

Test Report

Product: Ruune Magnetic AI Recorder Device

Trade Mark: Ruune

Model Number: IOHRNC1

FCC ID: 2BVR6-IOHRNC1

Prepared for

Internet of Humans Inc.

2033 2nd Avenue 805 Seattle, WA, 98121 US

Prepared by

Shenzhen HongBiao Certification& Testing Co., Ltd

Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China

Tel.: +86-755-2998 9321 Fax.: +86-755-2998 5110

Website: <http://www.sz-hongbiao.com>

Table of Contents

1	GENERAL DESCRIPTION	6
1.1	DESCRIPTION OF EUT	6
1.2	TEST MODE.....	6
1.3	OPERATION CHANNEL LIST	7
1.4	TEST SETUP	7
1.5	POWER SETTING CONFIGURATION PARAMETERS	7
1.6	ANCILLARY EQUIPMENT	8
2	SUMMARY OF TEST RESULT	9
3	TEST FACILITIES AND ACCREDITATIONS	10
3.1	TEST LABORATORY	10
3.2	ENVIRONMENTAL CONDITIONS	10
3.3	MEASUREMENT UNCERTAINTY	10
3.4	TEST SOFTWARE	11
4	LIST OF TEST EQUIPMENT	12
5	TEST ITEM AND RESULTS.....	14
5.1	ANTENNA REQUIREMENT	14
5.1.1	<i>Standard Requirement</i>	14
5.1.2	<i>Test Result</i>	14
5.2	POWER LINE CONDUCTED EMISSION	15
5.2.1	<i>Limits</i>	15
5.2.2	<i>Test Procedures</i>	15
5.2.3	<i>Test Setup</i>	16
5.2.4	<i>Test Result</i>	16
5.3	RADIATED EMISSION	19
5.3.1	<i>Limits</i>	19
5.3.2	<i>Test Procedures</i>	20
5.3.3	<i>Test Setup</i>	20
5.3.4	<i>Test Result</i>	21
5.3.5	<i>Radiated Band Edge</i>	29
5.4	AVERAGE OUTPUT POWER	37
5.4.1	<i>Limit</i>	37
5.4.2	<i>Test Procedure</i>	37
5.4.3	<i>Test Setup</i>	37
5.4.4	<i>Test Results</i>	37
5.5	POWER SPECTRAL DENSITY.....	39
5.5.1	<i>Limit</i>	39
5.5.2	<i>Test Procedure</i>	39
5.5.3	<i>Test Setup</i>	39
5.5.4	<i>Test Results</i>	40
5.6	26dB EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH	44
5.6.1	<i>Limit</i>	44
5.6.2	<i>Test Procedure</i>	44
5.6.3	<i>Test Setup</i>	44
5.6.4	<i>Test Results</i>	44
5.7	6 dB BANDWIDTH	49
5.7.1	<i>Limit</i>	49
5.7.2	<i>Test Procedure</i>	49

5.7.3	Test Setup.....	49
5.7.4	Test Results	49
5.8	DUTY CYCLE	53
5.8.1	Limit	53
5.8.2	Test Procedure	53
5.8.3	Test Setup.....	53
5.8.4	Test Results	53
5.9	OUT OF BAND EMISSION	64
5.9.1	Limit	64
5.9.2	Test Procedure	64
5.9.3	Test Setup.....	64
5.9.4	Test Results	65
5.10	SPURIOUS RF CONDUCTED EMISSIONS.....	69
5.10.1	Limit	69
5.10.2	Test Procedure.....	69
5.10.3	Test Setup.....	69
5.10.4	Test Results	69
5.11	FREQUENCY STABILITY.....	75
5.11.1	Limit	75
5.11.2	Test Procedure.....	75
5.11.3	Test Setup.....	75
5.11.4	Test Results	75
6	PHOTOGRAPHS OF THE TEST SETUP.....	86
7	PHOTOGRAPHS OF THE EUT.....	88

TEST RESULT CERTIFICATION

Applicant's Name..... : Internet of Humans Inc.

Address : 2033 2nd Avenue 805 Seattle, WA, 98121 US

Manufacturer's Name : Internet of Humans Inc.

Address : 2033 2nd Avenue 805 Seattle, WA, 98121 US

Product description

Product name : Ruune Magnetic AI Recorder Device

Model Number : IOHRNC1

Standards : FCC Part 15.407

Test procedure..... : IEEE/ANSI C63.10-2020+Cor. 1-2023

789033 D02 General UNII Test Procedures New Rules v02r01

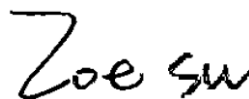
This device described above has been tested by Shenzhen HongBiao Certification& Testing Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.

Date of Test

Date (s) of performance of tests..... : May 25, 2026~May 29, 2026

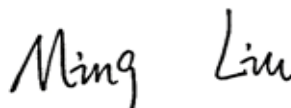
Test Result..... : **Pass**

Testing Engineer :



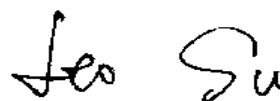
(Z o e S u)

Technical Manager :



(M i n g L i u)

Authorized Signatory :



(L e o S u)

[illegible]

1 General Description

1.1 Description of EUT

Product name:	Ruune Magnetic AI Recorder Device
Model name:	IOHRNC1
Series Model:	N/A
Different of series model:	N/A
Frequency range:	U-NII-1: 5180 MHz to 5240 MHz U-NII-3: 5745 MHz to 5825 MHz
Modulation type:	802.11a/n: OFDM(BPSK,QPSK,16QAM,64QAM, 256QAM)
Transfer rate:	802.11a: 6,9,12,18,24,36,48,54Mbps 802.11n(HT20/HT40): MCS0-MCS7
Channel bandwidth:	802.11a: 20 MHz 802.11n: 20 MHz, 40 MHz
Antenna type:	Multilayer Antenna
Antenna gain:	2.3dBi
Max. output power:	U-NII-1: 15.72dBm U-NII-3: 16.98dBm
Hardware version:	V1.0
Software version:	V1.0
Battery:	DC 3.87V, 130mAh, 0.51Wh
Power supply:	Input: DC 5V/0.5A
Adapter information:	N/A

1.2 Test Mode

For 802.11a/n (HT20)

U-NII-1 (5150 - 5250 MHz)			U-NII-3(5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
36	Low	5180	149	Low	5745
40	Mid	5200	157	Mid	5785
48	High	5240	165	High	5825

For 802.11n (HT40)

U-NII-1 (5150 - 5250 MHz)			U-NII-3(5725 - 5850 MHz)		
Channel	Channel	Frequency	Channel	Channel	Frequency

Number		(MHz)	Number		(MHz)
38	Low	5190	151	Low	5755
46	High	5230	159	High	5795

1.3 Operation Channel List

For U-NII-1:

20 MHz		40 MHz		80 MHz	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
36	5180	38	5190	--	--
40	5200	46	5230	--	--
44	5220	--	--	--	--
48	5240	--	--	--	--

For U-NII-3:

20 MHz		40 MHz		80 MHz	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
149	5745	151	5755	--	--
153	5765	159	5795	--	--
157	5785	--	--	--	--
161	5805	--	--	--	--
165	5825	--	--	--	--

1.4 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.5 Power setting configuration parameters

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Items	Mode	Data Rate	TX/RX
Radiated Emissions	802.11a(HT20)	6 Mbps	TX
	802.11n(HT20/40)	MCS0	TX
Duty Cycle	802.11a(HT20)	6 Mbps	TX
	802.11n(HT20/40)	MCS0	TX
Band Edge	802.11a (HT20)	6 Mbps	TX
	802.11n(HT20/40)	MCS0	TX
6dB Bandwidth	802.11a (HT20)	6 Mbps	TX
	802.11n(HT20/40)	MCS0	TX

26dB Bandwidth and 99% Occupied Bandwidth	802.11a (HT20)	6 Mbps	TX
	802.11n(HT20/40)	MCS0	TX
Conducted Output Power	802.11a(HT20)	6 Mbps	TX
	802.11n(HT20/40)	MCS0	TX
Power Spectral Density	802.11a(HT20)	6 Mbps	TX
	802.11n(HT20/40)	MCS0	TX
Frequency Stability	Un-modulation	/	TX

1.6 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
Notebook	BDR-WDH	A3RQPM242 0002411	Honor Terminal Co., Ltd.
Adapter	CD289	35810	Ugreen Group Limited
Wireless Charge	/	/	/

Note: The notebook is used to assist the RF test. In order to prevent the notebook from causing unnecessary impact on the test, the notebook will be removed from the test environment after the EUT successfully transmits at a fixed frequency using the notebook.

2 Summary of Test Result

No.	Standard Section	Test Item	Result	Remark
1	15.203/15.407	Antenna Requirement	Pass	
2	15.207	Power Line Conducted Emission	Pass	
3	15.407(b) 15.209	Radiation Spurious Emission	Pass	
4	15.407(a)	RF Output Power	Pass	
5	15.407(a)	Power Spectral Density	Pass	
6	15.407(a)	26dB Emission Bandwidth and Occupied bandwidth	Pass	
7	15.407(e)	6 dB bandwidth	Pass	
8	15.407(b)	Out Of Band Emission	Pass	
9	15.407(b)	Spurious RF Conducted Emissions	Pass	
10	15.407(g)	Frequency Stability	Pass	
11	/	Duty Cycle	Pass	

3 Test Facilities and Accreditations

3.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

3.2 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C~35°C
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

3.3 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

The data and results quoted in this document are true and accurate values, and uncertainties are not involved in the calculations.

In addition, components and mass production processes that are similar to testing equipment may introduce additional deviations, and the manufacturer is solely responsible for the continued compliance of the equipment.

Measurement Frequency Range	U, (dB)	Note
RF frequency	2×10^{-5}	
RF power, conducted	± 0.57 dB	
Conducted emission(150kHz~30MHz)	± 2.5 dB	
Radiated emission(9kHz-30MHz)	± 2.5 dB	
Radiated emission(30MHz~1GHz)	± 4.2 dB	
Radiated emission (above 1GHz)	± 4.7 dB	
Occupied Bandwidth	$\pm 3\%$	
Temperature	± 1 degree	

Humidity	± 5 %	
----------	-------	--

3.4 Test Software

Software name	Manufacturer	Model	Version
Conducted Emission test Software	Farad	EZ-EMC	EMC-CON 3A1.1+
Radiated Emission test Software	Farad	EZ-EMC	FA-03A2
RF Test System	MWRF	MTS 8310	2.0.0.0

4 List of Test Equipment

Radiation emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E001	Horn Antenna	Schwarzbeck	BBHA 9120D	02592	2026-04-25	2028-04-24
2	HB-E002	Biconical log-periodic composite antenna	Schwarzbeck	VULB 9168	01340	2026-04-25	2028-04-24
3	HB-E003	SHF-EHF Horn	Schwarzbeck	BBHA 9170	01193	2026-04-25	2028-04-24
4	HB-E005	Preamplifier	Noyetec	LAN-0118	NYCM1420102	2026-04-27	2027-04-26
5	HB-E006	Preamplifier	Noyetec	LAN-1840	NYCM1420103	2026-04-30	2027-04-29
6	HB-E007	EMI TEST RECEIVER	R&S	ESR7	102520	2026-04-28	2027-04-27
7	HB-E009	POSITINAL COTROLLE R	Noyetec	N/A	N/A	/	/
8	HB-E013	RF switch	Noyetec	NY-RF4	NY0CM1420204	/	/
9	HB-E066	Illuminance Tester	TASI	TA8121	N/A	2026-04-30	2027-04-29
10	HB-E075	Active loop antenna	Schwarzbeck	FMZB 1519B	1519B-00245	2026-04-25	2028-04-24
11	HB-E076	Preamplifier	Hewlett Packard	8447D	1937A02278	2026-04-28	2027-04-27
Conduction emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E014	4 Path V-LISN	Schwarzbeck	NNLK 8121	00770	2026-04-27	2027-04-26
2	HB-E015	Pulse Limiter	Schwarzbeck	VTSD 9561-F	00949	2026-04-27	2027-04-26
3	HB-E016	Absorb clamp	ZHINAN	ZN23201	*21066*	2026-04-29	2027-04-28
4	HB-E059	Attenuator	Xianghua	TS2-6-1	220215166	2026-04-27	2027-04-26
5	HB-E069	EMI TEST RECEIVER	R&S	ESCI	100610	2026-04-27	2027-04-26

RF							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E041	MXG Anaio Signal Generator	Agilent	N5181A	MY47070421	2026-04-27	2027-04-26

2	HB-E042	WIDEBAND RADIO COMMUNICA TION TESTER	R&S	CMW500	132108	2026-04-27	2027-04-26
3	HB-E043	MXG Anaio Signal Generator	Agilent	N5182A	US46240335	2026-04-28	2027-04-27
4	HB-E044	Signal& spectrum Analyzer	R&S	FSV3044	101264	2026-04-28	2027-04-27
5	HB-E045	RF Control Box	Noyetec	NY100-R FCB	N/A	2026-04-28	2027-04-27
6	HB-E058	Thermometer Clock Humidity Monitor	N/A	HTC-1S	N/A	2026-04-30	2027-04-29

Note: the calibration interval of the above test instruments is 12&24 months and the calibrations are traceable to international system unit (SI).

5 Test Item And Results

5.1 Antenna Requirement

5.1.1 Standard Requirement

15.203 requirement: For intentional device, according to 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.

5.1.2 Test Result

The antenna is Multilayer Antenna, which was permanently affixed to the device and un-replaced, complies with 15.203. In addition, the maximum antenna gain is 2.3dBi.

5.2 Power Line Conducted Emission

5.2.1 Limits

Limits – Class B		
Frequency (MHz)	Limit (dBμV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50
Note: 1. the tighter limit applies at the band edges. 2. the limit of "*" marked band means the limitation decreases linearly with the logarithm of the frequency in the range.		

5.2.2 Test Procedures

a) EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

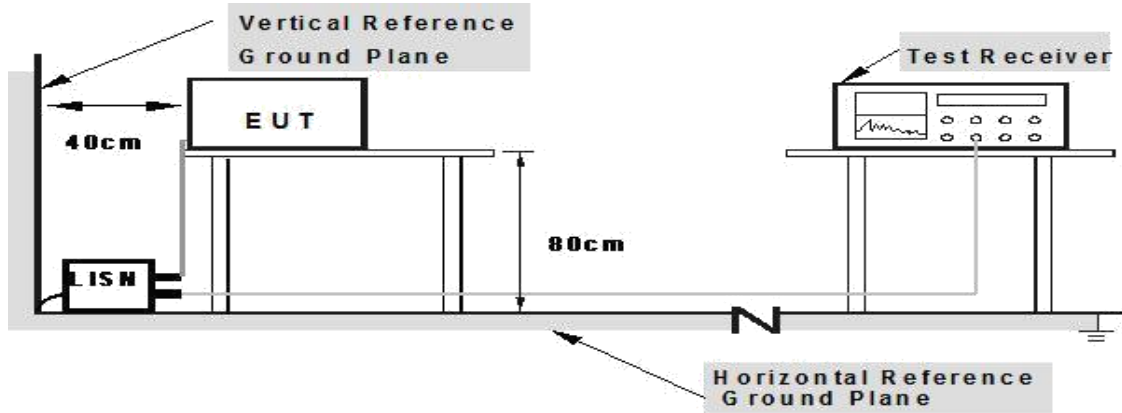
b) The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

- c) The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- d) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- e) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- f) LISN is at least 80 cm from nearest part of EUT chassis.
- g) For the actual test configuration, please refer to the related Item – photographs of the test

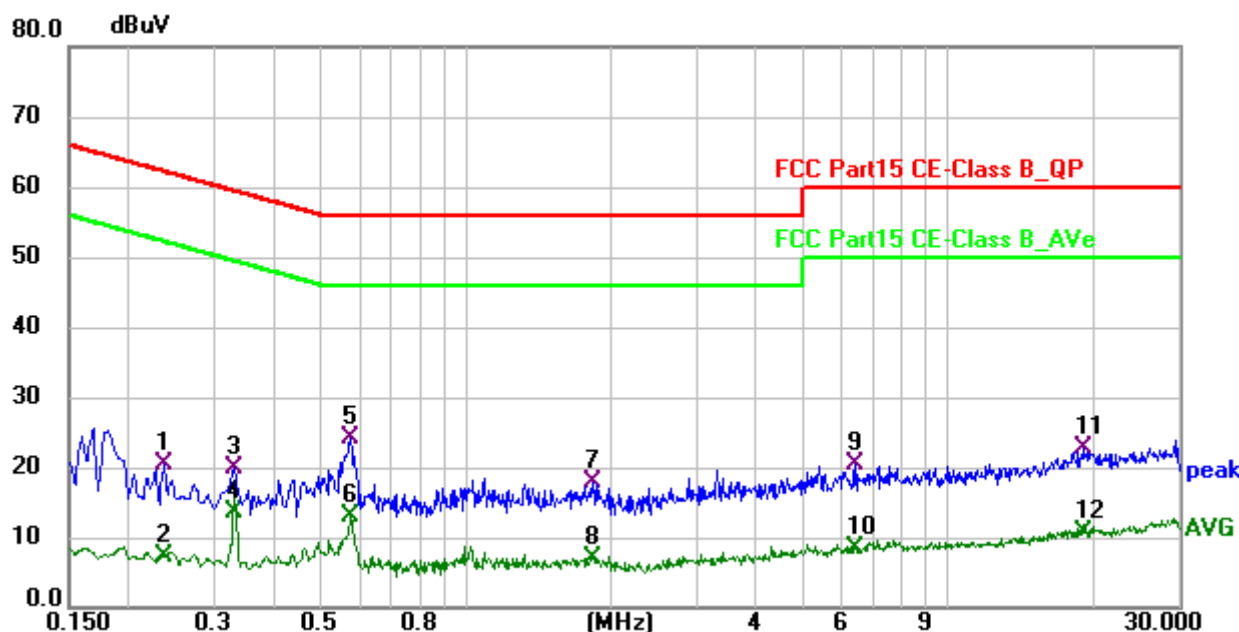
setup.

5.2.3 Test Setup



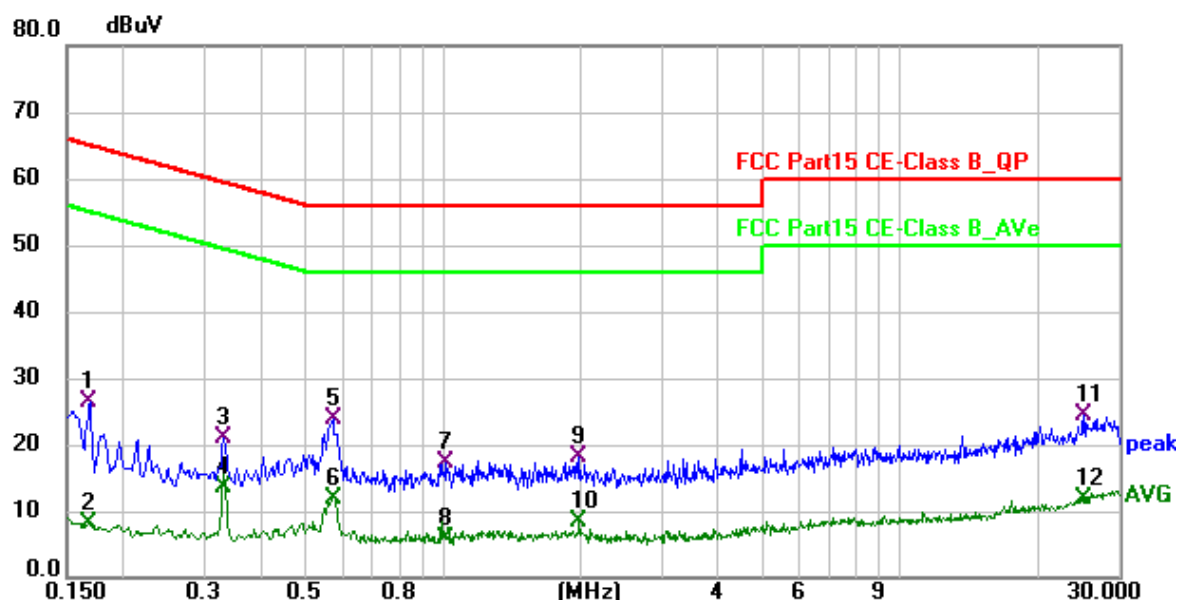
5.2.4 Test Result

EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	Charging + TX (802.11a 5180MHz)	Phase:	L
Test Voltage:	DC 5V from wireless charge		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.235	10.34	10.11	20.45	62.27	-41.82	QP
2	0.235	-2.86	10.11	7.25	52.27	-45.02	AVG
3	0.330	9.65	10.09	19.74	59.45	-39.71	QP
4	0.330	3.42	10.09	13.51	49.45	-35.94	AVG
5 *	0.578	14.17	10.11	24.28	56.00	-31.72	QP
6	0.578	2.82	10.11	12.93	46.00	-33.07	AVG
7	1.833	7.56	10.31	17.87	56.00	-38.13	QP
8	1.833	-3.40	10.31	6.91	46.00	-39.09	AVG
9	6.410	8.29	12.03	20.32	60.00	-39.68	QP
10	6.410	-3.63	12.03	8.40	50.00	-41.60	AVG
11	19.090	8.18	14.55	22.73	60.00	-37.27	QP
12	19.090	-3.73	14.55	10.82	50.00	-39.18	AVG

EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	Charging + TX(802.11a 5180MHz)	Phase:	N
Test Voltage:	DC 5V from wireless charge		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.168	16.38	10.17	26.55	65.06	-38.51	QP
2	0.168	-2.02	10.17	8.15	55.06	-46.91	AVG
3	0.330	10.79	10.13	20.92	59.45	-38.53	QP
4	0.330	3.54	10.13	13.67	49.45	-35.78	AVG
5 *	0.573	13.67	10.12	23.79	56.00	-32.21	QP
6	0.573	1.66	10.12	11.78	46.00	-34.22	AVG
7	1.018	7.18	10.13	17.31	56.00	-38.69	QP
8	1.018	-4.30	10.13	5.83	46.00	-40.17	AVG
9	1.982	7.66	10.35	18.01	56.00	-37.99	QP
10	1.982	-1.81	10.35	8.54	46.00	-37.46	AVG
11	25.265	8.95	15.38	24.33	60.00	-35.67	QP
12	25.265	-3.57	15.38	11.81	50.00	-38.19	AVG

Note: All modes have been tested, and only the worst mode 802.11a in the report.

5.3 Radiated Emission

5.3.1 Limits

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 e.i.r.p. 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 e.i.r.p. of -27 dBm/MHz.

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 e.i.r.p. of -27 dBm/MHz.

4. For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Frequency Range	RBW	VBW	Measurement
30MHz-1GHz	1MHz	3MHz	Peak
Above 1GHz	1MHz	10Hz ^{Note1}	Average
	1MHz	>1/T ^{Note2}	Average
Note1	When duty cycle is no less than 98%		
Note2	When duty cycle is less than 98%		

Receiver Parameter	Setting
--------------------	---------

Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.3.2 Test Procedures

The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the floor on a support that is RF transparent for the frequencies of interest. Final measurements for the EUT require a measurement antenna height scan of 1 m to 4 m.

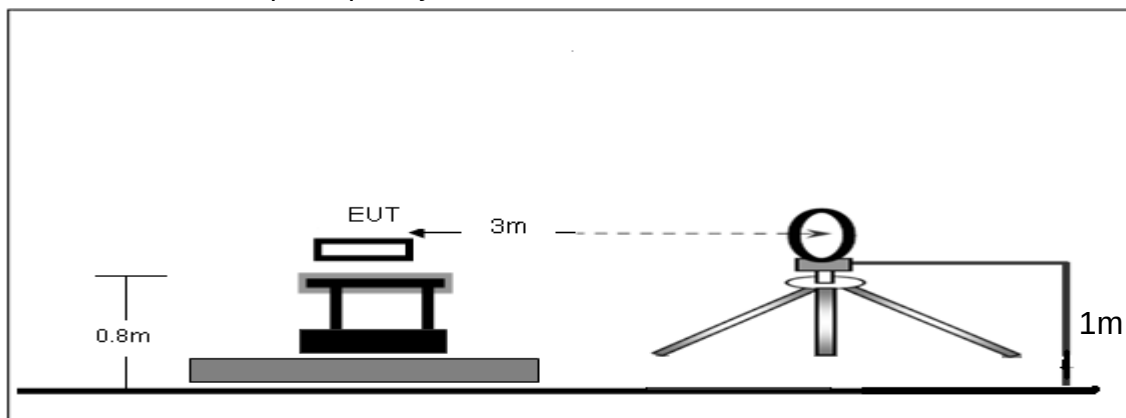
The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. For the actual test configuration, please refer to the related Item –EUT Test Photos.

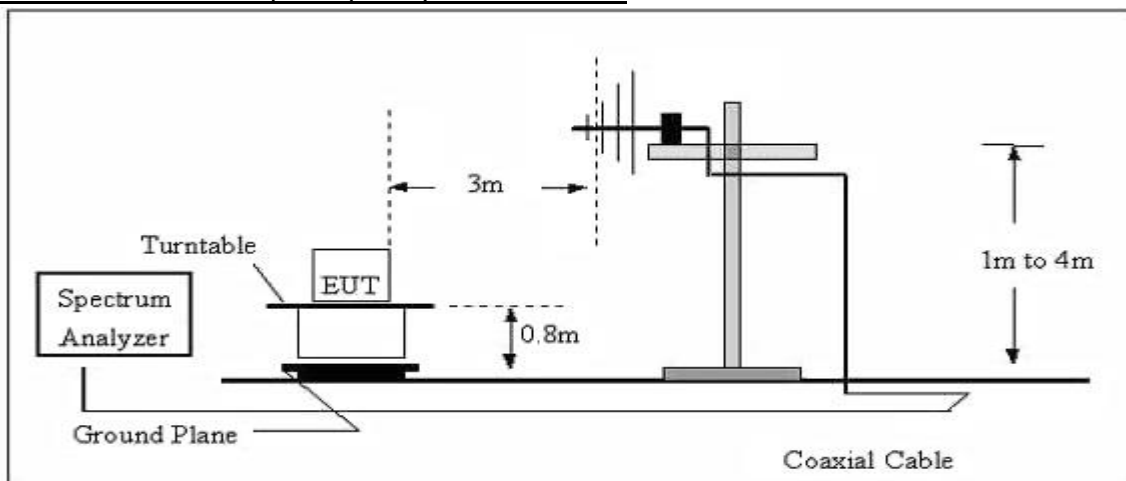
Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

5.3.3 Test Setup

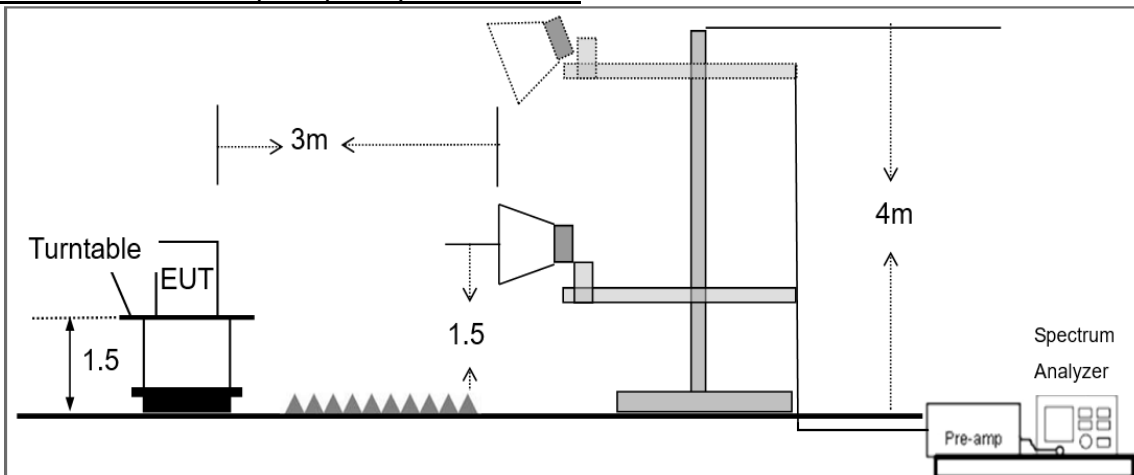
Radiated Emission Test-Up Frequency Below 30MHz



Radiated Emission Test-Up Frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



5.3.4 Test Result

Below 30MHz

EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Pressure:	1010 hPa	Test Voltage:	DC 3.87V from battery
Test Mode:	TX	Polarization:	--

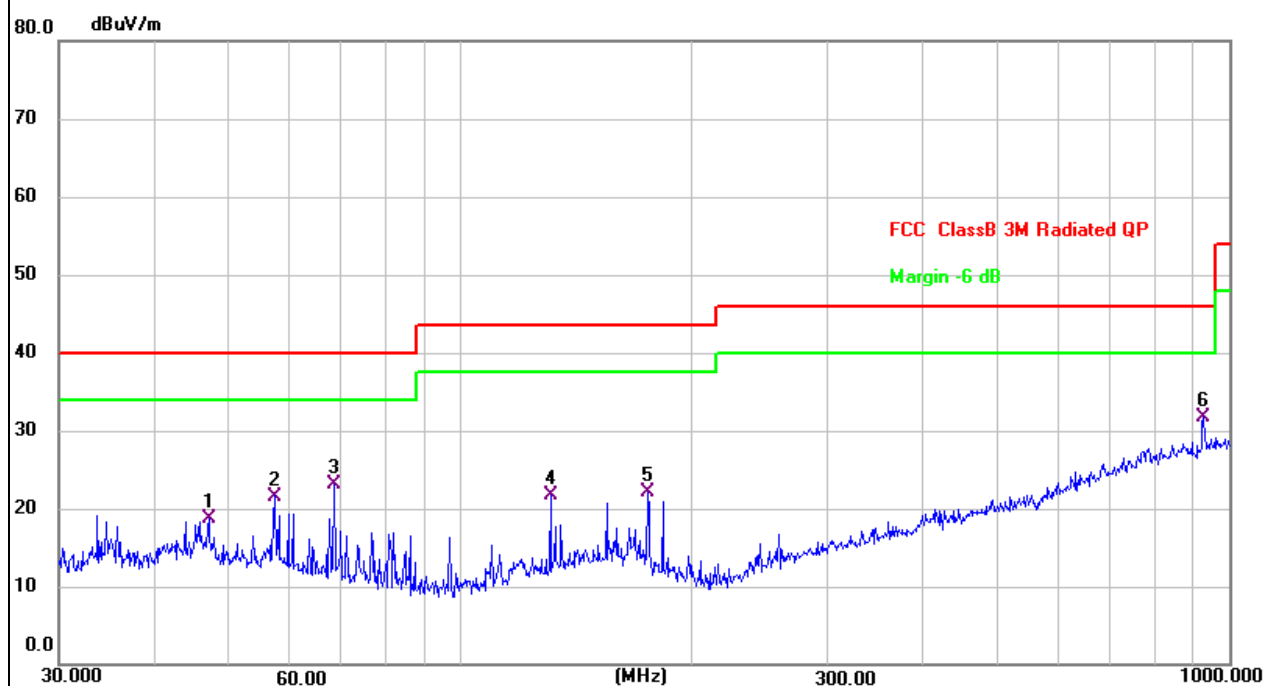
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

Note:

1. Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);
2. Limit line = specific limits (dBuV) + distance extrapolation factor.

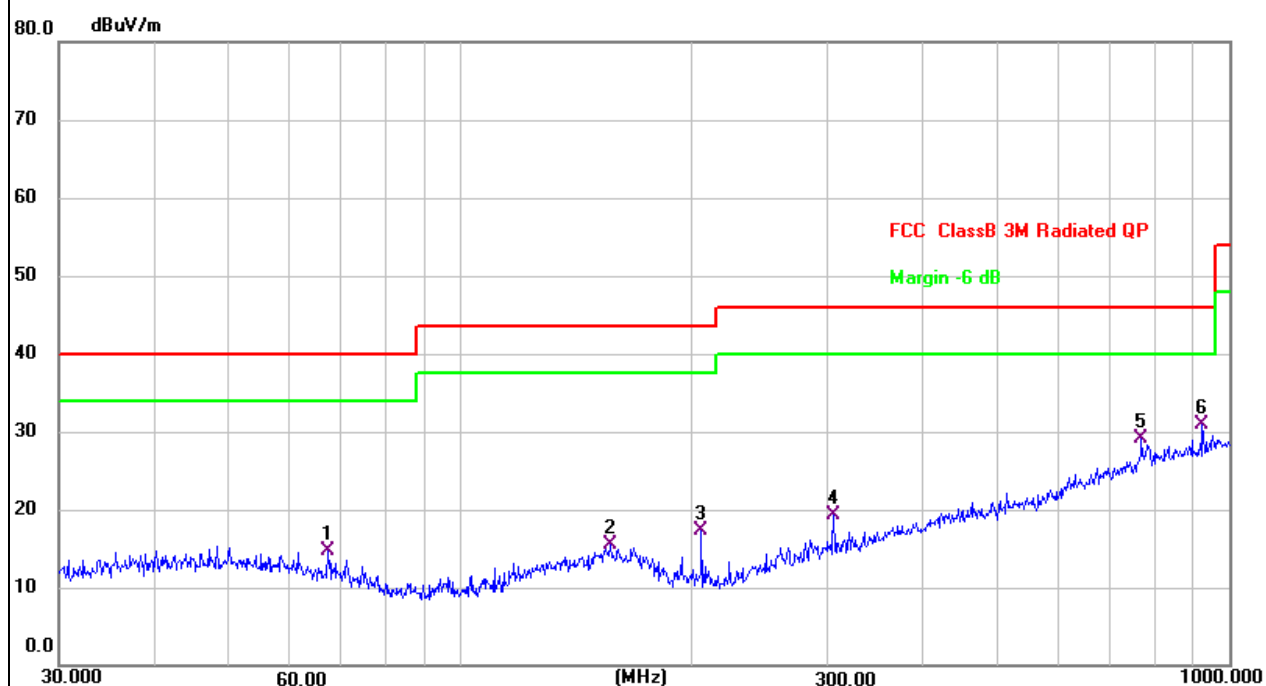
Frequency range (30MHz – 1GHz)

EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX(802.11a 5180MHz)	Phase:	Vertical
Test Voltage:	DC 3.87V from battery		



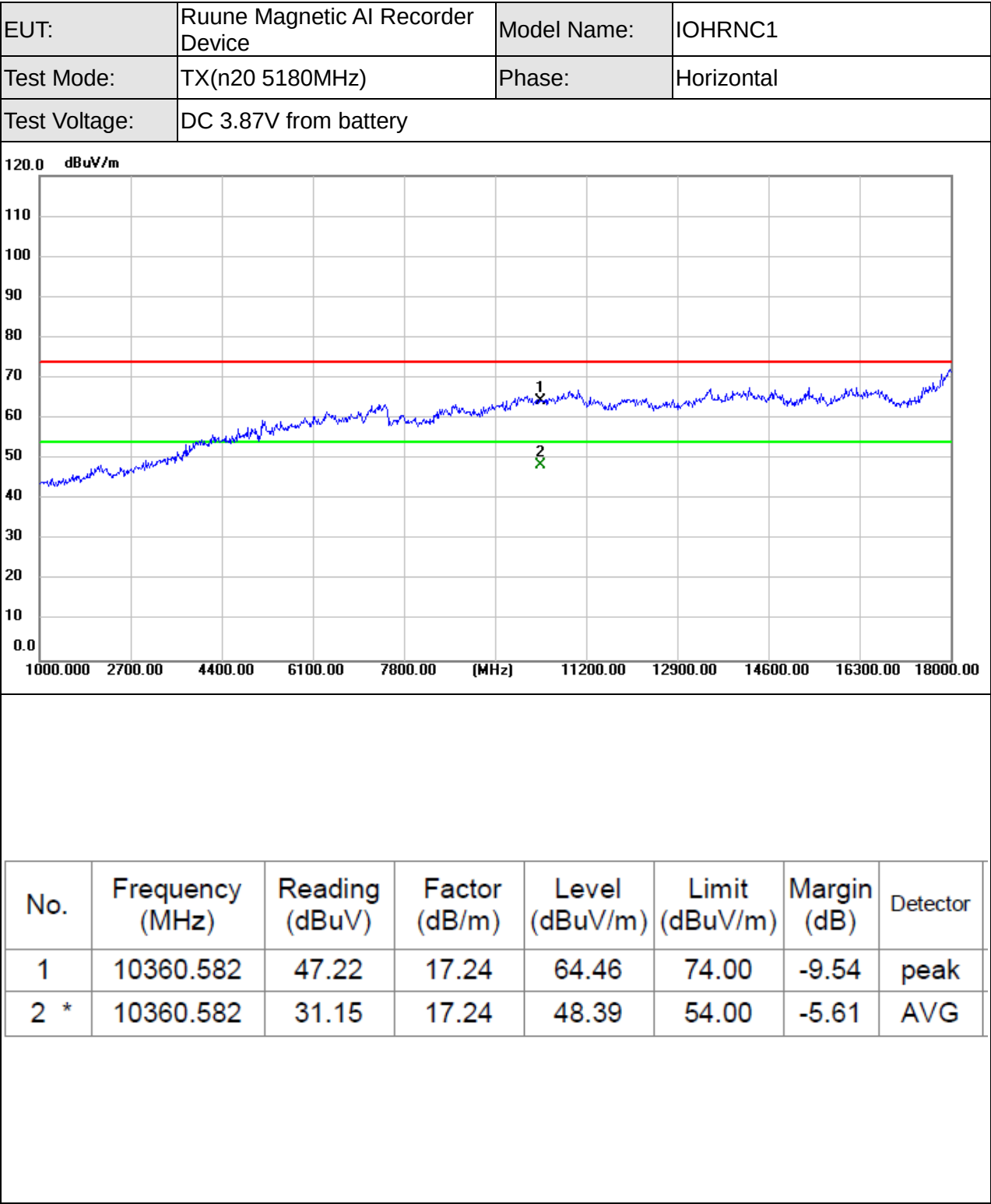
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	46.9948	32.61	-13.95	18.66	40.00	-21.34	QP
2	57.1914	36.06	-14.46	21.60	40.00	-18.40	QP
3	68.3908	38.84	-15.82	23.02	40.00	-16.98	QP
4	130.8369	36.57	-14.78	21.79	43.50	-21.71	QP
5	175.0368	36.39	-14.30	22.09	43.50	-21.41	QP
6 *	925.7563	30.33	1.29	31.62	46.00	-14.38	QP

EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX(802.11a 5180MHz)	Phase:	Horizontal
Test Voltage:	DC 3.87V from battery		

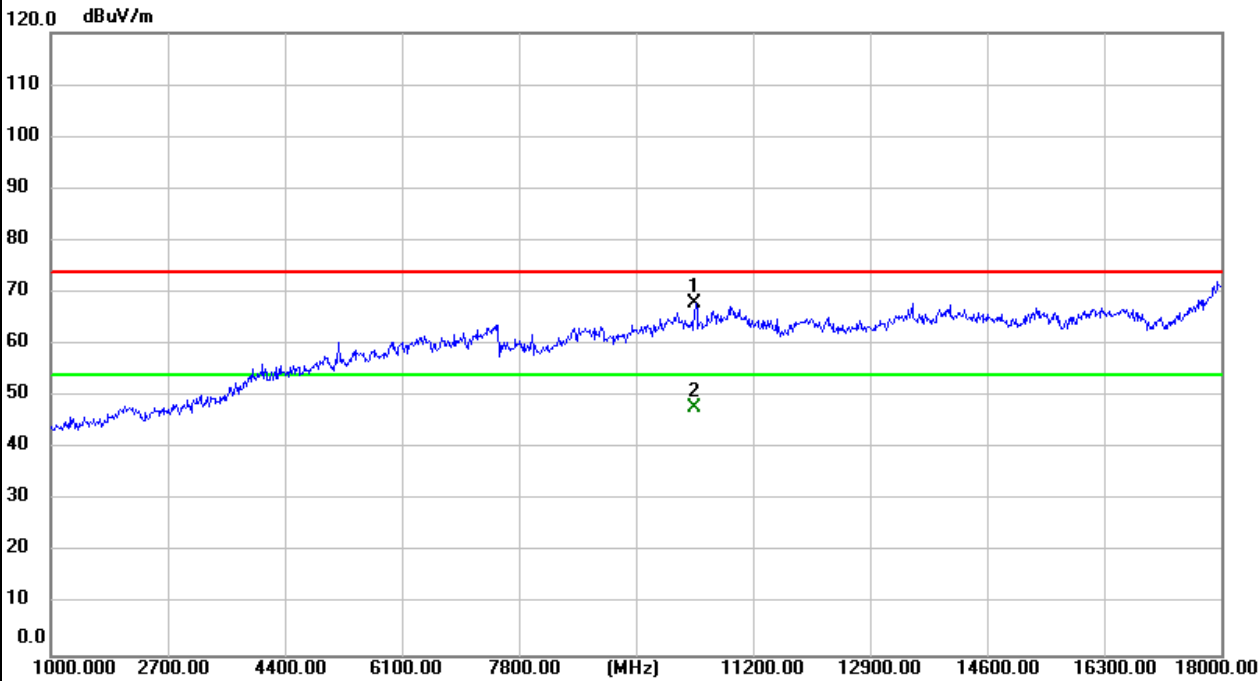


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	67.2022	30.24	-15.62	14.62	40.00	-25.38	QP
2	156.4578	28.66	-13.12	15.54	43.50	-27.96	QP
3	205.6751	34.03	-16.75	17.28	43.50	-26.22	QP
4	305.6800	31.63	-12.27	19.36	46.00	-26.64	QP
5	768.7481	29.13	-0.06	29.07	46.00	-16.93	QP
6 *	922.5157	29.57	1.30	30.87	46.00	-15.13	QP

U-NII-1:

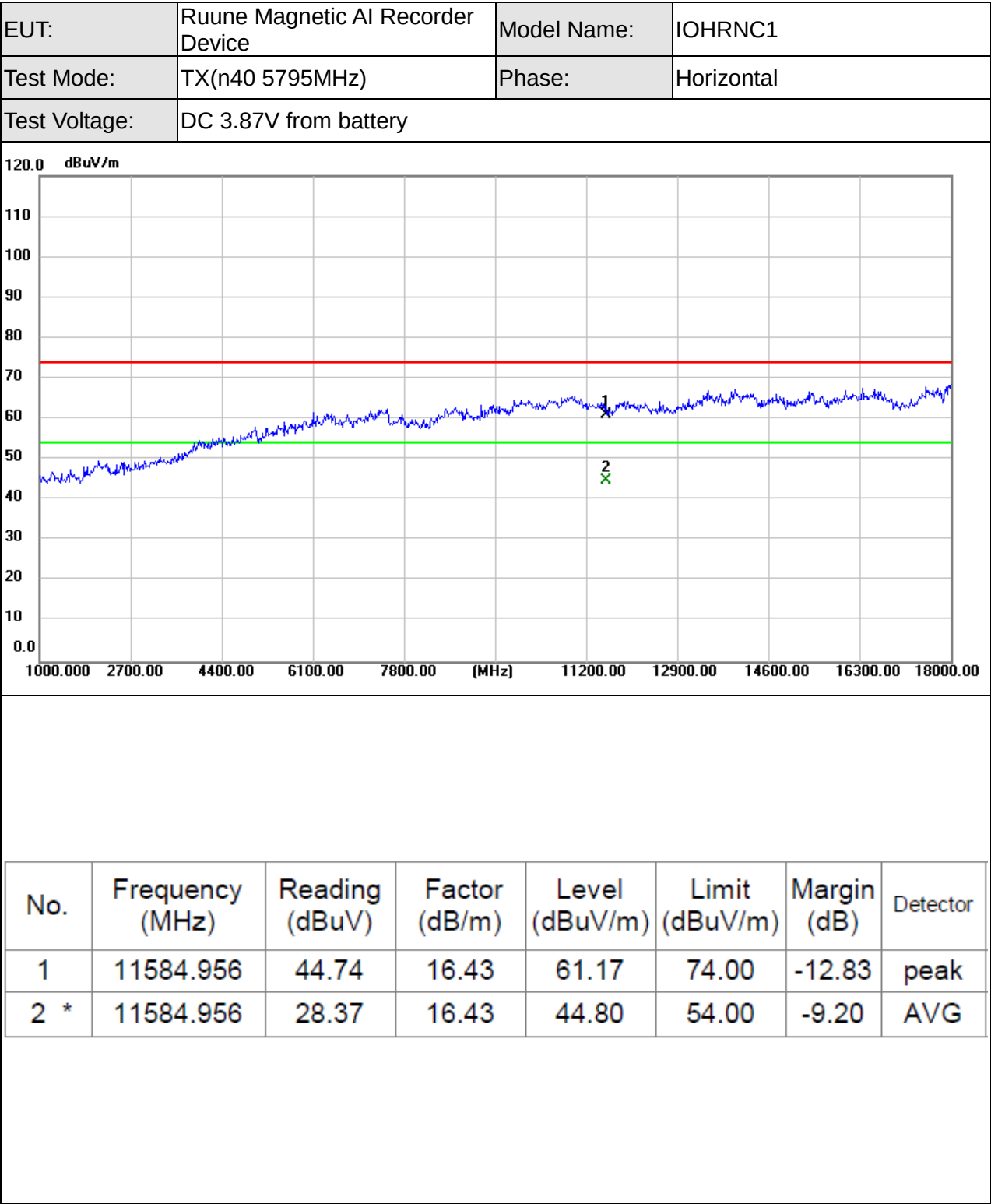


EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX(n20 5180MHz)	Phase:	Vertical
Test Voltage:	DC 3.87V from battery		

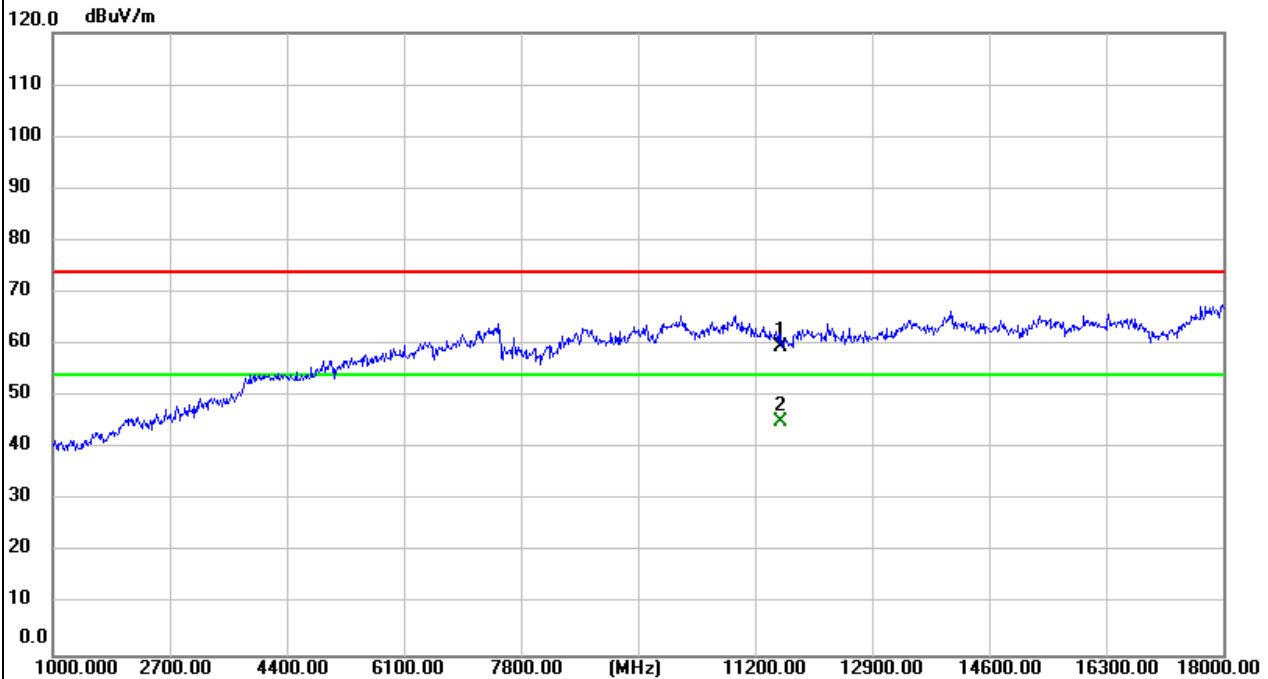


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	10360.155	50.59	17.24	67.83	74.00	-6.17	peak
2	10360.155	30.59	17.24	47.83	54.00	-6.17	AVG

U-NII-3:



EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX(n40 5795MHz)	Phase:	Vertical
Test Voltage:	DC 3.87V from battery		



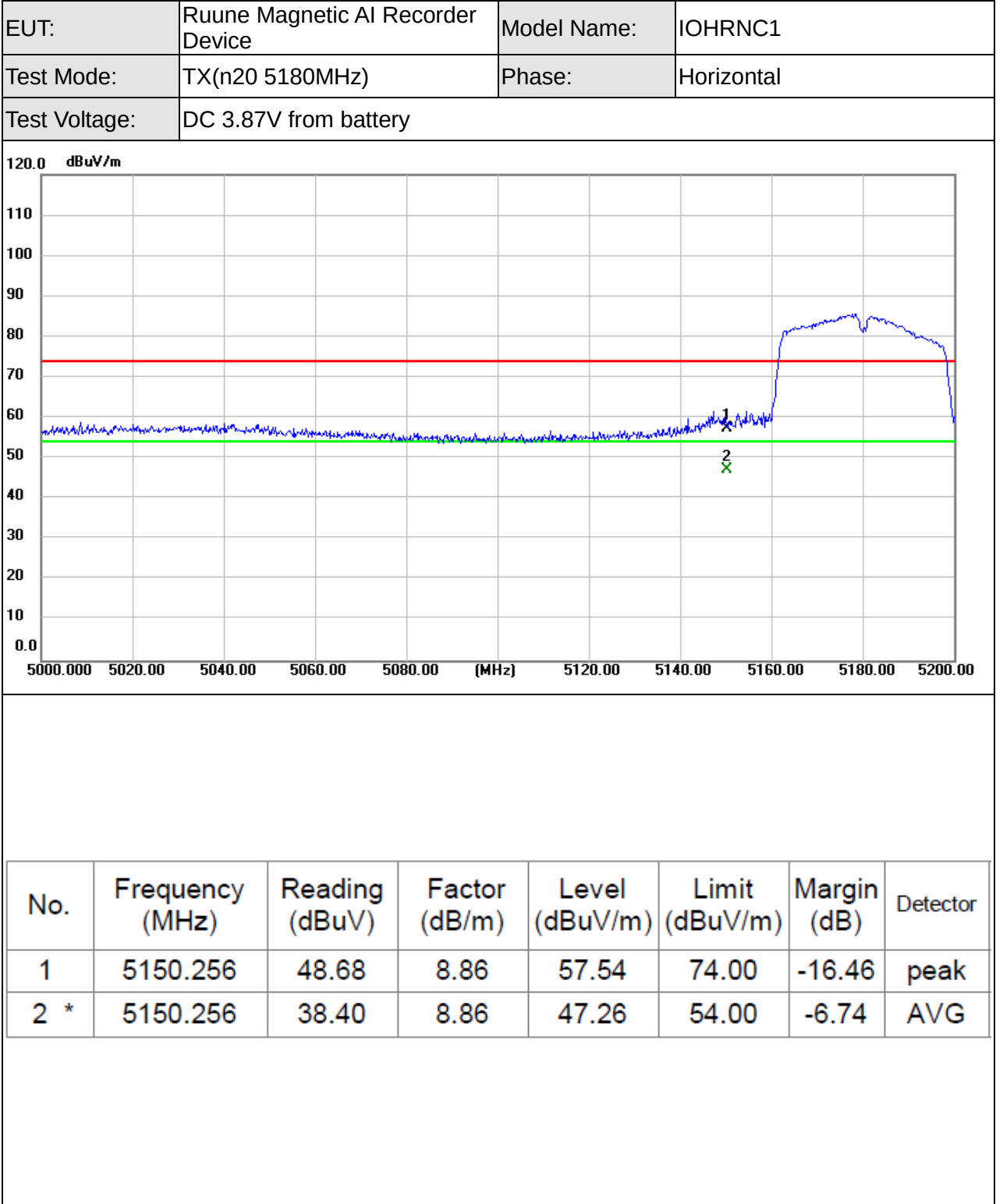
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	11584.231	43.17	16.44	59.61	74.00	-14.39	peak
2 *	11584.234	28.76	16.44	45.20	54.00	-8.80	AVG

Note:

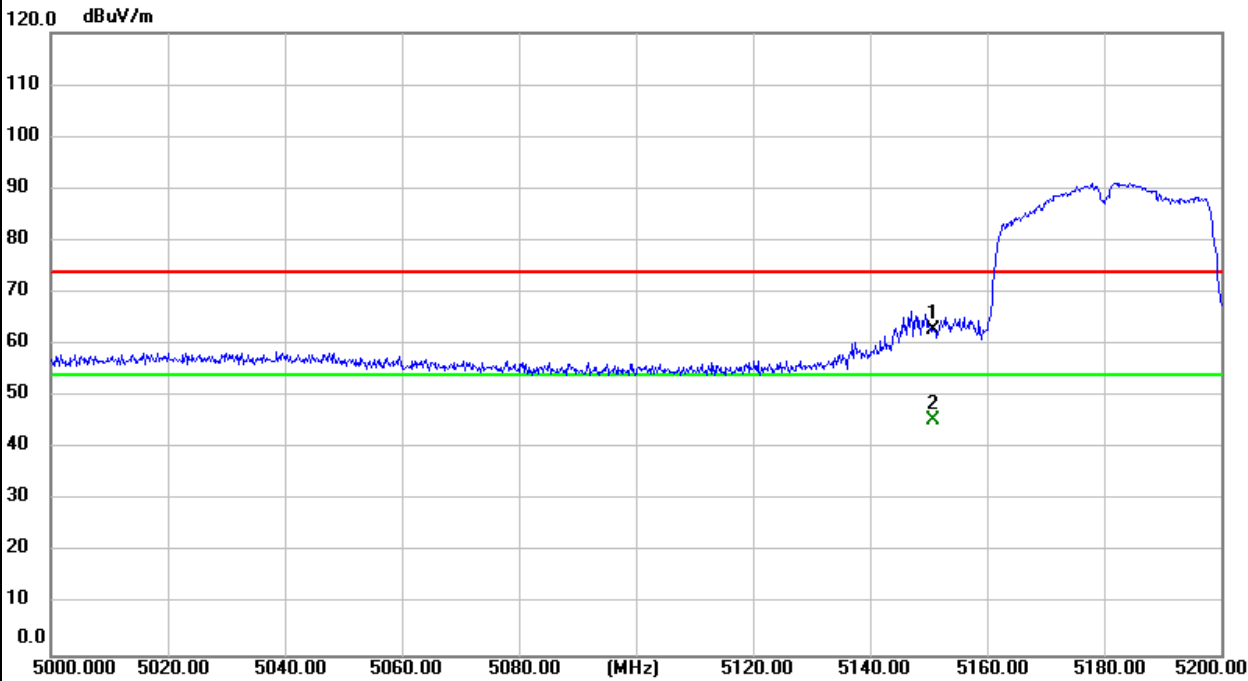
- (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
- (2) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor
- (3) All other emissions more than 20dB below the limit.
- (4) All modes have been tested, and only the worst mode in the report.
- (5) For 18G-40G, the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

5.3.5 Radiated Band Edge

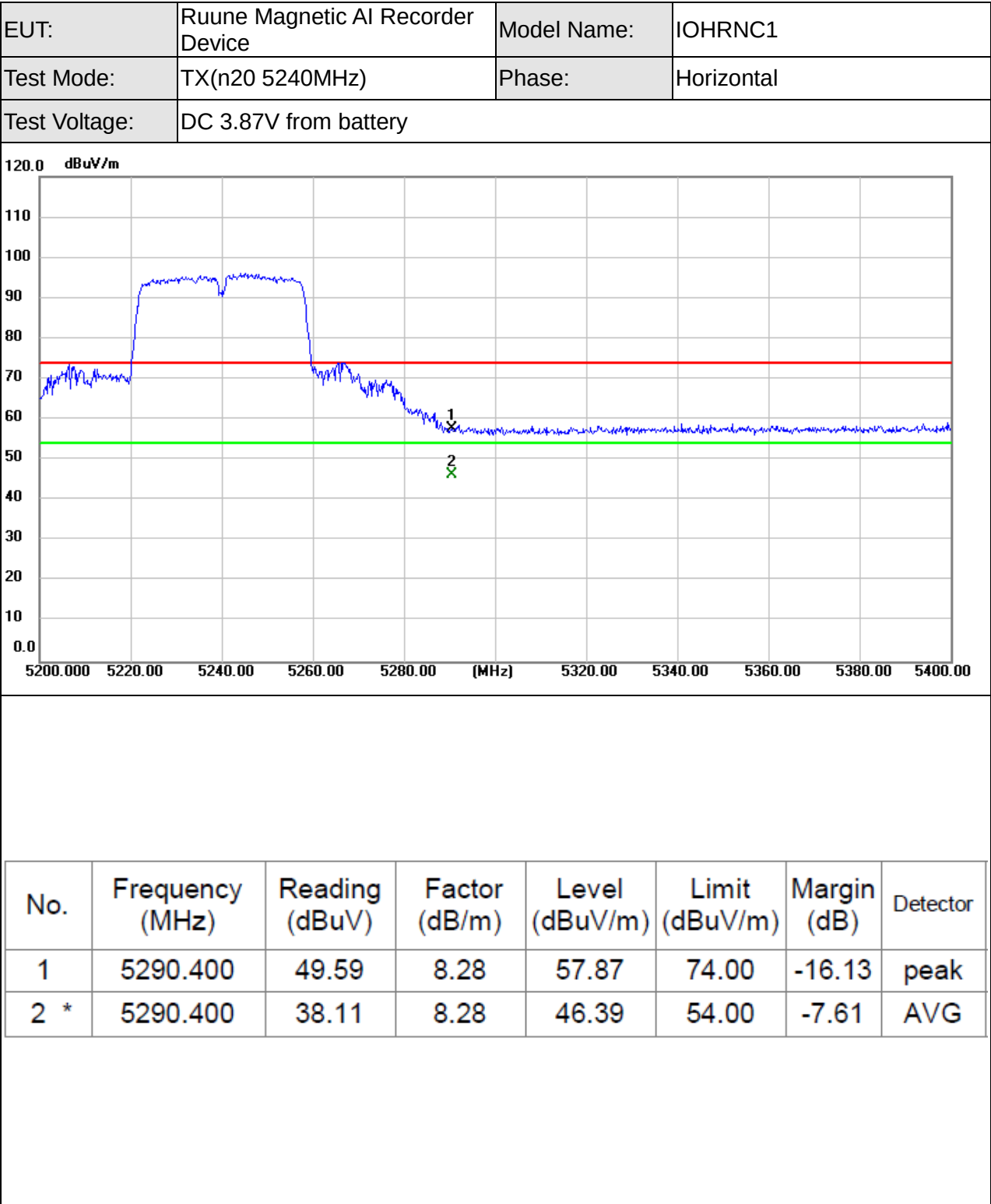
U-NII-1:



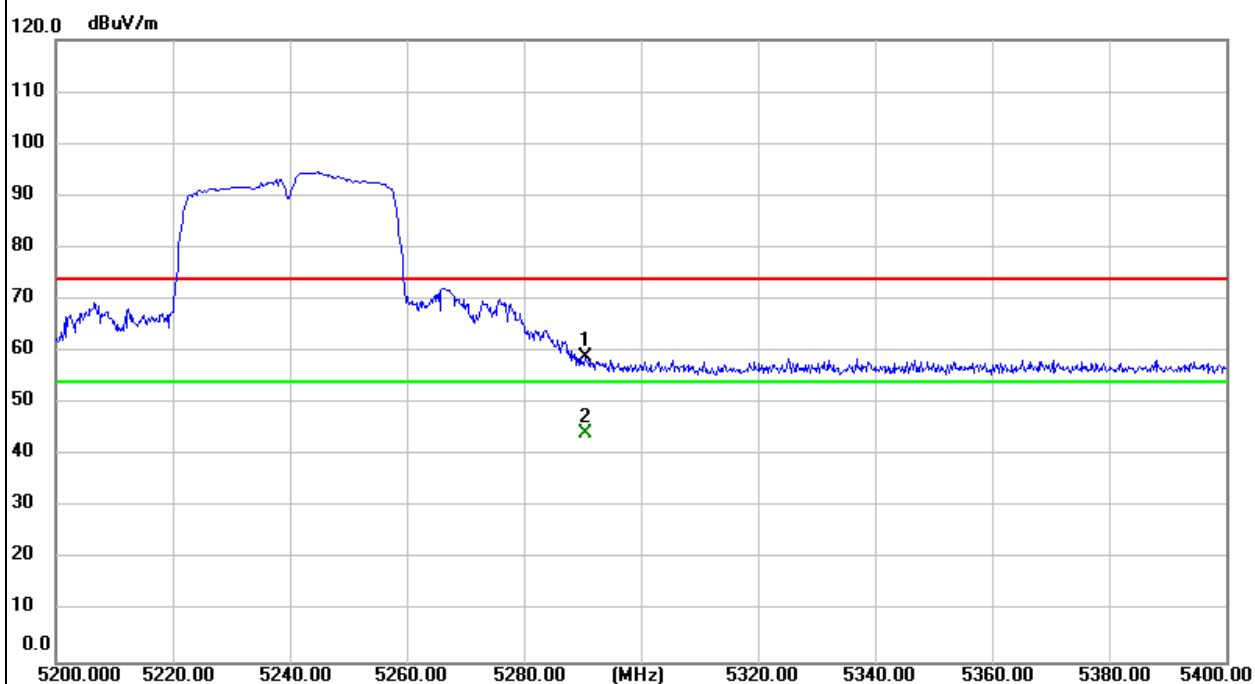
EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX(n20 5180MHz)	Phase:	Vertical
Test Voltage:	DC 3.87V from battery		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	5150.845	54.00	8.85	62.85	74.00	-11.15	peak
2 *	5150.845	36.51	8.85	45.36	54.00	-8.64	AVG

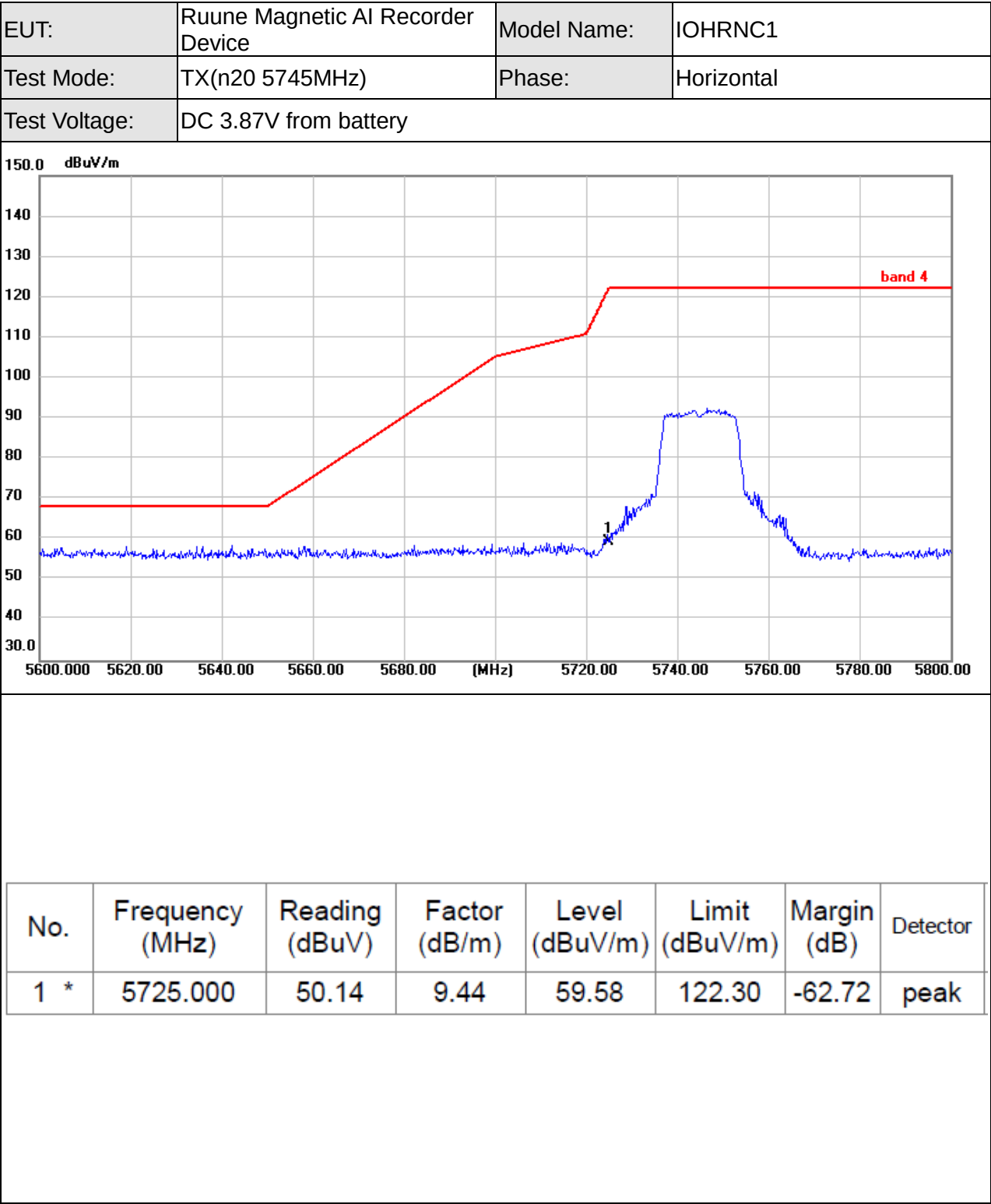


EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX(n20 5240MHz)	Phase:	Vertical
Test Voltage:	DC 3.87V from battery		

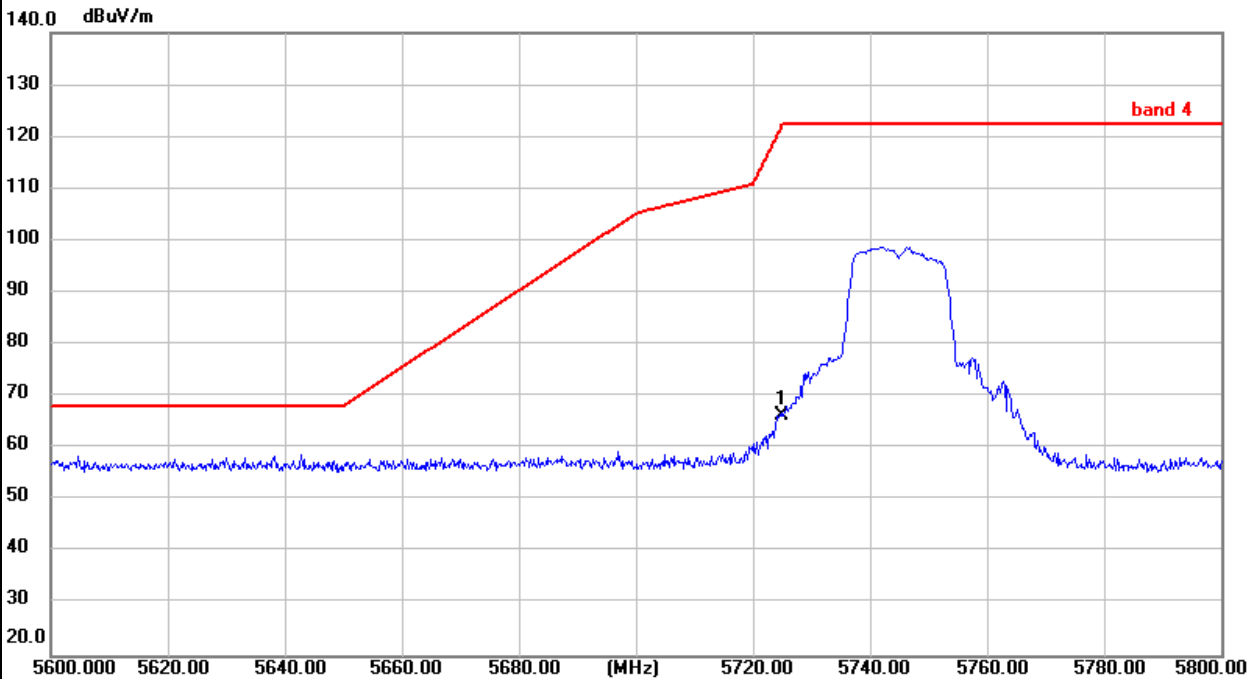


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	5290.400	50.77	8.28	59.05	74.00	-14.95	peak
2 *	5290.400	36.04	8.28	44.32	54.00	-9.68	AVG

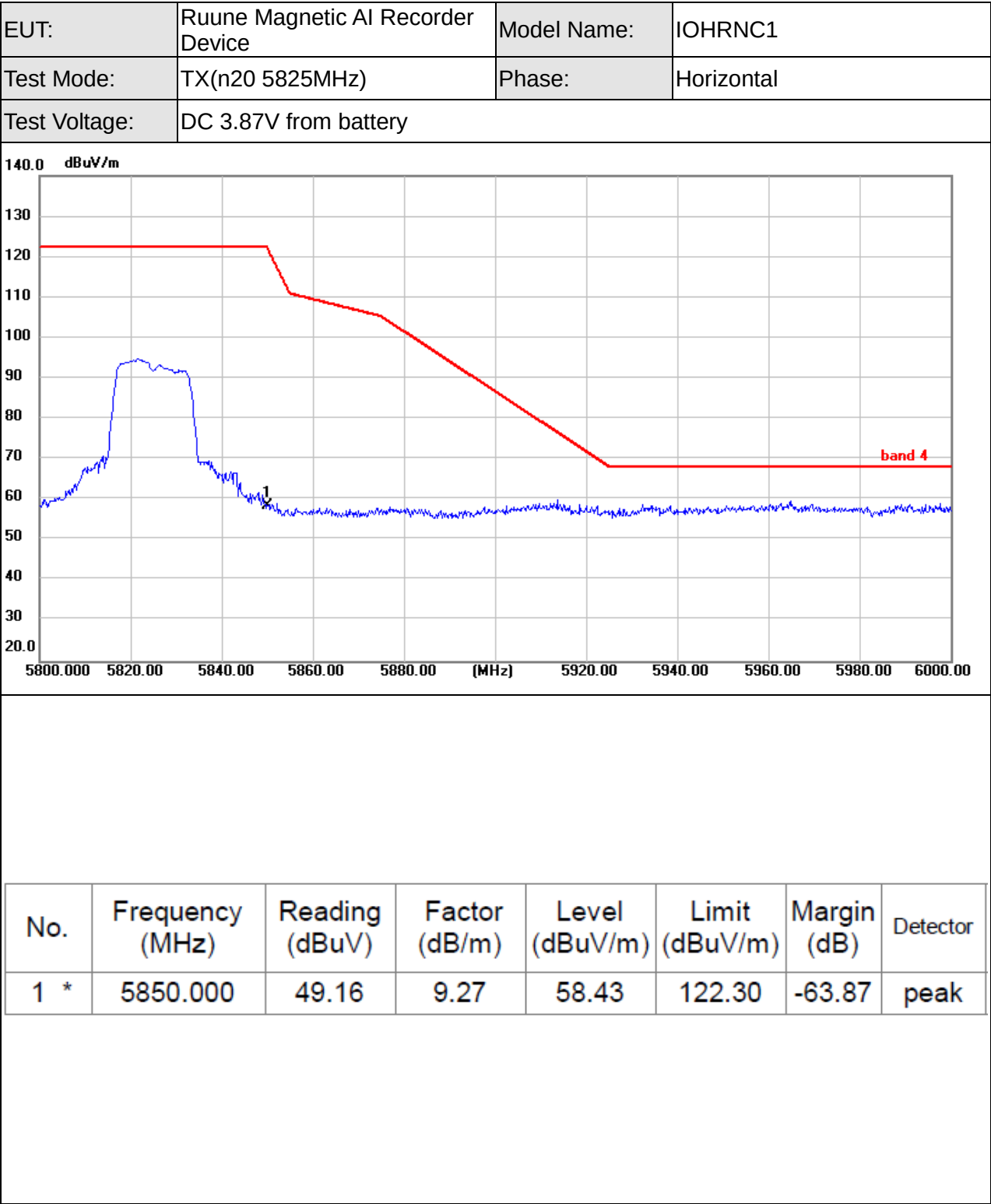
U-NII-3:



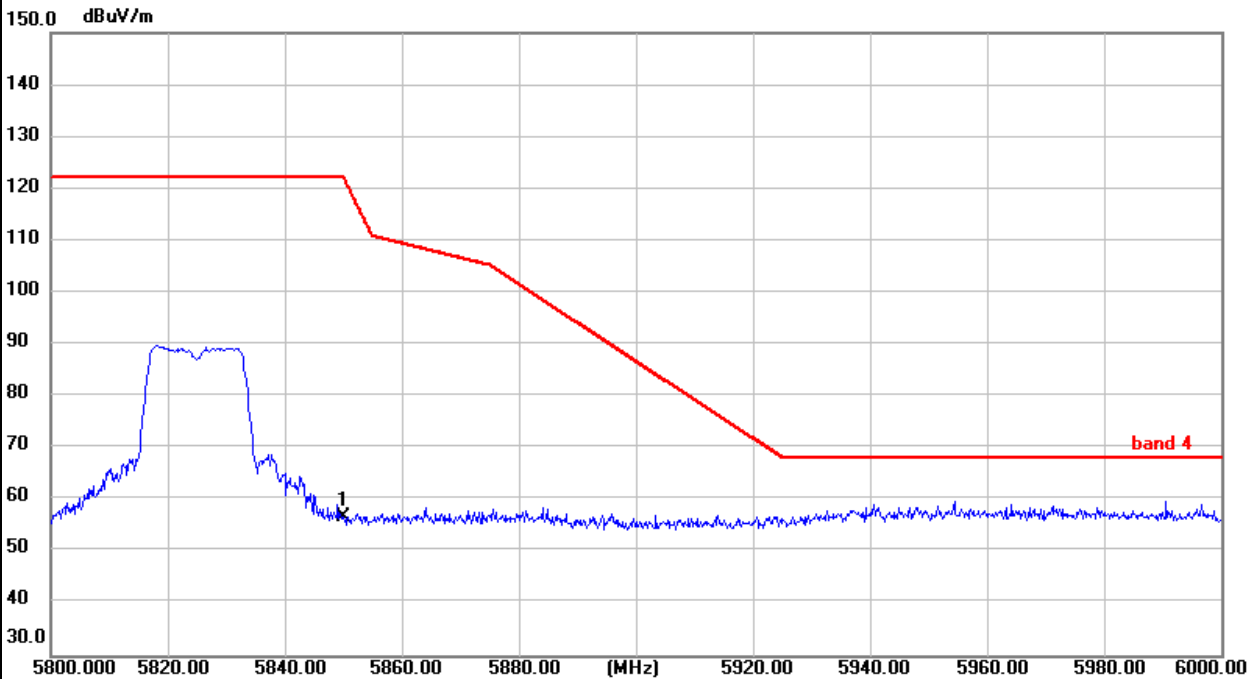
EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX(n20 5745MHz)	Phase:	Vertical
Test Voltage:	DC 3.87V from battery		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	5725.000	56.85	9.44	66.29	122.30	-56.01	peak



EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX(n20 5825MHz)	Phase:	Vertical
Test Voltage:	DC 3.87V from battery		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	5850.000	47.50	9.27	56.77	122.30	-65.53	peak

Note: All modes have been tested, and only the worst mode 802.11n 20 in the report.

5.4 Average Output Power

5.4.1 Limit

For 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 provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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.

For the 5.25-5.35 GHz and 5.47-5.725 GHz band

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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.

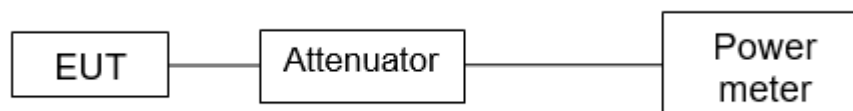
For the band 5.725-5.85 GHz

The maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.4.2 Test Procedure

The maximum average conducted output power may be measured using a broadband average RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector.

5.4.3 Test Setup



5.4.4 Test Results

EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX Mode	Test Voltage:	DC 3.87V from battery

For U-NII-1

Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
a	5180	Ant1	15.26	1.75	17.01	24	Pass
a	5200	Ant1	15.47	1.75	17.22	24	Pass
a	5240	Ant1	15.72	1.75	17.47	24	Pass
n20	5180	Ant1	15.64	1.85	17.49	24	Pass
n20	5200	Ant1	15.06	1.85	16.91	24	Pass
n20	5240	Ant1	15.51	1.85	17.36	24	Pass
n40	5190	Ant1	10.64	3.18	13.82	24	Pass
n40	5230	Ant1	10.72	3.18	13.9	24	Pass

For U-NII-3

Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
a	5745	Ant1	16.16	1.75	17.91	30	Pass
a	5785	Ant1	16.42	1.75	18.17	30	Pass
a	5825	Ant1	16.47	1.75	18.22	30	Pass
n20	5745	Ant1	16.38	1.85	18.23	30	Pass
n20	5785	Ant1	16.03	1.85	17.88	30	Pass
n20	5825	Ant1	16.98	1.85	18.83	30	Pass
n40	5755	Ant1	16.31	3.18	19.49	30	Pass
n40	5795	Ant1	16.33	3.17	19.5	30	Pass

5.5 Power Spectral Density

5.5.1 Limit

For the band 5.15-5.25 GHz

For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.25-5.35 GHz and 5.47-5.725 GHz

The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

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, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.5.2 Test Procedure

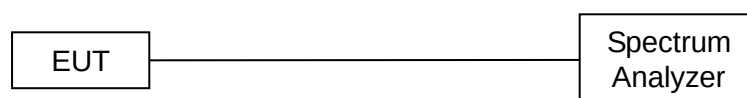
For U-NII-1

1. Set analyzer center frequency to NII channel center frequency.
2. Set the RBW $\geq$ 1MHz.
3. Set the VBW $\geq$ 3 x RBW.
4. Detector = Avgpwr.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level.

For U-NII-3

1. Set analyzer center frequency to NII channel center frequency.
2. Set the RBW $\geq$ 500kHz.
3. Set the VBW $\geq$ 3 x RBW.
4. Detector = Avgpwr.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level.

5.5.3 Test Setup



5.5.4 Test Results

For U-NII-1

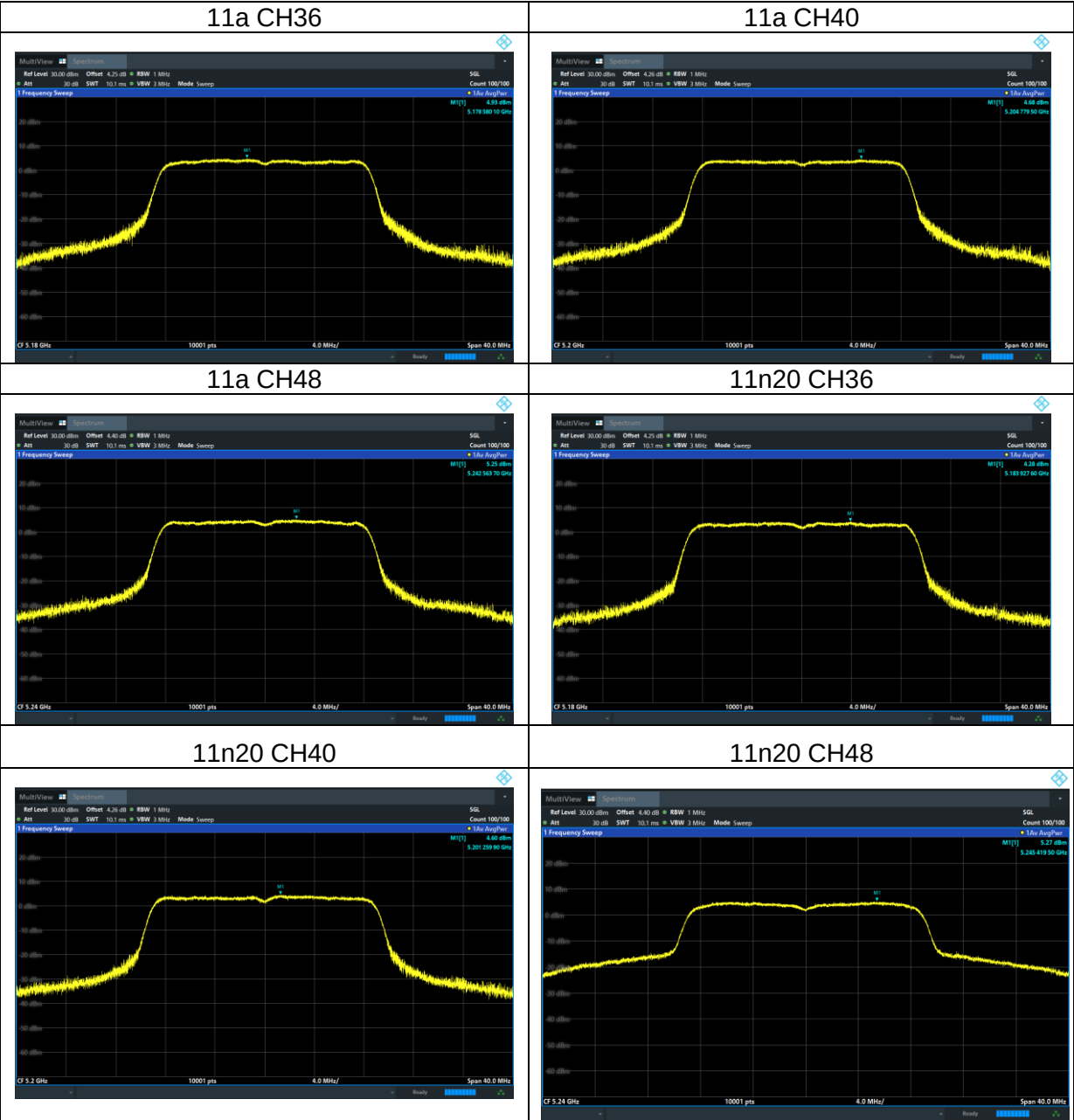
Mode	Channel	Frequency (MHz)	Conducted PSD (dBm/MHz)	Duty Factor (dB)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
11a	CH36	5180	4.93	1.75	6.68	11	Pass
11a	CH40	5200	4.68	1.75	6.43	11	Pass
11a	CH48	5240	5.25	1.75	7	11	Pass
11n(HT20)	CH36	5180	4.28	1.85	6.13	11	Pass
11n(HT20)	CH40	5200	4.6	1.85	6.45	11	Pass
11n(HT20)	CH48	5240	5.27	1.85	7.12	11	Pass
11n(HT40)	CH38	5190	-1.61	3.18	1.57	11	Pass
11n(HT40)	CH46	5230	-2.47	3.18	0.71	11	Pass

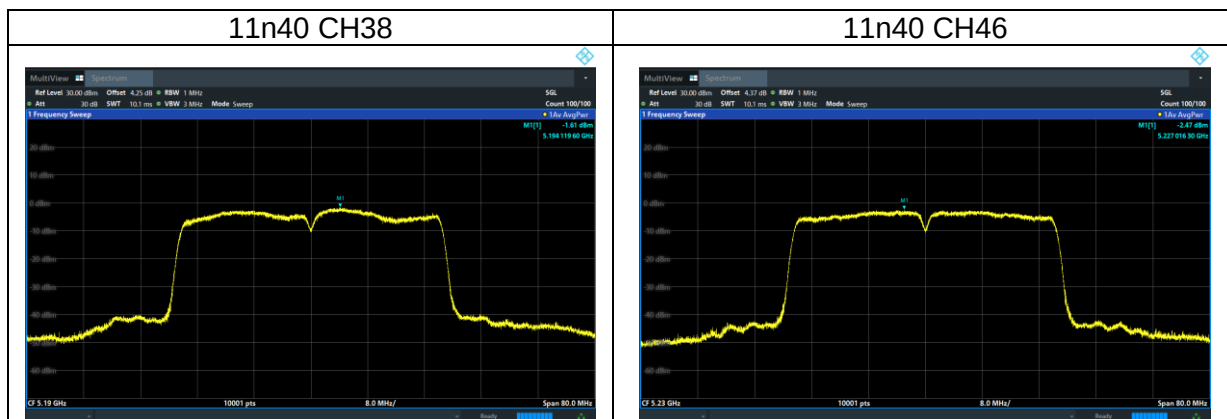
For U-NII-3

Mode	Channel	Frequency (MHz)	Conducted PSD (dBm/500kHz)	Duty Factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
11a	CH149	5745	3.16	1.75	4.91	30	Pass
11a	CH157	5785	3.33	1.75	5.08	30	Pass
11a	CH165	5825	3.49	1.75	5.24	30	Pass
11n(HT20)	CH149	5745	2.68	1.85	4.53	30	Pass
11n(HT20)	CH157	5785	2.49	1.85	4.34	30	Pass
11n(HT20)	CH165	5825	3.71	1.85	5.56	30	Pass
11n(HT40)	CH151	5755	0.66	3.18	3.84	30	Pass
11n(HT40)	CH159	5795	0.33	3.17	3.5	30	Pass

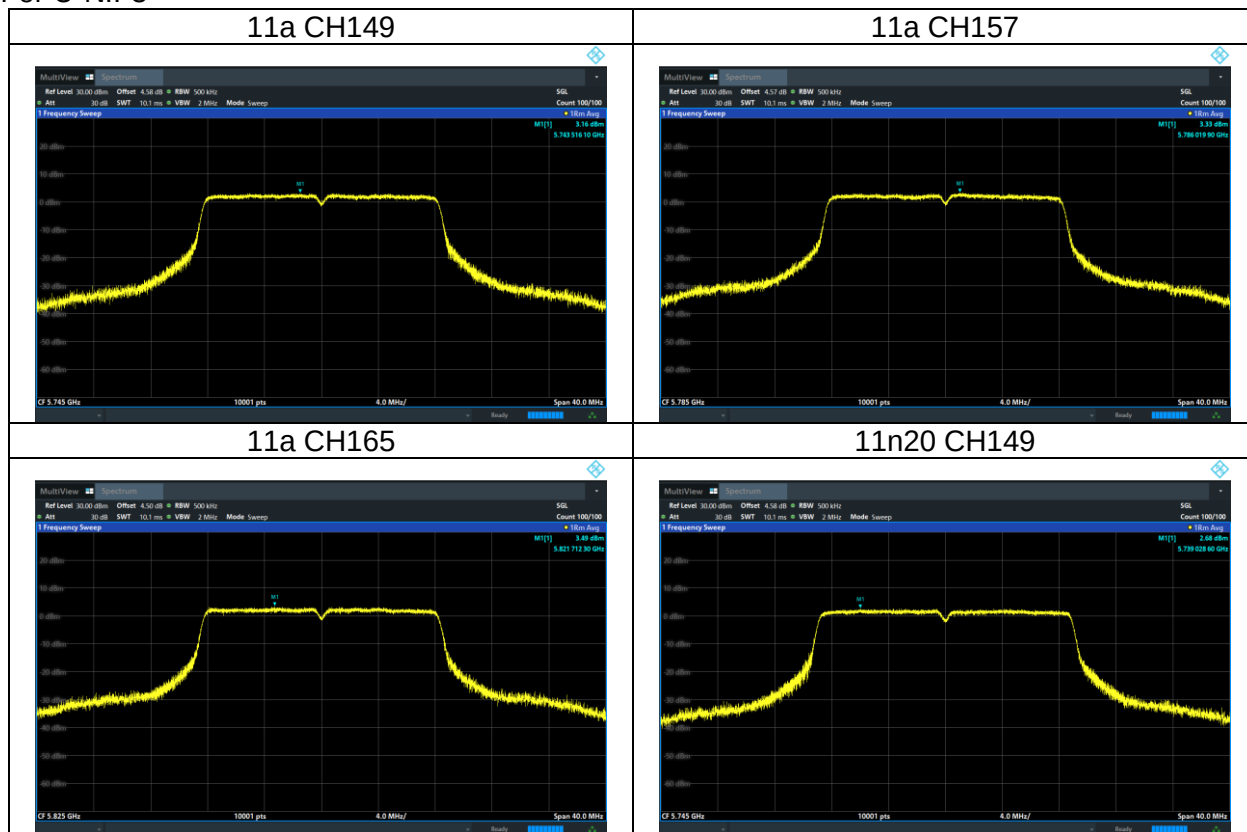
Test plots

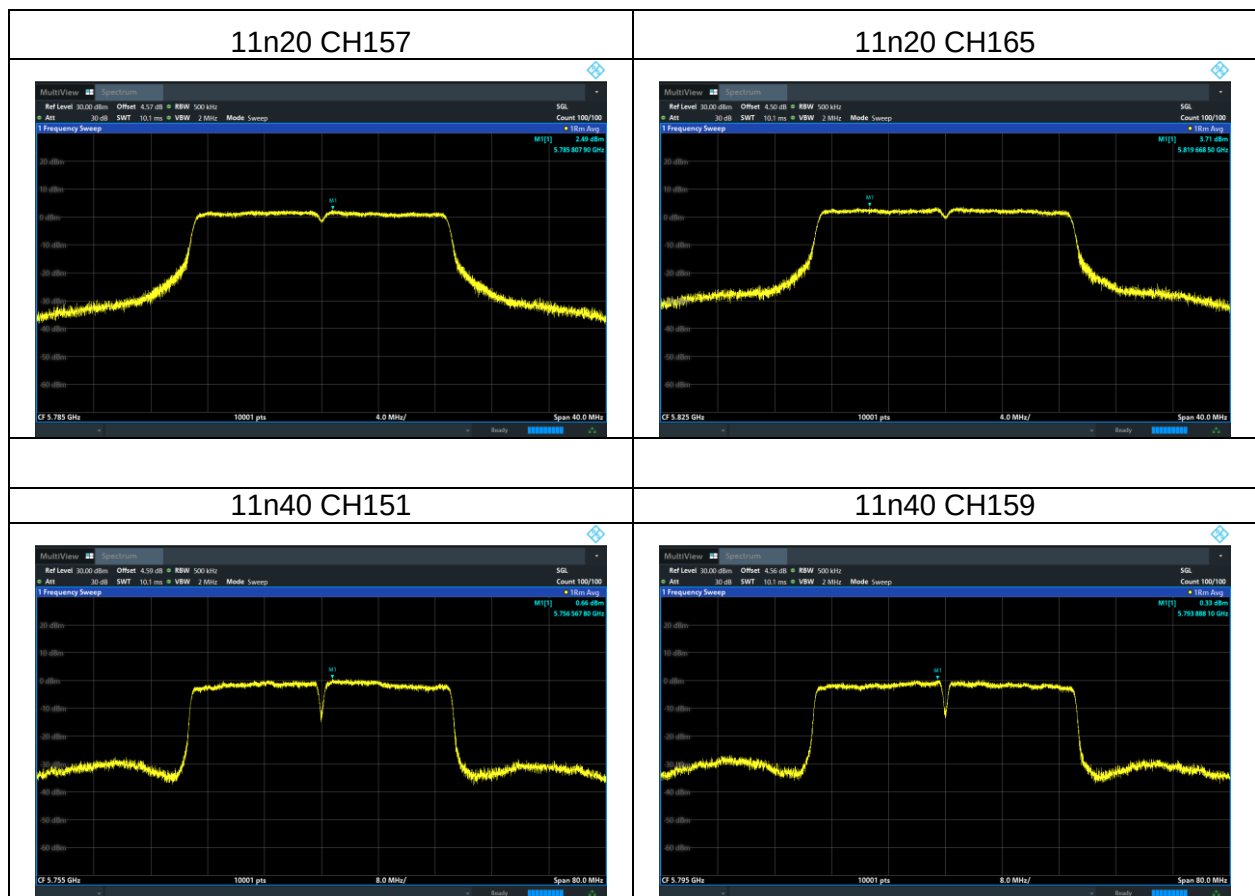
For U-NII-1





Test plots For U-NII-3





5.6 26dB Emission Bandwidth and Occupied bandwidth

5.6.1 Limit

For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier

5.6.2 Test Procedure

26dB Emission bandwidth

Set RBW = approximately 1% of the emission bandwidth.

Set VBW $\geq 3 \times \text{RBW}$

Detector = Peak.

Trace mode = Max hold.

Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

Occupied Bandwidth

Set Span = 1.5 times to 5.0 times the OBW

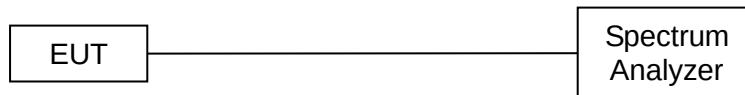
Set RBW = 1% to 5% of the OBW.

Set VBW $\geq 3 \times \text{RBW}$, Detector = Peak.

Trace mode = Max hold.

Use the 99% power bandwidth function of the instrument.

5.6.3 Test Setup

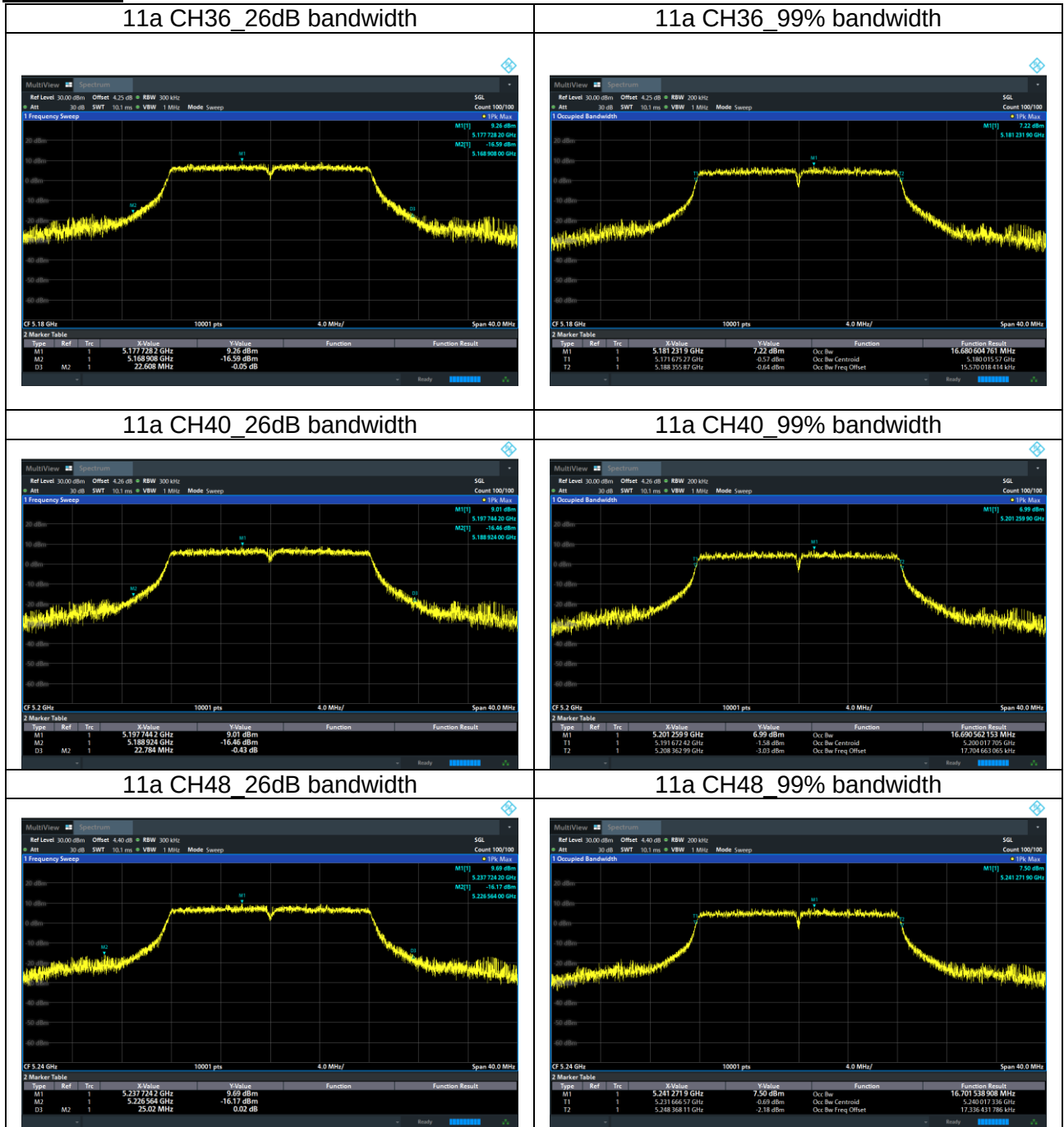


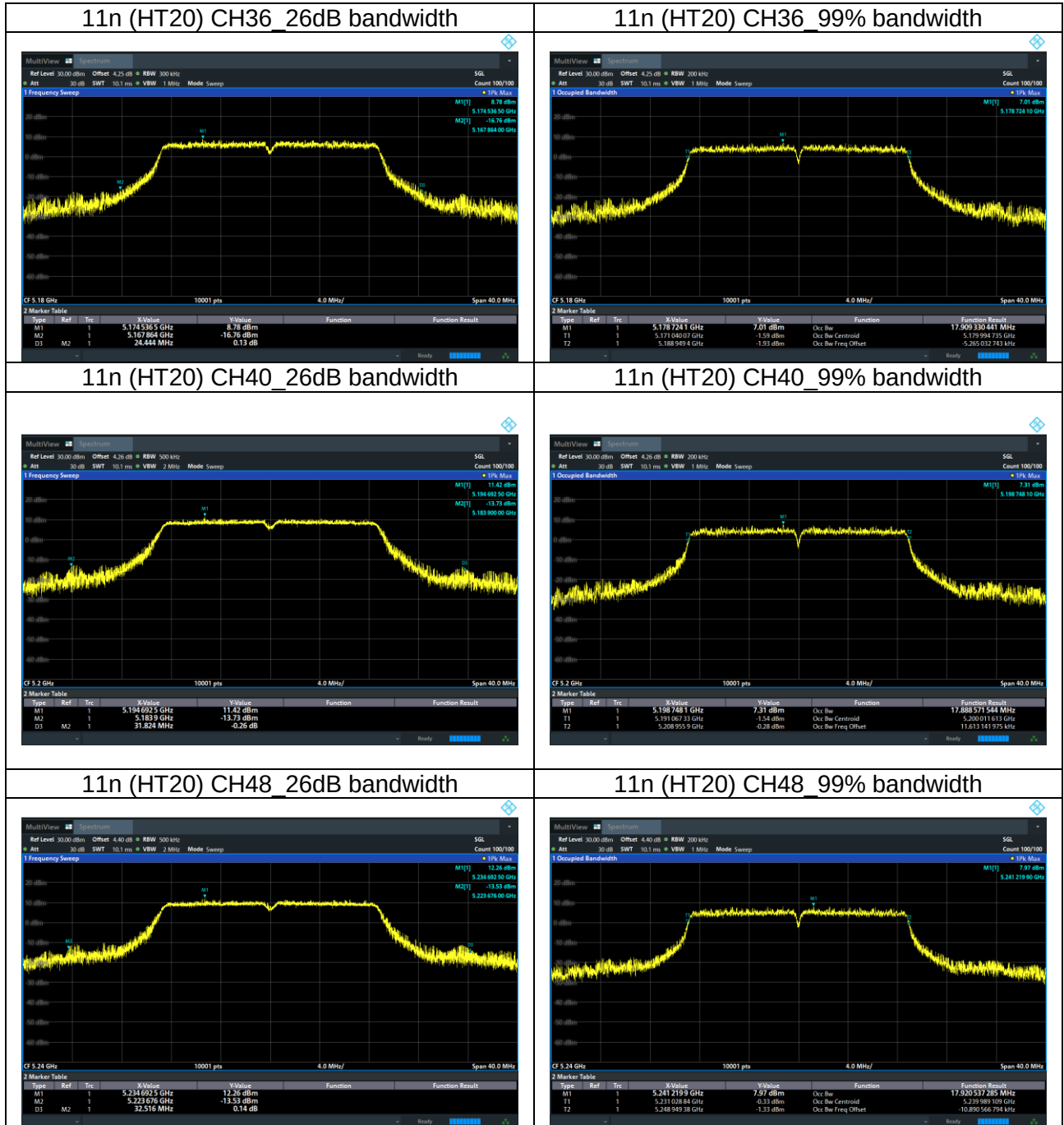
5.6.4 Test Results

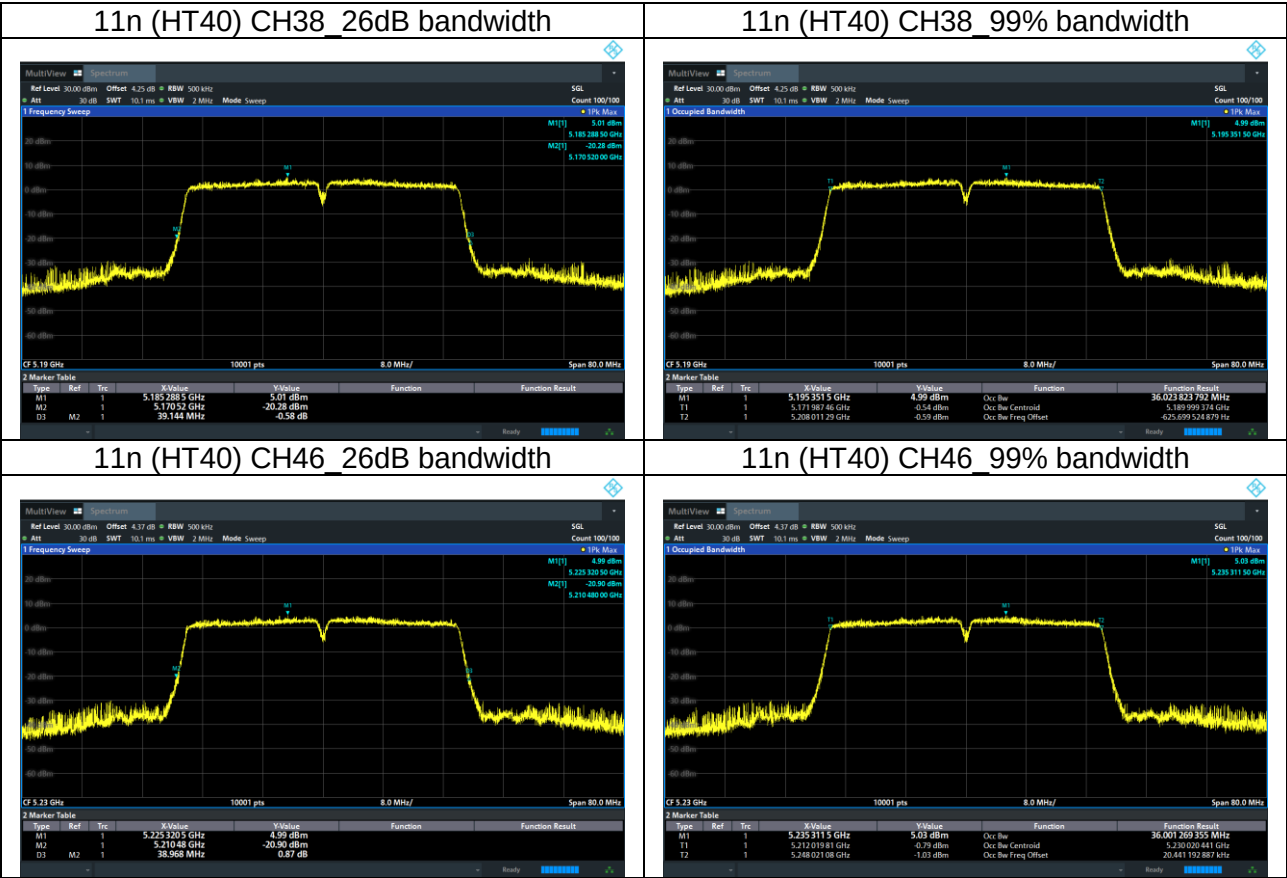
For U-NII-1

Channel	Test Channel	Frequency (MHz)	26dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
11a	CH36	5180	22.608	16.681	/	Pass
11a	CH40	5200	22.784	16.691	/	Pass
11a	CH48	5240	25.02	16.702	/	Pass
11n (HT20)	CH36	5180	24.444	17.909	/	Pass
11n (HT20)	CH40	5200	31.824	17.889	/	Pass
11n (HT20)	CH48	5240	32.516	17.921	/	Pass
11n (HT40)	CH38	5190	39.144	36.024	/	Pass
11n (HT40)	CH46	5230	38.968	36.001	/	Pass

Test plots:
For U-NII-1







5.7 6 dB Bandwidth

5.7.1 Limit

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

5.7.2 Test Procedure

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. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

5.7.3 Test Setup



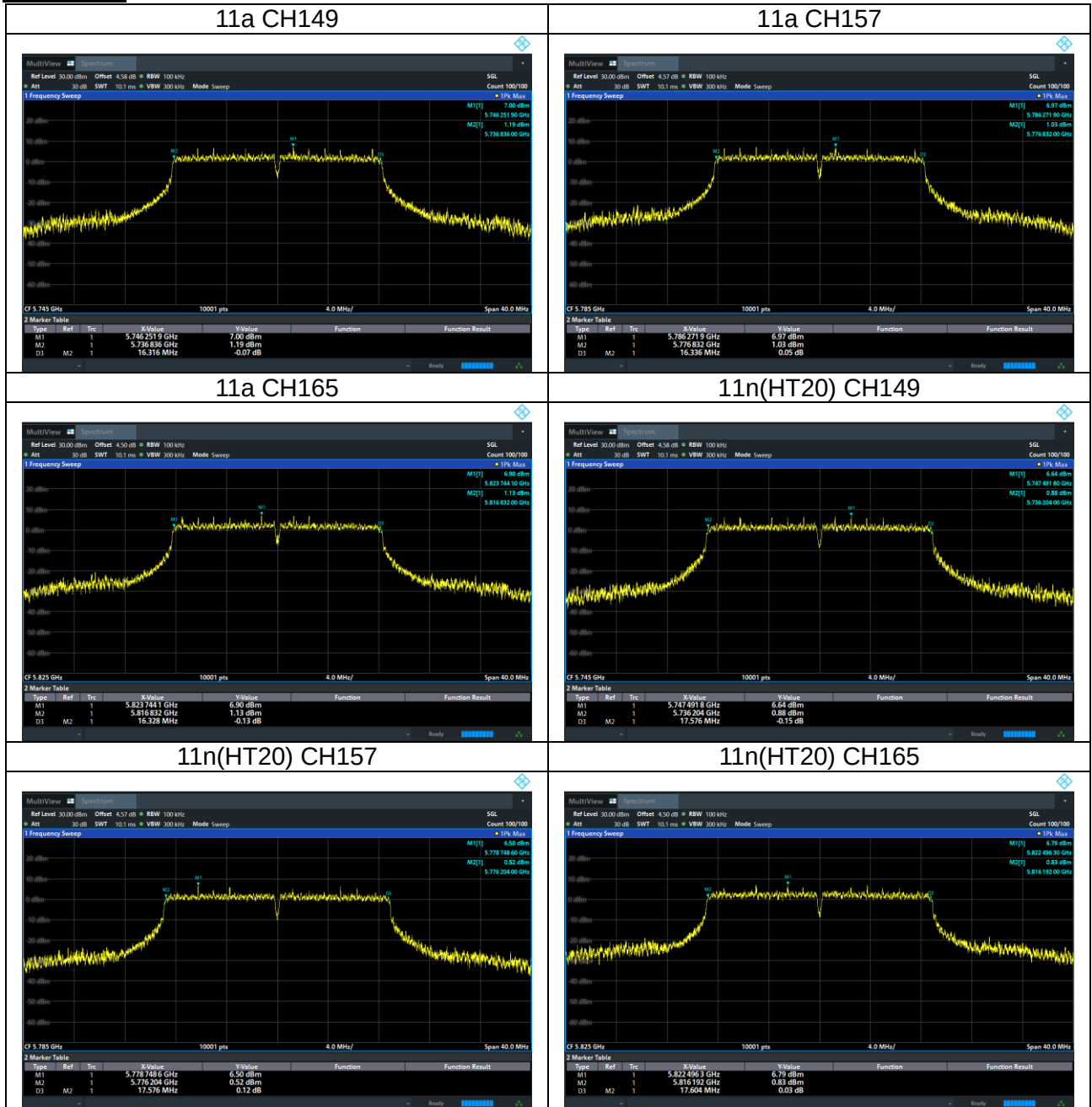
5.7.4 Test Results

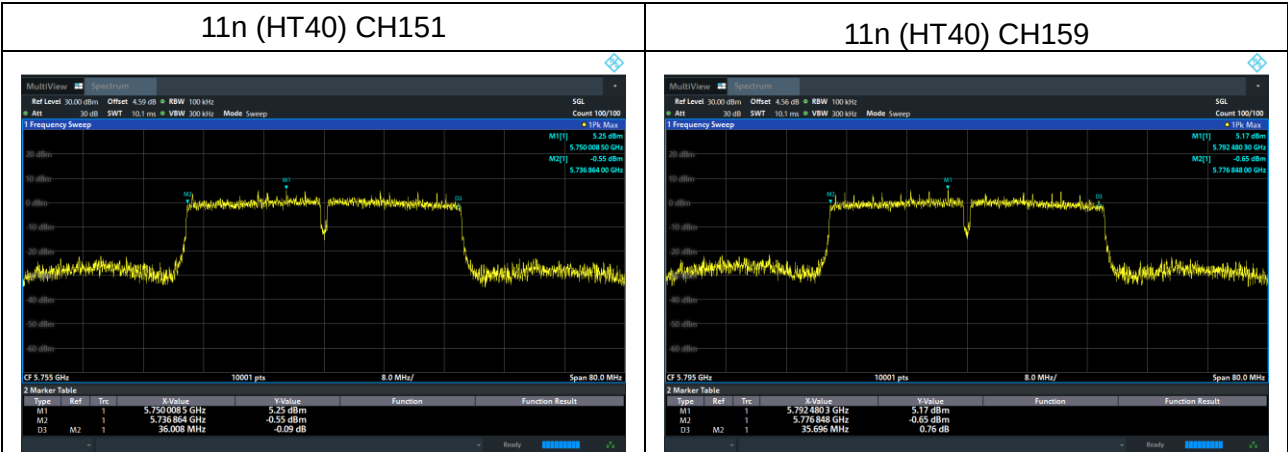
EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Test Mode:	TX Mode	Test Voltage:	DC 3.87V from battery

For U-NII-3

Channel	Test Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
11a	CH149	5745	16.316	500	Pass
11a	CH157	5785	16.336	500	Pass
11a	CH165	5825	16.328	500	Pass
11n (HT20)	CH149	5745	17.576	500	Pass
11n (HT20)	CH157	5785	17.576	500	Pass
11n (HT20)	CH165	5825	17.604	500	Pass
11n (HT40)	CH151	5755	36.008	500	Pass
11n (HT40)	CH159	5795	35.696	500	Pass

Test plots:
For U-NII-3





5.8 Duty Cycle

5.8.1 Limit

N/A

5.8.2 Test Procedure

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set $RBW \geq OBW$ if possible; otherwise, set RBW to the largest available value. Set $VBW \geq RBW$. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T \leq 16.7$ microseconds.)

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

Span = Zero Span

RBW = 10MHz (the largest available value)

VBW = 10MHz ($\geq$ RBW)

Number of points in Sweep > 100

Detector function = peak

Trace = Clear write

Measure Total and Ton

Calculate Duty Cycle = $Ton / Total$

5.8.3 Test Setup



5.8.4 Test Results

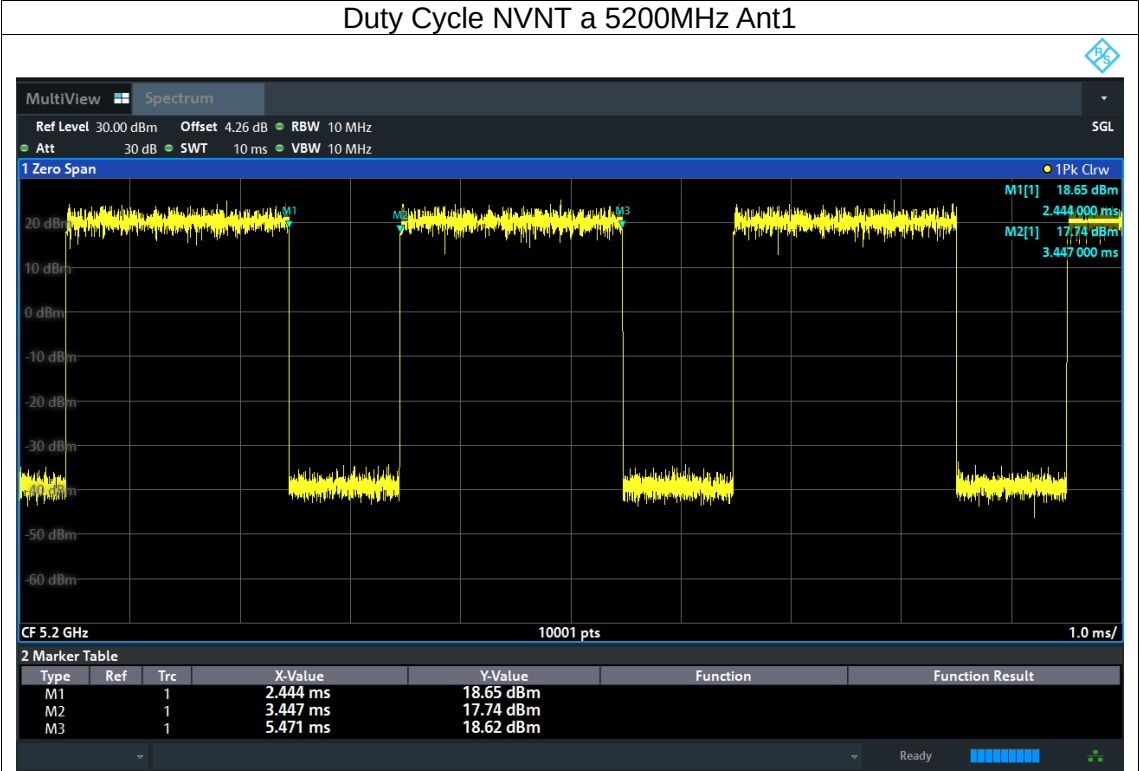
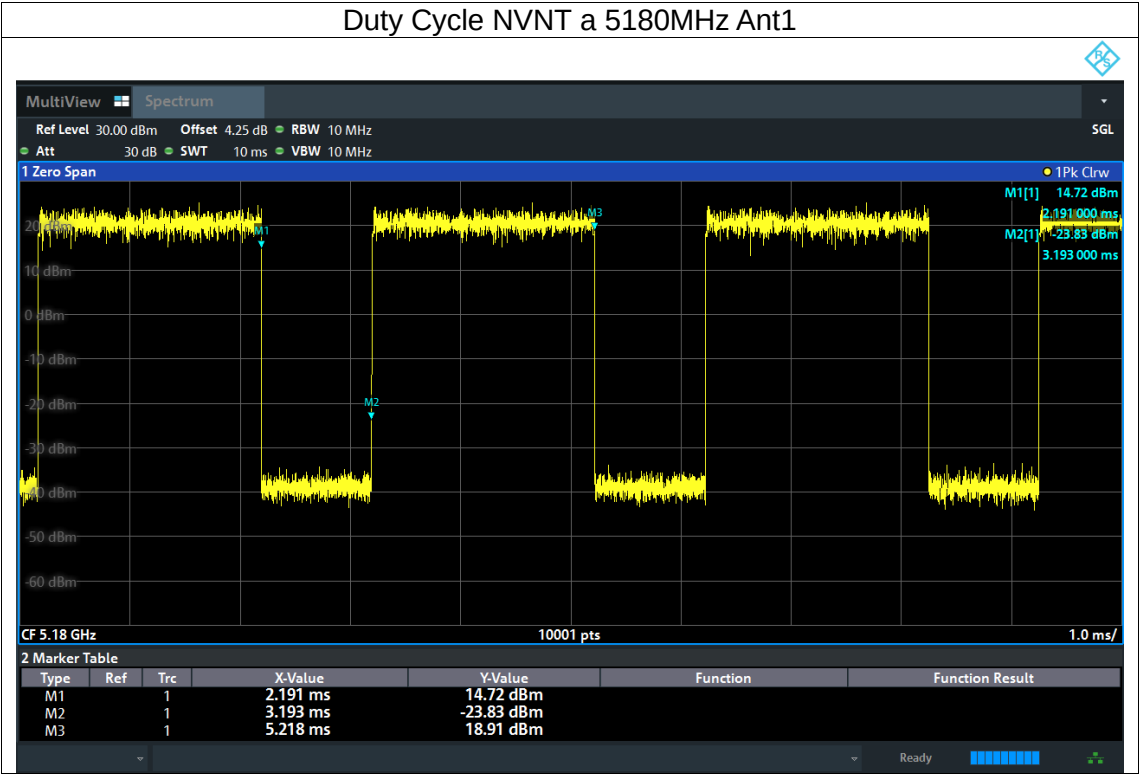
EUT:	Ruune Magnetic AI Recorder Device	Model Name:	IOHRNC1
Pressure:	1012 hPa	Test Voltage:	DC 3.87V from battery

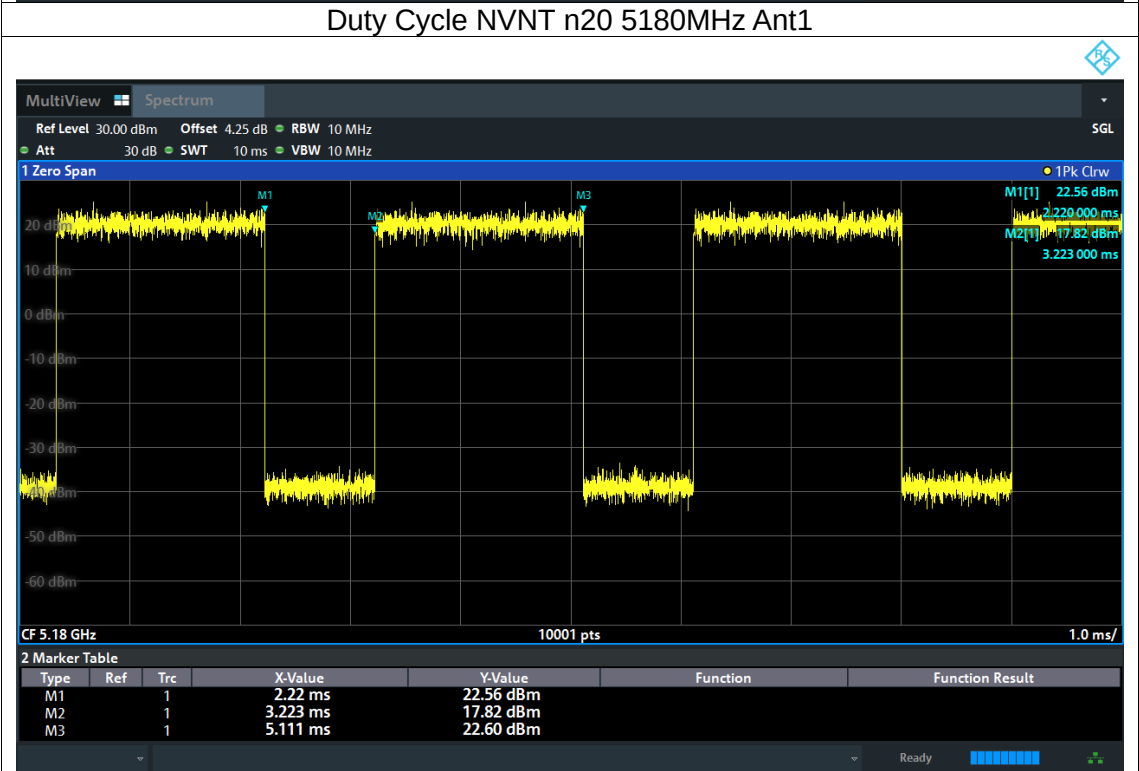
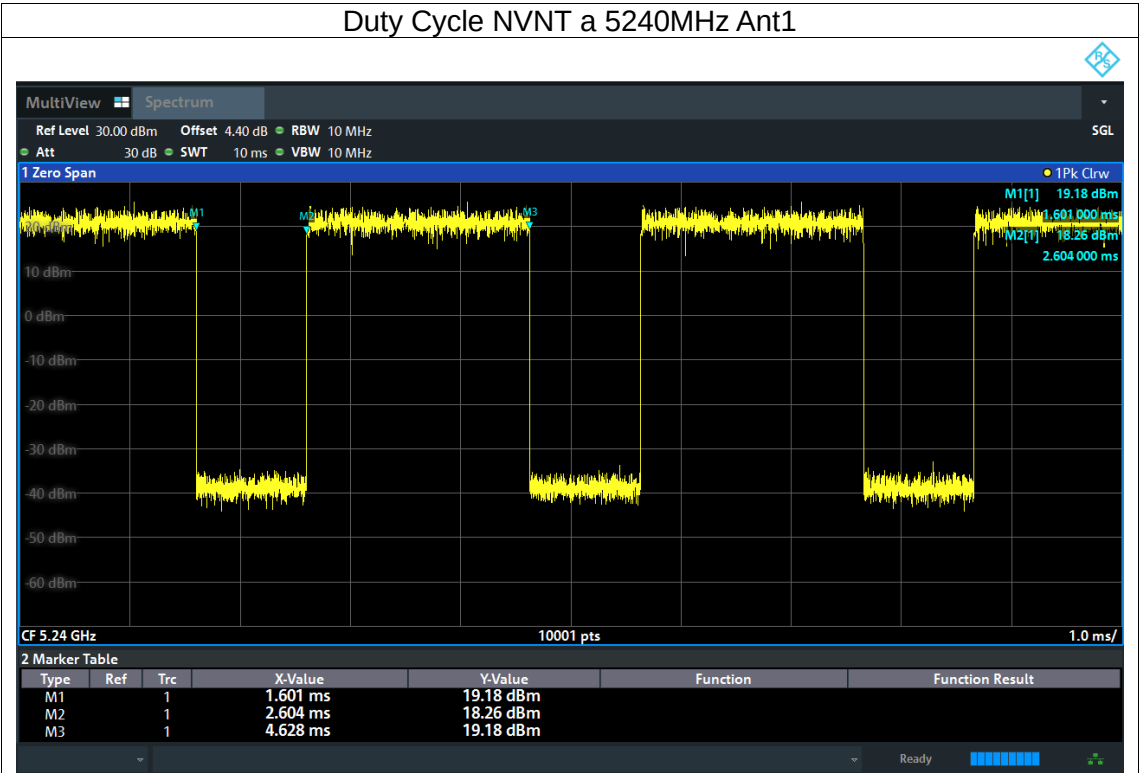
U-NII-1:

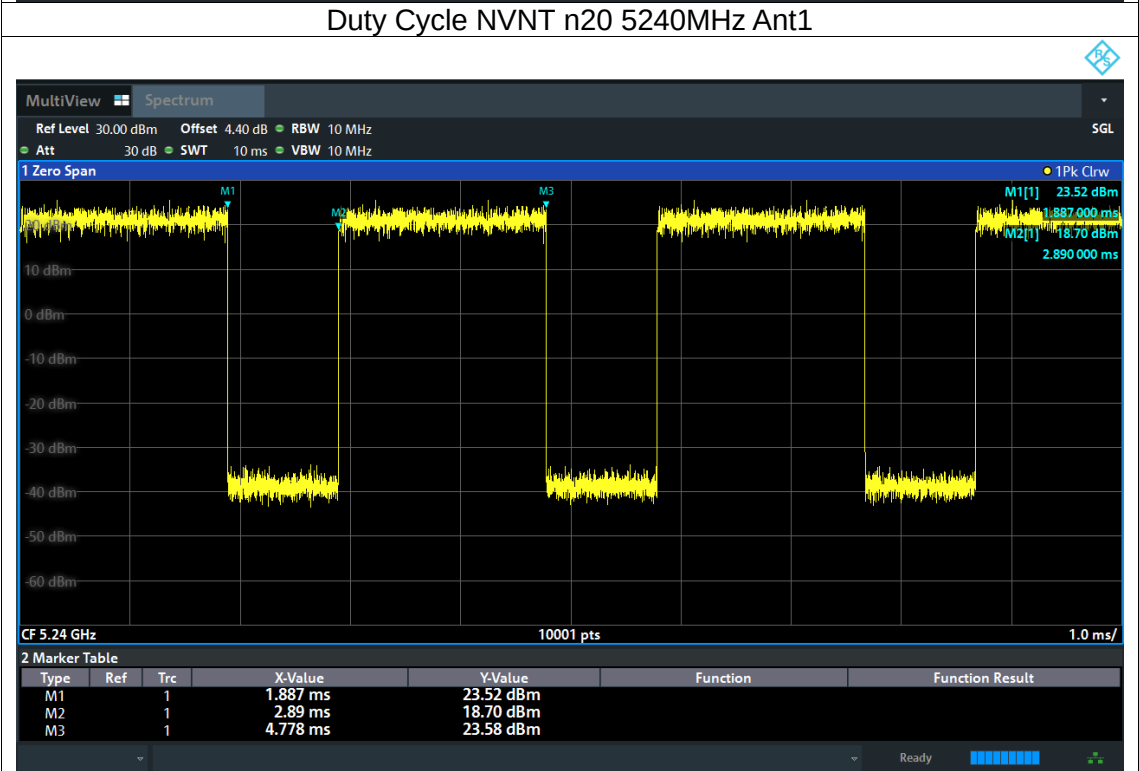
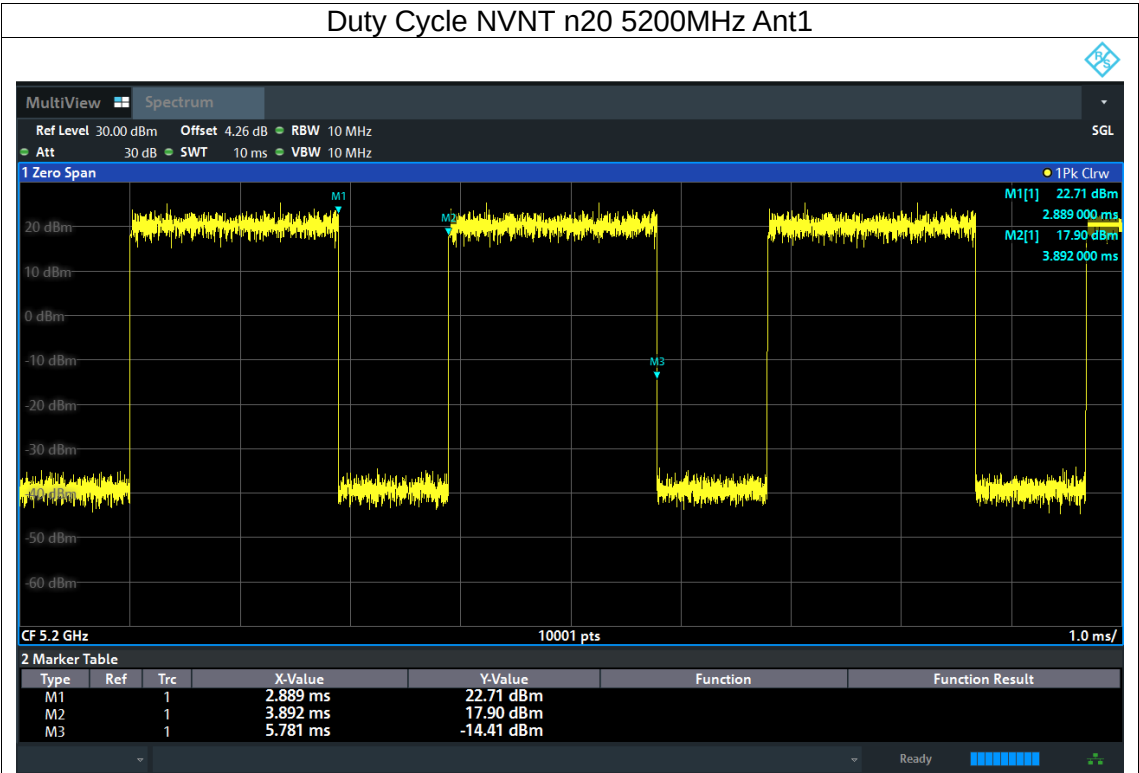
Mode	Frequency (MHz)	T _{on} (ms)	T _{total} (ms)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
a	5180	2.025	3.027	66.90	1.75	0.49
a	5200	2.024	3.027	66.86	1.75	0.49
a	5240	2.024	3.027	66.86	1.75	0.49
n20	5180	1.888	2.891	65.31	1.85	0.53
n20	5200	1.889	2.892	65.32	1.85	0.53
n20	5240	1.888	2.891	65.31	1.85	0.53
n40	5190	0.929	1.931	48.11	3.18	1.08
n40	5230	0.928	1.931	48.06	3.18	1.08

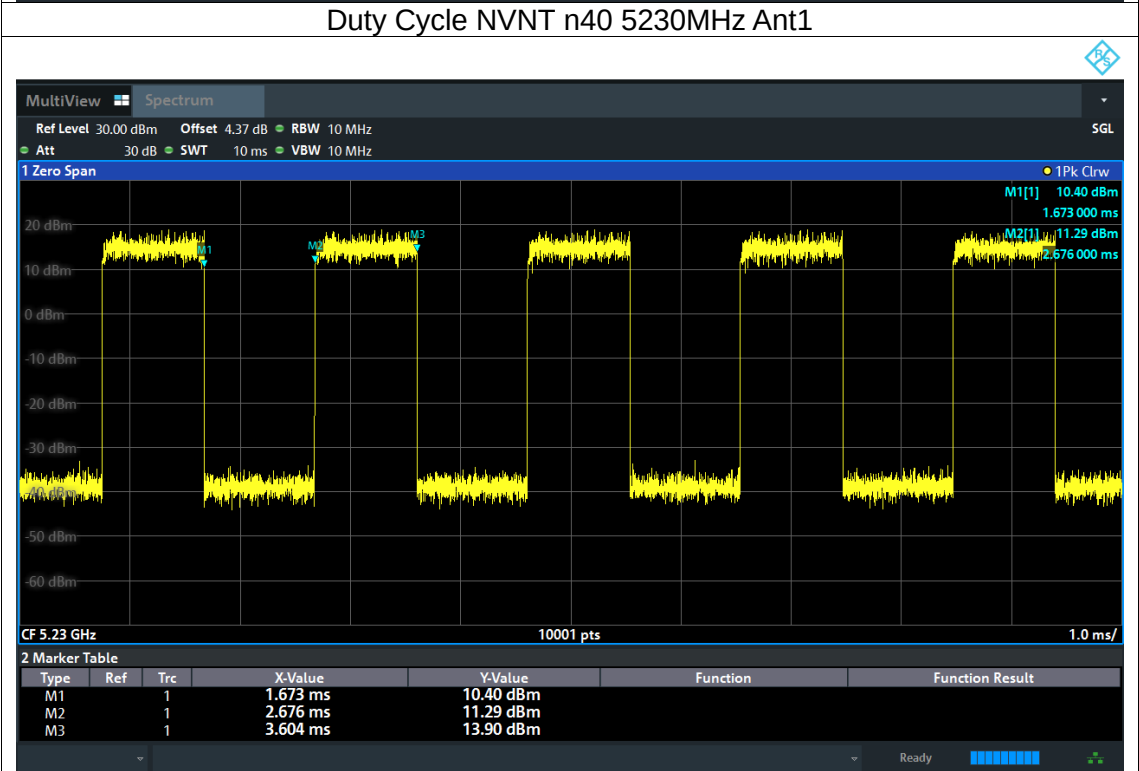
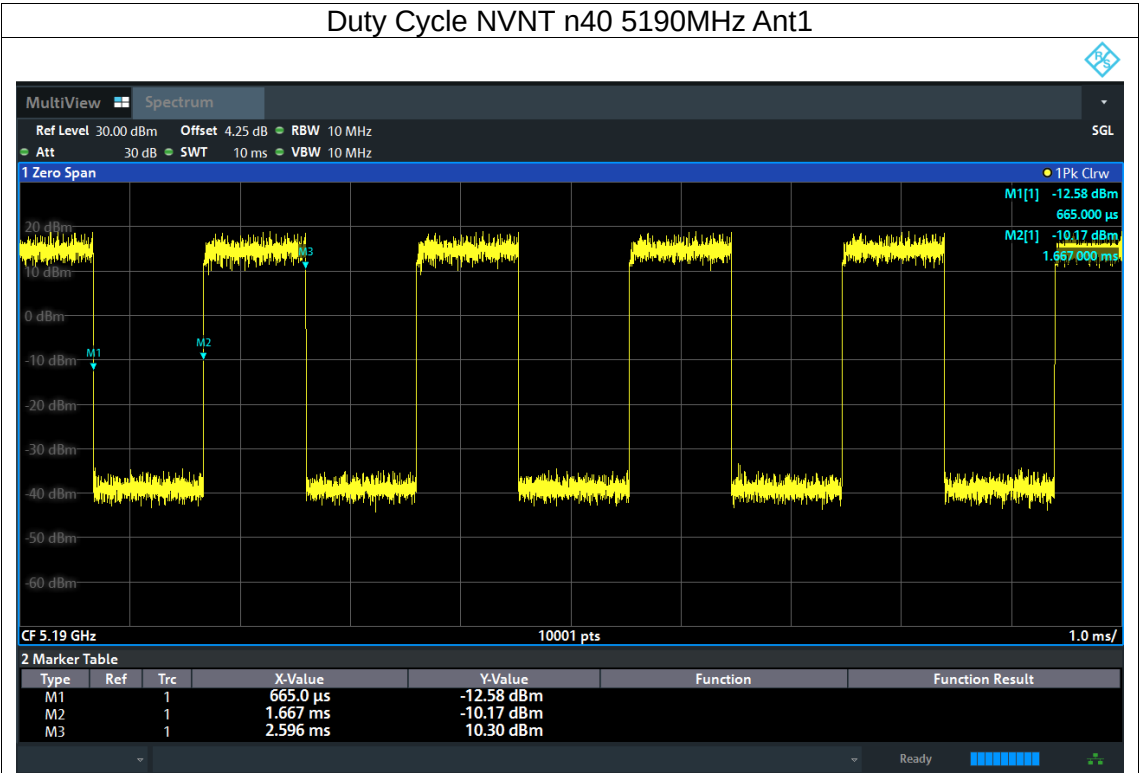
Note:

1. Duty Cycle = T_{on} / T_{total}
2. Correction Factor = $10 \log (1 / \text{Duty Cycle})$
3. $1 / T = 1 / T_{on}$









U-NII-3:

Mode	Frequency (MHz)	T _{on} (ms)	T _{total} (ms)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
a	5745	2.026	3.028	66.91	1.75	0.49
a	5785	2.025	3.027	66.90	1.75	0.49
a	5825	2.025	3.027	66.90	1.75	0.49
n20	5745	1.890	2.891	65.38	1.85	0.53
n20	5785	1.890	2.892	65.35	1.85	0.53
n20	5825	1.890	2.892	65.35	1.85	0.53
n40	5755	0.929	1.931	48.11	3.18	1.08
n40	5795	0.930	1.931	48.16	3.17	1.08

Note:

1. Duty Cycle = T_{on} / T_{total}
2. Correction Factor = $10 \log (1 / \text{Duty Cycle})$
3. $1 / T = 1 / T_{on}$

