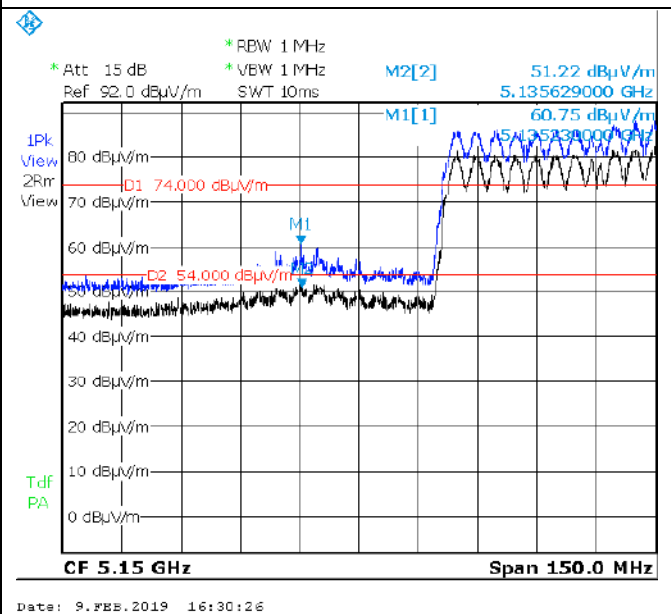
802.11a 5180M- Edge 5150MHz



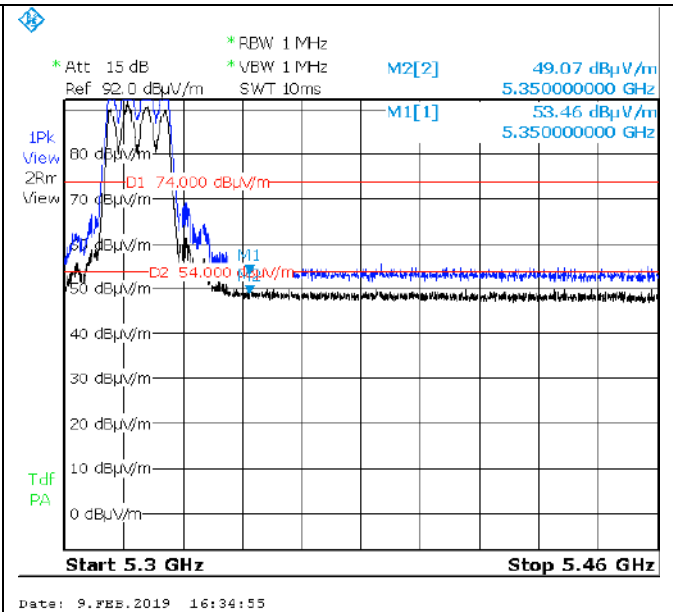
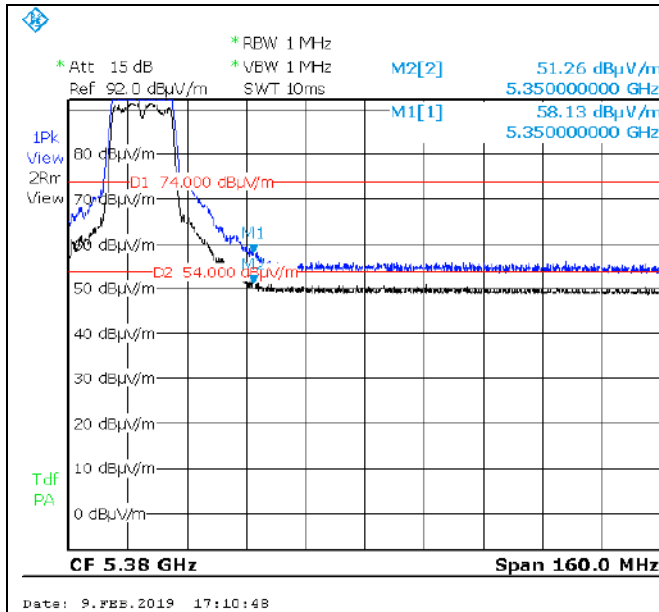
802.11n-20M 5180M- Edge 5150MHz



802.11n-40M 5190M- Edge 5150MHz

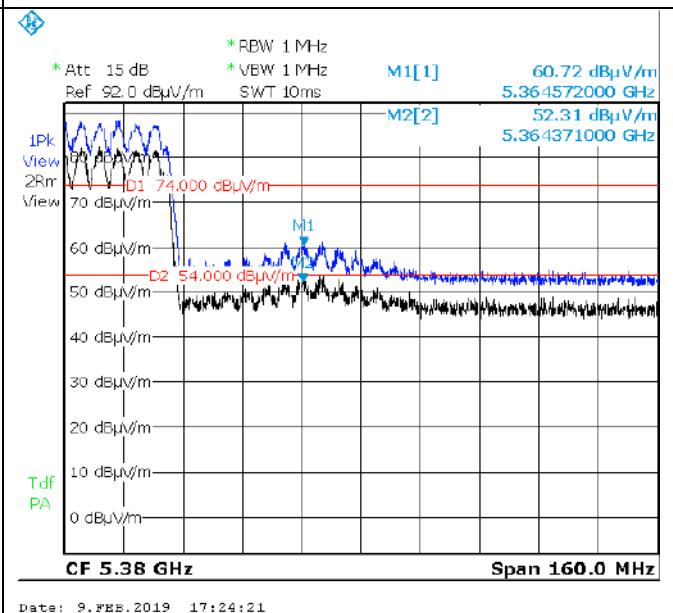
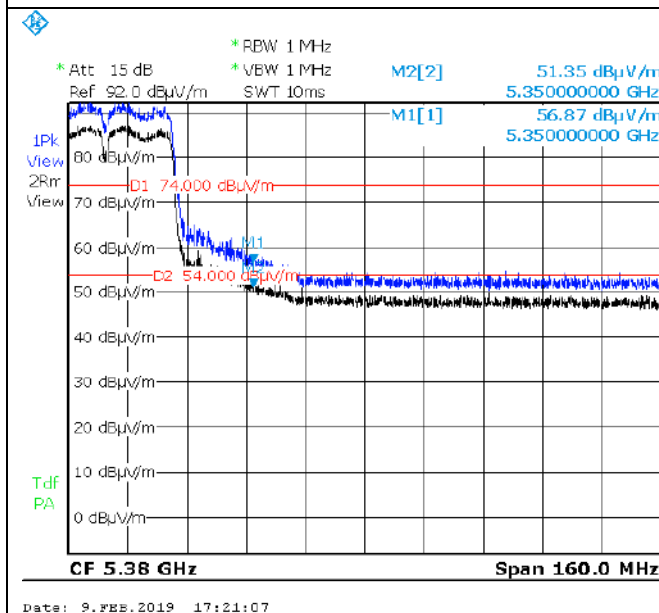


802.11ac-80M 5210M- Edge 5150MHz



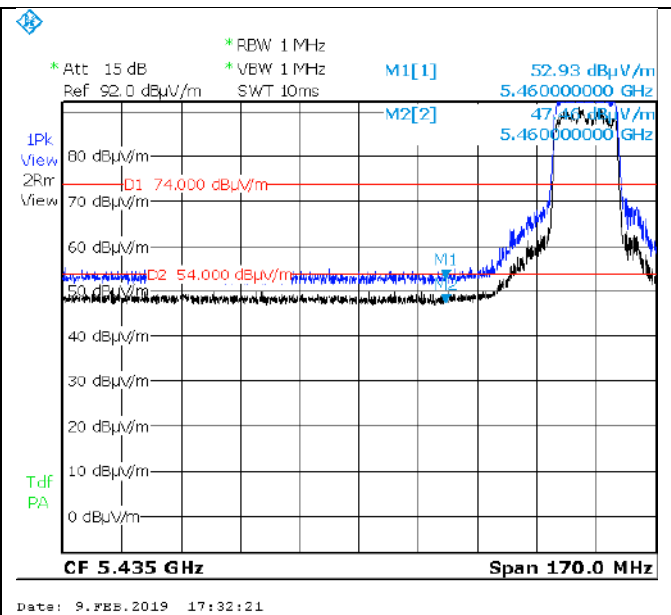
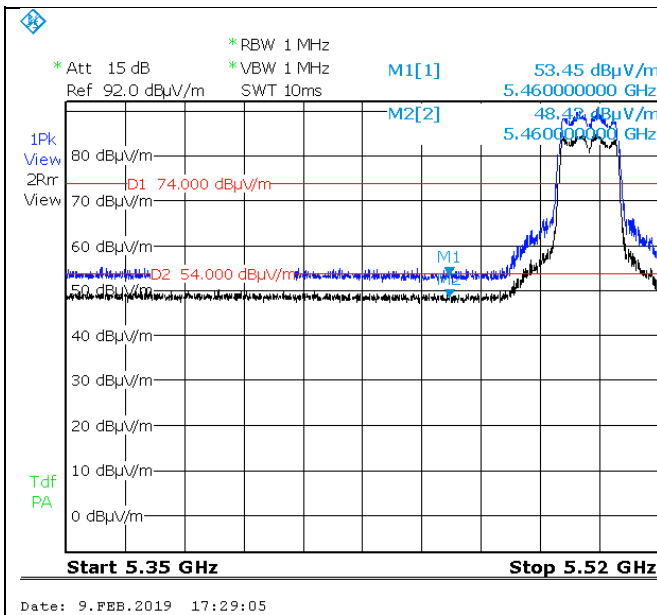
802.11a 5320M- Edge 5350MHz

802.11n 5320M- Edge 5350MHz



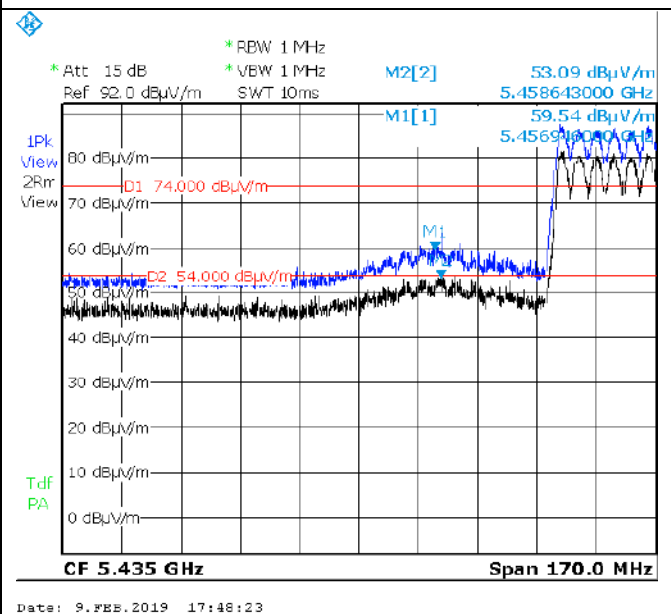
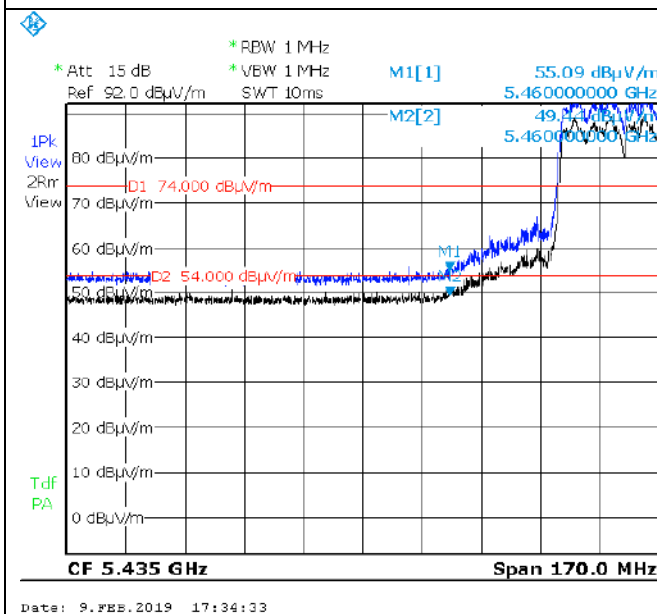
802.11n40MHz 5310M- Edge 5350MHz

802.11ac80MHz 5290M- Edge 5350MHz



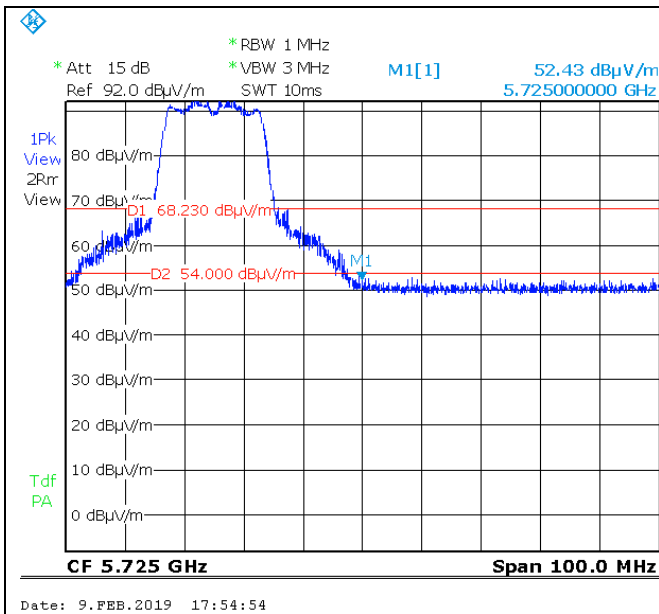
802.11a 5500M- Edge 5470MHz

802.11n 5500M- Edge 5470MHz

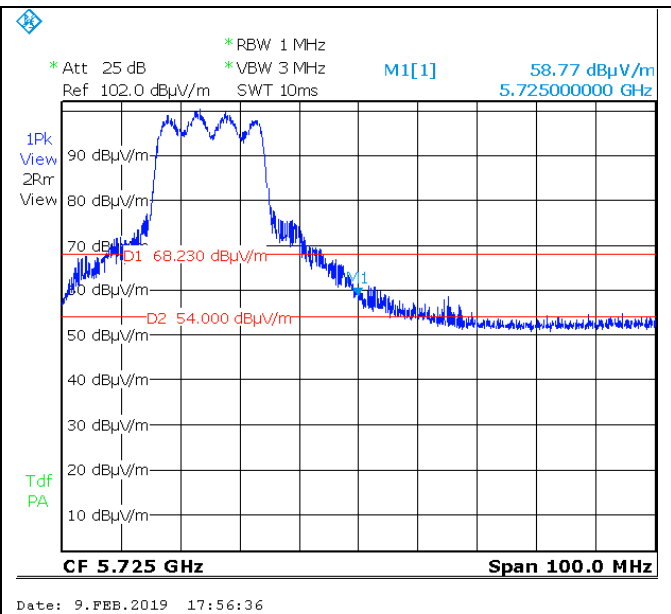


802.11n40MHz 5510M- Edge 5470MHz

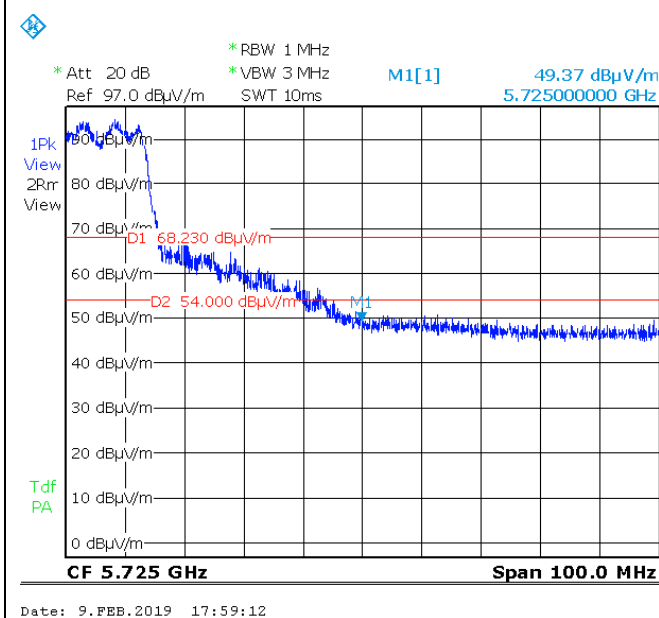
802.11ac40MHz 5530M- Edge 5470MHz



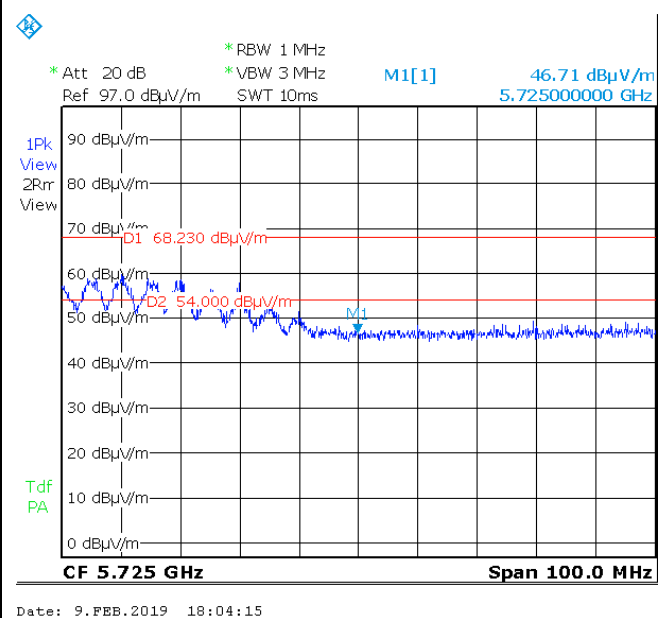
802.11a 5700M- Edge 5725MHz



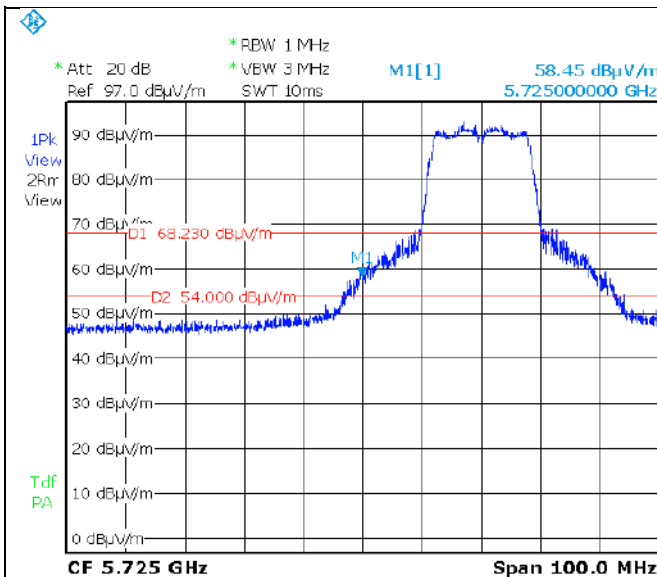
802.11n 5700M- Edge 5725MHz



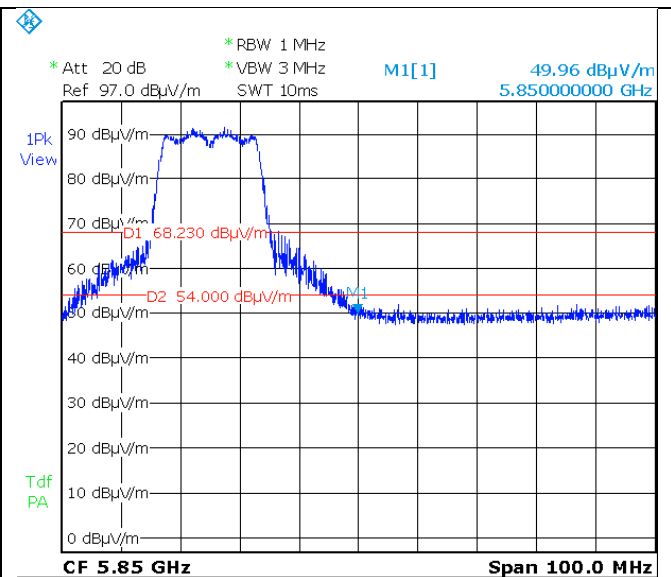
802.11n40MHz 5670M- Edge 5725MHz



802.11ac80MHz 5530M- Edge 5725MHz

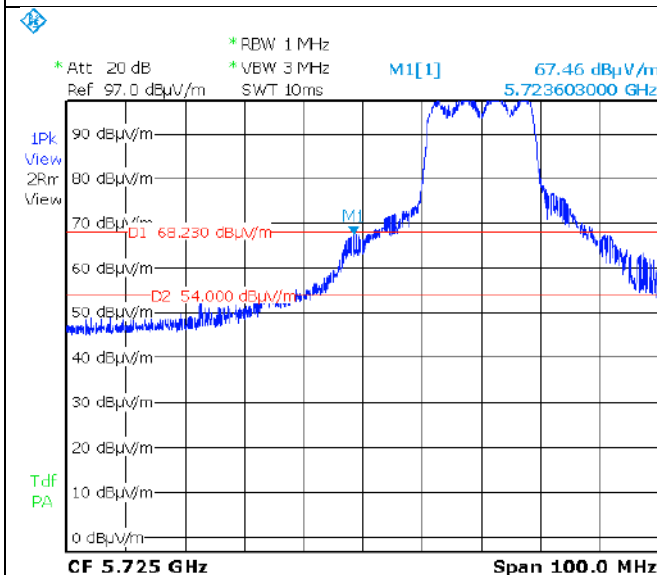


Date: 9.FEB.2019 18:07:13



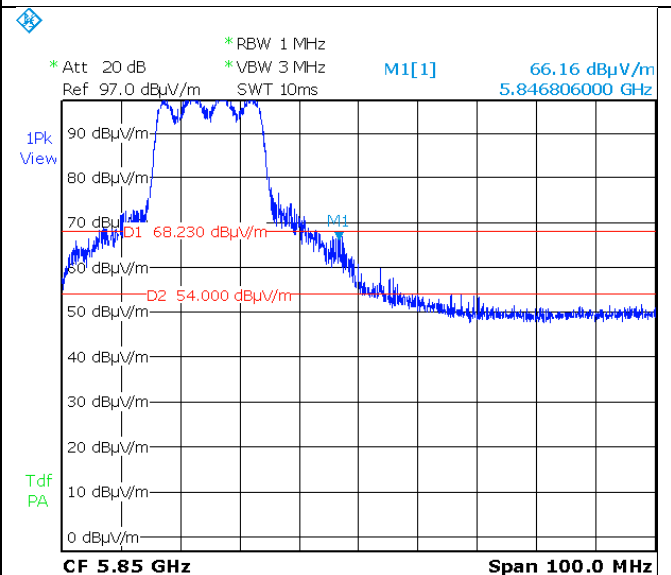
Date: 9.FEB.2019 18:45:34

Radiated Band Edge-802.11a 5745M– Edge 5725MHz



Date: 9.FEB.2019 18:09:03

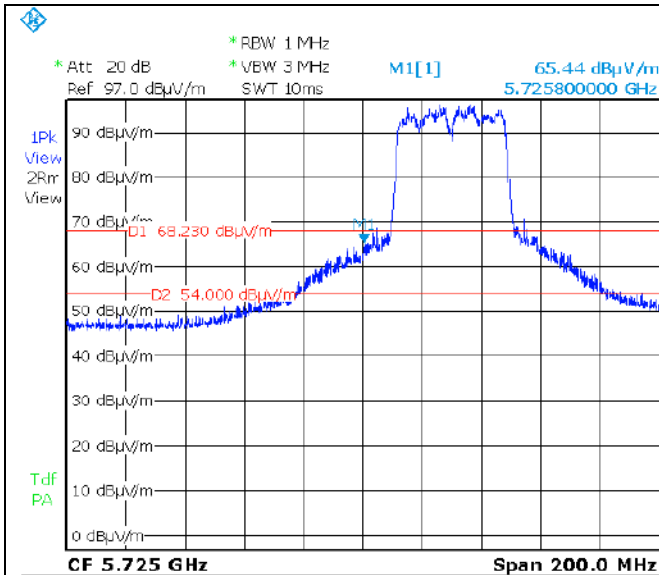
Radiated Band Edge-802.11a 5825M– Edge 5850MHz



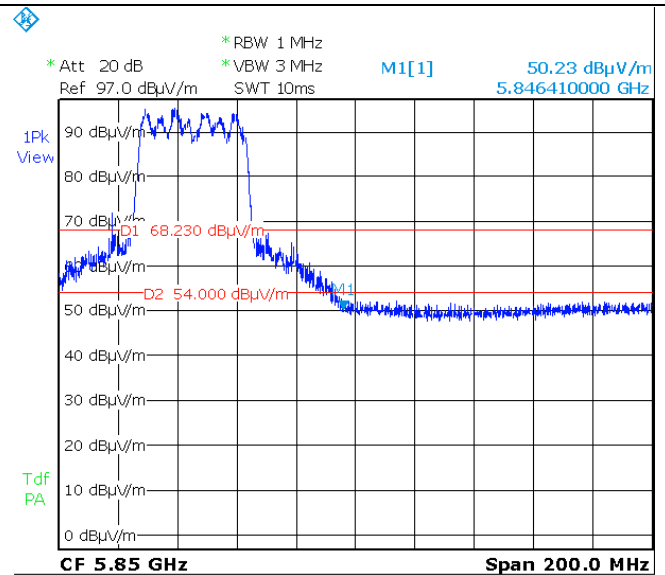
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Radiated Band Edge-802.11n 5745M– Edge 5725MHz

Radiated Band Edge-802.11n 5825M– Edge 5850MHz

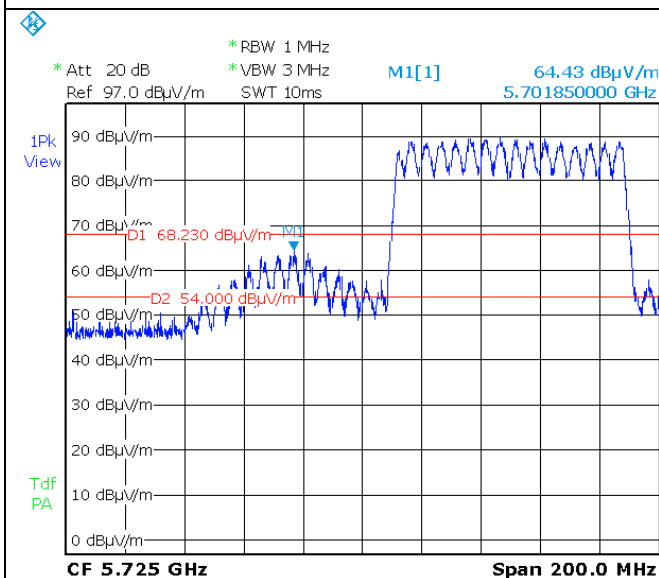


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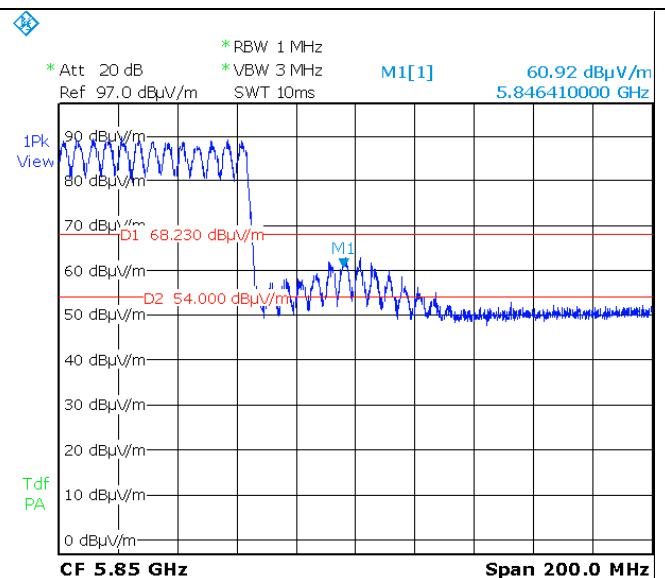
Date: 9.FEB.2019 18:42:14

Radiated Band Edge-802.11n 5755M- Edge 5725MHz



Date: 9.FEB.2019 18:39:41

Radiated Band Edge-802.11n 5795M- Edge 5850MHz



Date: 9.FEB.2019 18:40:23

Restricted Band-802.11ac 5775M- Edge 5725MHz

Radiated Band Edge-802.11ac 5775M- Edge 5850MHz

8.8 Conducted Emissions

8.8.1 Requirement

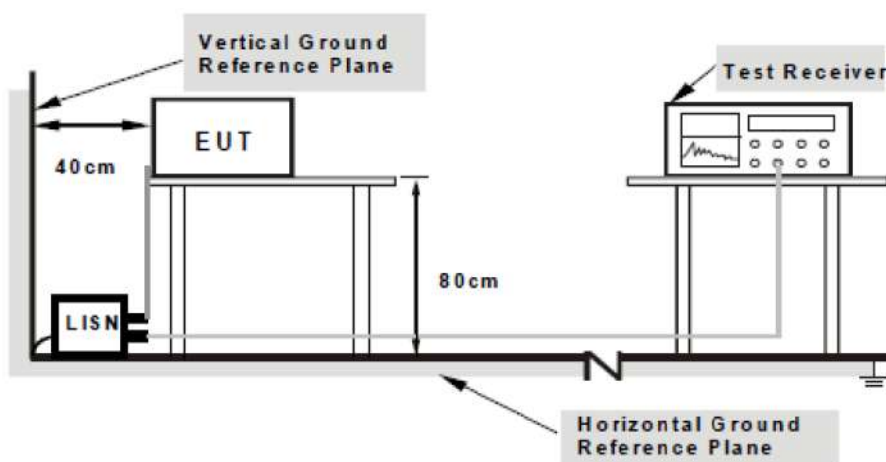
Per § 15.207 (a), an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Limits for Conducted Emissions at the Mains Ports

Section	Frequency ranges (MHz)	Limit (dBuV)	
		QP	Average
Class B devices	0.15 – 0.5	66 – 56	56 – 46
	0.5 – 5	56	46
	5 - 30	60	50

NOTE 1 The lower limit shall apply at the transition frequencies.

8.8.2 Test setup



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.8.3 Test Procedure

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment was powered separately from another main supply.
5. The EUT was switched on and allowed to warm up to its normal operating condition.
6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.
7. High peaks, relative to the limit line, were then selected.
8. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made
9. All possible modes of operation were investigated. Only the worst case emissions were measured and reported. All other emissions were relatively insignificant.

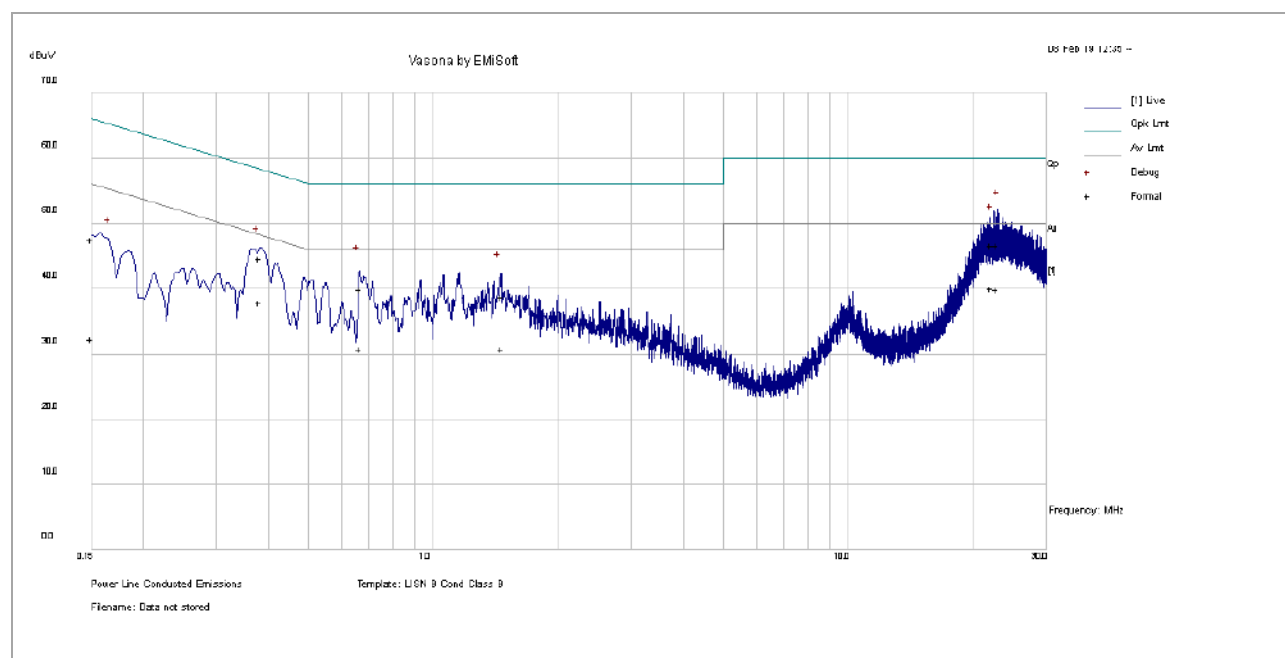
Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



8.8.4 Test Result

Live Line

Test Standard:	47CFR 15.207	Mode:	Line
Frequency Range:	0.15-30MHz	Test Date:	02/08/2019
Antenna Type/Polarity:	N/A	Test Personnel:	Sherwin Lee
Remark:	120VAC, 60Hz	Test Result:	Pass



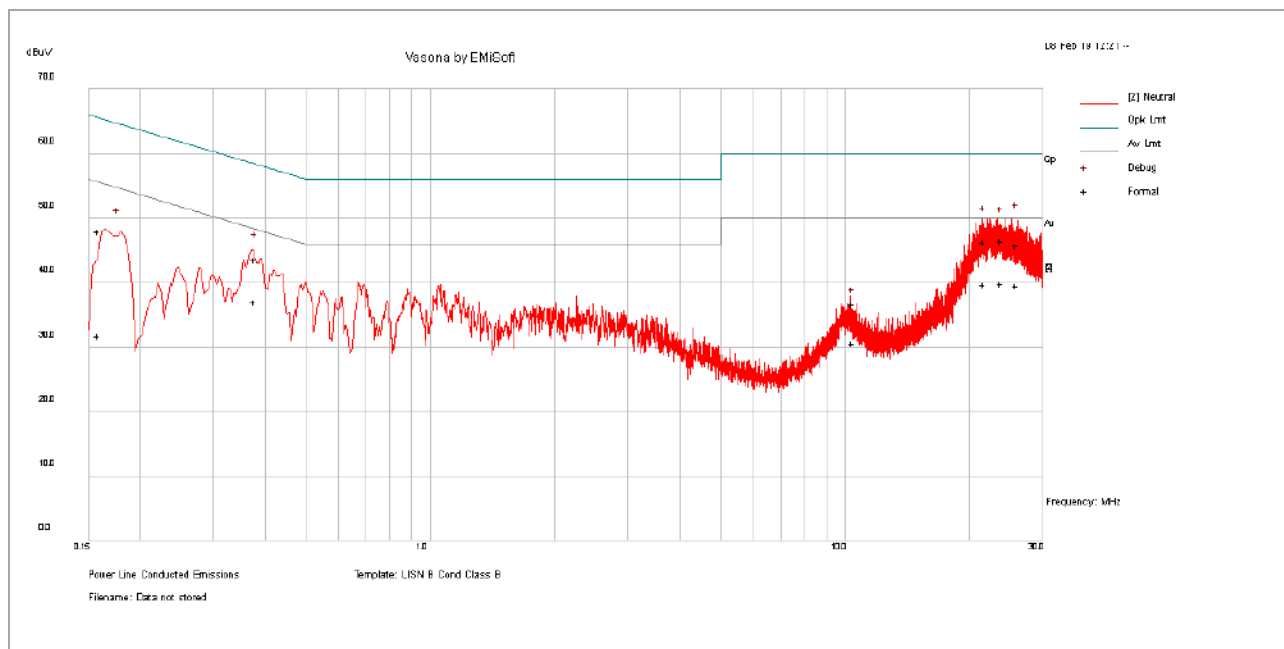
Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV/m)	Meas. Type	Line	Limit (dBuV/m)	Margin (dB)	Pass /Fail
0.15	36.89	10.32	0.24	47.45	QP	Live	66.00	-18.55	Pass
0.38	33.98	10.37	0.25	44.59	QP	Live	58.24	-13.64	Pass
0.67	29.21	10.45	0.30	39.96	QP	Live	56.00	-16.04	Pass
1.46	27.75	10.57	0.49	38.81	QP	Live	56.00	-17.19	Pass
22.12	16.10	11.17	19.34	46.60	QP	Live	60.00	-13.40	Pass
22.90	16.37	11.20	19.15	46.72	QP	Live	60.00	-13.28	Pass
0.15	21.71	10.32	0.24	32.26	AV	Live	56	-23.74	Pass
0.38	27.35	10.37	0.25	37.97	AV	Live	48.24	-10.27	Pass
0.67	20.09	10.45	0.30	30.84	AV	Live	46.00	-15.16	Pass
1.46	19.79	10.57	0.49	30.85	AV	Live	46.00	-15.15	Pass
22.12	9.57	11.17	19.34	40.08	AV	Live	50.00	-9.92	Pass
22.90	9.62	11.20	19.15	39.97	AV	Live	50.00	-10.03	Pass

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



Neutral Line

Test Standard:	47CFR 15.207	Mode:	Neutral
Frequency Range:	0.15-30MHz	Test Date:	02/08/2019
Antenna Type/Polarity:	N/A	Test Personnel:	Sherwin Lee
Remark:	120VAC, 60Hz	Test Result:	Pass



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV/m)	Meas. Type	Line	Limit (dBuV/m)	Margin (dB)	Pass /Fail
0.16	37.46	10.32	0.24	48.02	QP	Neutral	65.51	-17.49	Pass
0.38	33.07	10.37	0.25	43.69	QP	Neutral	58.32	-14.63	Pass
10.47	17.62	10.78	8.40	36.80	QP	Neutral	60.00	-23.20	Pass
21.59	16.20	11.14	19.03	46.38	QP	Neutral	60.00	-13.62	Pass
23.77	16.20	11.23	19.05	46.48	QP	Neutral	60.00	-13.52	Pass
25.87	15.80	11.30	18.76	45.87	QP	Neutral	60.00	-14.13	Pass
0.16	21.22	10.32	0.24	31.78	AV	Neutral	55.51	-23.73	Pass
0.38	26.41	10.37	0.25	37.02	AV	Neutral	48.32	-11.30	Pass
10.47	11.54	10.78	8.40	30.71	AV	Neutral	50.00	-19.29	Pass
21.59	9.54	11.14	19.03	39.72	AV	Neutral	50.00	-10.28	Pass
23.77	9.66	11.23	19.05	39.95	AV	Neutral	50.00	-10.05	Pass
25.87	9.48	11.30	18.76	39.55	AV	Neutral	50.00	-10.45	Pass

Report Number:	GBX-19011401-LC-RF-FCC-UNII
Product:	GNARBOX 2.0 SSD
Model Number:	GNAR128V2
Family Model:	GNAR256V2, GNAR512V2, GNAR1024V2, GNAR2048V2



9 Test instrument list

Equipment	Manufacturer	Model	Serial Number	Cal. Date	Cal. Due
Semi-Anechoic Chamber	ETS-Lindgren	10M	VL001	5/11/2018	5/11/2019
Shielding Control Room	ETS-Lindgren	Series 81	VL006	N/A	N/A
Spectrum Analyzer	Keysight	N9020A	MY50110074	5/4/2018	5/4/2019
EMC Test Receiver	R&S	ESL6	100230	5/7/2018	5/7/2019
LISN (9KHz – 30MHz)	EMCO	3816/2	9705-1066	5/4/2018	5/4/2019
Bi-Log Antenna	ETS-Lindgren	3142E	217921	11/15/2018	11/15/2019
Horn Antenna (1-18GHz)	Electro-Metrics	EM-6961	6292	5/2/2018	5/2/2019
Horn Antenna (18-40GHz)	Com-Power	AH-840	101109	5/2/2018	5/2/2019
Preamplifier	RF Bay, Inc.	LPA-10-20	11180621	5/10/2018	5/10/2019
True RMS Multi-meter	UNI-T	UT181A	C173014829	5/10/2018	5/10/2019
Temp / Humidity / Pressure Meter	PCE Instruments	PCE-THB 40	R062028	5/9/2018	5/9/2019
RF Attenuator	Pasternack	PE7005-3	VL061	5/10/2018	5/10/2019
Preamplifier 100KHz - 40GHz	Aeroflex	33711-392- 77150-11	064	5/10/2018	5/10/2019
EM Center Control	ETS-Lindgren	7006-001	160136	N/A	N/A
Turn Table	ETS-Lindgren	2181-3.03	VL002	N/A	N/A
Boresight Antenna Tower	ETS-Lindgren	2171B	VL003	N/A	N/A
Loop Antenna (9k-30MHz)	Com-Power	AL-130	121012	5/9/2018	5/9/2019
RE test cable(below 6GHz)	Vista	RE-6GHz-01	RE-6GHz-01	5/10/2018	5/10/2019
RE test cable (1-18GHz)	PhaseTrack	II-240	RE-18GHz-01	5/10/2018	5/10/2019
RE test cable (>18GHz)	Sucoflex	104	344903/4	5/10/2018	5/10/2019
Pulse limiter	Com-Power	LIT-930A	531727	5/15/2018	5/15/2019
CE test cable #1	FIRST RF	FRF-C-1002-001	CE-6GHz-01	5/10/2018	5/10/2019
CE test cable#2	FIRST RF	FRF-C-1002-001	CE-6GHz-02	5/9/2018	5/9/2019