



Test report No.: 22A0288R-RFUSV03S-B

TEST REPORT

Product Name	Internet Gateway
Trademark	Verizon
Model and /or type reference	WNC-CR200A
FCC ID	NKR-LV65C-T3
Applicant's name / address	Wistron NeWeb Corporation 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan
Manufacturer's name	Wistron NeWeb Corporation
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart E ANSI C63.4: 2014, ANSI C63.10: 2013 KDB Publication 789033
Verdict Summary	IN COMPLIANCE
Documented By (Senior Project Specialist / Ida Tung)	<i>Ida Tung</i>
Tested By (Senior Engineer / Ivan Chuang)	<i>Ivan Chuang</i>
Approved By (Senior Engineer / Jack Hsu)	<i>Jack Hsu</i>
Date of Receipt	2022/10/13
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Appendix 1: EUT Test Photographs

Appendix 2: Product Photos-Please refer to the file: 22A0288R-Product Photos

Competences and Guarantees

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

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

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

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

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

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General conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Revision History

Report No.	Version	Description	Issued Date
22A0288R-RFUSV03S-B	V1.0	Initial issue of report.	2023/06/09

1. General Information

1.1. EUT Description

Product Name	Internet Gateway
Trademark	Verizon
Model and /or type reference	WNC-CR200A
EUT Rated Voltage	AC 100-120V / 60Hz
EUT Test Voltage	AC 120V / 60Hz
Frequency Range	802.11a/ax-20 MHz: 6115-7095 MHz, 802.11ax-40 MHz: 6125-7085 MHz 802.11ax-80 MHz: 6145-7025 MHz, 802.11ax-160 MHz: 6185-6985 Hz
Number of Channels	802.11a/ax-20 MHz: 50CH, 802.11ax-40 MHz: 25CH 802.11ax-80 MHz: 12CH, 802.11ax-160 MHz: 6CH
Data Rate	802.11a: 6 – 54 Mbps, 802.11ax: MCS0 - MCS11
Type of Modulation	OFDM, OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Channel Control	Auto
Adapter (1)	MFR: Lucent Trans, M/N: 1A100-US1230 Input: AC 100 - 120V~ 60Hz, 1.0A Output: 12.0V= 3.0A, 36.0W Cable out: Non-shielded, 1.8m
Adapter (2)	MFR: Delta, M/N: ADH-36NW B Input: AC 100 - 120V~ 60Hz, 0.9A Output: 12.0V= 3.0A Cable out: Non-shielded, 1.7m

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	WNC	LV65C-WiFi-S11H	Dipole	4.07 dBi for UNII-5 4.27 dBi for UNII-6 4.48 dBi for UNII-7 4.49 dBi for UNII-8
2	WNC	LV65C-WiFi-S11V	Dipole	4.02 dBi for UNII-5 4.49 dBi for UNII-6 4.50 dBi for UNII-7 4.90 dBi for UNII-8
3	WNC	LV65C-WiFi-S12H	Dipole	3.52 dBi for UNII-5 3.14 dBi for UNII-6 3.53 dBi for UNII-7 3.56 dBi for UNII-8
4	WNC	LV65C-WiFi-S12V	Dipole	3.91 dBi for UNII-5 4.65 dBi for UNII-6 4.71 dBi for UNII-7 4.80 dBi for UNII-8

Note: The antenna of EUT is conform to FCC 15.203.

802.11a/ax-20 MHz Center Working Frequency of Each Channel:

Channel	Frequency (MHz)						
33	6115	37	6135	41	6155	45	6175
49	6195	53	6215	57	6235	61	6255
65	6275	69	6295	73	6315	77	6335
81	6355	85	6375	89	6395	93	6415
97	6435	101	6455	105	6475	109	6495
113	6515	117	6535	121	6555	125	6575
129	6595	133	6615	137	6635	141	6655
145	6675	149	6695	153	6715	157	6735
161	6755	165	6775	169	6795	173	6815
177	6835	181	6855	185	6875	189	6895
193	6915	197	6935	201	6955	205	6975
209	6995	213	7015	217	7035	221	7055
225	7075	229	7095	--	--	--	--

802.11ax-40 MHz Center Working Frequency of Each Channel:

Channel	Frequency (MHz)						
35	6125	43	6165	51	6205	59	6245
67	6285	75	6325	83	6365	91	6405
99	6445	107	6485	115	6525	123	6565
131	6605	139	6645	147	6685	155	6725
163	6765	171	6805	179	6845	187	6885
195	6925	203	6965	211	7005	219	7045
227	7085	--	--	--	--	--	--

802.11ax-80 MHz Center Working Frequency of Each Channel:

Channel	Frequency (MHz)						
39	6145	55	6225	71	6305	87	6385
103	6465	119	6545	135	6625	151	6705
167	6785	183	6865	199	6945	215	7025

802.11ax-160 MHz Center Working Frequency of Each Channel:

Channel	Frequency (MHz)						
47	6185	79	6345	111	6505	143	6665
175	6825	207	6985	--	--	--	--

Note:

1. This EUT is an Internet Gateway with a built-in WLAN and WWAN transceiver, this report for 6 GHz WLAN.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. After evaluation and investigation, the worst case for Adapter (1) and Adapter (2) is Adapter (1), so it was used to perform all testing and record in the test report.
4. Lowest data rates are tested in each mode. Only worst case is shown in the report.
(802.11a is 6Mbps 、 802.11ax-20BW/40BW/80BW/160BW is MCS0)
5. The spectrum plot against conducted items only shows the worst case.
6. This device does not support partial RU function.
7. These tests were conducted on a sample for the purpose of demonstrating compliance of 802.11a/ax transmitter with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.

Test Mode	Transmit (802.11a-CDD)
	Transmit (802.11ax-20BW-CDD)
	Transmit (802.11ax-40BW-CDD)
	Transmit (802.11ax-80BW-CDD)
	Transmit (802.11ax-160BW-CDD)
	Transmit (802.11ax-20BW-Beamforming)
	Transmit (802.11ax-40BW-Beamforming)
	Transmit (802.11ax-80BW-Beamforming)
	Transmit (802.11ax-160BW-Beamforming)
	Transmit Co-location for WLAN + WWAN

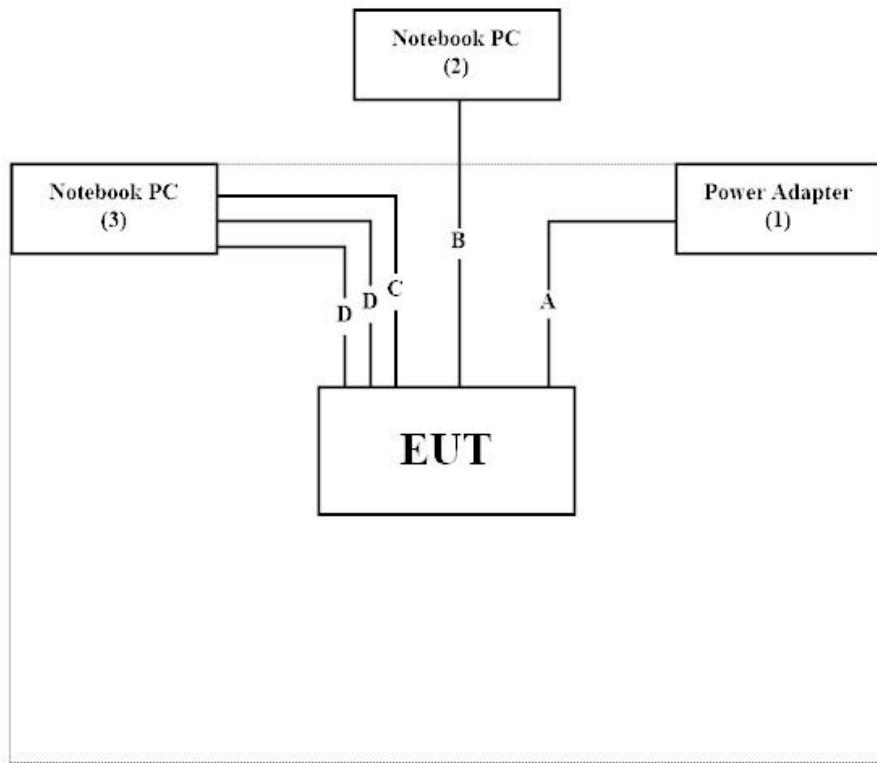
1.2. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Power Adapter	Lucent Trans	1A100-US1230	N/A	N/A
2 Notebook PC	DELL	Latitude 5580	GDZN7H2	N/A
3 Notebook PC	DELL	Latitude E5440	FS9TK32	N/A

Cable Type	Cable Description
A Power Cable	Non-shielded, 1.8m
B LAN Cable	Non-shielded, 10m
C LAN Cable	Non-shielded, 2m
D USB Cable	Shielded, 1m, 2pcs

1.3. Configuration of tested System



1.4. EUT Exercise Software

1	Setup the EUT as shown in Section 1.3.
2	Execute software “QSPR Version 5.0-00202” on the Notebook PC.
3	Configure the test mode, test channel, and data rate.
4	Press “OK” to start the continuous Transmit.
5	Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	22.3 °C
	Humidity (%RH)	10~90 %	58.8 %
Radiated Emission	Temperature (°C)	10~40 °C	24.3 °C
	Humidity (%RH)	10~90 %	66.3 %
Conductive	Temperature (°C)	10~40 °C	25.0 °C
	Humidity (%RH)	10~90 %	55.0 %

USA	FCC Registration Number: TW0033
Canada	CAB Identifier Number: TW3023 / Company Number: 26930

Site Description	Accredited by TAF Accredited Number: 3023
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Test Laboratory	DEKRA Testing and Certification Co., Ltd. Linkou Laboratory
Address	No.5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan, R.O.C.
Performed Location	No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.
Phone Number	+886-3-275-7255
Fax Number	+886-3-327-8031

1.6. List of Test Equipment

For Conduction Measurements / HY-SR01

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	EMI Test Receiver	R&S	ESR7	101601	2022/06/23	2023/06/22
V	Two-Line V-Network	R&S	ENV216	101307	2022/07/04	2023/07/03
V	Coaxial Cable	SUHNER	RG400_BNC	RF001	2023/01/10	2024/01/09
V	Spectrum Analyzer	KEYSIGHT	N9010A	MY55150401	2022/09/27	2023/09/26
V	Analog Signal Generator	Agilent	E8257DK	MY44320633	2022/11/24	2023/11/23
V	Signal Generator	Agilent	N5182B	MY53050685	2022/07/27	2023/07/26

Note:

1. The test instruments marked with “V” are used to measure the final test results.
2. Test Software Version: e3 230303 dekra.

For Conducted Measurements / HY-SR02

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Spectrum Analyzer	R&S	FSV30	103466	2022/12/20	2023/12/21
V	Power Sensor	KEYSIGHT	N1923A	MY59240002	2022/08/05	2023/08/04
V	Power Sensor	KEYSIGHT	N1923A	MY59240003	2022/08/05	2023/08/04

Note:

1. The test instruments marked with “V” are used to measure the final test results.
2. Test Software Version: RF Conducted Test Tools Ver3.0.1.14

For Radiated Measurements / HY-CB01

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Loop Antenna	AMETEK	HLA6121	49611	2023/02/21	2024/02/20
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0675	2021/08/11	2023/08/10
V	Horn Antenna	RF SPIN	DRH18-E	210507A18ES	2022/06/08	2023/06/07
V	Horn Antenna	Com-Power	AH-840	101101	2021/11/30	2023/11/29
V	Pre-Amplifier	SGH	0301	20211007-7	2023/01/10	2024/01/09
V	Pre-Amplifier	EMCI	EMC051845SE	980632	2023/01/10	2024/01/09
V	Pre-Amplifier	EMCI	EMC05820SE	980361	2023/01/10	2024/01/09
V	Pre-Amplifier	EMCI	EMC184045SE	980369	2023/01/10	2024/01/09
V	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314		
V	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242		
V	EMI Test Receiver	R&S	ESR3	102792	2022/12/29	2023/12/28
V	Spectrum Analyzer	R&S	FSVA40	101435	2022/06/04	2023/06/03
V	Spectrum Analyzer	R&S	FSV3044	101115	2023/01/06	2024/01/05
V	UXM 5G Wireless Test Platform	Keysight	E7515B	MY59321672	2022/05/31	2023/05/30
V	Universal Radio Communication Tester	Anritsu	MT8820C	6201465467	2022/08/10	2023/08/09
V	Coaxial Cable	SUHNER	SUCOFLEX 106	25450/6	2023/01/10	2024/01/09
V	Coaxial Cable	SGH	HA800	GD20110222-8		
V	Coaxial Cable	SGH	SGH18	2021003-8		
V	Coaxial Cable	EMCI	EMC106	151113		

Note:

1. The test instruments marked with “V” are used to measure the final test results.
2. Test Software Version: e3 230303 dekra.

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document.

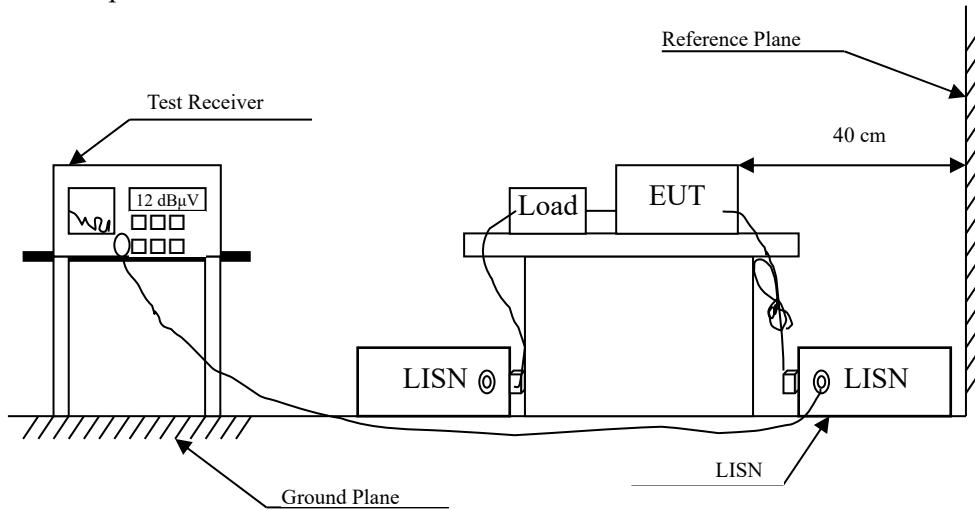
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Item	Uncertainty
Conducted Emission	± 3.50 dB
99 % & 26 dB Bandwidth	± 1580.61 Hz
Transmit Output	± 4.28 dB
Peak Power Spectrum Density	± 4.28 dB
Radiated Emission	9 kHz~30 MHz: ± 3.88 dB 30 MHz~1 GHz: ± 4.42 dB 1 GHz~18 GHz: ± 4.28 dB 18 GHz~40 GHz: ± 3.90 dB
Band Edge	± 4.28 dB
In-BandS Emission (Mask)	± 2.14 dB
Contention-Based Protocol	± 1.05 dB
Duty Cycle	± 0.53 %

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC CFR Title 47 Part 15 Subpart C Paragraph 15.207 Limits (dB μ V)		
Frequency MHz	QP	AV
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remark: In the above table, the tighter Limit applies at the band edges.

2.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs.)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

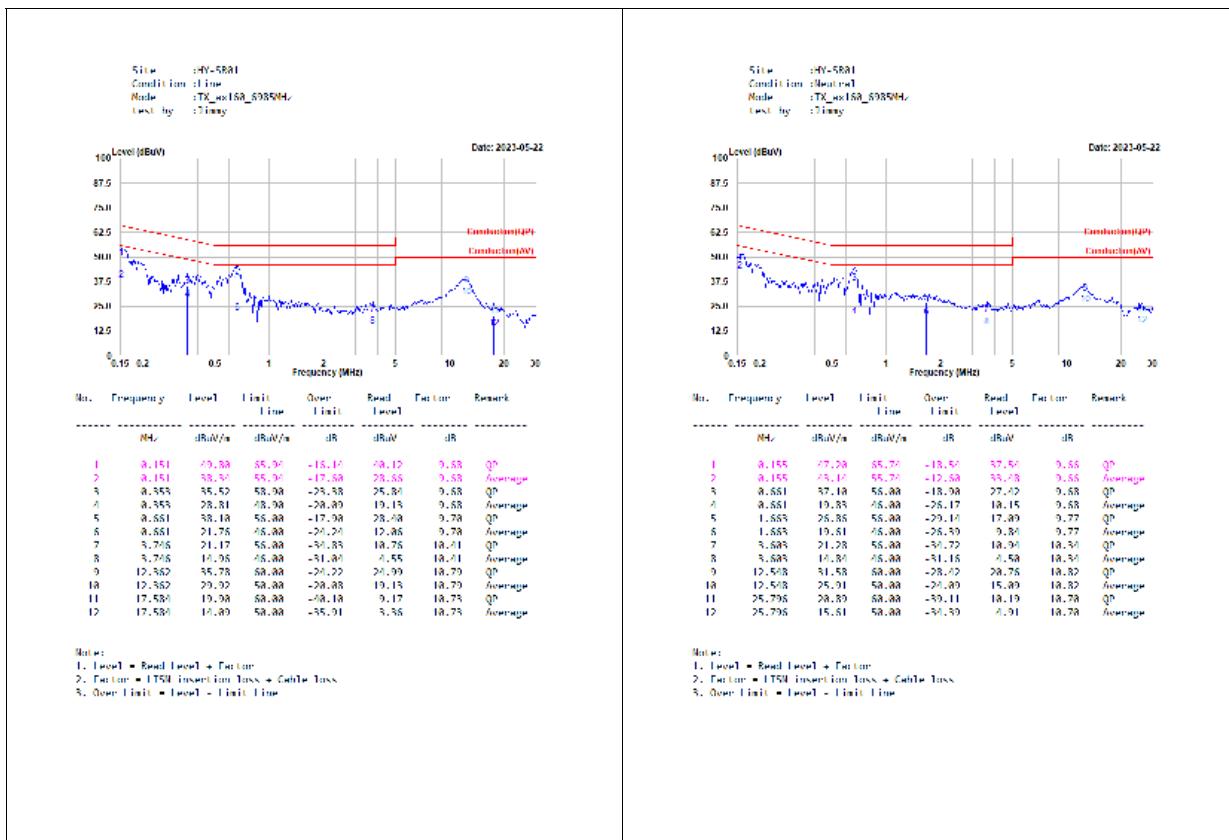
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15 MHz to 30MHz using a receiver bandwidth of 9 kHz.

2.4. Test Specification

According to FCC CFR Title 47 Part 15 Subpart C Paragraph 15.207.

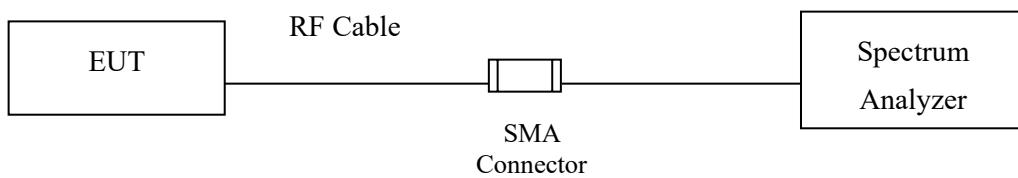
2.5. Test Result of Conducted Emission



3. 99 % & 26 dB Bandwidth

3.1. Test Setup

26 dB Occupied Bandwidth



3.2. Limits

No Required

3.3. Test Procedure

The EUT was tested according to U-NII test procedure of KDB 789033.D02 V02r01
Set RBW 1 % of the emission bandwidth, VBW equal to 3 times the RBW.

3.4. Test Result of 99 % & 26 dB Bandwidth

Product : Internet Gateway
 Test Item : 99 % & 26 dB Bandwidth
 Test Mode : Transmit (802.11a-CDD)
 Test Date : 2023/05/02

Channel No.	Frequency (MHz)	26 dB Bandwidth (MHz)				99 % Occupied Bandwidth (MHz)			
		Chain A	Chain B	Chain C	Chain D	Chain A	Chain B	Chain C	Chain D
33	6115	20.9790	20.9790	20.6194	20.5794	16.8630	16.9430	16.7832	16.9430
37	6135	21.0589	20.6593	20.6993	20.6593	17.0229	16.9830	16.9830	16.8631
61	6255	21.0190	20.8991	20.7393	20.7792	16.9830	16.9830	16.9430	16.9430
93	6415	20.9790	20.7792	20.8591	20.7393	16.9830	16.9030	16.9830	16.8231
97	6435	20.8991	21.0589	20.8192	20.4595	17.0629	16.9430	16.9430	16.7432
105	6475	20.8991	21.0190	20.8192	20.7393	16.9030	16.9030	16.9030	16.8231
113	6515	21.0589	20.8192	20.6993	20.4595	16.9830	17.0229	16.9030	16.8231
117	6535	20.8192	20.6194	20.7792	20.6194	16.9830	16.8631	16.8231	16.9430
149	6695	20.8192	21.0190	20.7393	20.9391	16.8231	16.8631	16.9430	16.9430
181	6855	20.9391	21.0589	20.7393	20.8991	16.7832	16.9430	16.8631	16.8631
185	6875	20.9790	20.8991	20.6194	20.6593	16.8231	16.9430	16.9830	16.9430
189	6895	20.9790	20.9391	20.8192	20.8591	16.9830	16.9430	16.9830	16.8631
209	6995	20.9790	20.8192	20.8192	20.5794	17.0229	16.9430	16.9830	16.9430
229	7095	21.0989	21.0190	20.8591	20.5395	17.0229	16.9430	16.9430	16.9430

Product : Internet Gateway
 Test Item : 99 % & 26 dB Bandwidth
 Test Mode : Transmit (802.11ax-20BW-CDD)
 Test Date : 2023/05/02

Channel No.	Frequency (MHz)	26 dB Bandwidth (MHz)				99 % Occupied Bandwidth (MHz)			
		Chain A	Chain B	Chain C	Chain D	Chain A	Chain B	Chain C	Chain D
33	6115	22.1778	22.0979	21.9780	22.1778	19.3006	19.3006	19.3806	19.1808
37	6135	21.8581	22.3377	22.6174	21.8581	19.3006	19.3006	19.2607	19.2207
61	6255	21.6983	22.1379	21.9381	22.0979	19.2207	19.1808	19.2207	19.2607
93	6415	22.2577	22.1778	21.9780	21.9780	19.1808	19.2607	19.1408	19.1808
97	6435	21.7383	22.4975	22.5375	22.4176	19.1808	19.3006	19.2207	19.2607
105	6475	21.9381	21.7383	21.9780	21.7383	19.2207	19.2207	19.2607	19.3806
113	6515	22.6174	21.9381	22.0579	21.7782	19.3406	19.2207	19.3006	19.2607
117	6535	22.1379	22.6573	21.8581	22.2977	19.3806	19.2207	19.3406	19.3806
149	6695	22.1778	21.9381	21.9381	22.6973	19.2207	19.3006	19.3006	19.2607
181	6855	22.0180	22.0180	21.6983	21.7782	19.2607	19.2207	19.2607	19.2607
185	6875	22.2977	22.1379	22.6973	21.8981	19.1408	19.1808	19.3006	19.3006
189	6895	21.6184	21.8981	22.0579	22.1379	19.2207	19.2607	19.2607	19.2607
209	6995	22.3377	22.4176	21.9780	21.8981	19.3006	19.2607	19.2207	19.2607
229	7095	22.5375	22.1379	22.4575	22.5375	19.3006	19.3006	19.2207	19.2207

Product : Internet Gateway
 Test Item : 99 % & 26 dB Bandwidth
 Test Mode : Transmit (802.11ax-40BW-CDD)
 Test Date : 2023/05/02

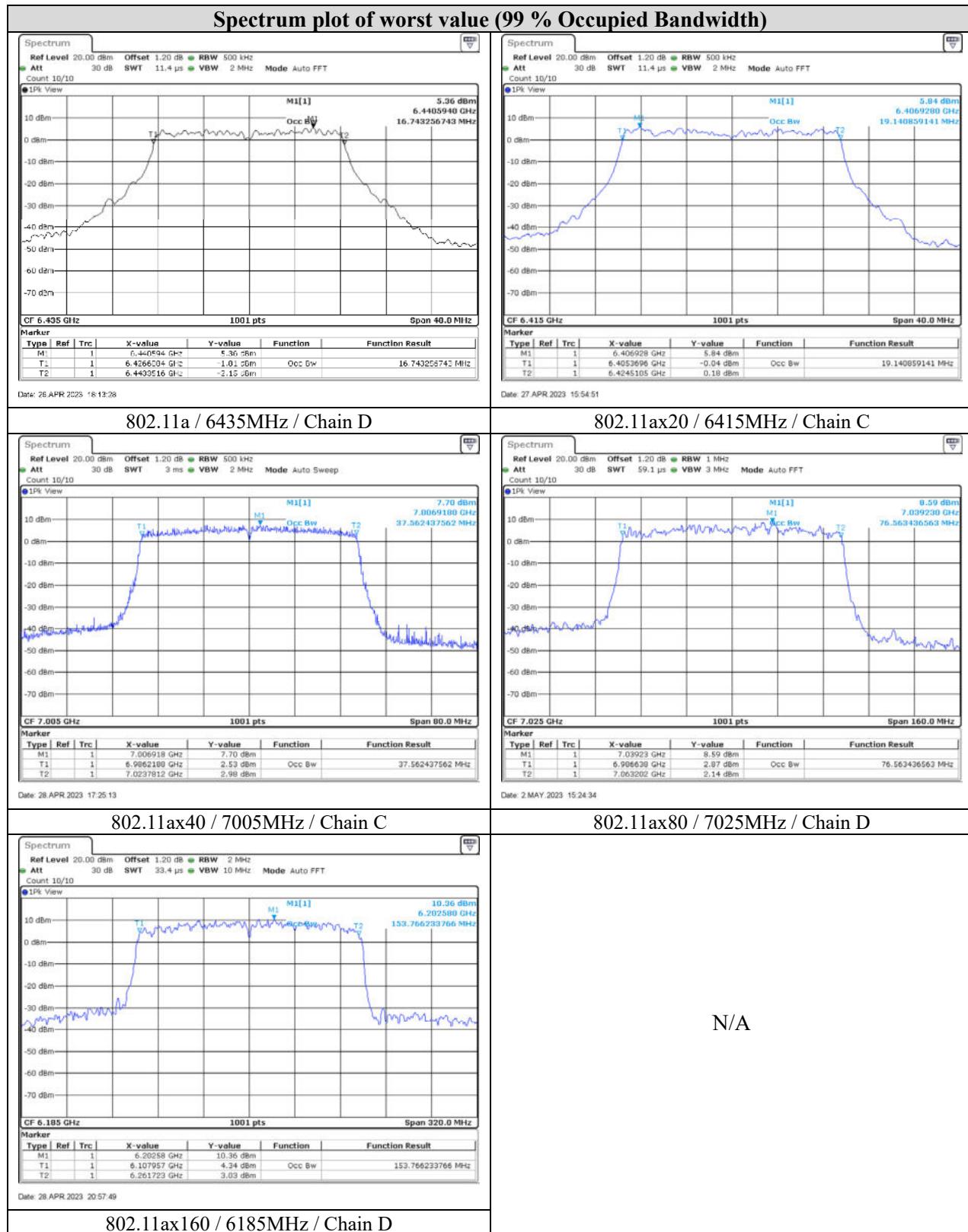
Channel No.	Frequency (MHz)	26 dB Bandwidth (MHz)				99 % Occupied Bandwidth (MHz)			
		Chain A	Chain B	Chain C	Chain D	Chain A	Chain B	Chain C	Chain D
35	6125	40.5195	40.3596	40.1199	40.1998	37.7222	37.6423	37.8021	37.7222
59	6245	40.1199	40.3596	40.1199	40.1199	37.6423	37.6423	37.7222	37.6423
91	6405	40.1199	40.1998	40.1199	40.1998	37.7222	37.7222	37.6423	37.8021
99	6445	40.0400	40.4396	40.3596	40.4396	37.8021	37.8021	37.6423	37.6423
107	6485	40.3596	40.2797	40.1998	40.3596	37.6423	37.6423	37.6423	37.7222
115	6525	40.3596	40.4396	40.1998	40.1199	37.6423	37.8821	37.6423	37.7222
123	6565	40.0400	40.2797	40.2797	40.1998	37.7222	37.6423	37.7222	37.7222
155	6725	40.4396	40.0400	40.3596	39.8801	37.7222	37.6423	37.7222	37.8021
179	6845	40.1998	40.1998	40.1199	40.0400	37.7222	37.6423	37.7222	37.6423
187	6885	40.1199	40.1998	40.1199	40.7592	37.8021	37.7222	37.7222	37.7222
195	6925	39.9600	40.2797	40.5994	40.1199	37.6423	37.6423	37.8021	37.7222
211	7005	40.2797	40.0400	40.1199	40.3596	37.6423	37.6423	37.5624	37.7222
227	7085	40.3596	40.5994	40.4396	40.5994	37.7222	37.7222	37.6423	37.6423

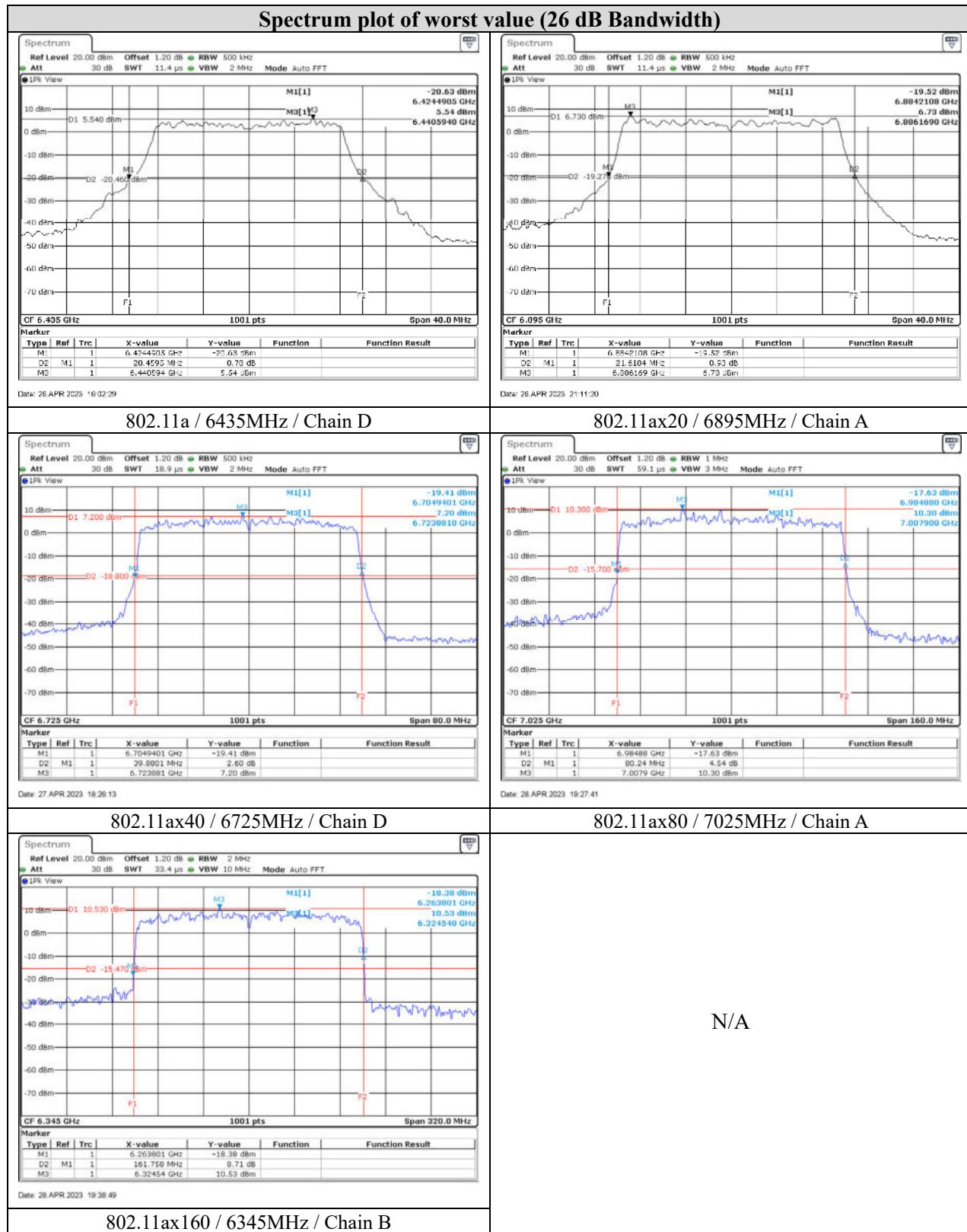
Product : Internet Gateway
Test Item : 99 % & 26 dB Bandwidth
Test Mode : Transmit (802.11ax-80BW-CDD)
Test Date : 2023/05/02

Channel No.	Frequency (MHz)	26 dB Bandwidth (MHz)				99 % Occupied Bandwidth (MHz)			
		Chain A	Chain B	Chain C	Chain D	Chain A	Chain B	Chain C	Chain D
39	6145	81.0390	81.8380	81.6780	81.1990	77.0429	77.0429	77.0429	77.2027
55	6225	81.1990	81.0390	81.5180	81.8380	77.0429	76.8831	76.8831	77.0429
87	6385	81.1990	82.3180	81.0390	81.1990	76.7232	77.0429	77.2027	77.0429
103	6465	81.1990	80.8790	81.3590	81.6780	77.2027	76.7232	77.2027	76.8831
119	6545	81.3590	82.1580	81.1990	81.6780	77.0429	77.2027	77.5224	77.2027
135	6625	81.8380	81.5180	81.3590	81.3590	77.2027	77.0429	77.2027	77.0429
151	6705	81.5180	81.3590	81.5180	80.8790	77.0429	77.0429	77.2027	76.8831
167	6785	82.7970	81.6780	81.3590	81.6780	77.0429	77.2027	77.0429	77.4029
183	6865	82.4780	80.5590	81.6780	80.8790	77.0429	77.2027	77.0429	77.4029
199	6945	80.7190	81.3590	81.6780	82.3180	77.0429	76.8831	77.0429	77.4029
215	7025	80.2400	80.2400	80.7190	81.6780	76.8831	76.7232	76.7232	76.5634

Product : Internet Gateway
Test Item : 99 % & 26 dB Bandwidth
Test Mode : Transmit (802.11ax-160BW-CDD)
Test Date : 2023/05/02

Channel No.	Frequency (MHz)	26 dB Bandwidth (MHz)				99 % Occupied Bandwidth (MHz)			
		Chain A	Chain B	Chain C	Chain D	Chain A	Chain B	Chain C	Chain D
47	6185	162.3980	162.3980	162.0780	162.0780	153.7662	154.4055	154.0859	153.7662
79	6345	162.0780	161.7580	162.3980	162.0780	155.0449	154.7252	154.0859	154.4055
111	6505	161.7580	161.7580	162.7170	163.0370	153.7662	154.7252	154.0859	154.7252
143	6665	163.6760	162.3980	162.3980	162.0780	154.4055	153.7662	154.7252	154.4055
175	6825	162.7170	162.0780	162.0780	163.3570	155.3646	154.4055	154.7252	154.7252
207	6985	162.3980	162.3980	162.0780	161.7580	155.0449	155.0449	155.6843	154.4055

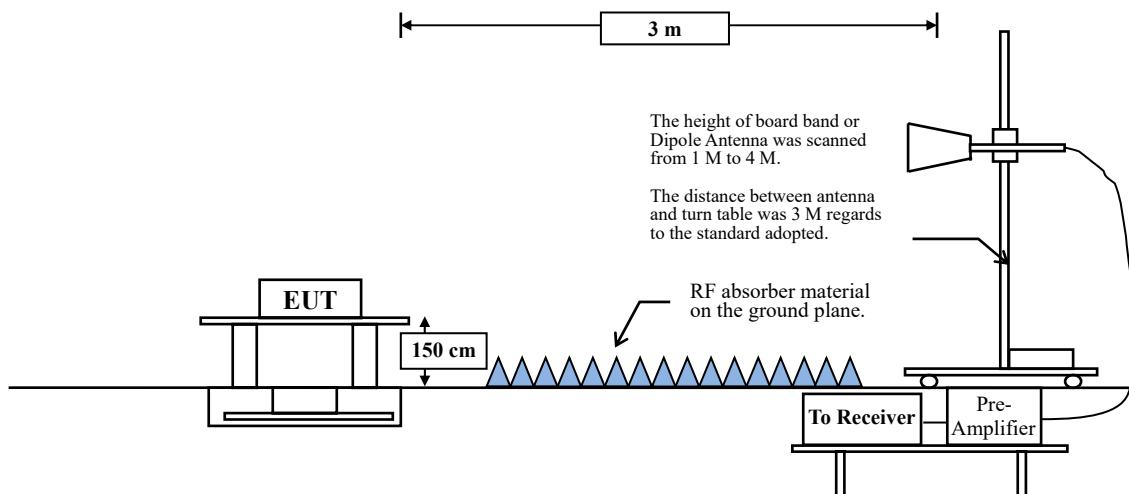




4. Transmit Output

4.1. Test Setup

Radiated Power Measurement



4.2. Limits

1. For the 5.925~6.425 GHz band:

For standard power access point and fixed client device : e.i.r.p < 36 dBm , For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees not exceed 125 mW (21 dBm).

For indoor access point : e.i.r.p < 30 dBm.

For subordinate device control of an indoor access point : e.i.r.p < 30 dBm.

For client device control of a standard power access point : e.i.r.p < 30 dBm.

For client device control of an indoor access point : e.i.r.p < 24 dBm.

2. For the 6.425~6.525 GHz band:

For indoor access point : e.i.r.p < 30 dBm.

For client device control of an indoor access point : e.i.r.p < 24 dBm.

3. For the 6.525~6.875 GHz band:

For standard power access point and fixed client device : e.i.r.p < 36 dBm , For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees not exceed 125 mW (21 dBm).

For indoor access point : e.i.r.p < 30 dBm.

For subordinate device control of an indoor access point : e.i.r.p < 30 dBm.

For client device control of a standard power access point : e.i.r.p < 30 dBm.

For client device control of an indoor access point : e.i.r.p < 24 dBm.

4. For the 6.87~7.125 GHz band:

For indoor access point : e.i.r.p < 30 dBm.

For client device control of an indoor access point : e.i.r.p < 24 dBm.

4.3. Test Procedure

1. The EUT was setup to ANSI C63.10: 2013; tested to U-NII test procedure of KDB 789033 D02 v02r01 Method SA-2 for compliance to FCC CFR Title 47 Part 15 Subpart E requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground and the turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level.
3. Perform a field strength measurement following ANSI C63.10 and record the worst field strength value via spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then convert the measured field strength level to EIRP level.
4. Following ANSI C63.10 and KDB 412172 D01 v01r01,

$$\text{EIRP value (dBm)} = \text{Field strength value (dB}\mu\text{V/m)} + \text{Correction factor (dB) } @3 \text{ m}$$

$$\text{Correction factor (dB) } @3 \text{ m} = 20 * \log(3) - 104.77 = -95.23 \text{ dB}$$

4.4. Test Result of Transmit Output

Product : Internet Gateway
 Test Item : Transmit Output
 Test Mode : Transmit (802.11a-CDD)
 Test Date : 2023/04/17

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)
33	6115	89.83	17.13	106.96	0.34	-95.23	12.07	30
37	6135	90.06	17.31	107.37	0.34	-95.23	12.48	30
61	6255	89.25	18.40	107.65	0.34	-95.23	12.76	30
93	6415	88.28	19.31	107.59	0.34	-95.23	12.70	30
97	6435	88.85	19.38	108.23	0.34	-95.23	13.34	30
105	6475	88.22	19.38	107.60	0.34	-95.23	12.71	30
113	6515	88.36	19.36	107.72	0.34	-95.23	12.83	30
117	6535	88.49	19.42	107.91	0.34	-95.23	13.02	30
149	6695	87.35	19.74	107.09	0.34	-95.23	12.20	30
181	6855	87.52	20.08	107.60	0.34	-95.23	12.71	30
185	6875	87.32	20.10	107.42	0.34	-95.23	12.53	30
189	6895	87.02	20.13	107.15	0.34	-95.23	12.26	30
209	6995	86.87	20.21	107.08	0.34	-95.23	12.19	30
229	7095	86.99	20.30	107.29	0.34	-95.23	12.40	30

Product : Internet Gateway
 Test Item : Transmit Output
 Test Mode : Transmit (802.11ax-20BW-CDD)
 Test Date : 2023/04/18

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)
33	6115	89.35	17.05	106.40	0.32	-95.23	11.49	30
37	6135	91.12	17.18	108.30	0.32	-95.23	13.39	30
61	6255	88.13	18.38	106.51	0.32	-95.23	11.60	30
93	6415	87.61	19.28	106.89	0.32	-95.23	11.98	30
97	6435	86.42	19.33	105.75	0.32	-95.23	10.84	30
105	6475	86.66	19.38	106.04	0.32	-95.23	11.13	30
113	6515	87.91	19.36	107.27	0.32	-95.23	12.36	30
117	6535	87.79	19.40	107.19	0.32	-95.23	12.28	30
149	6695	87.17	19.74	106.91	0.32	-95.23	12.00	30
181	6855	87.37	20.07	107.44	0.32	-95.23	12.53	30
185	6875	87.10	20.08	107.18	0.32	-95.23	12.27	30
189	6895	87.18	20.11	107.29	0.32	-95.23	12.38	30
209	6995	85.50	20.21	105.71	0.32	-95.23	10.80	30
229	7095	85.64	20.29	105.93	0.32	-95.23	11.02	30

Product : Internet Gateway
Test Item : Transmit Output
Test Mode : Transmit (802.11ax-40BW-CDD)
Test Date : 2023/04/19

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)
35	6125	91.62	17.15	108.77	0.33	-95.23	13.87	30
59	6245	91.12	18.28	109.40	0.33	-95.23	14.50	30
91	6405	90.40	19.27	109.67	0.33	-95.23	14.77	30
99	6445	89.87	19.39	109.26	0.33	-95.23	14.36	30
107	6485	89.64	19.37	109.01	0.33	-95.23	14.11	30
115	6525	89.01	19.36	108.37	0.33	-95.23	13.47	30
123	6565	89.38	19.51	108.89	0.33	-95.23	13.99	30
155	6725	88.89	19.82	108.71	0.33	-95.23	13.81	30
179	6845	88.33	20.06	108.39	0.33	-95.23	13.49	30
187	6885	89.59	20.09	109.68	0.33	-95.23	14.78	30
195	6925	88.84	20.17	109.01	0.33	-95.23	14.11	30
211	7005	90.31	20.21	110.52	0.33	-95.23	15.62	30
227	7085	88.53	20.28	108.81	0.33	-95.23	13.91	30

Product : Internet Gateway
Test Item : Transmit Output
Test Mode : Transmit (802.11ax-80BW-CDD)
Test Date : 2023/04/18

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)
39	6145	94.79	17.33	112.12	0.39	-95.23	17.28	30
55	6225	94.11	18.08	112.19	0.39	-95.23	17.35	30
87	6385	93.58	19.18	112.76	0.39	-95.23	17.92	30
103	6465	93.24	19.39	112.63	0.39	-95.23	17.79	30
119	6545	93.30	19.44	112.74	0.39	-95.23	17.90	30
135	6625	92.37	19.66	112.03	0.39	-95.23	17.19	30
151	6705	92.20	19.75	111.95	0.39	-95.23	17.11	30
167	6785	92.73	19.96	112.69	0.39	-95.23	17.85	30
183	6865	91.86	20.08	111.94	0.39	-95.23	17.10	30
199	6945	92.30	20.20	112.50	0.39	-95.23	17.66	30
215	7025	91.67	20.23	111.90	0.39	-95.23	17.06	30

Product : Internet Gateway
Test Item : Transmit Output
Test Mode : Transmit (802.11ax-160BW-CDD)
Test Date : 2023/04/19

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)
47	6185	97.2	17.89	115.09	0.42	-95.23	20.28	30
79	6345	96.33	19.19	115.52	0.42	-95.23	20.71	30
111	6505	95.6	19.36	114.96	0.42	-95.23	20.15	30
143	6665	95.31	19.65	114.96	0.42	-95.23	20.15	30
175	6825	94.93	20.08	115.01	0.42	-95.23	20.20	30
207	6985	95.19	20.21	115.40	0.42	-95.23	20.59	30

Product : Internet Gateway
 Test Item : Transmit Output
 Test Mode : Transmit (802.11ax-20BW-Beamforming)
 Test Date : 2023/05/08

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)
33	6115	90.25	17.01	107.26	0.30	-95.23	12.33	30
37	6135	94.81	17.31	112.12	0.30	-95.23	17.19	30
61	6255	91.92	18.48	110.40	0.30	-95.23	15.47	30
93	6415	90.73	19.29	110.02	0.30	-95.23	15.09	30
97	6435	90.61	19.34	109.95	0.30	-95.23	15.02	30
105	6475	91.27	19.39	110.66	0.30	-95.23	15.73	30
113	6515	91.59	19.36	110.95	0.30	-95.23	16.02	30
117	6535	91.61	19.38	110.99	0.30	-95.23	16.06	30
149	6695	91.29	19.75	111.04	0.30	-95.23	16.11	30
181	6855	90.38	20.08	110.46	0.30	-95.23	15.53	30
185	6875	89.34	20.08	109.42	0.30	-95.23	14.49	30
189	6895	88.96	20.13	109.09	0.30	-95.23	14.16	30
209	6995	89.44	20.21	109.65	0.30	-95.23	14.72	30
229	7095	89.54	20.29	109.83	0.30	-95.23	14.90	30

Product : Internet Gateway
Test Item : Transmit Output
Test Mode : Transmit (802.11ax-40BW-Beamforming)
Test Date : 2023/05/09

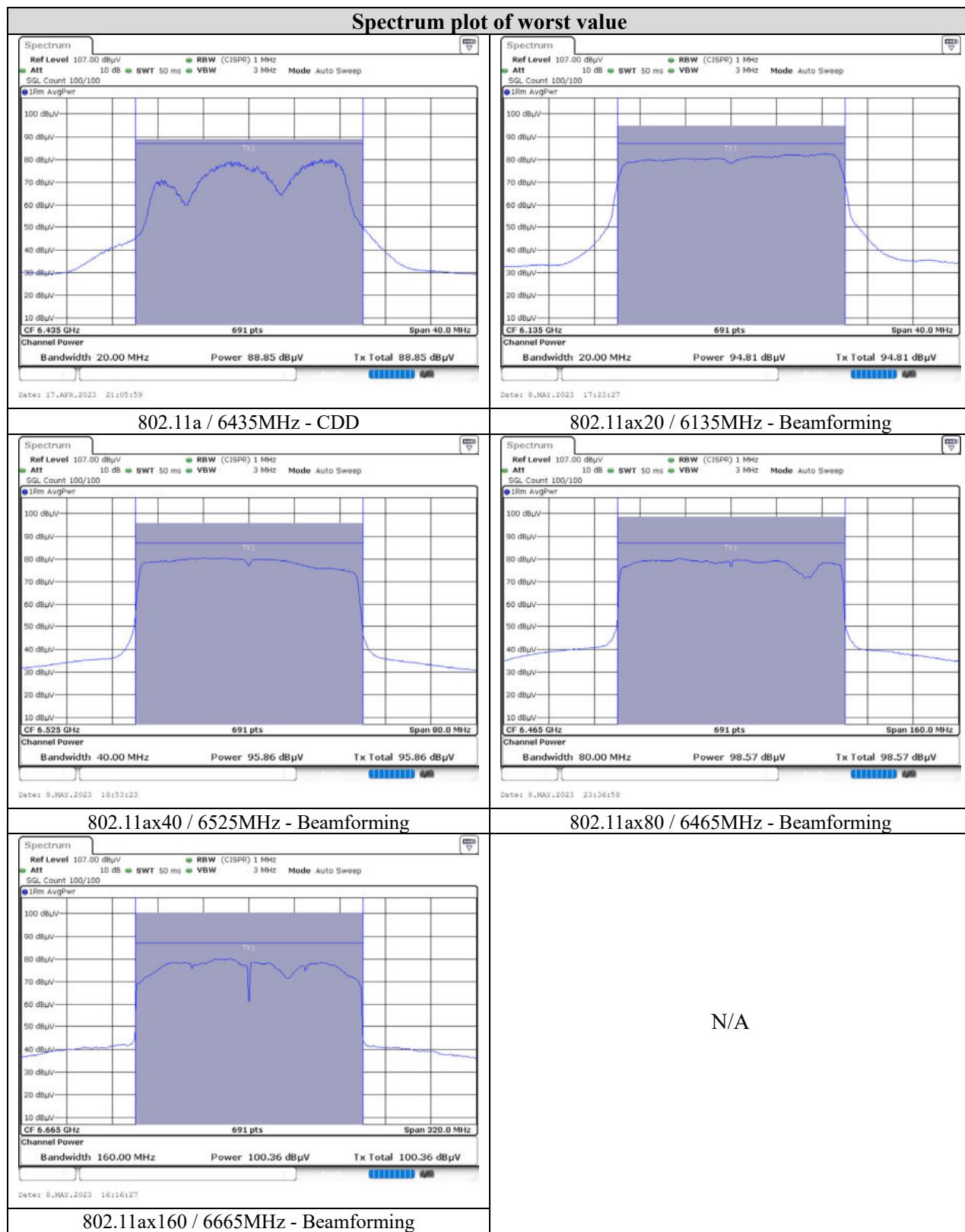
Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)
35	6125	95.80	17.25	113.05	0.32	-95.23	18.14	30
59	6245	95.20	18.34	113.54	0.32	-95.23	18.63	30
91	6405	94.57	19.29	113.86	0.32	-95.23	18.95	30
99	6445	94.36	19.38	113.74	0.32	-95.23	18.83	30
107	6485	92.94	19.36	112.30	0.32	-95.23	17.39	30
115	6525	95.86	19.36	115.22	0.32	-95.23	20.31	30
123	6565	93.25	19.51	112.76	0.32	-95.23	17.85	30
155	6725	93.45	19.79	113.24	0.32	-95.23	18.33	30
179	6845	94.02	20.06	114.08	0.32	-95.23	19.17	30
187	6885	92.01	20.12	112.13	0.32	-95.23	17.22	30
195	6925	94.25	20.18	114.43	0.32	-95.23	19.52	30
211	7005	94.22	20.21	114.43	0.32	-95.23	19.52	30
227	7085	94.06	20.28	114.34	0.32	-95.23	19.43	30

Product : Internet Gateway
Test Item : Transmit Output
Test Mode : Transmit (802.11ax-80BW-Beamforming)
Test Date : 2023/05/15

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)
39	6145	98.77	17.31	116.08	0.37	-95.23	21.22	30
55	6225	96.17	18.11	114.28	0.37	-95.23	19.42	30
87	6385	96.63	19.16	115.79	0.37	-95.23	20.93	30
103	6465	98.57	19.39	117.96	0.37	-95.23	23.10	30
119	6545	97.64	19.48	117.12	0.37	-95.23	22.26	30
135	6625	97.22	19.66	116.88	0.37	-95.23	22.02	30
151	6705	96.54	19.78	116.32	0.37	-95.23	21.46	30
167	6785	97.96	19.95	117.91	0.37	-95.23	23.05	30
183	6865	96.78	20.09	116.87	0.37	-95.23	22.01	30
199	6945	95.37	20.20	115.57	0.37	-95.23	20.71	30
215	7025	96.17	20.23	116.40	0.37	-95.23	21.54	30

Product : Internet Gateway
Test Item : Transmit Output
Test Mode : Transmit (802.11ax-160BW-Beamforming)
Test Date : 2023/05/08

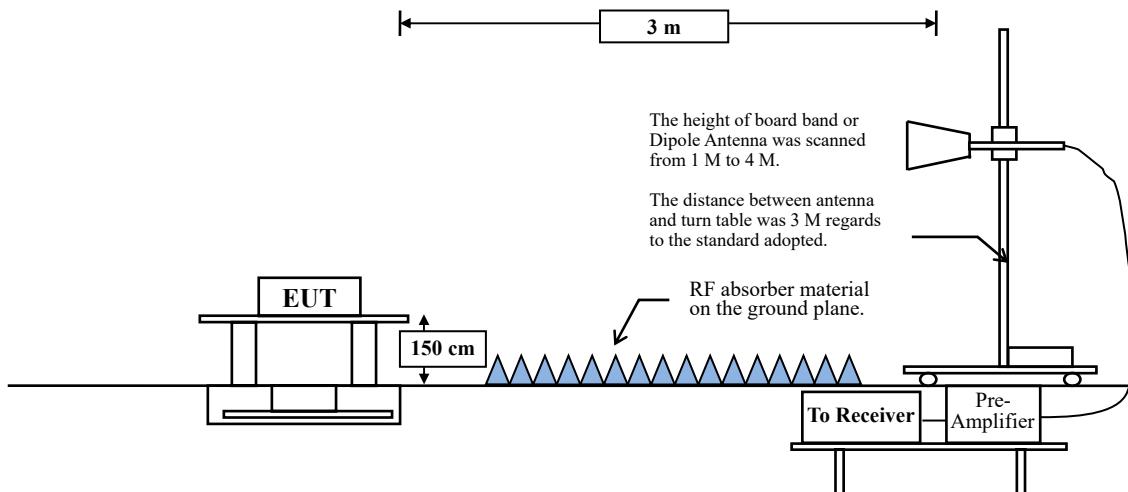
Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)
47	6185	99.76	17.45	117.21	0.17	-95.23	22.15	30
79	6345	99.93	18.87	118.80	0.17	-95.23	23.74	30
111	6505	99.8	19.36	119.16	0.17	-95.23	24.10	30
143	6665	100.36	19.66	120.02	0.17	-95.23	24.96	30
175	6825	97.08	20.04	117.12	0.17	-95.23	22.06	30
207	6985	96.57	20.21	116.78	0.17	-95.23	21.72	30



5. Maximum Power Spectrum Density

5.1. Test Setup

Radiated PSD Measurement



5.2. Limits

1. For the 5.925~6.425 GHz band:

For standard power access point and fixed client device : e.i.r.p PSD < 23 dBm/MHz.

For indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For subordinate device control of an indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For client device control of a standard power access point : e.i.r.p PSD < 17 dBm/MHz.

For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.

2. For the 6.425~6.525 GHz band:

For indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.

3. For the 6.525~6.875 GHz band:

For standard power access point and fixed client device : e.i.r.p PSD < 23 dBm/MHz.

For indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For subordinate device control of an indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For client device control of a standard power access point : e.i.r.p PSD < 17 dBm/MHz.

For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.

4. For the 6.875~7.125 GHz band:

For indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.

5.3. Test Procedure

1. The EUT was setup to ANSI C63.10: 2013; tested to U-NII test procedure of KDB 789033 D02 v02r01 Method SA-2 for compliance to FCC CFR Title 47 Part 15 Subpart E requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground and the turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level.
3. Perform a field strength measuremrnt following ANSI C63.10 and record thr worse field strength value via spectrm reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then convert the measured field strength level to EIRP level.
4. Following ANSI C63.10 and KDB 412172 D01 v01r01,
EIRP value (dBm) = Field strength value (dB μ V/m) + Correction factor (dB) @3 m
Correction factor (dB) @3m = $20 * \log(3) - 104.77 = -95.23$ dB

5.4. Test Result of Maximum Power Spectral Density

Product : Internet Gateway
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11a-CDD)
 Test Date : 2023/05/02

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
33	6115	82.52	17.13	99.65	0.34	-95.23	4.76	5
37	6135	82.33	17.31	99.64	0.34	-95.23	4.75	5
61	6255	81.37	18.40	99.77	0.34	-95.23	4.88	5
93	6415	80.55	19.31	99.86	0.34	-95.23	4.97	5
97	6435	80.25	19.38	99.63	0.34	-95.23	4.74	5
105	6475	80.28	19.38	99.66	0.34	-95.23	4.77	5
113	6515	80.49	19.36	99.85	0.34	-95.23	4.96	5
117	6535	80.37	19.42	99.79	0.34	-95.23	4.90	5
149	6695	79.83	19.74	99.57	0.34	-95.23	4.68	5
181	6855	79.72	20.08	99.80	0.34	-95.23	4.91	5
185	6875	79.53	20.10	99.63	0.34	-95.23	4.74	5
189	6895	79.39	20.13	99.52	0.34	-95.23	4.63	5
209	6995	79.47	20.21	99.68	0.34	-95.23	4.79	5
229	7095	79.40	20.30	99.70	0.34	-95.23	4.81	5

Product : Internet Gateway
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11ax-20BW-CDD)
 Test Date : 2023/05/02

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
33	6115	82.56	17.05	99.61	0.32	-95.23	4.70	5
37	6135	82.65	17.18	99.83	0.32	-95.23	4.92	5
61	6255	81.39	18.38	99.77	0.32	-95.23	4.86	5
93	6415	80.45	19.28	99.73	0.32	-95.23	4.82	5
97	6435	80.48	19.33	99.81	0.32	-95.23	4.90	5
105	6475	80.45	19.38	99.83	0.32	-95.23	4.92	5
113	6515	80.51	19.36	99.87	0.32	-95.23	4.96	5
117	6535	80.29	19.40	99.69	0.32	-95.23	4.78	5
149	6695	79.97	19.74	99.71	0.32	-95.23	4.80	5
181	6855	79.52	20.07	99.59	0.32	-95.23	4.68	5
185	6875	79.48	20.08	99.56	0.32	-95.23	4.65	5
189	6895	79.75	20.11	99.86	0.32	-95.23	4.95	5
209	6995	79.62	20.21	99.83	0.32	-95.23	4.92	5
229	7095	79.22	20.29	99.51	0.32	-95.23	4.60	5

Product : Internet Gateway
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11ax-40BW-CDD)
 Test Date : 2023/05/02

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
35	6125	82.69	17.15	99.84	0.33	-95.23	4.94	5
59	6245	81.40	18.28	99.68	0.33	-95.23	4.78	5
91	6405	80.61	19.27	99.88	0.33	-95.23	4.98	5
99	6445	80.48	19.39	99.87	0.33	-95.23	4.97	5
107	6485	80.52	19.37	99.89	0.33	-95.23	4.99	5
115	6525	80.32	19.36	99.68	0.33	-95.23	4.78	5
123	6565	80.08	19.51	99.59	0.33	-95.23	4.69	5
155	6725	79.79	19.82	99.61	0.33	-95.23	4.71	5
179	6845	79.79	20.06	99.85	0.33	-95.23	4.95	5
187	6885	79.64	20.09	99.73	0.33	-95.23	4.83	5
195	6925	79.68	20.17	99.85	0.33	-95.23	4.95	5
211	7005	79.63	20.21	99.84	0.33	-95.23	4.94	5
227	7085	79.35	20.28	99.63	0.33	-95.23	4.73	5

Product : Internet Gateway
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11ax-80BW-CDD)
 Test Date : 2023/05/02

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
39	6145	82.20	17.33	99.53	0.39	-95.23	4.69	5
55	6225	81.71	18.08	99.79	0.39	-95.23	4.95	5
87	6385	80.57	19.18	99.75	0.39	-95.23	4.91	5
103	6465	80.28	19.38	99.66	0.39	-95.23	4.82	5
119	6545	80.11	19.44	99.55	0.39	-95.23	4.71	5
135	6625	79.89	19.66	99.55	0.39	-95.23	4.71	5
151	6705	79.97	19.75	99.72	0.39	-95.23	4.88	5
167	6785	79.73	19.96	99.69	0.39	-95.23	4.85	5
183	6865	79.53	20.08	99.61	0.39	-95.23	4.77	5
199	6945	79.49	20.20	99.69	0.39	-95.23	4.85	5
215	7025	79.23	20.23	99.46	0.39	-95.23	4.62	5

Product : Internet Gateway
Test Item : Maximum Power Spectral Density
Test Mode : Transmit (802.11ax-160BW-CDD)
Test Date : 2023/05/02

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
47	6185	81.83	17.89	99.72	0.42	-95.23	4.91	5
79	6345	80.33	19.19	99.52	0.42	-95.23	4.71	5
111	6505	80.31	19.36	99.67	0.42	-95.23	4.86	5
143	6665	80.06	19.65	99.71	0.42	-95.23	4.90	5
175	6825	79.68	20.08	99.76	0.42	-95.23	4.95	5
207	6985	79.29	20.21	99.50	0.42	-95.23	4.69	5

Product : Internet Gateway
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11ax-20BW-Beamforming)
 Test Date : 2023/05/17

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
33	6115	82.71	17.01	99.72	0.3	-95.23	4.79	5
37	6135	82.39	17.31	99.7	0.3	-95.23	4.77	5
61	6255	81.32	18.48	99.8	0.3	-95.23	4.87	5
93	6415	80.42	19.29	99.71	0.3	-95.23	4.78	5
97	6435	80.56	19.34	99.9	0.3	-95.23	4.97	5
105	6475	80.24	19.39	99.63	0.3	-95.23	4.70	5
113	6515	80.4	19.36	99.76	0.3	-95.23	4.83	5
117	6535	80.3	19.38	99.68	0.3	-95.23	4.75	5
149	6695	80.14	19.75	99.89	0.3	-95.23	4.96	5
181	6855	79.58	20.08	99.66	0.3	-95.23	4.73	5
185	6875	79.75	20.08	99.83	0.3	-95.23	4.90	5
189	6895	79.67	20.13	99.8	0.3	-95.23	4.87	5
209	6995	79.43	20.21	99.64	0.3	-95.23	4.71	5
229	7095	79.37	20.29	99.66	0.3	-95.23	4.73	5

Product : Internet Gateway
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11ax-40BW-Beamforming)
 Test Date : 2023/05/17

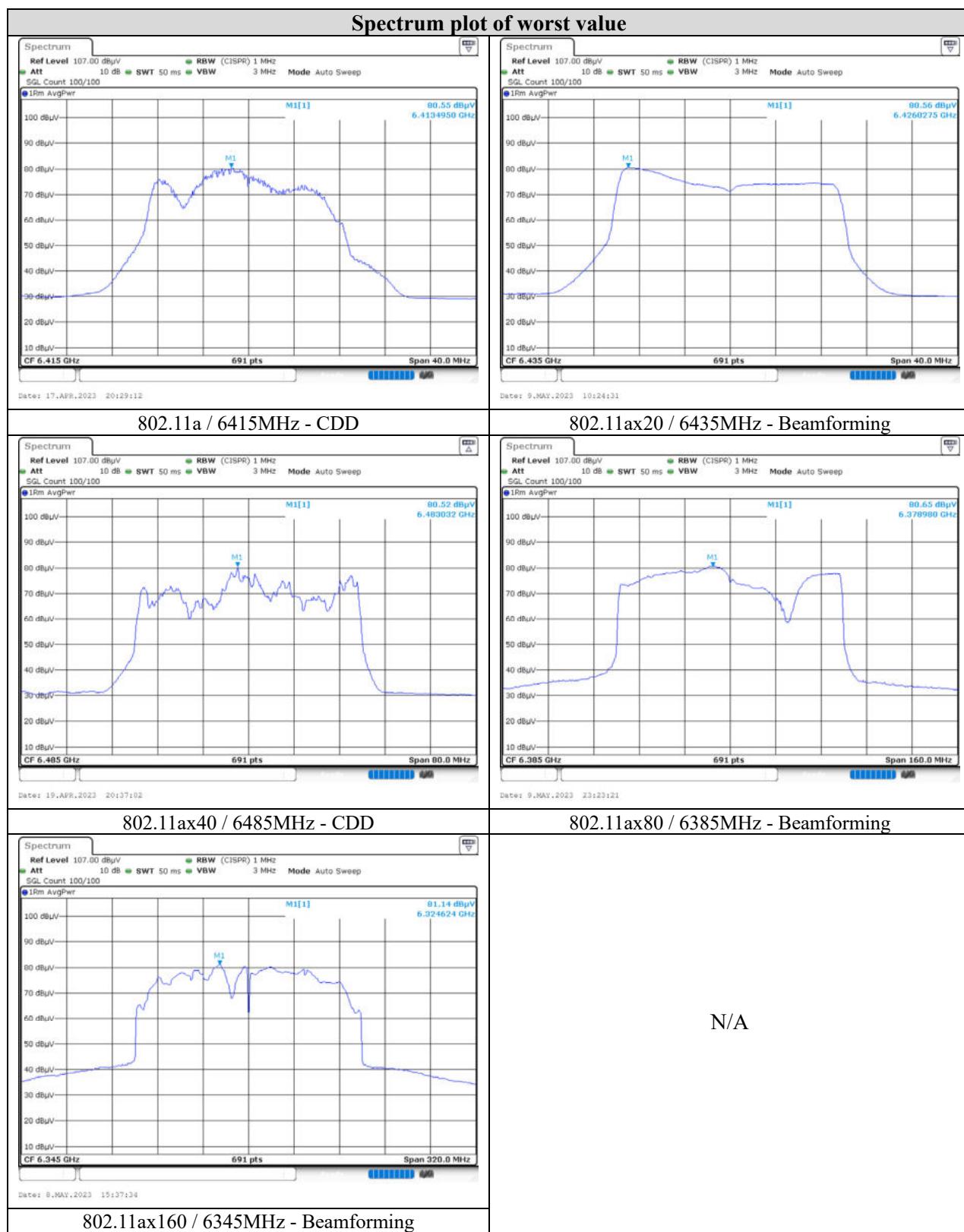
Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
35	6125	82.52	17.25	99.77	0.32	-95.23	4.86	5
59	6245	81.46	18.34	99.8	0.32	-95.23	4.89	5
91	6405	80.44	19.29	99.73	0.32	-95.23	4.82	5
99	6445	80.45	19.38	99.83	0.32	-95.23	4.92	5
107	6485	80.25	19.36	99.61	0.32	-95.23	4.70	5
115	6525	80.43	19.36	99.79	0.32	-95.23	4.88	5
123	6565	80.33	19.51	99.84	0.32	-95.23	4.93	5
155	6725	80.08	19.79	99.87	0.32	-95.23	4.96	5
179	6845	79.68	20.06	99.74	0.32	-95.23	4.83	5
187	6885	79.56	20.12	99.68	0.32	-95.23	4.77	5
195	6925	79.65	20.18	99.83	0.32	-95.23	4.92	5
211	7005	79.4	20.21	99.61	0.32	-95.23	4.70	5
227	7085	79.47	20.28	99.75	0.32	-95.23	4.84	5

Product : Internet Gateway
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11ax-80BW-Beamforming)
 Test Date : 2023/05/17

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
39	6145	82.48	17.31	99.79	0.37	-95.23	4.93	5
55	6225	81.66	18.11	99.77	0.37	-95.23	4.91	5
87	6385	80.65	19.16	99.81	0.37	-95.23	4.95	5
103	6465	80.34	19.39	99.73	0.37	-95.23	4.87	5
119	6545	80.25	19.48	99.73	0.37	-95.23	4.87	5
135	6625	80.02	19.66	99.68	0.37	-95.23	4.82	5
151	6705	79.92	19.78	99.7	0.37	-95.23	4.84	5
167	6785	79.71	19.95	99.66	0.37	-95.23	4.80	5
183	6865	79.63	20.09	99.72	0.37	-95.23	4.86	5
199	6945	79.41	20.2	99.61	0.37	-95.23	4.75	5
215	7025	79.34	20.21	99.55	0.37	-95.23	4.69	5

Product : Internet Gateway
Test Item : Maximum Power Spectral Density
Test Mode : Transmit (802.11ax-160BW-Beamforming)
Test Date : 2023/05/17

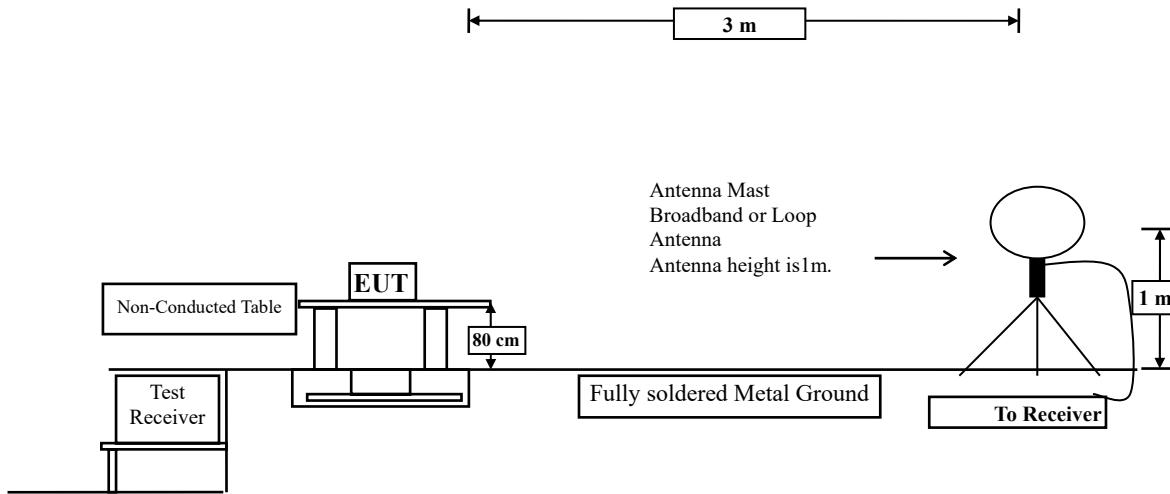
Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)
47	6185	82.5	17.45	99.95	0.17	-95.23	4.89	5
79	6345	81.14	18.87	100.01	0.17	-95.23	4.95	5
111	6505	80.4	19.36	99.76	0.17	-95.23	4.70	5
143	6665	80.31	19.66	99.97	0.17	-95.23	4.91	5
175	6825	79.8	20.04	99.84	0.17	-95.23	4.78	5
207	6985	79.58	20.21	99.79	0.17	-95.23	4.73	5



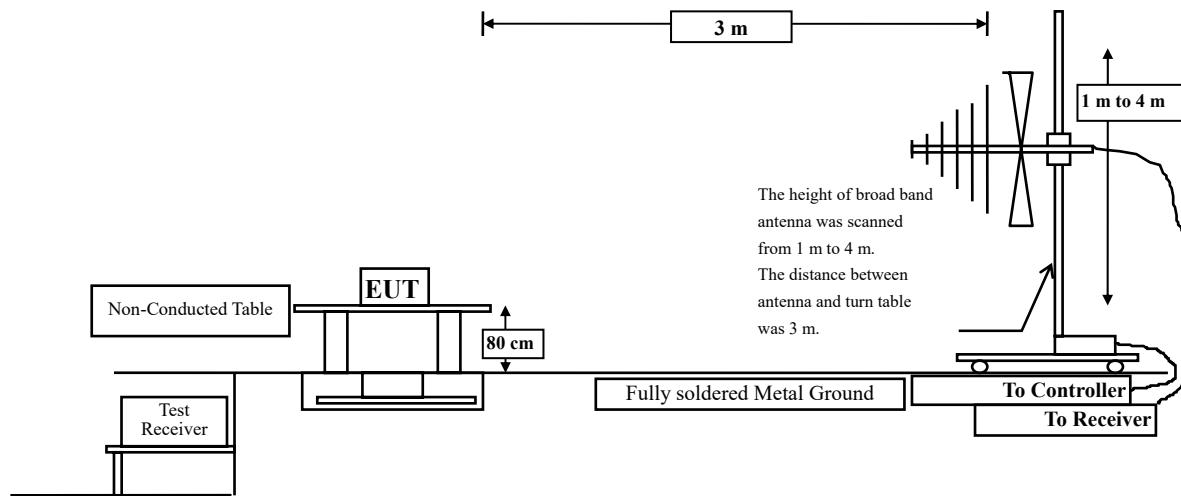
6. Radiated Emission

6.1. Test Setup

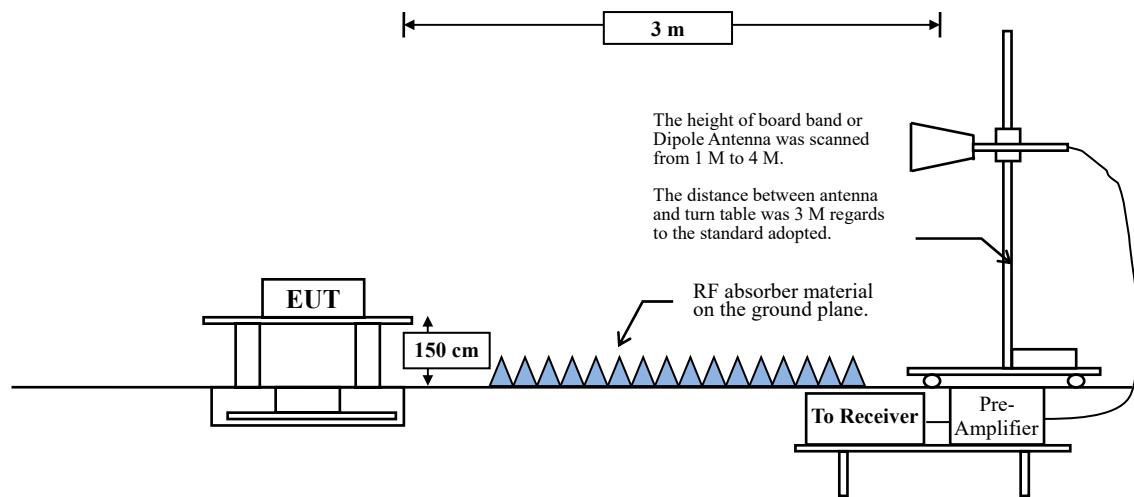
Radiated Emission Under 30 MHz



Radiated Emission Below 1 GHz



Radiated Emission Above 1GHz



6.2. Limits

General Radiated Emission Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section. Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission Limits specified in Section 15.209:

FCC CFR Title 47 Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3 m	dB μ V/m@3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

Remark:

1. RF Voltage (dB μ V) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter Limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Unwanted Emission out of the restricted bands Limits

FCC CFR Title 47 Part 15 Subpart E Paragraph 15.407(b) Limits		
Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength (dB μ V/m@3m)
5925 MHz > F 7125 MHz	Peak: -7	88.2
	Average: -27	68.2

Remark:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \text{ uV/m, where P is the eirp (Watts).}$$

6.3. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The additional latch filter below 1 GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

The bandwidth below 1 GHz setting on the field strength meter is 120 KHz, above 1 GHz are 1 MHz. The frequency range from 30 MHz to 10th harmonics and included The frequency range from the lowest oscillator frequency generated within the device up to the 10th harmonic was checked is checked.

CDD:

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11a	92.52	1.9800	505	1000
802.11ax-20 MHz	92.81	5.4200	185	200
802.11ax-40 MHz	92.78	5.4000	185	200
802.11ax-80 MHz	91.50	5.3800	186	200
802.11ax-160 MHz	90.85	5.3600	187	200

Note: Duty Cycle Refer to Section 10.

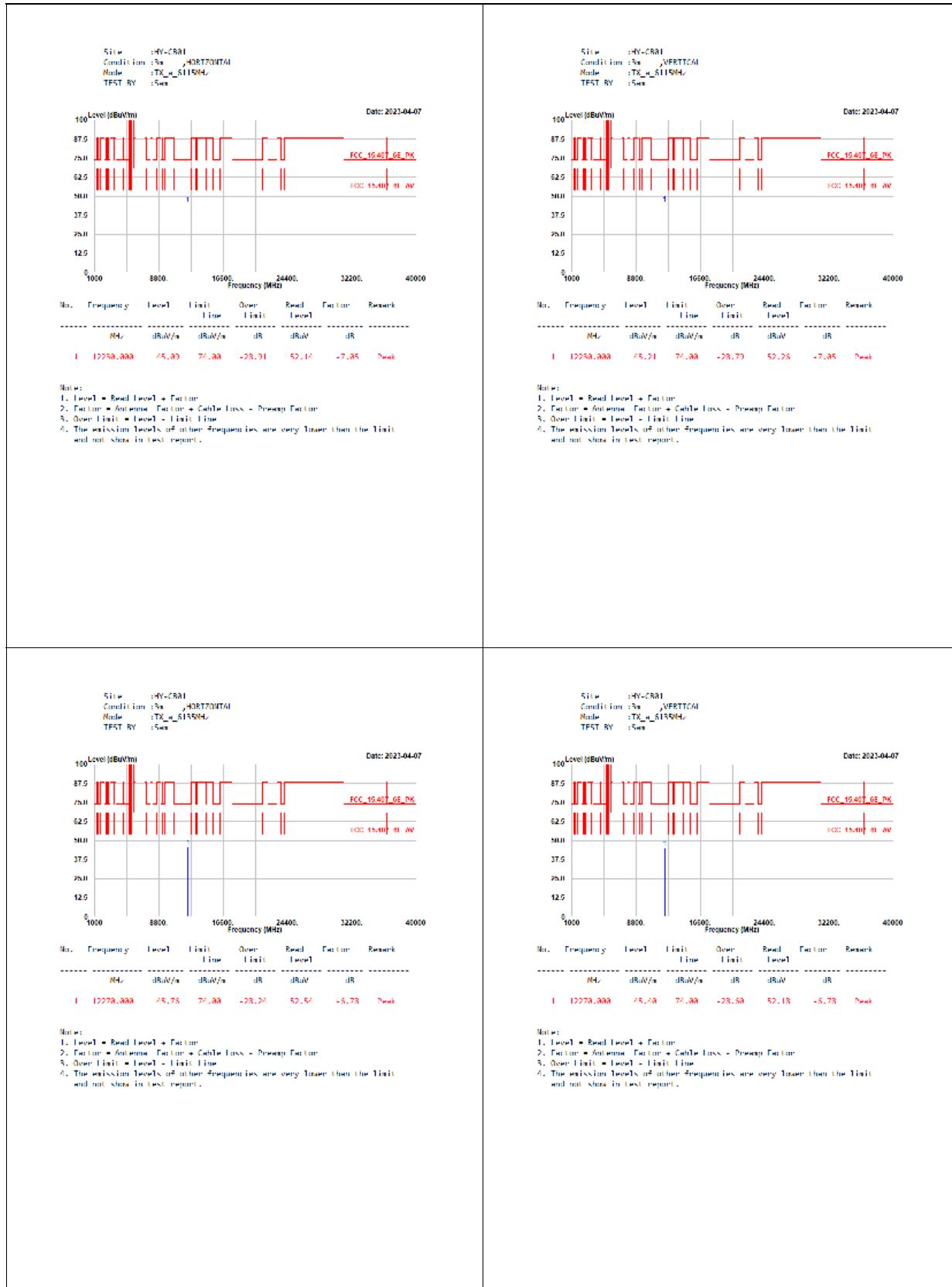
Beamforming:

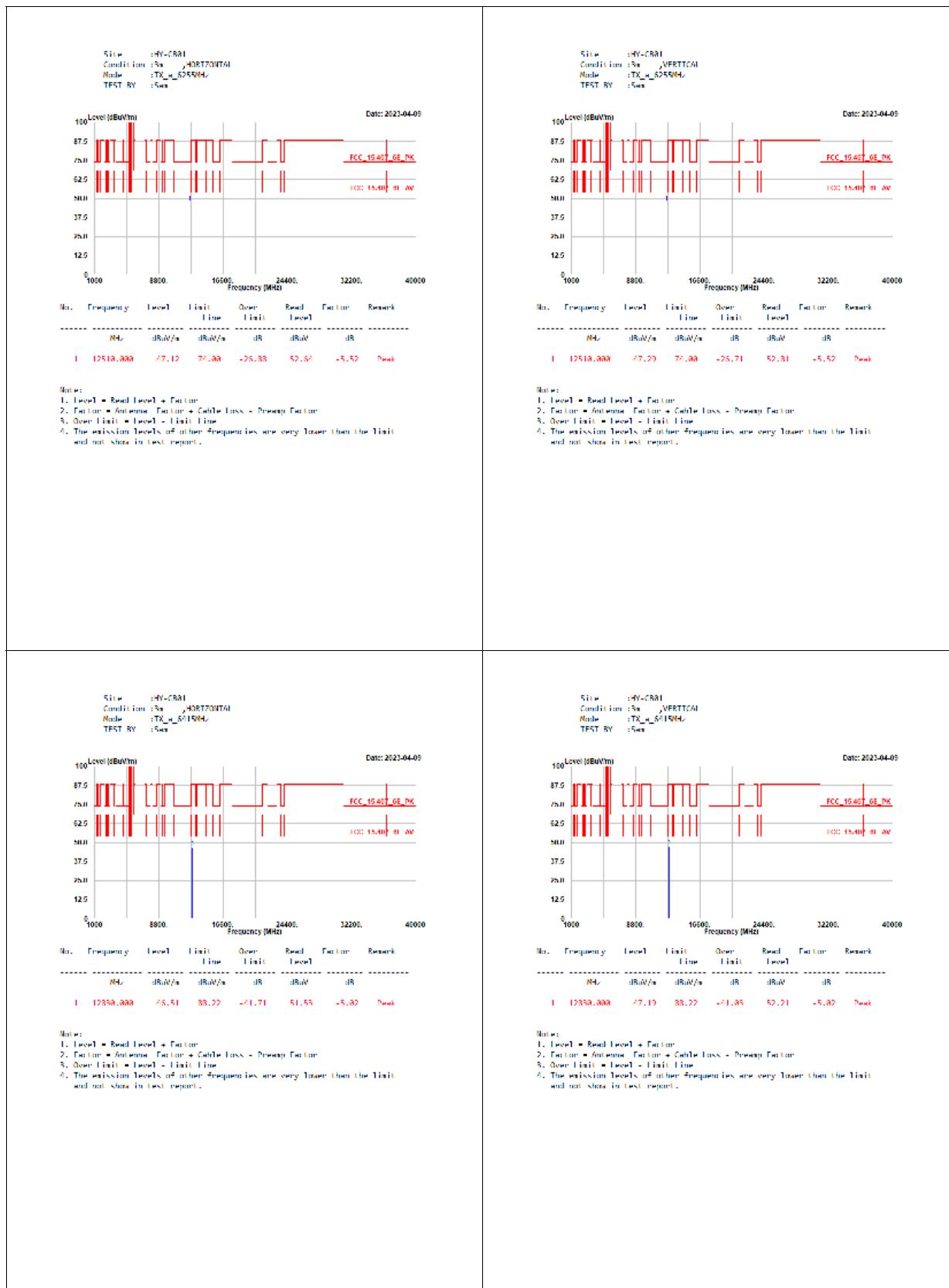
2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11ax-20 MHz	93.24	6.9000	145	200
802.11ax-40 MHz	92.92	6.8200	147	200
802.11ax-80 MHz	91.92	7.2800	137	200
802.11ax-160 MHz	96.12	7.9200	126	200

Note: Duty Cycle Refer to Section 10.

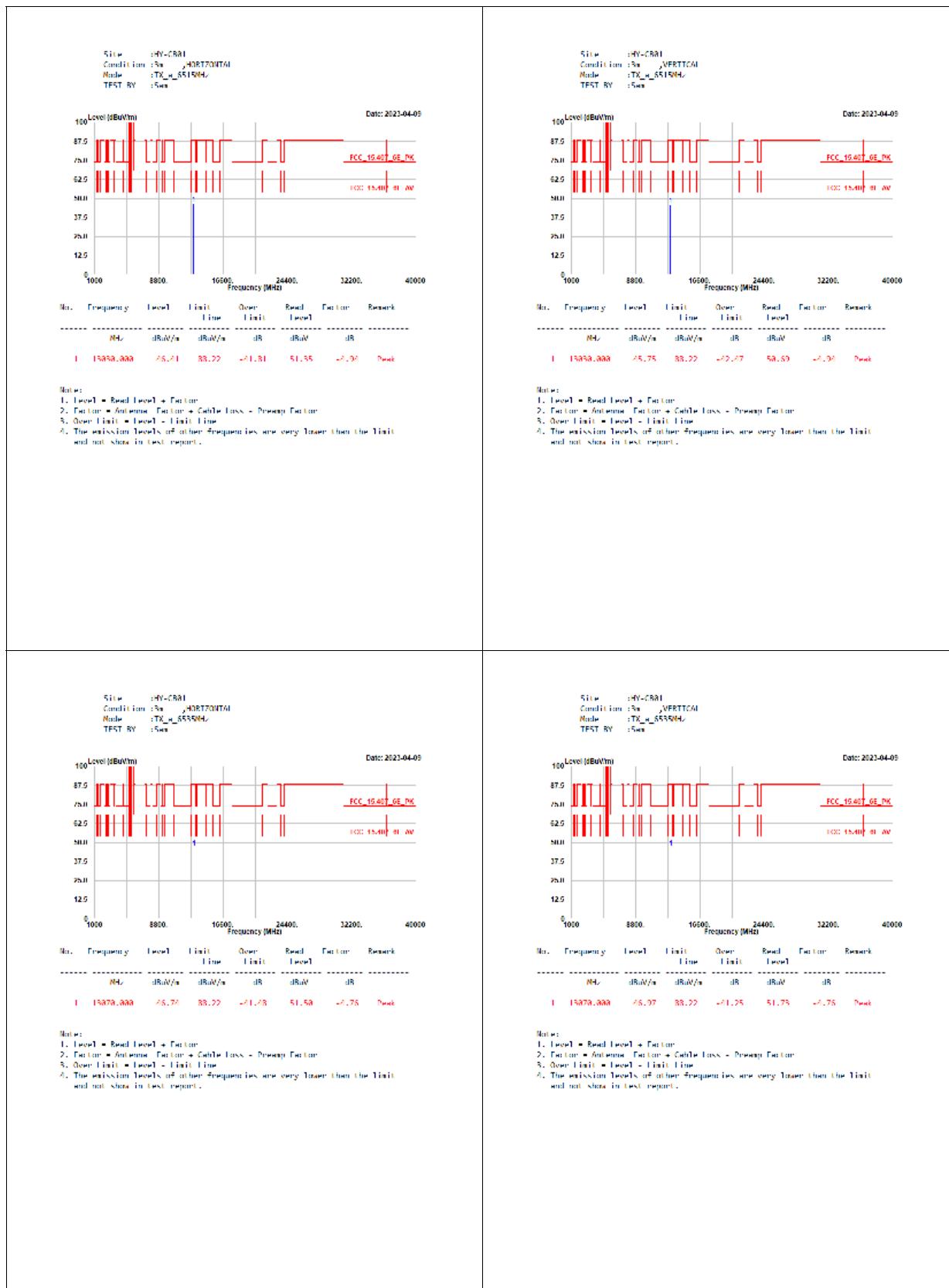
6.4. Test Result of Radiated Emissions

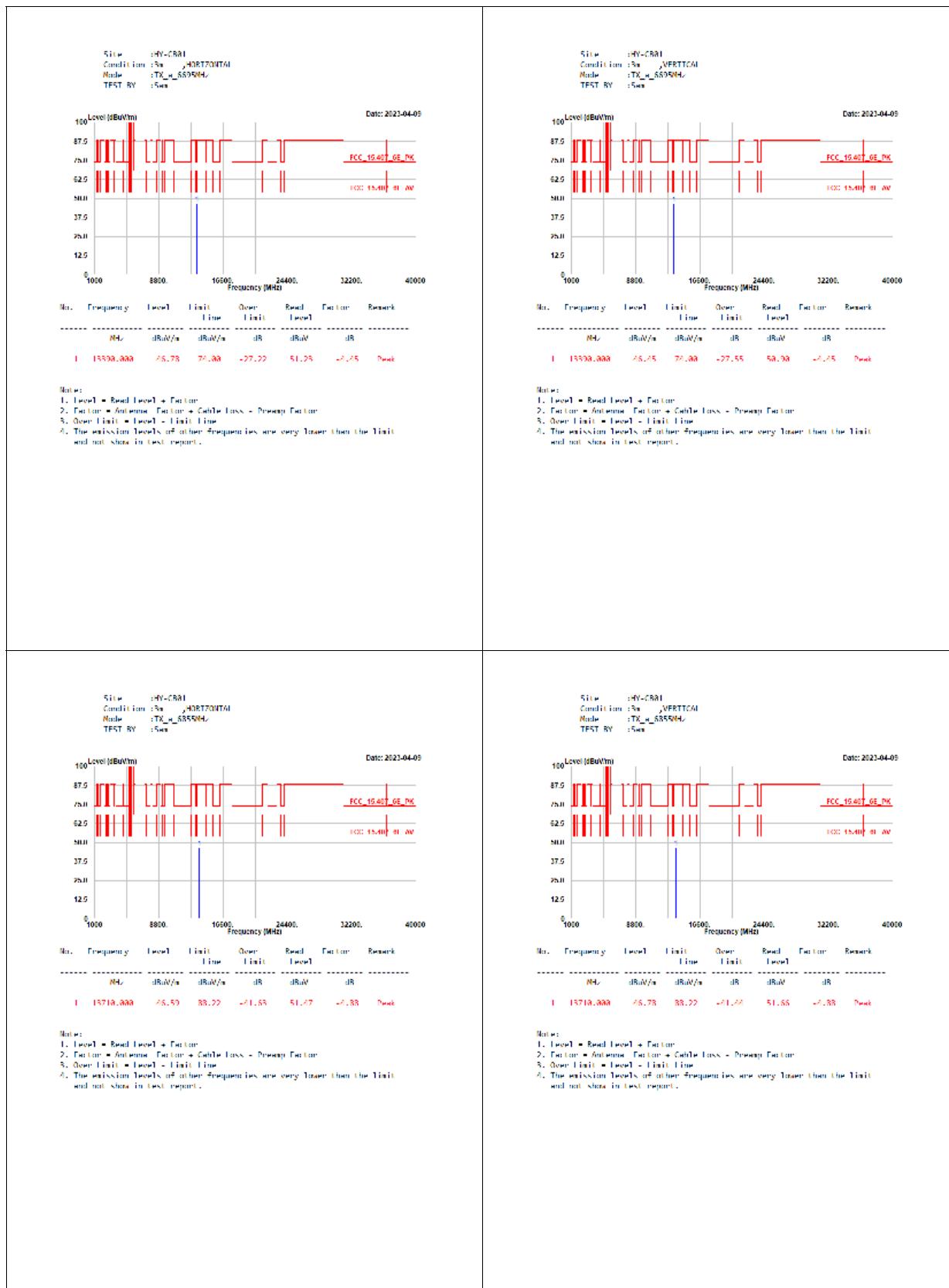
CDD

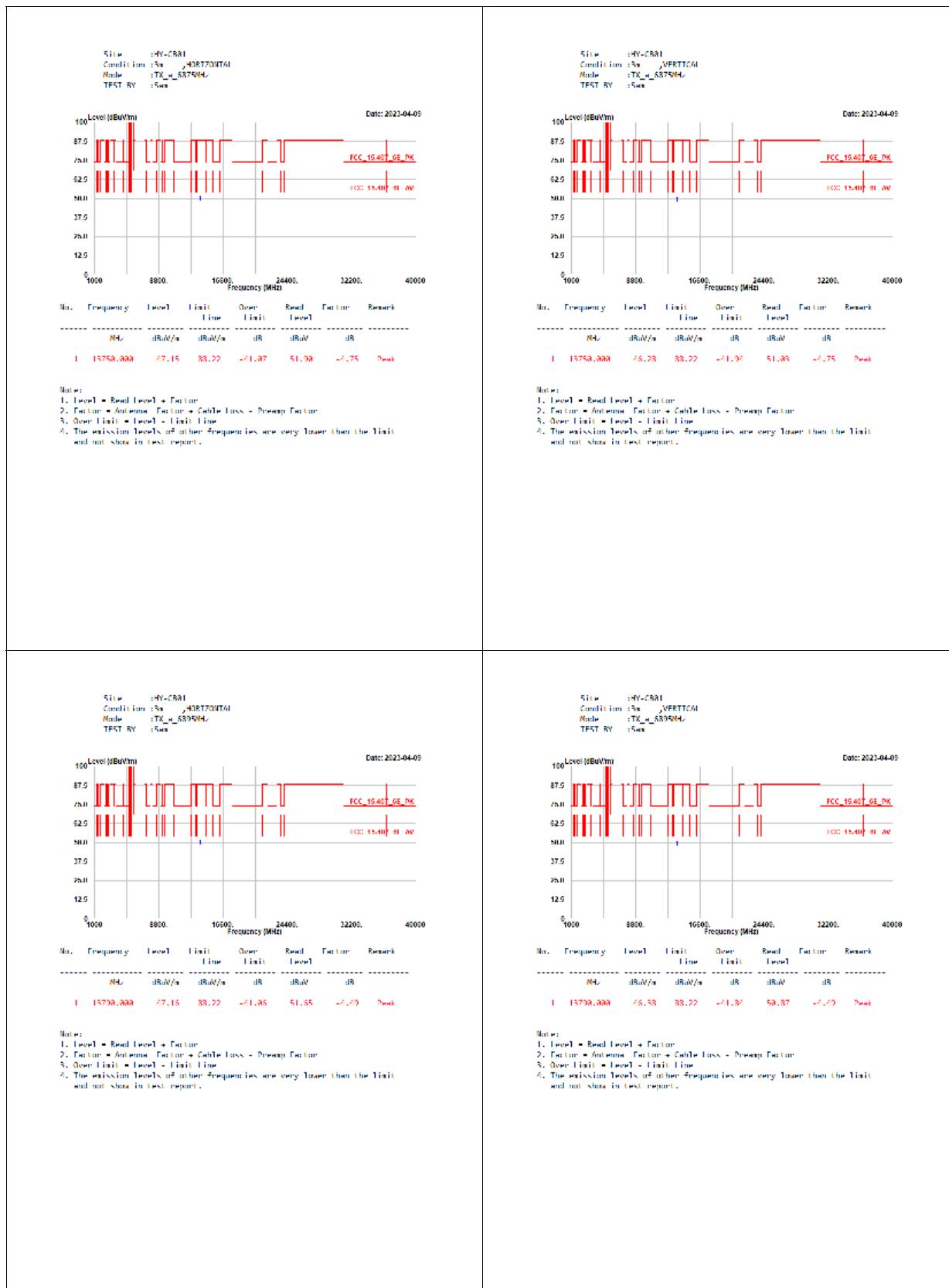


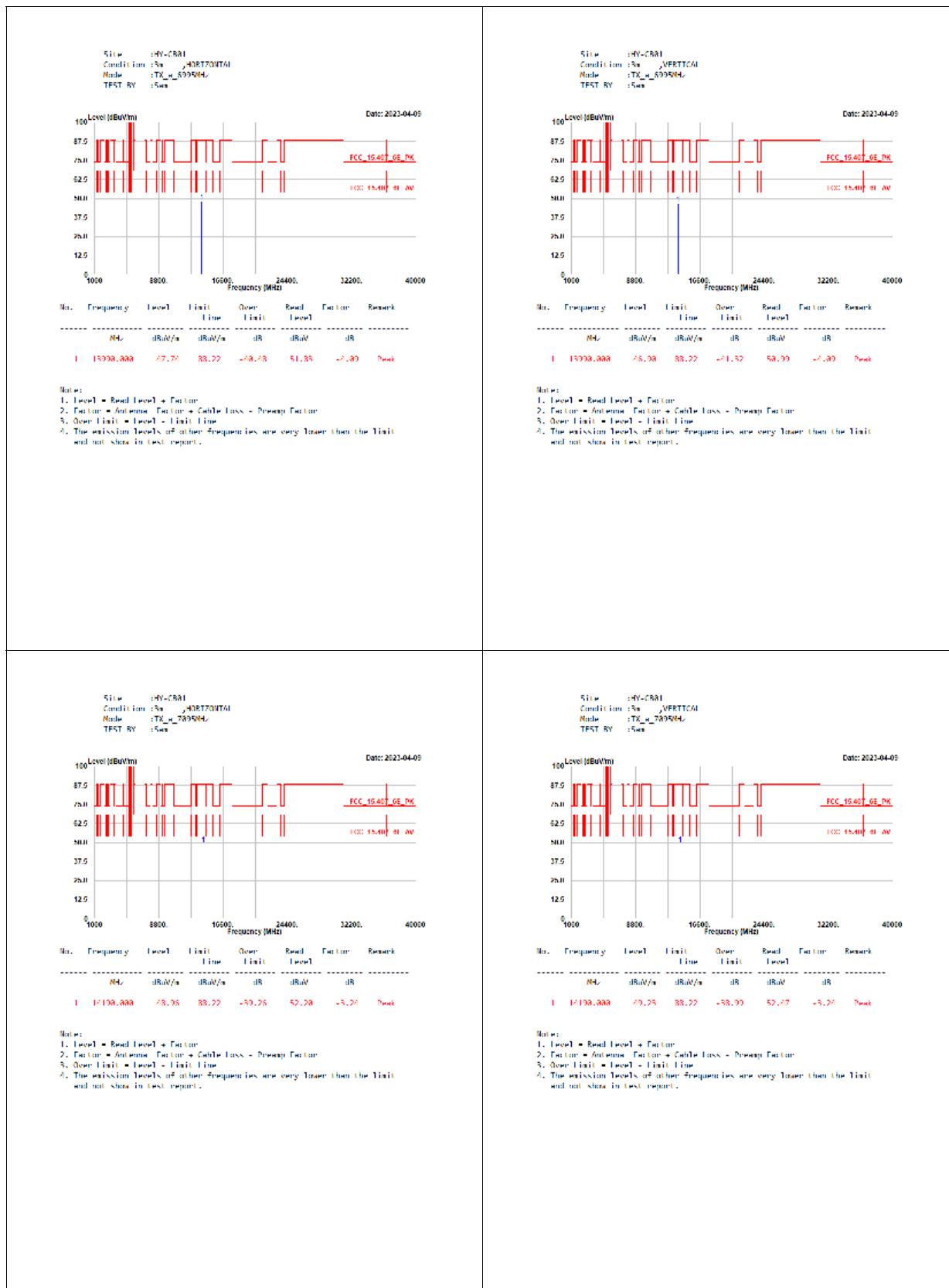


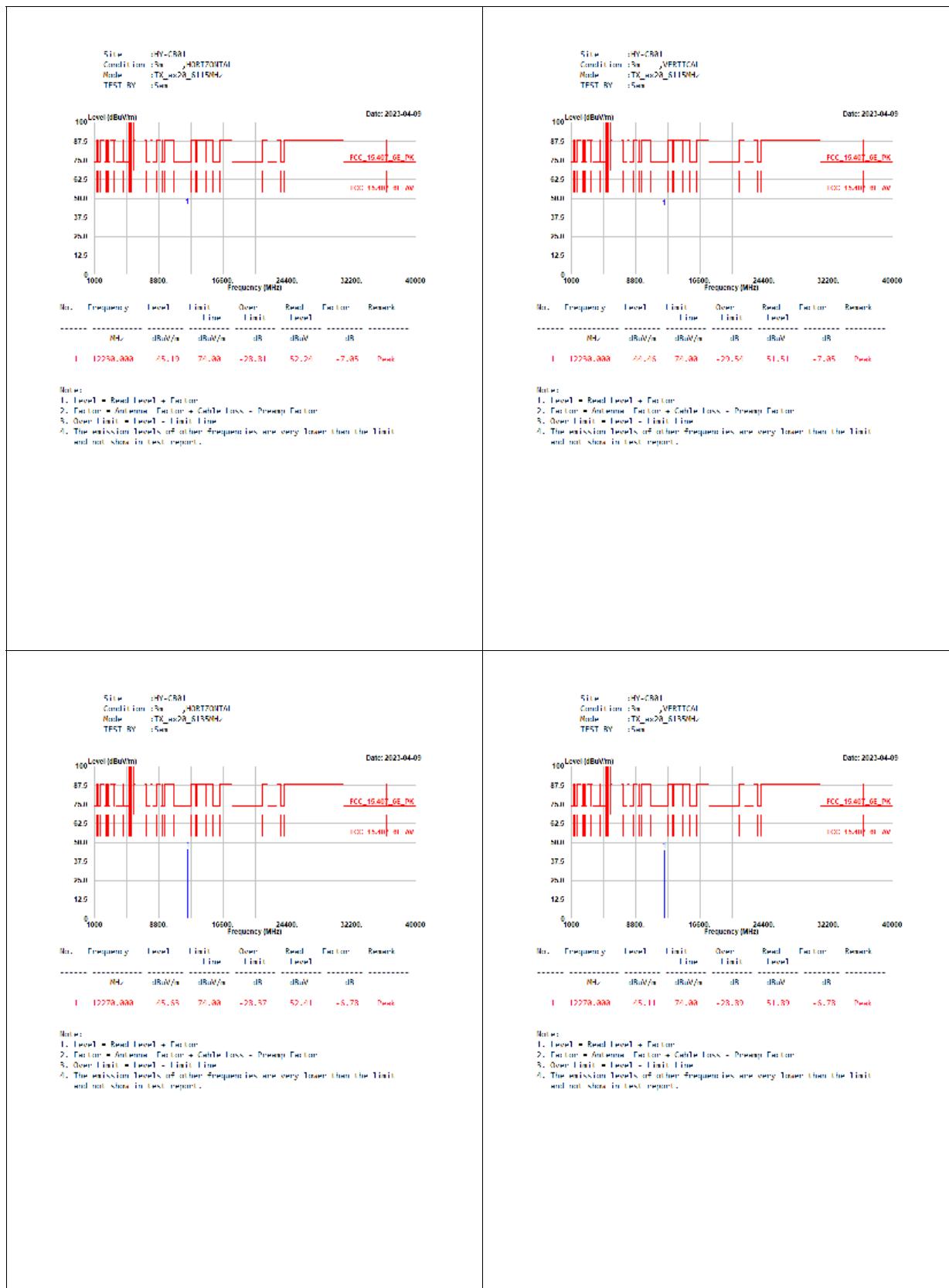


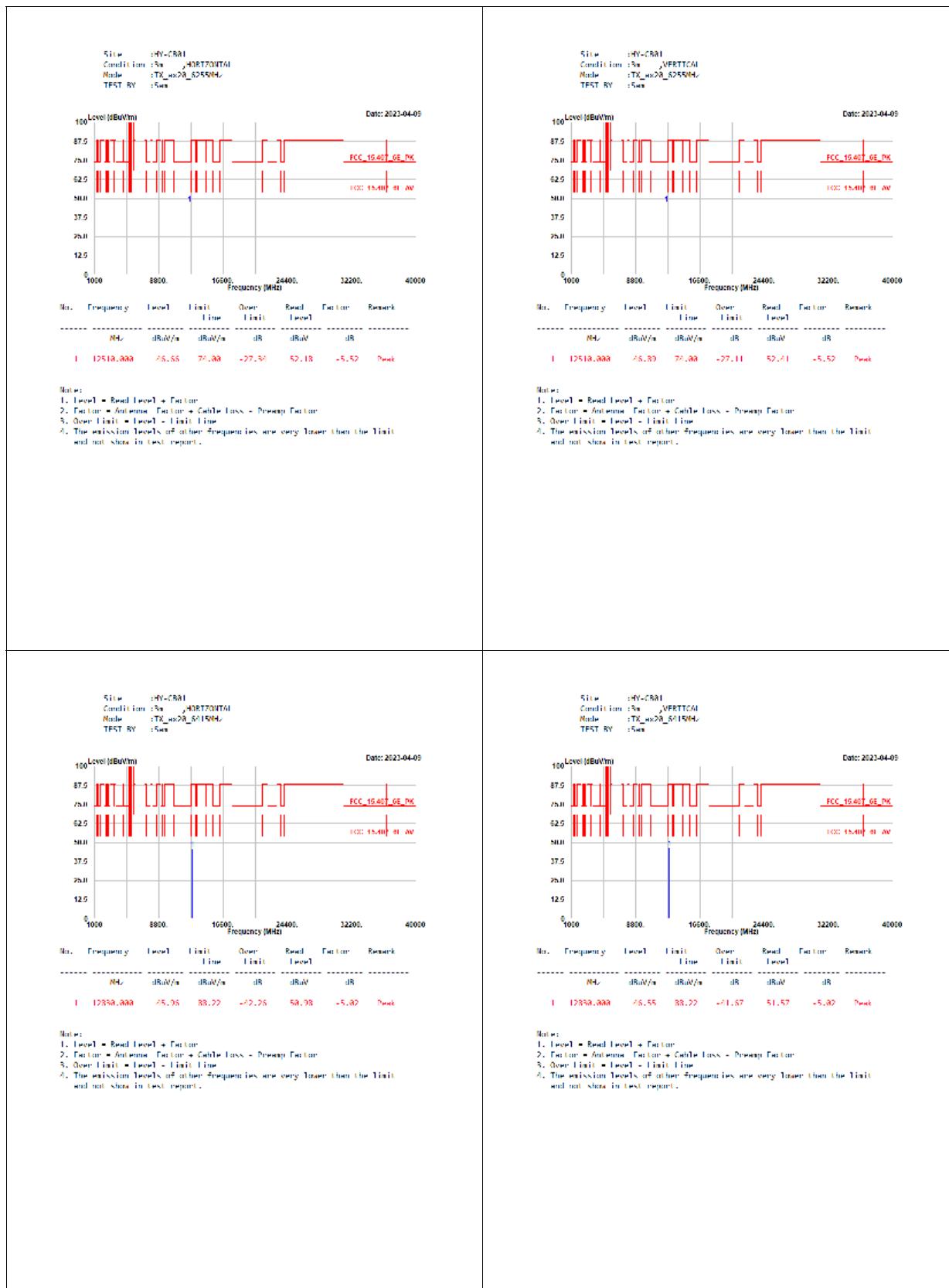


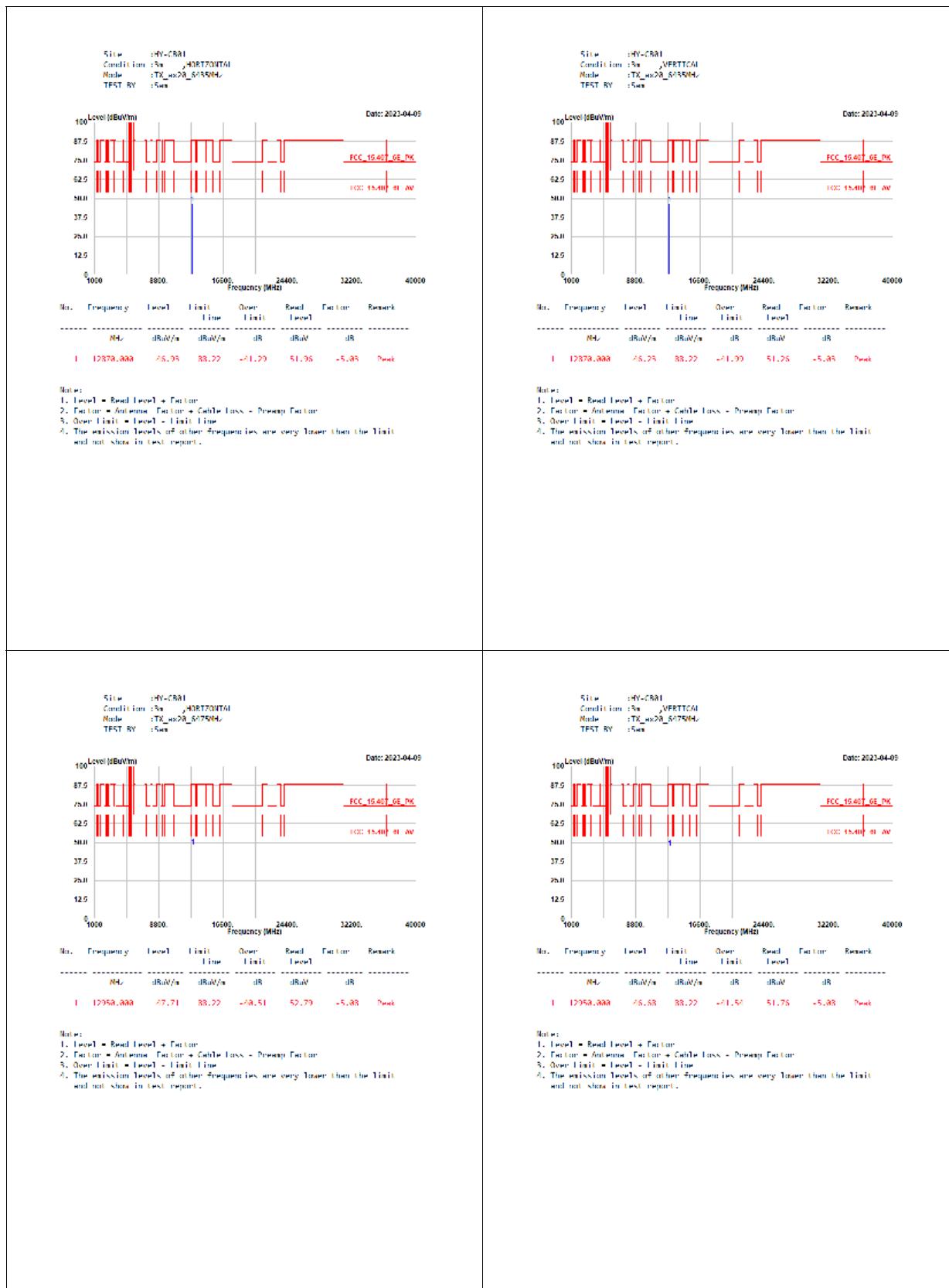


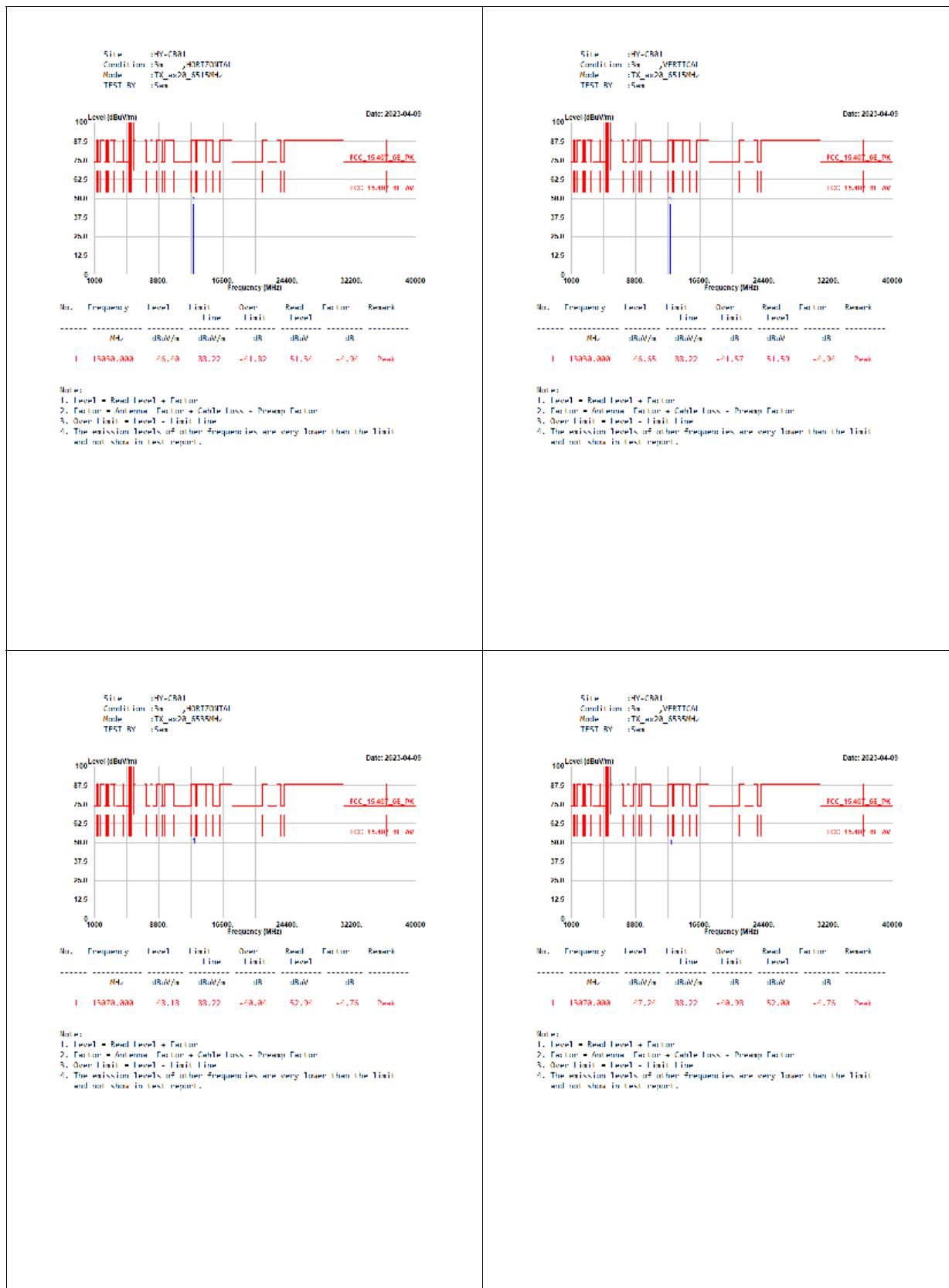


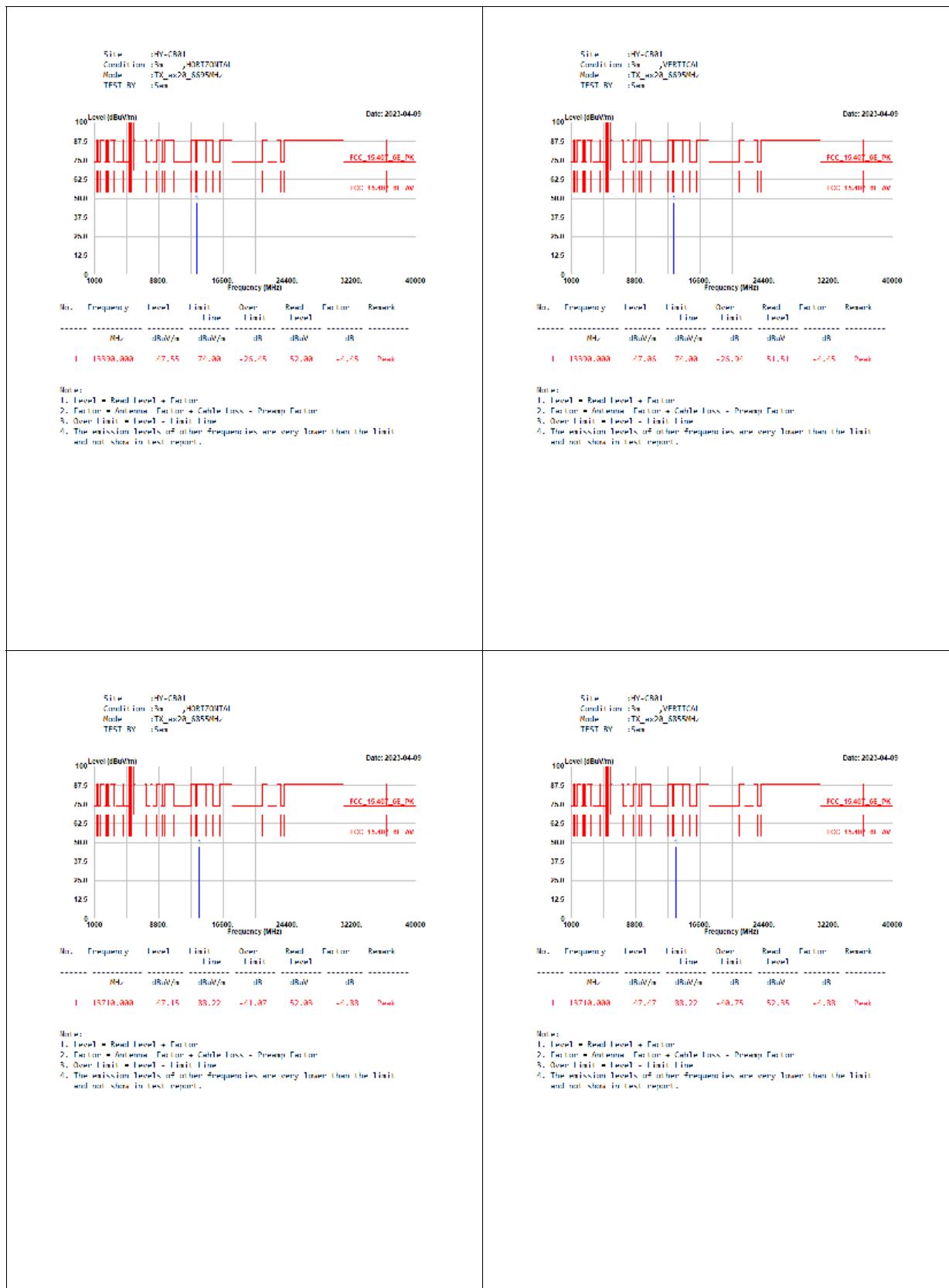




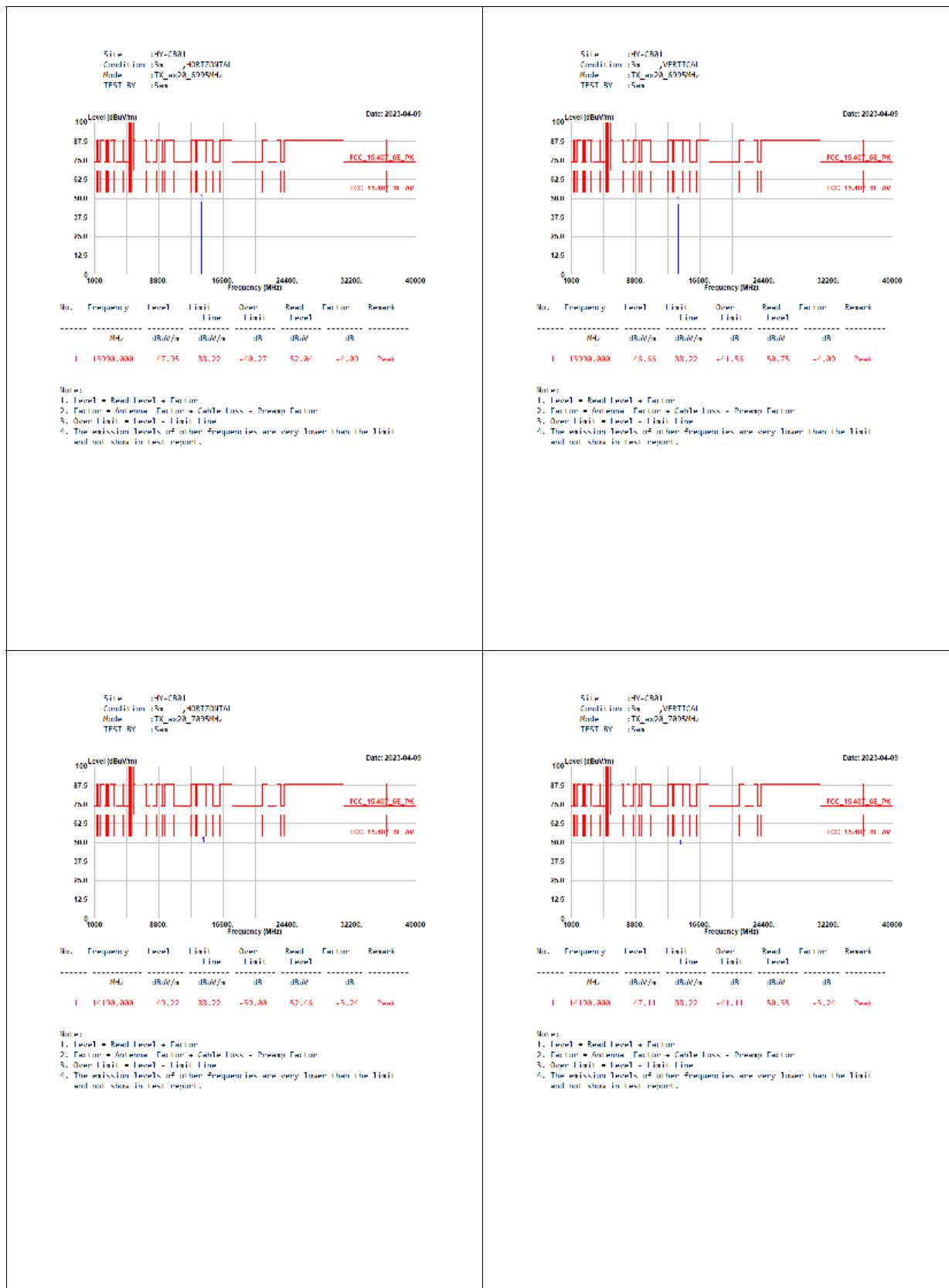




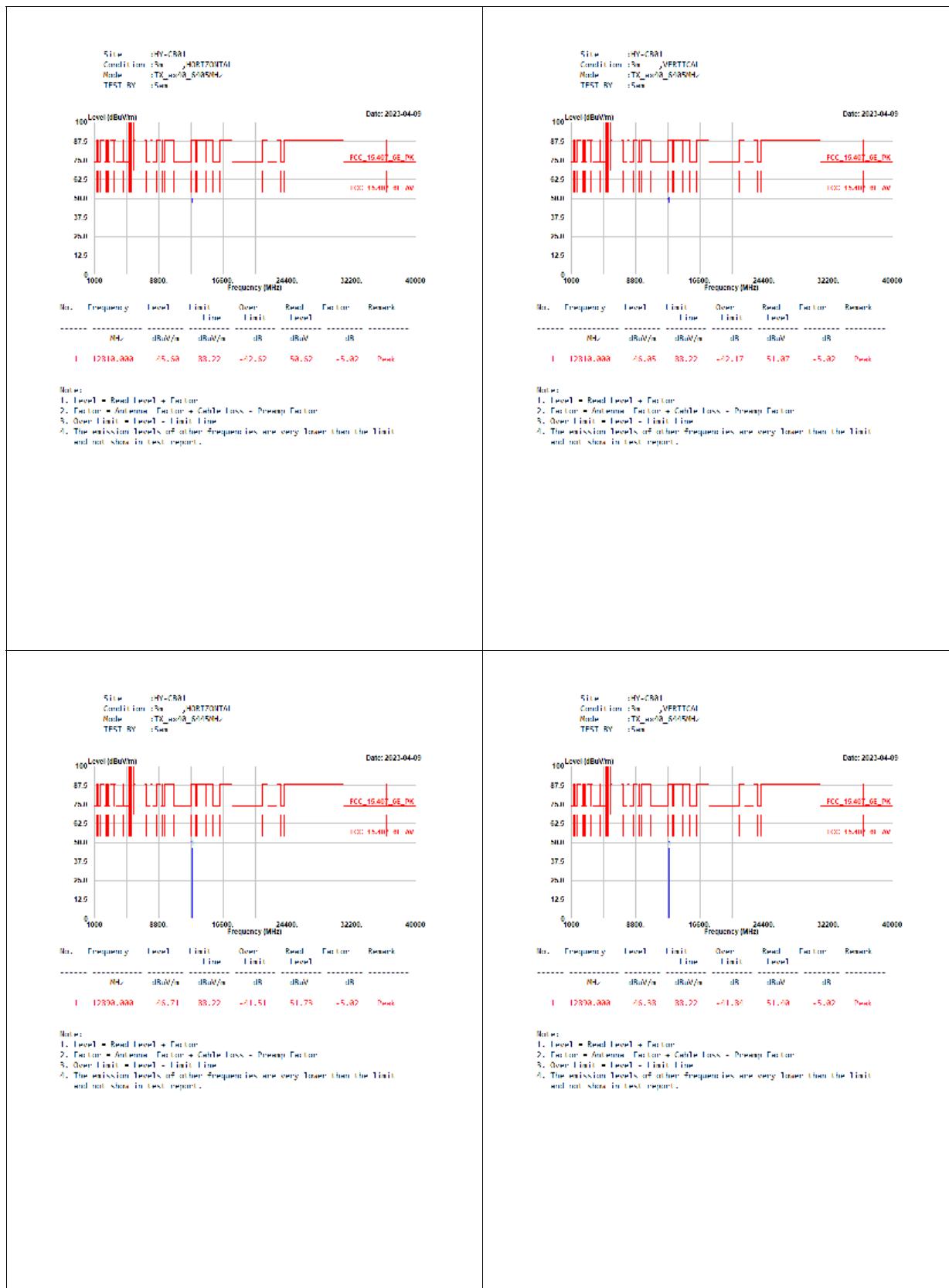


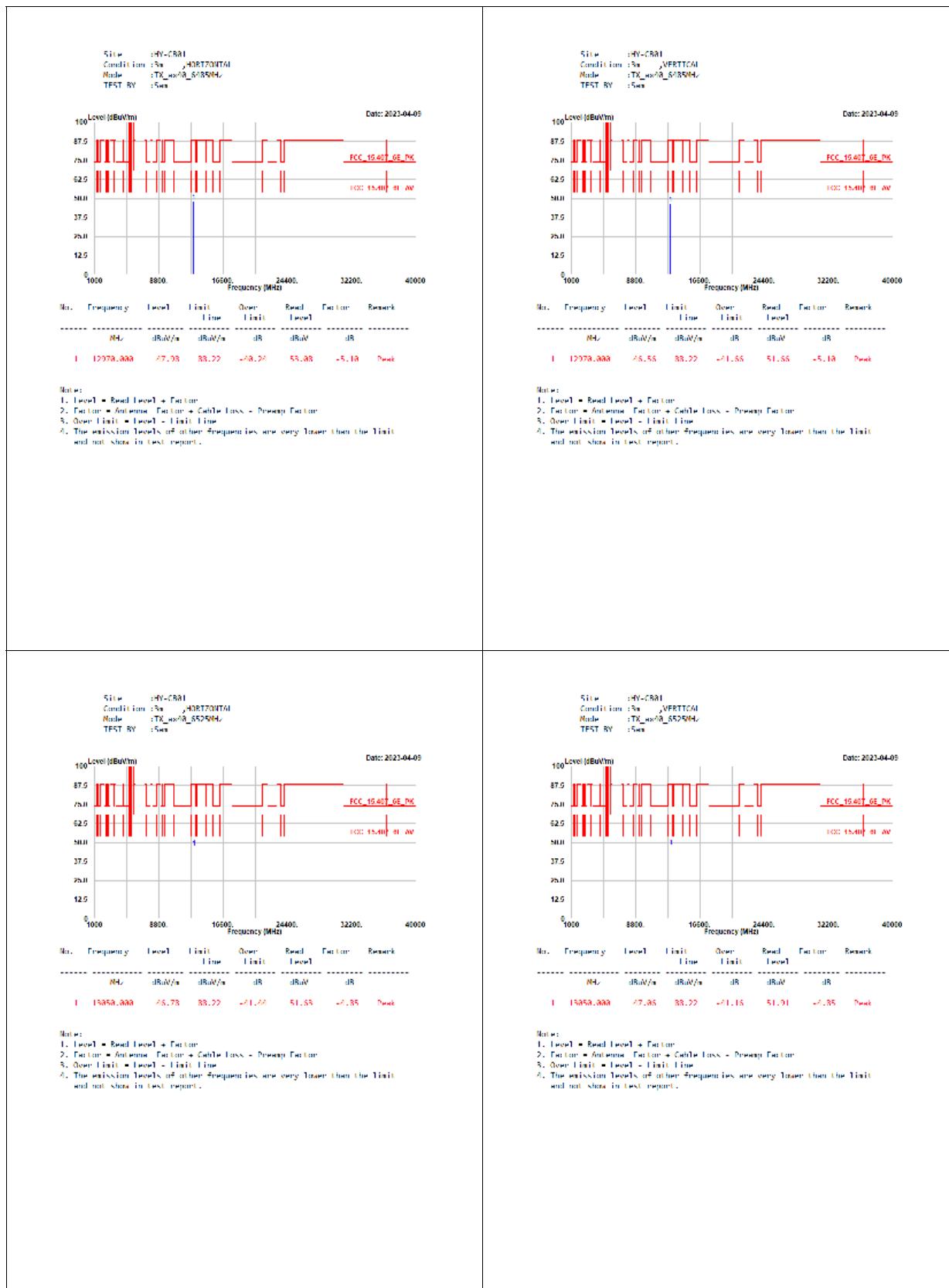


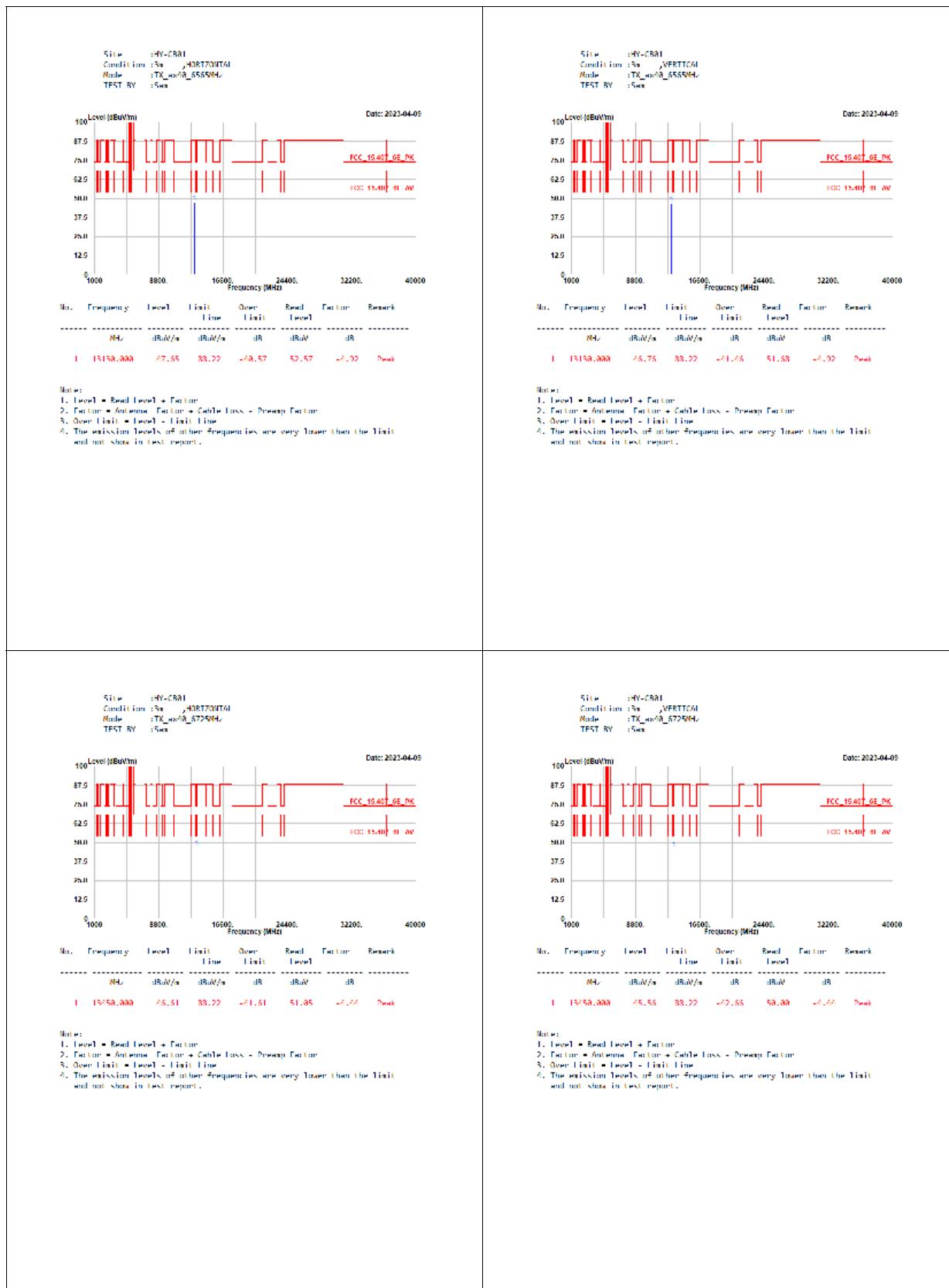


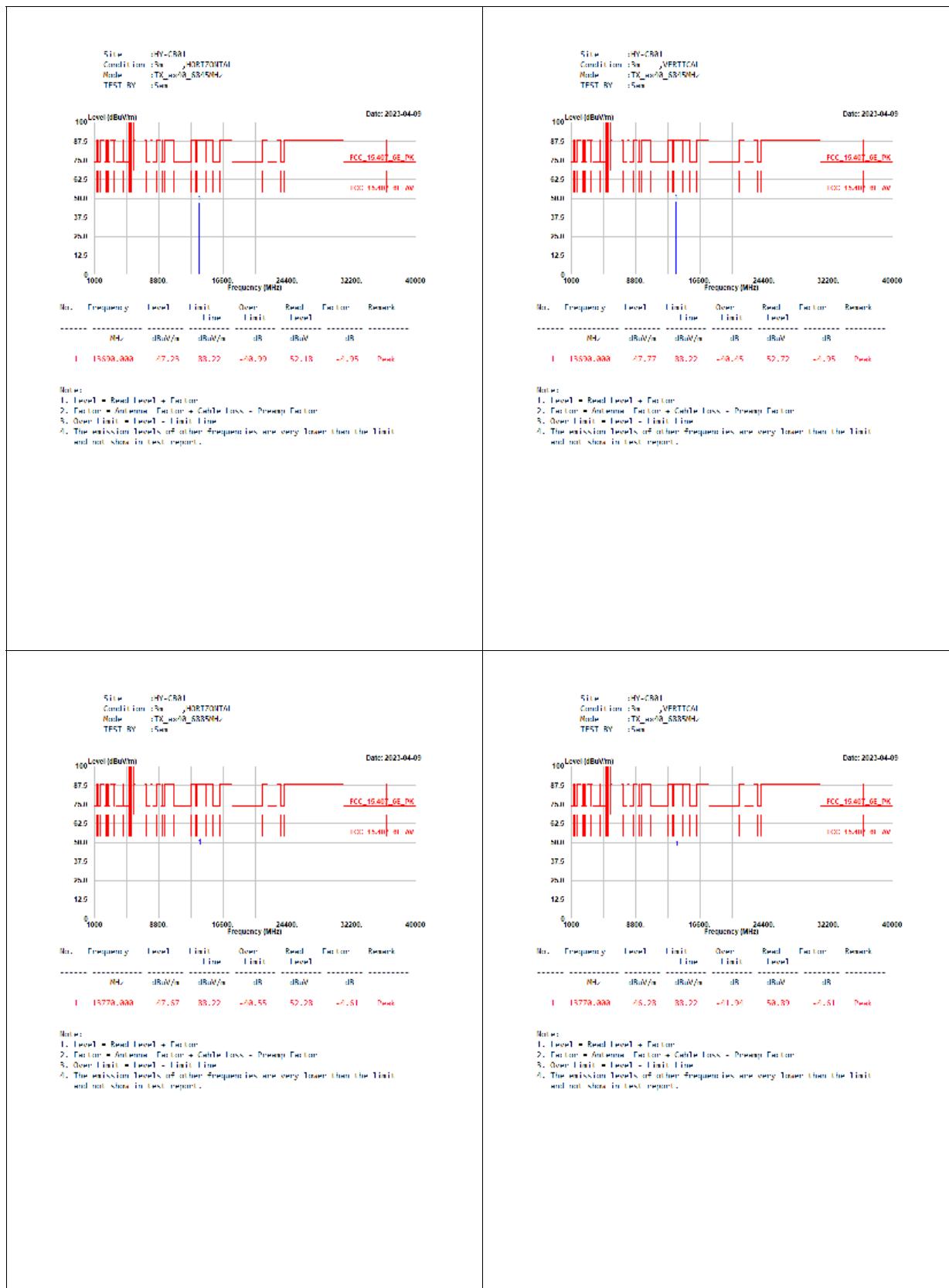


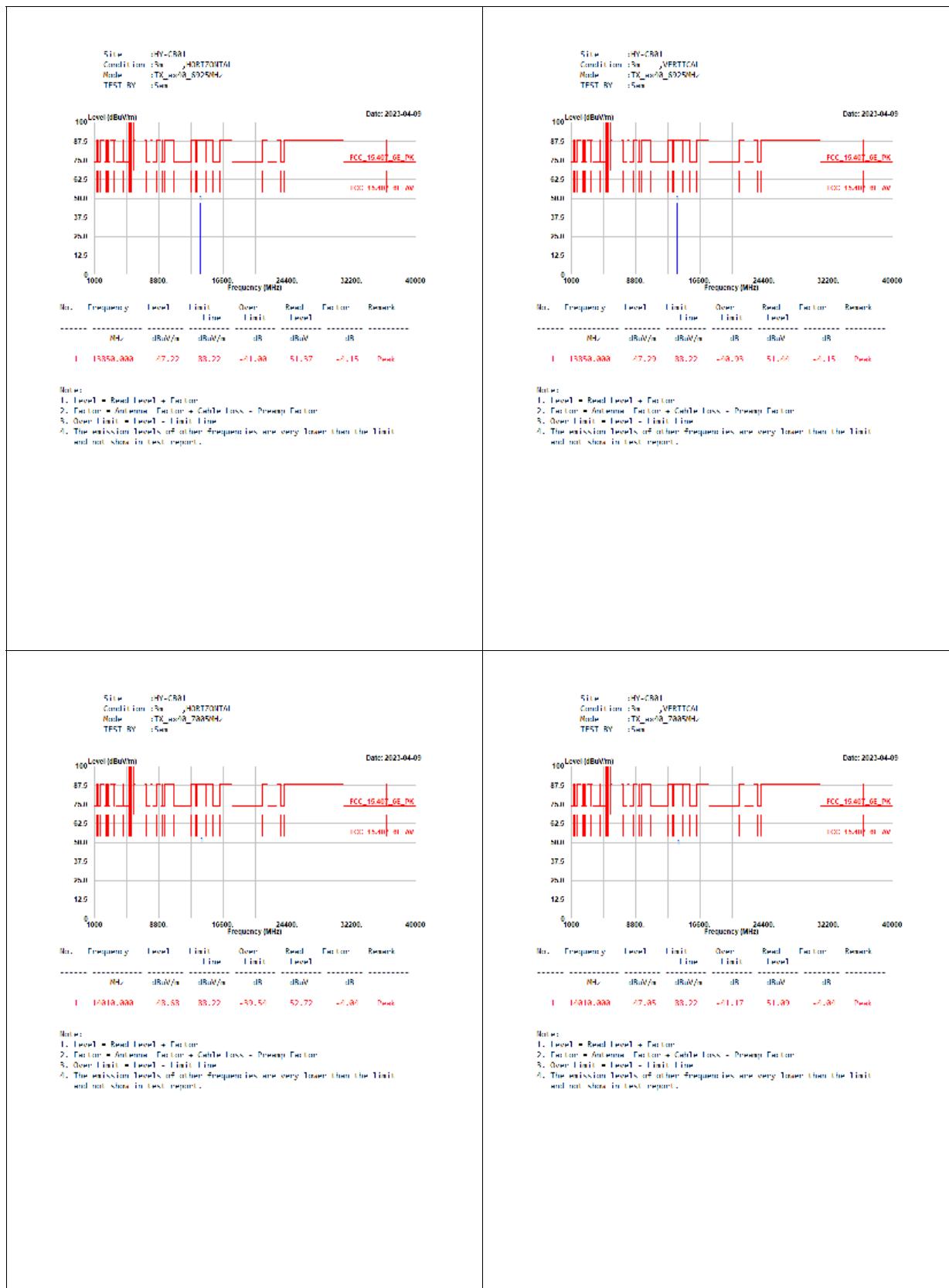


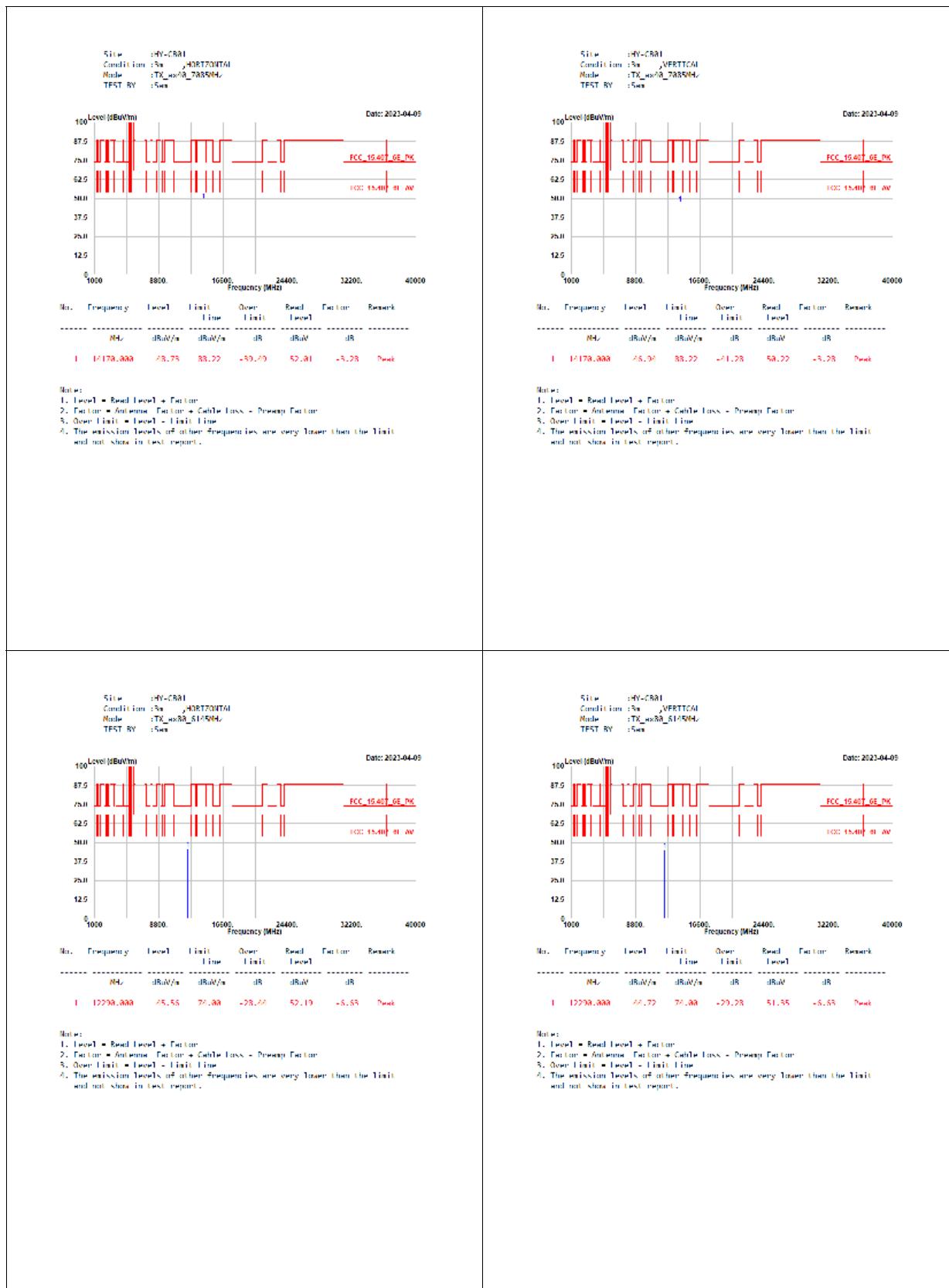


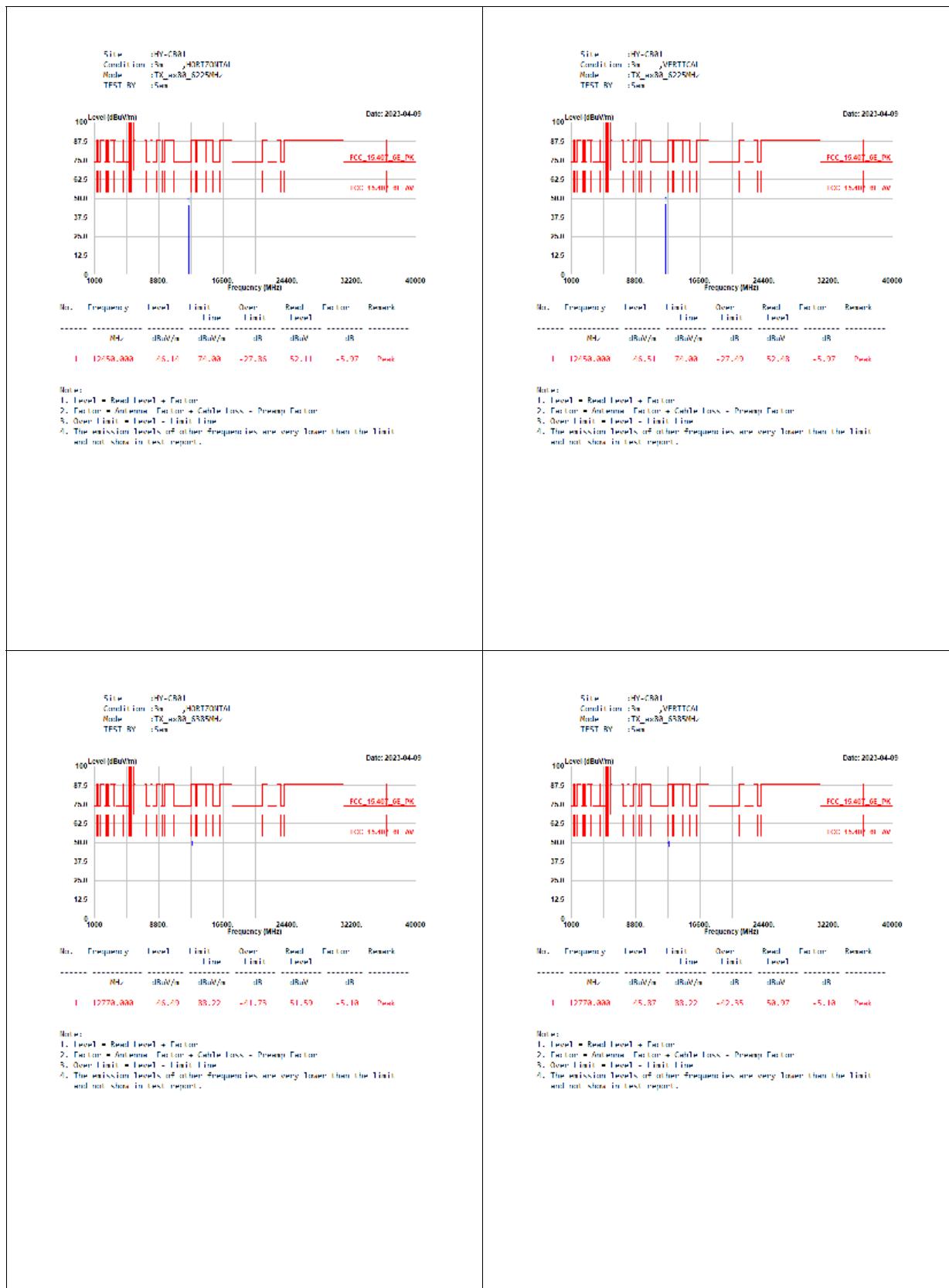


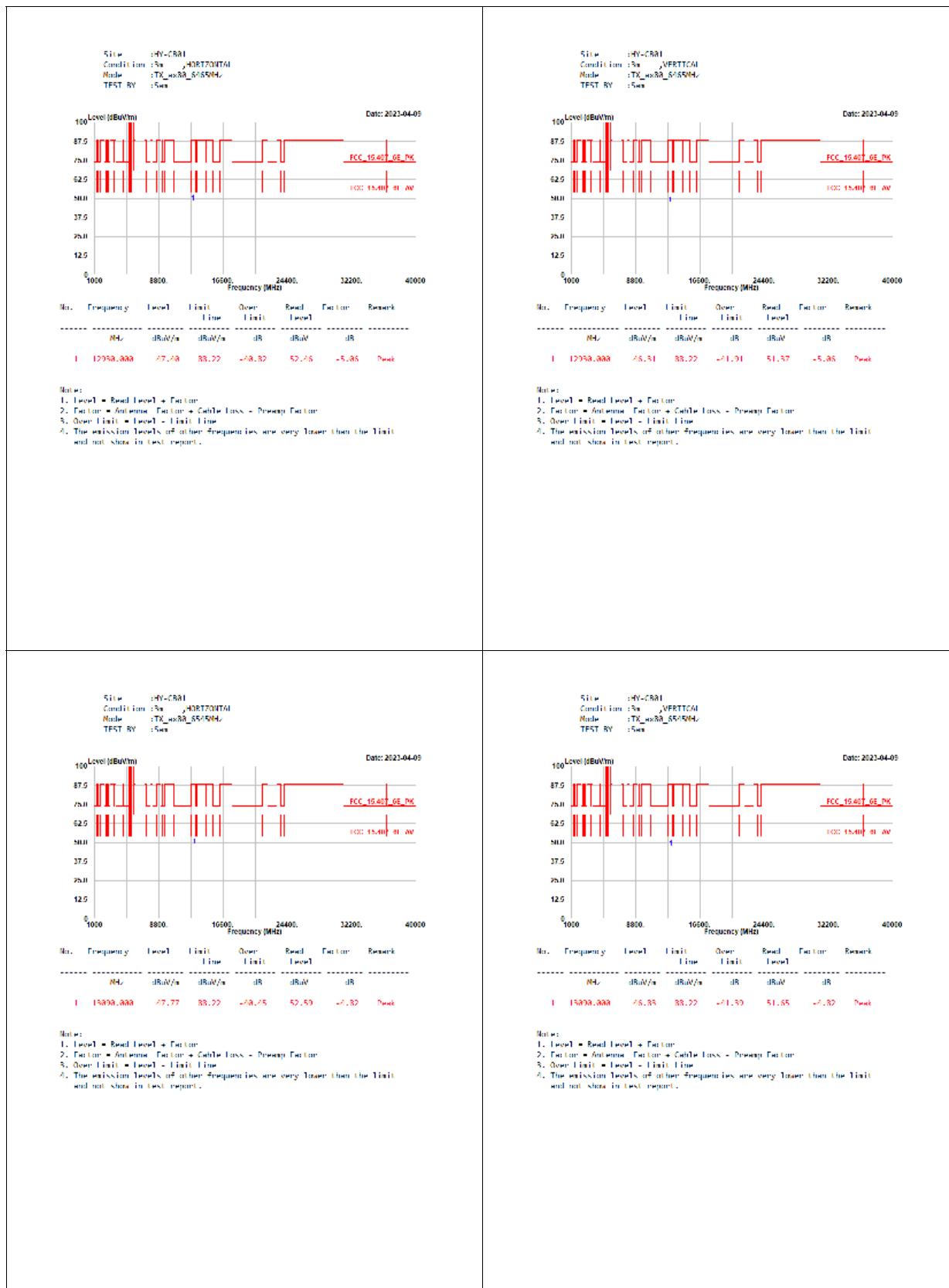


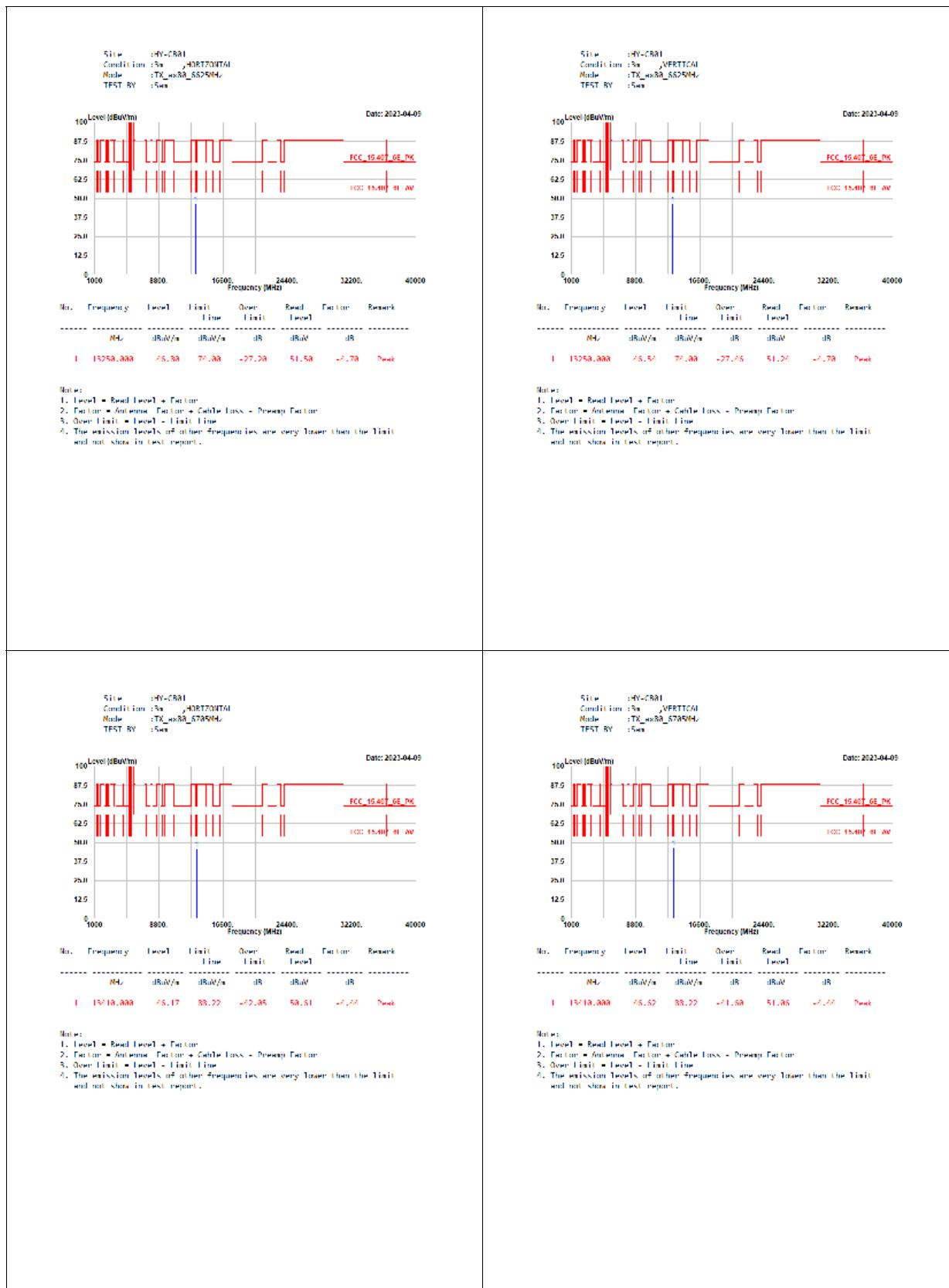


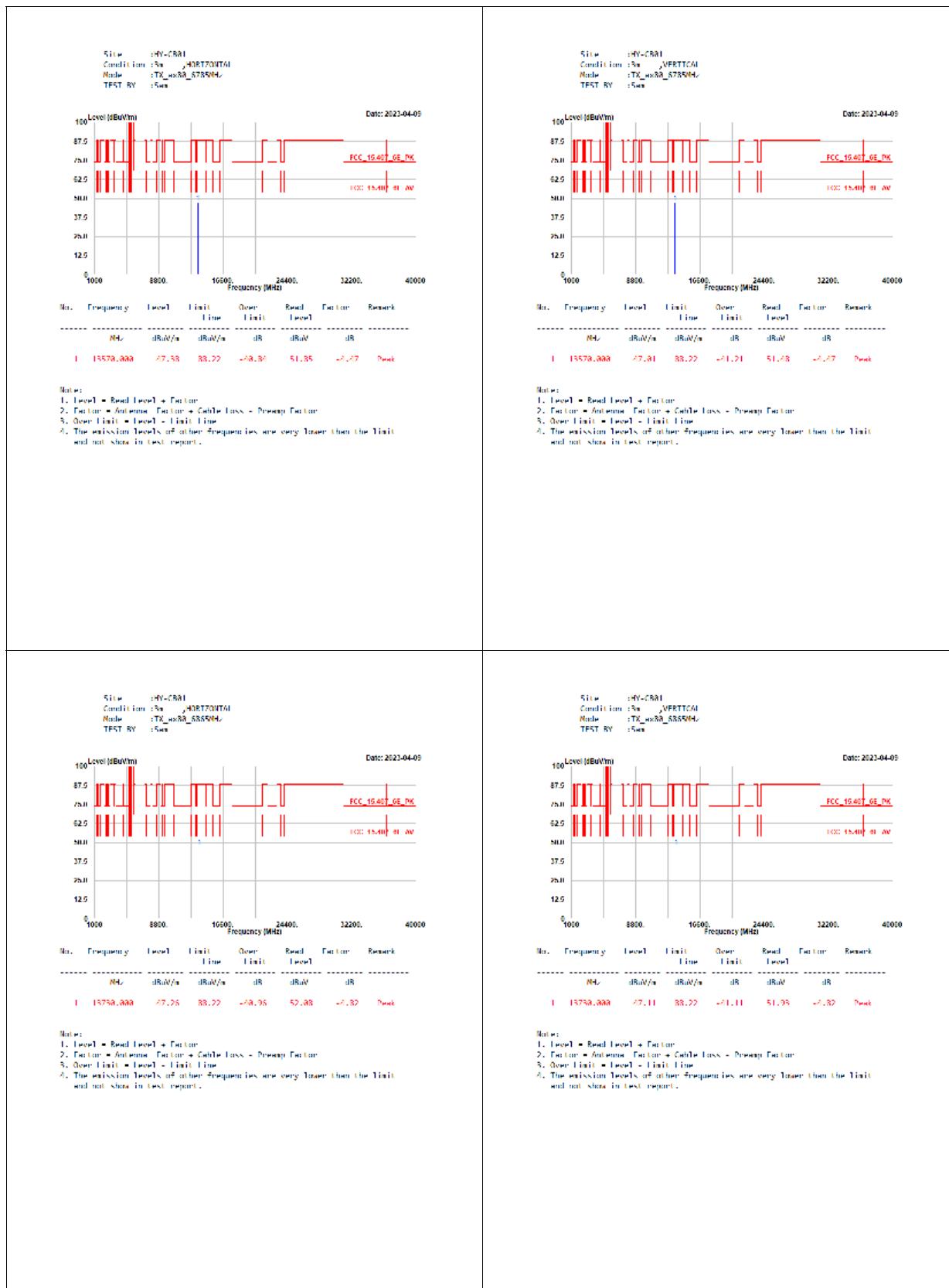




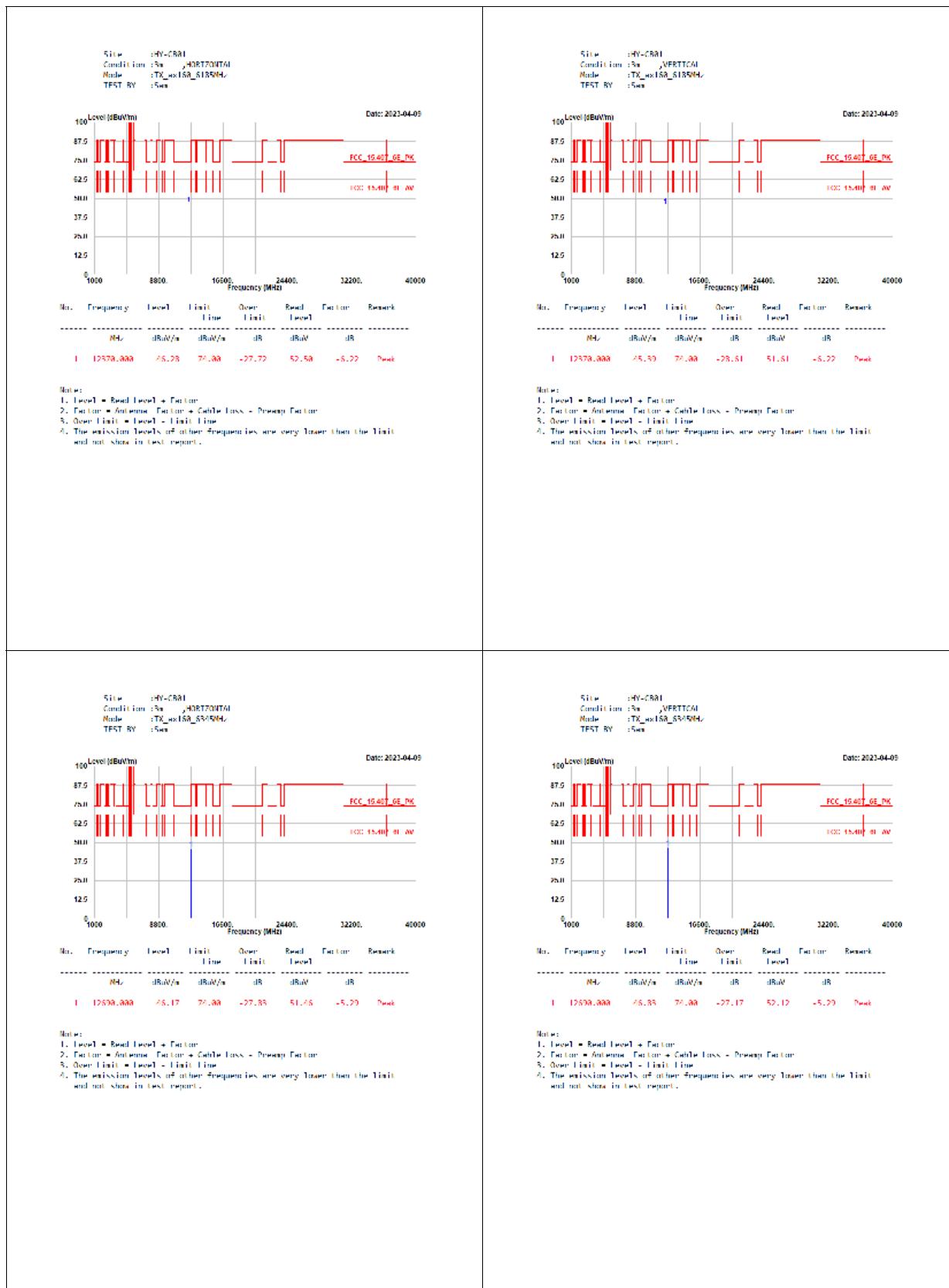


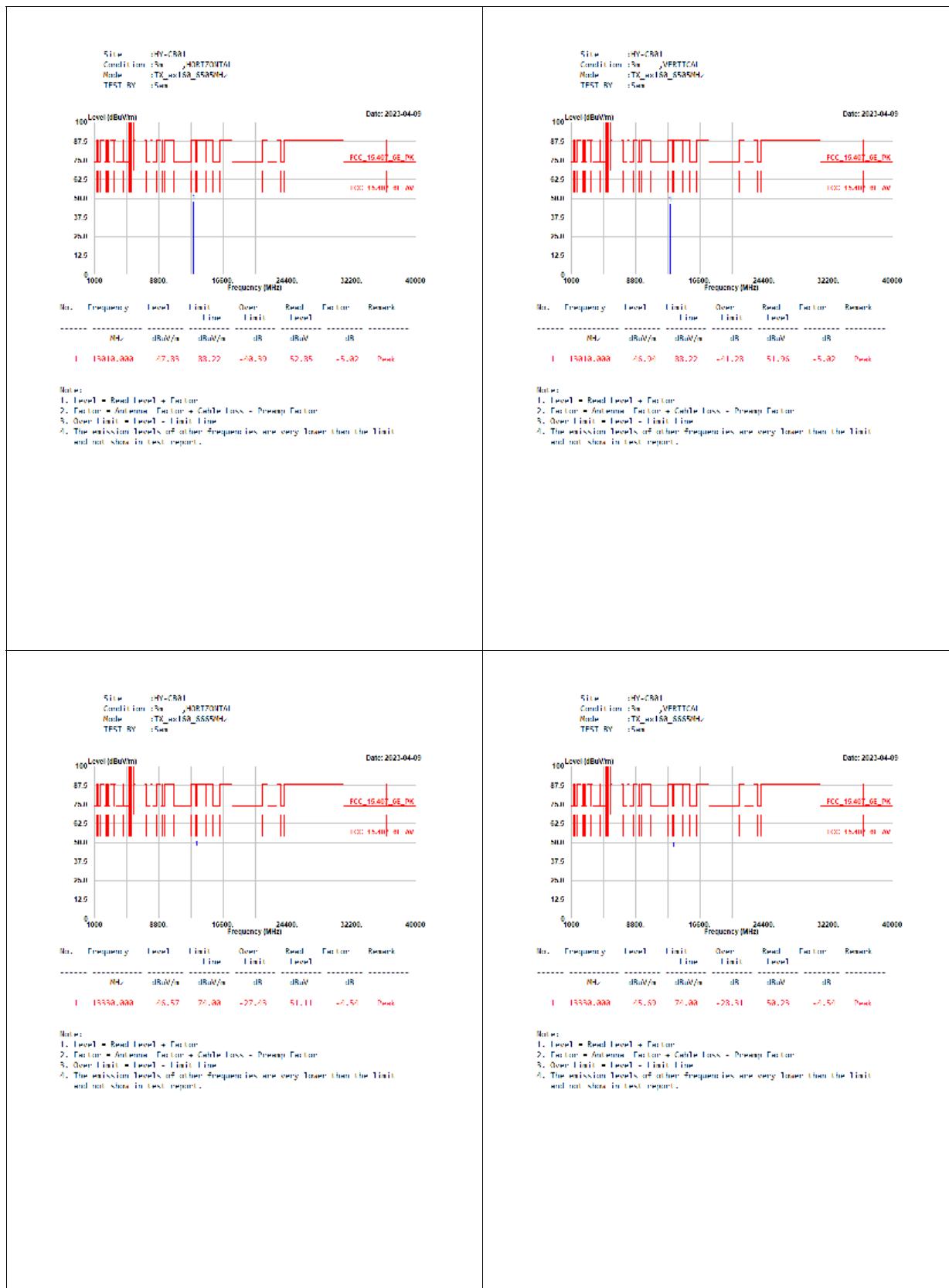


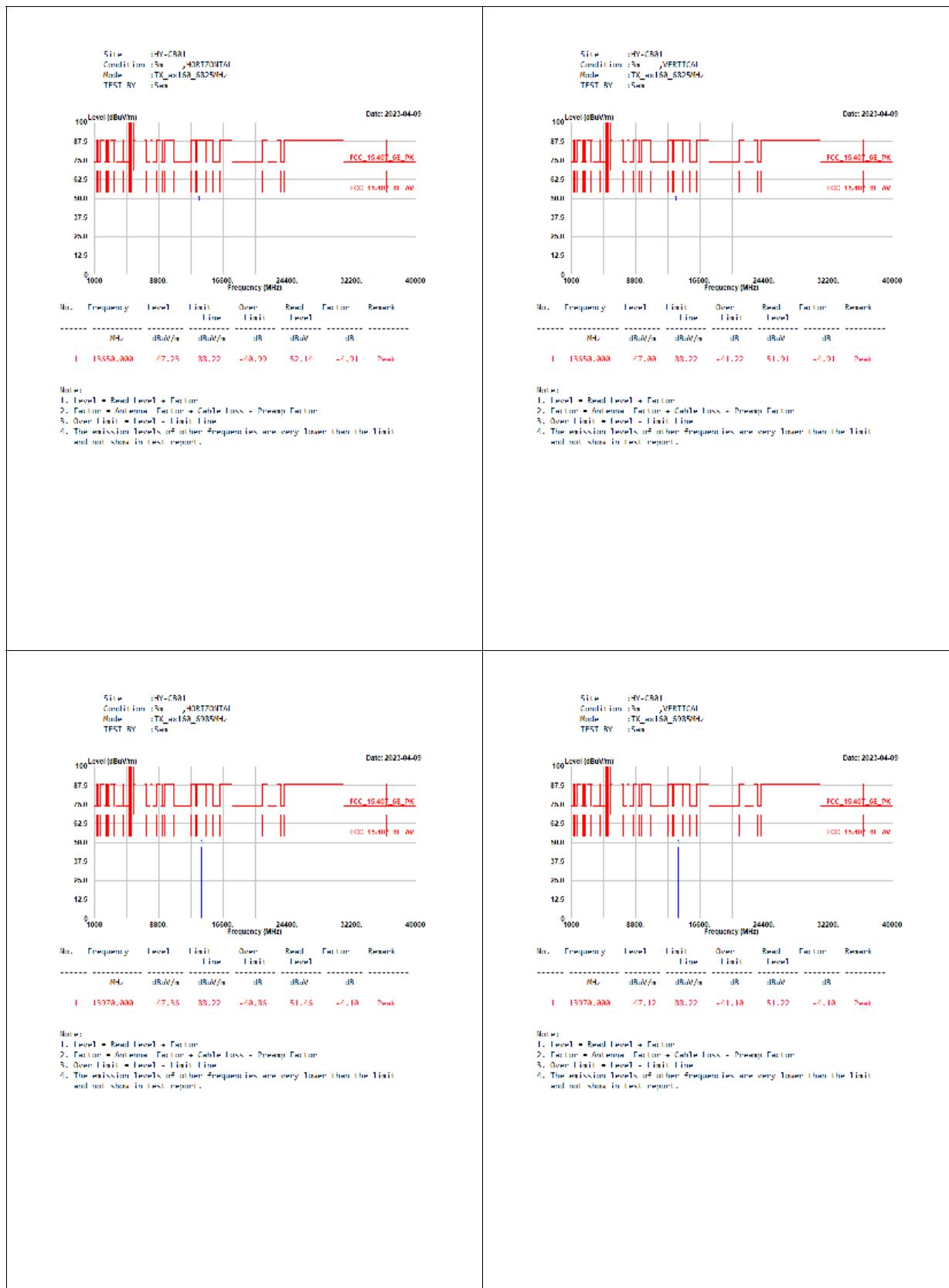


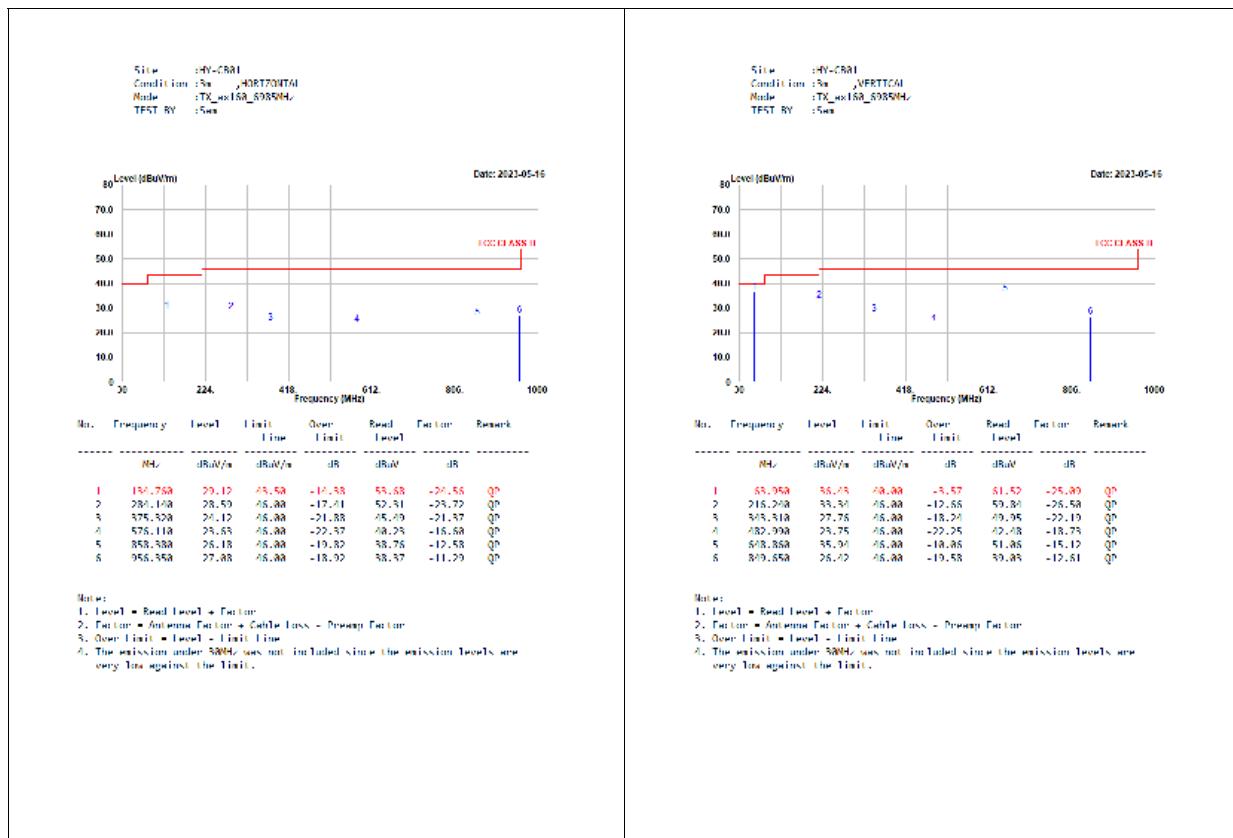




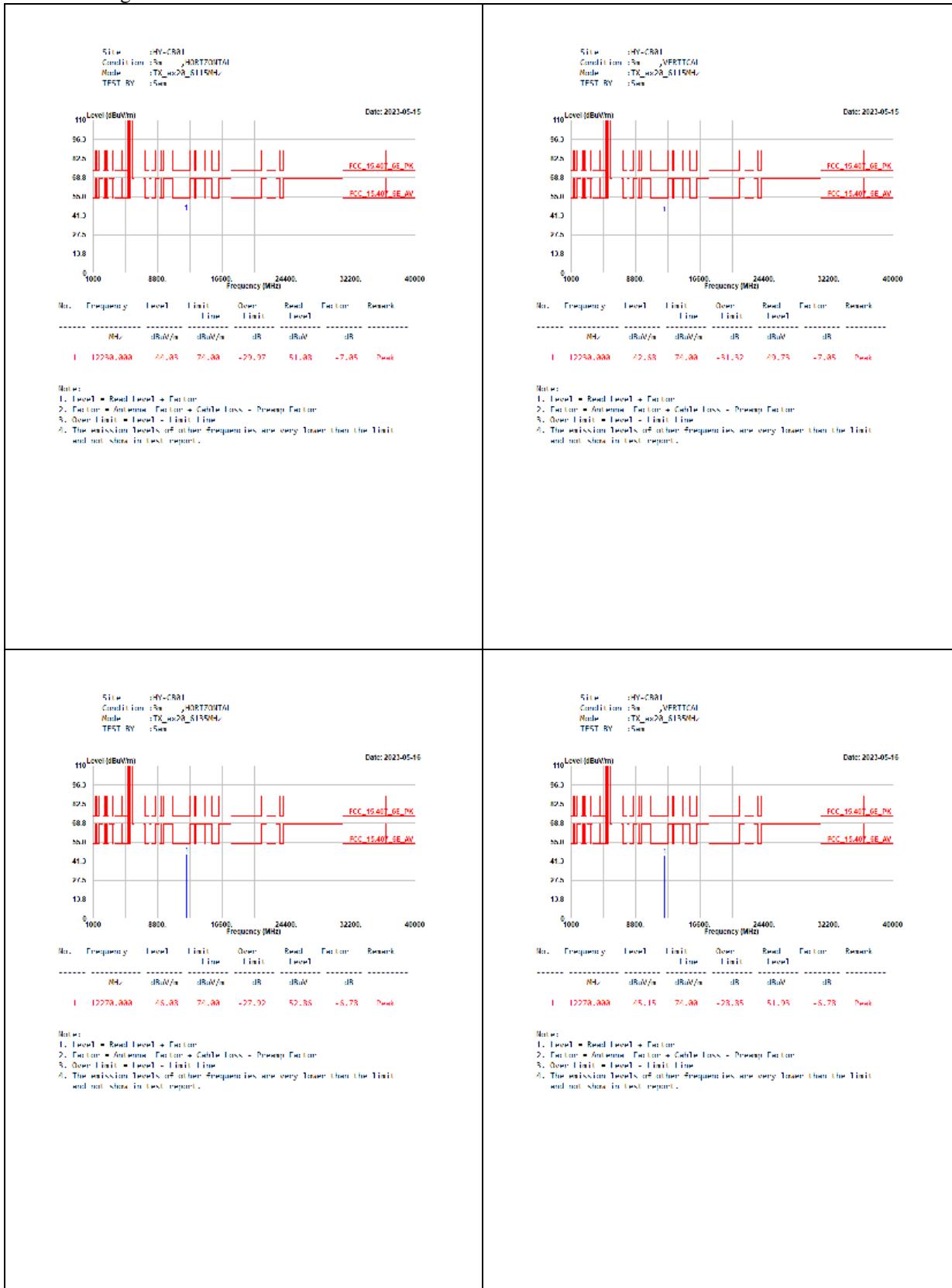


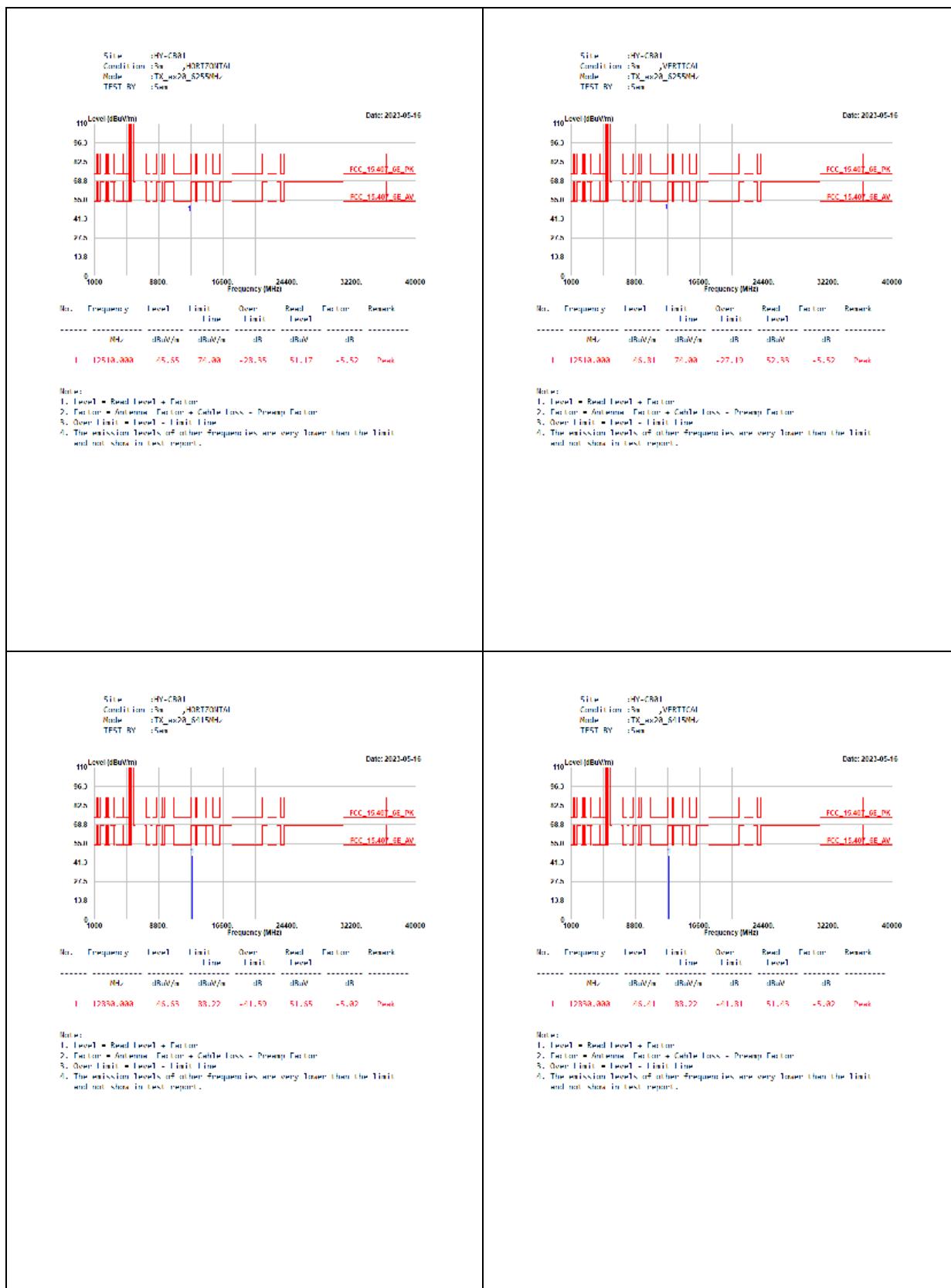


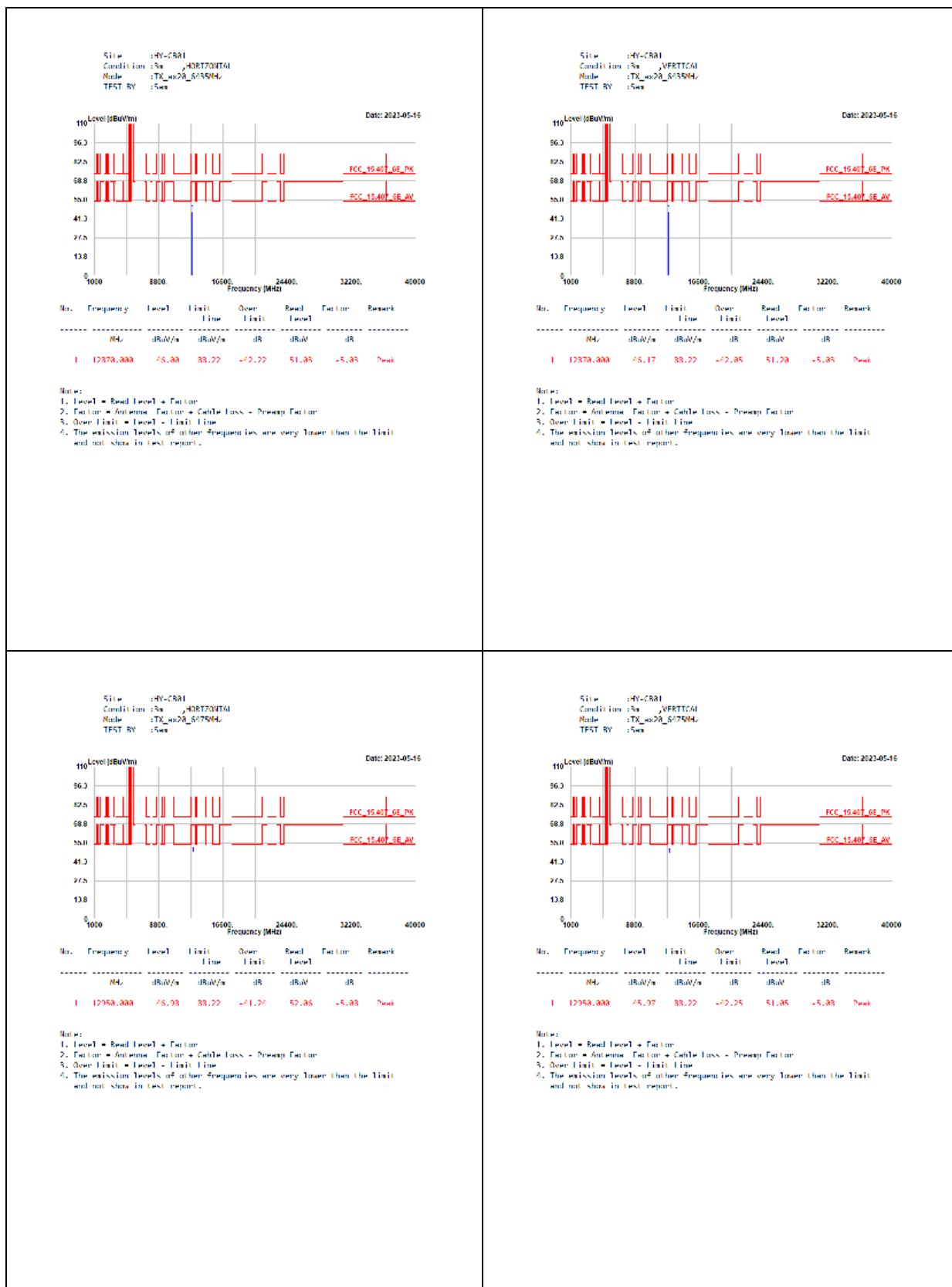


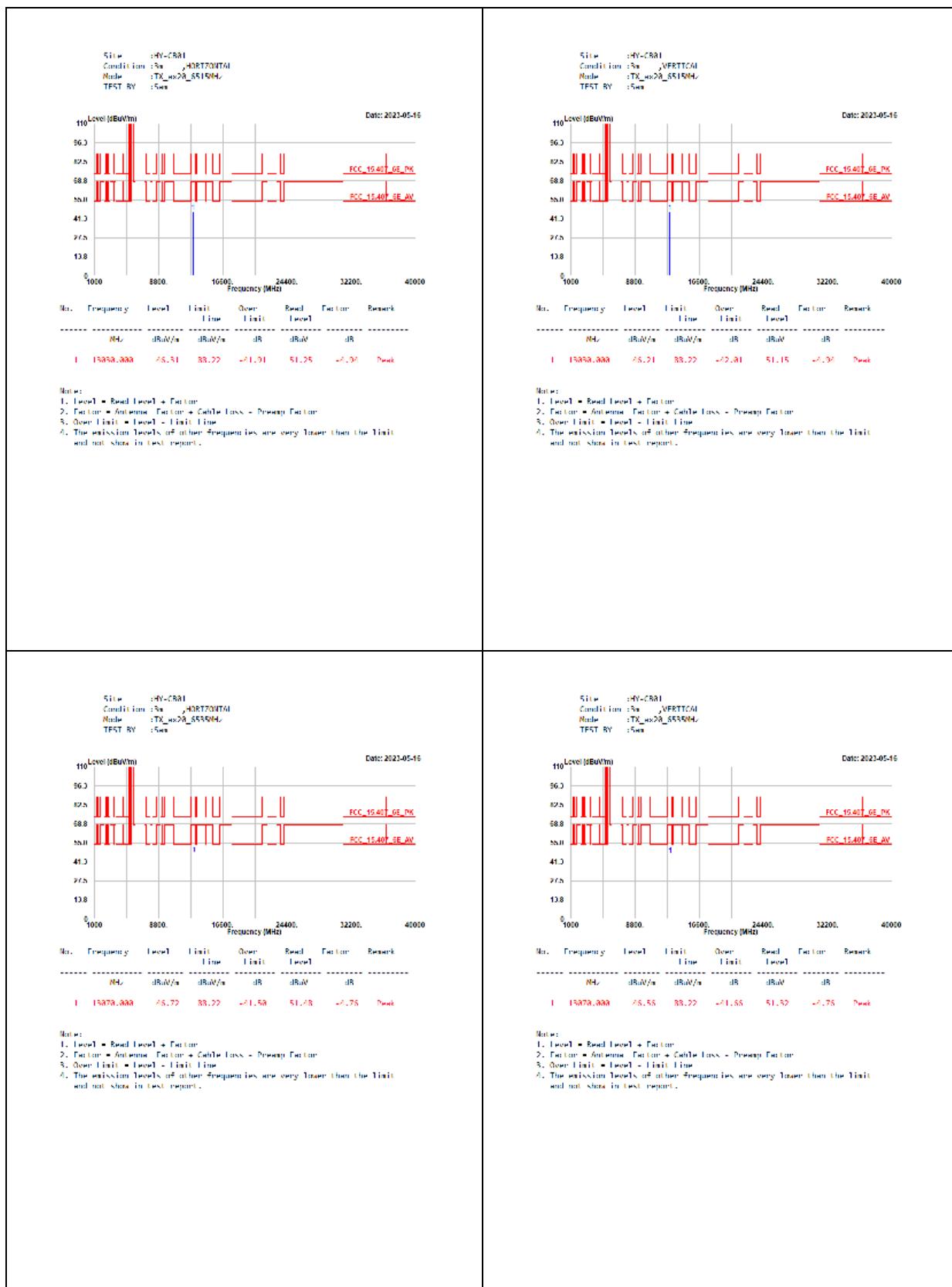


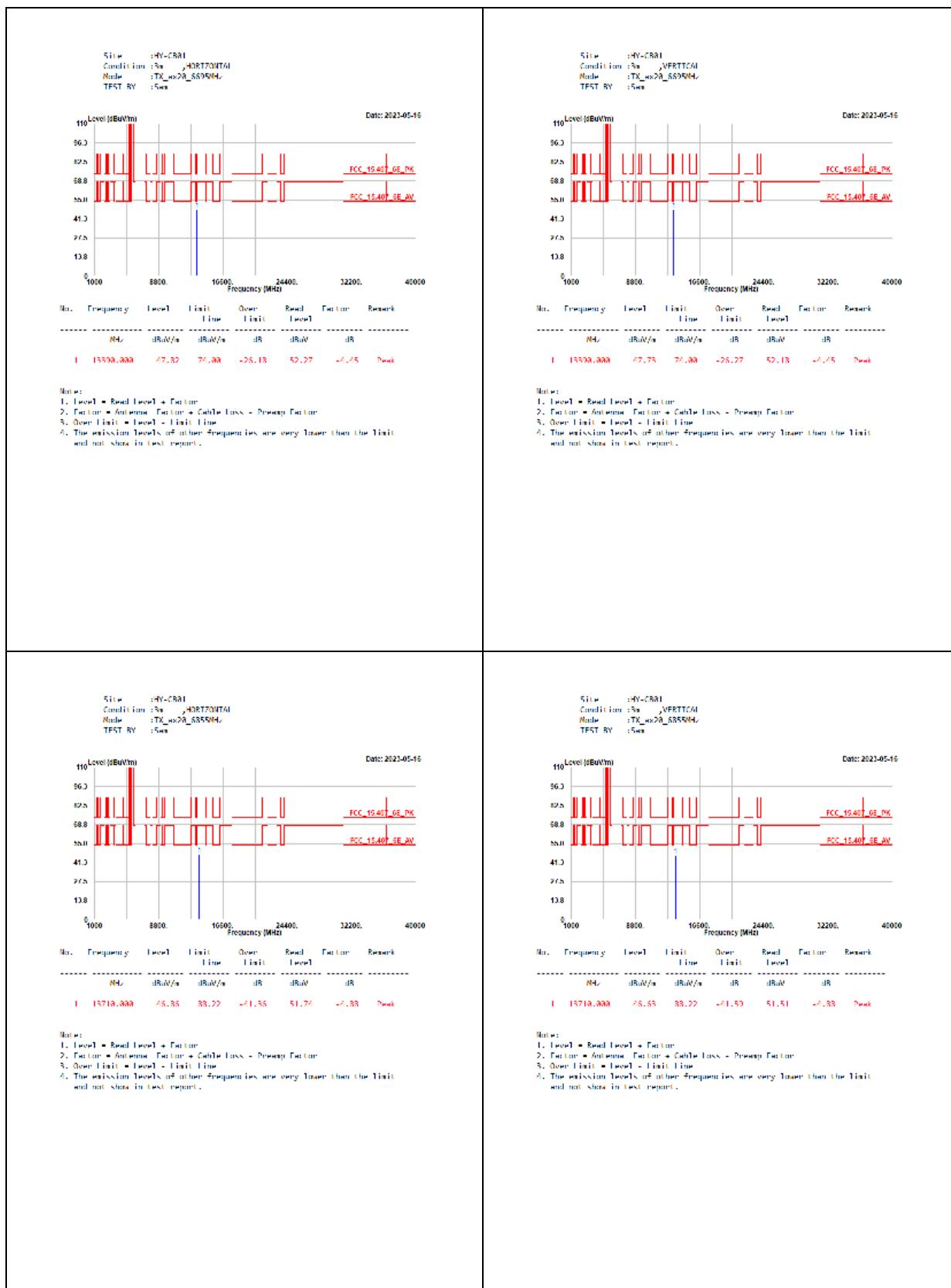
Beamforming

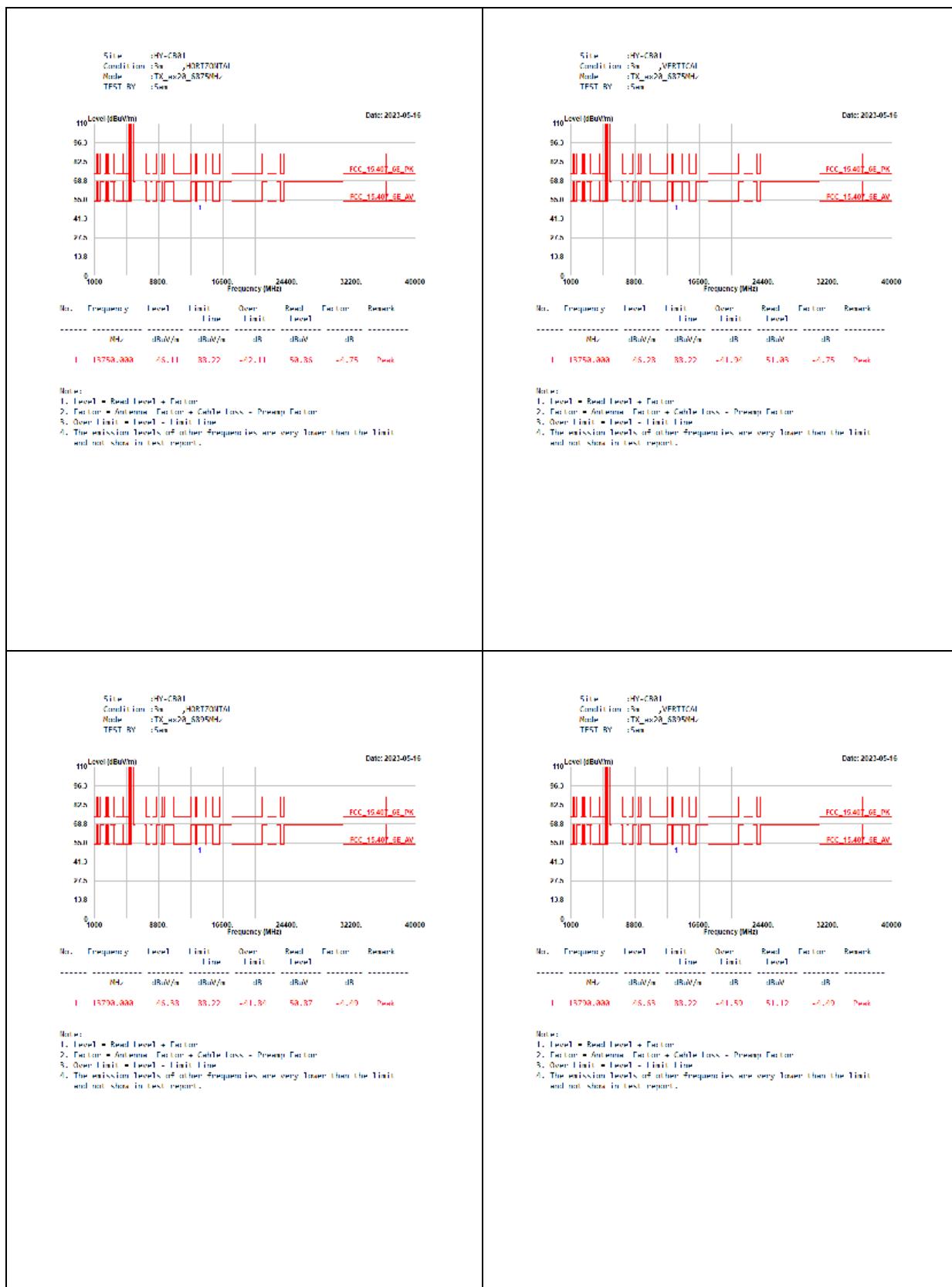


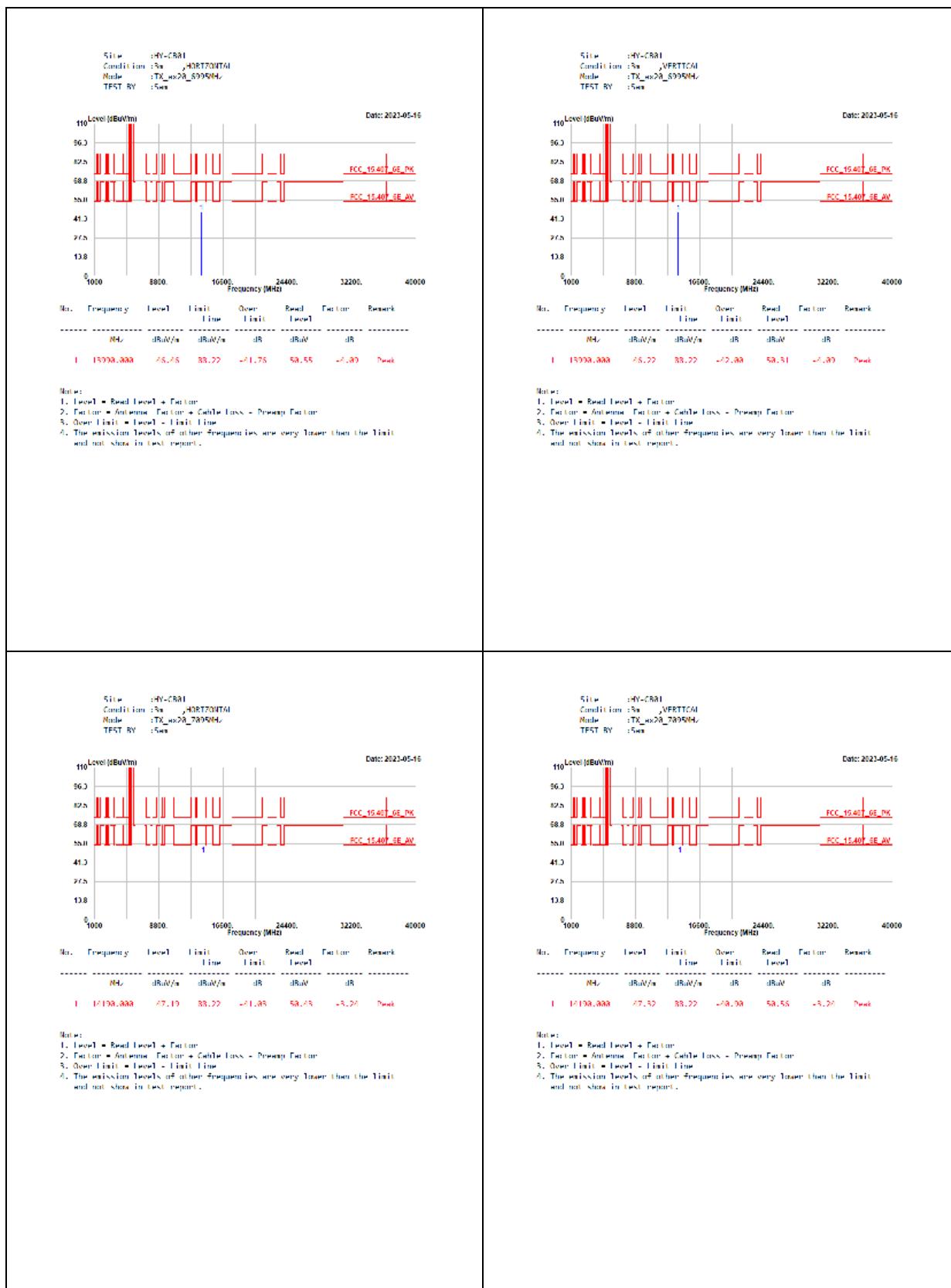


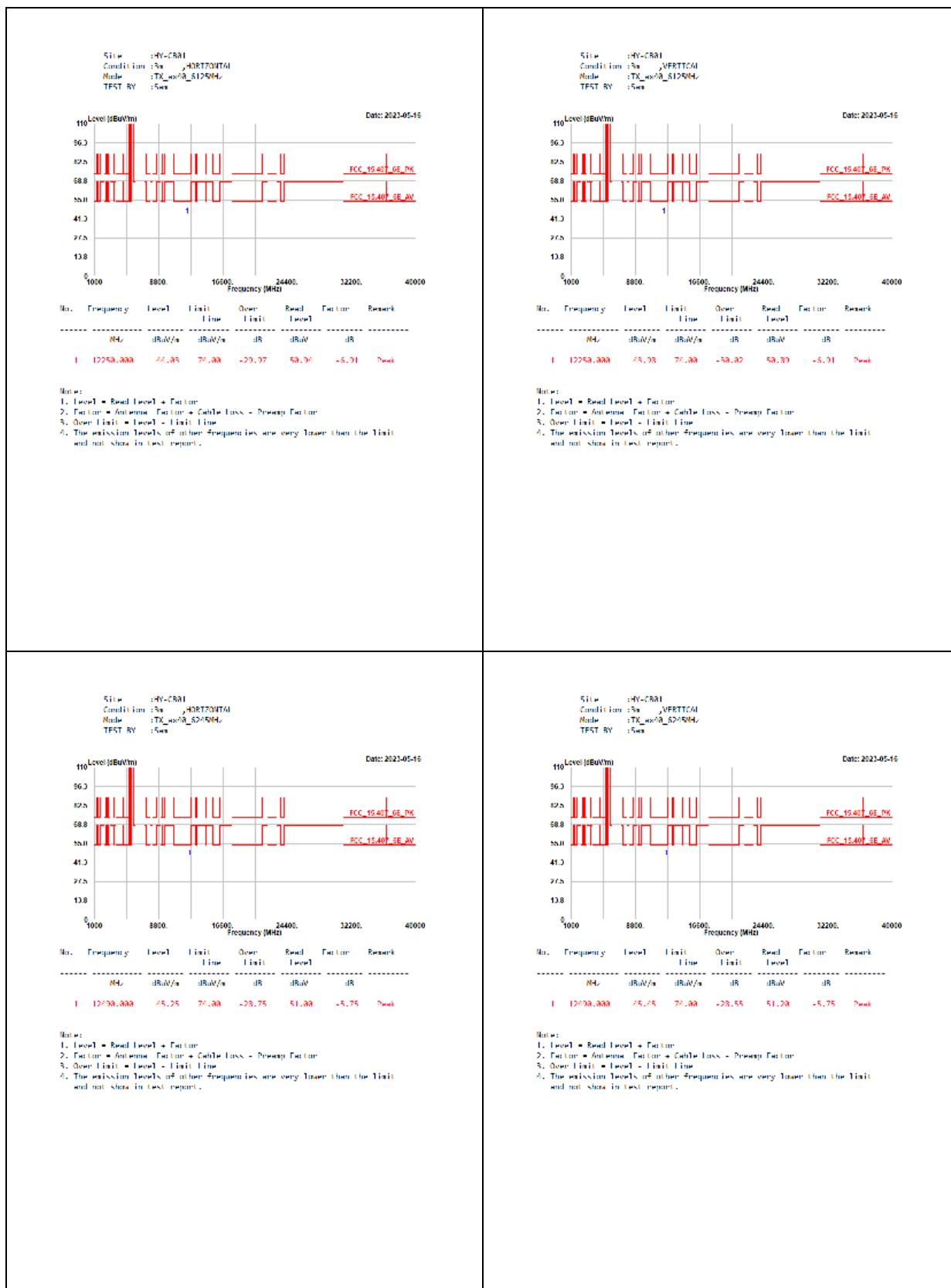


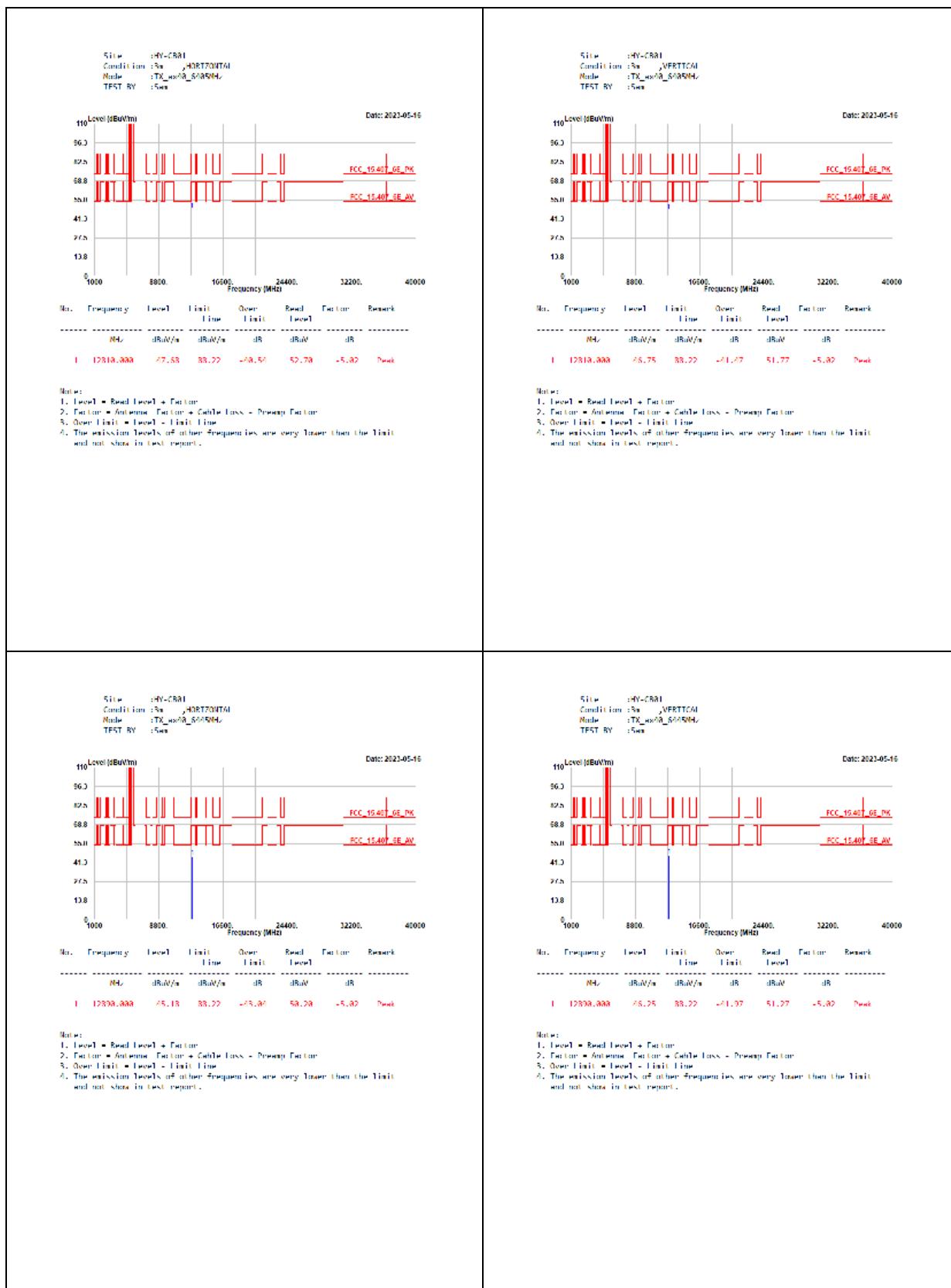


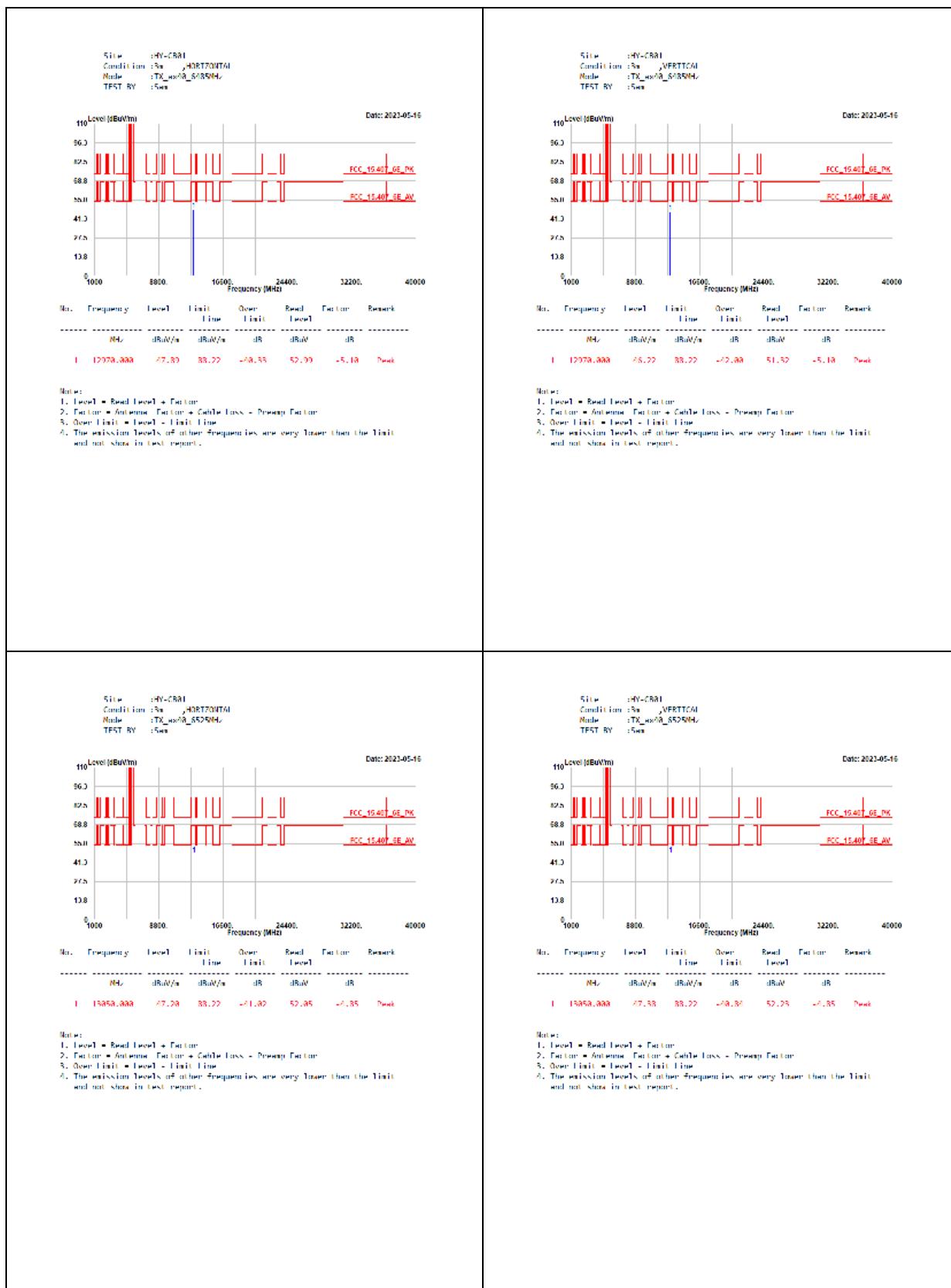


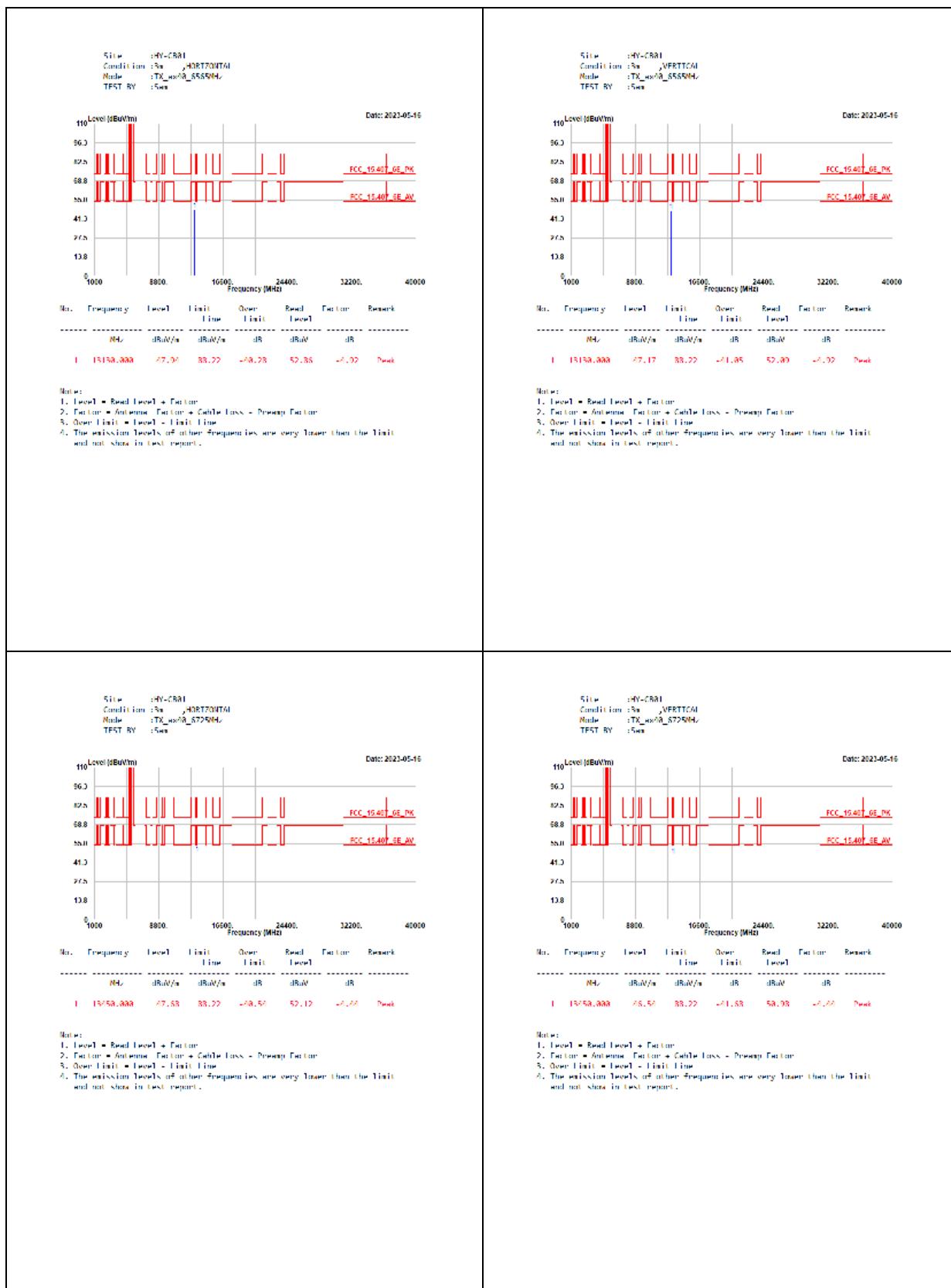


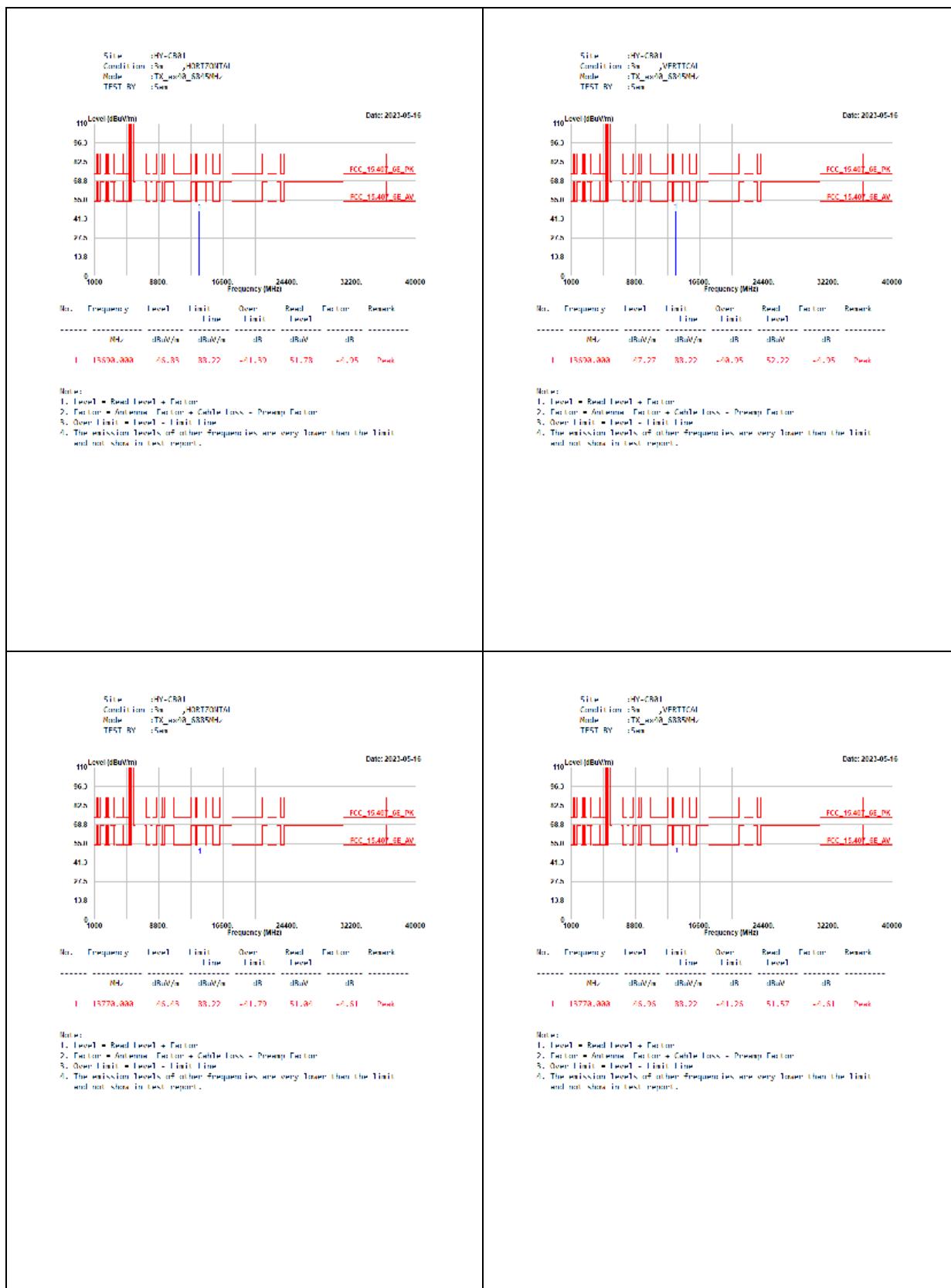


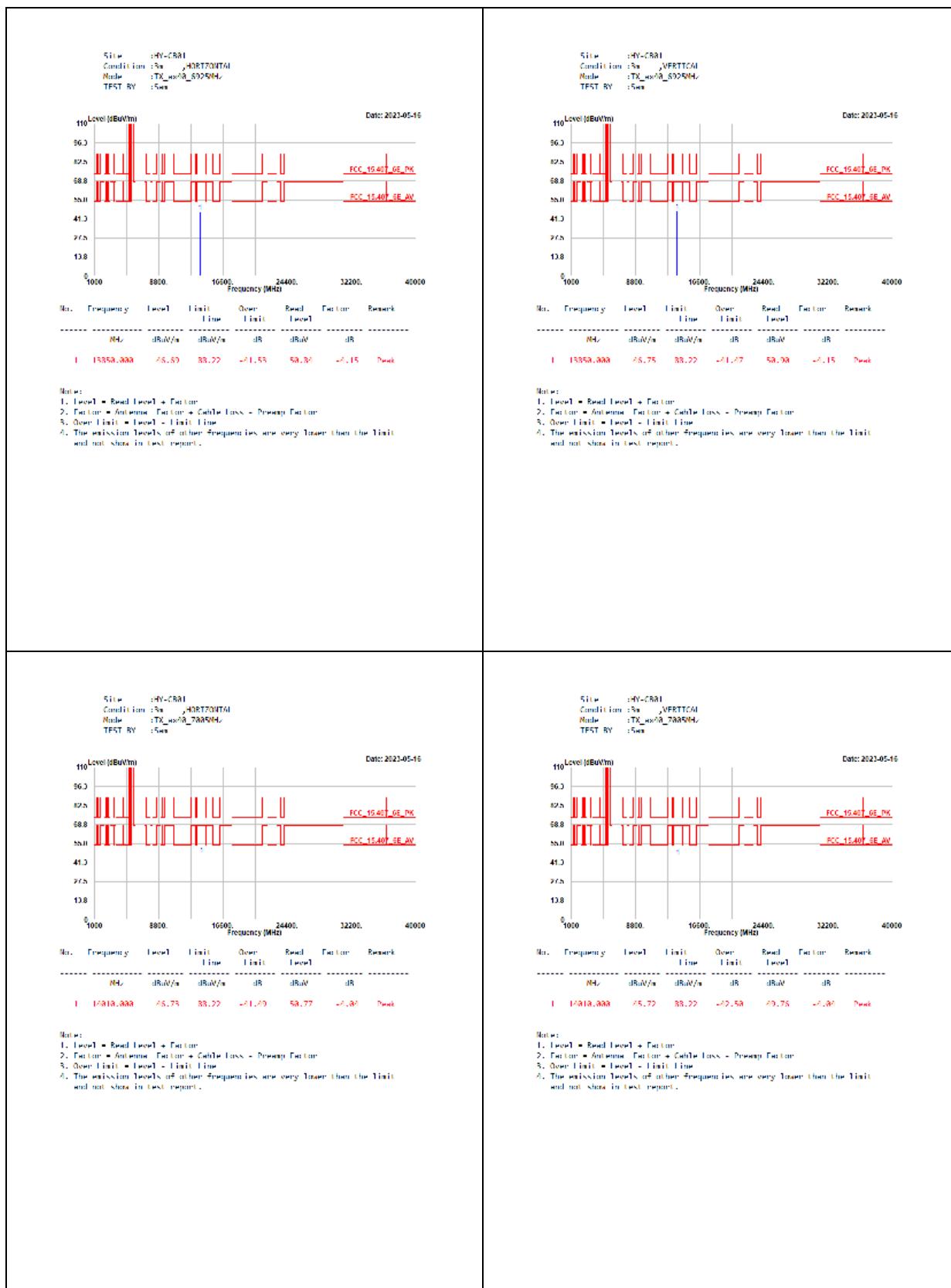


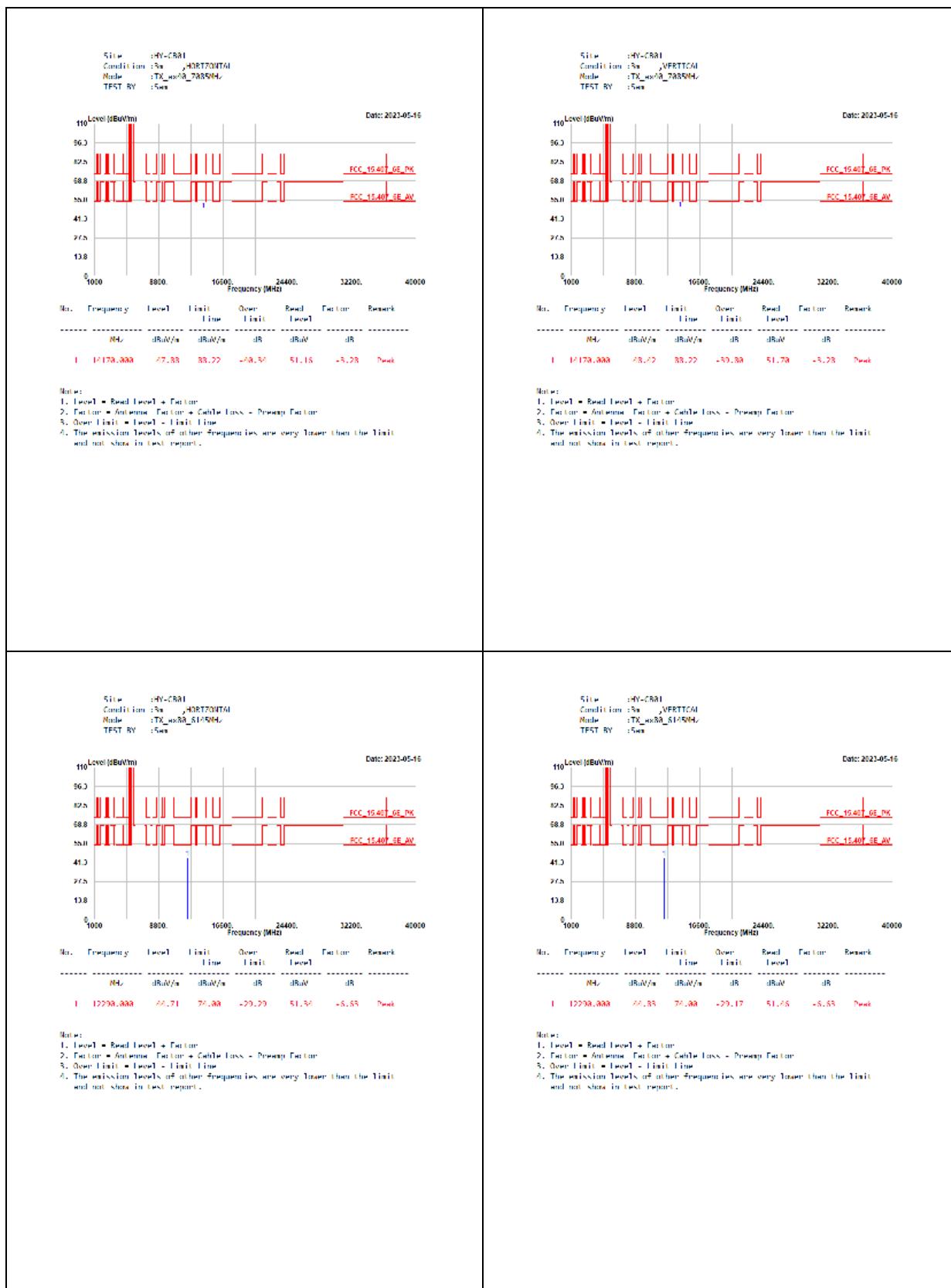


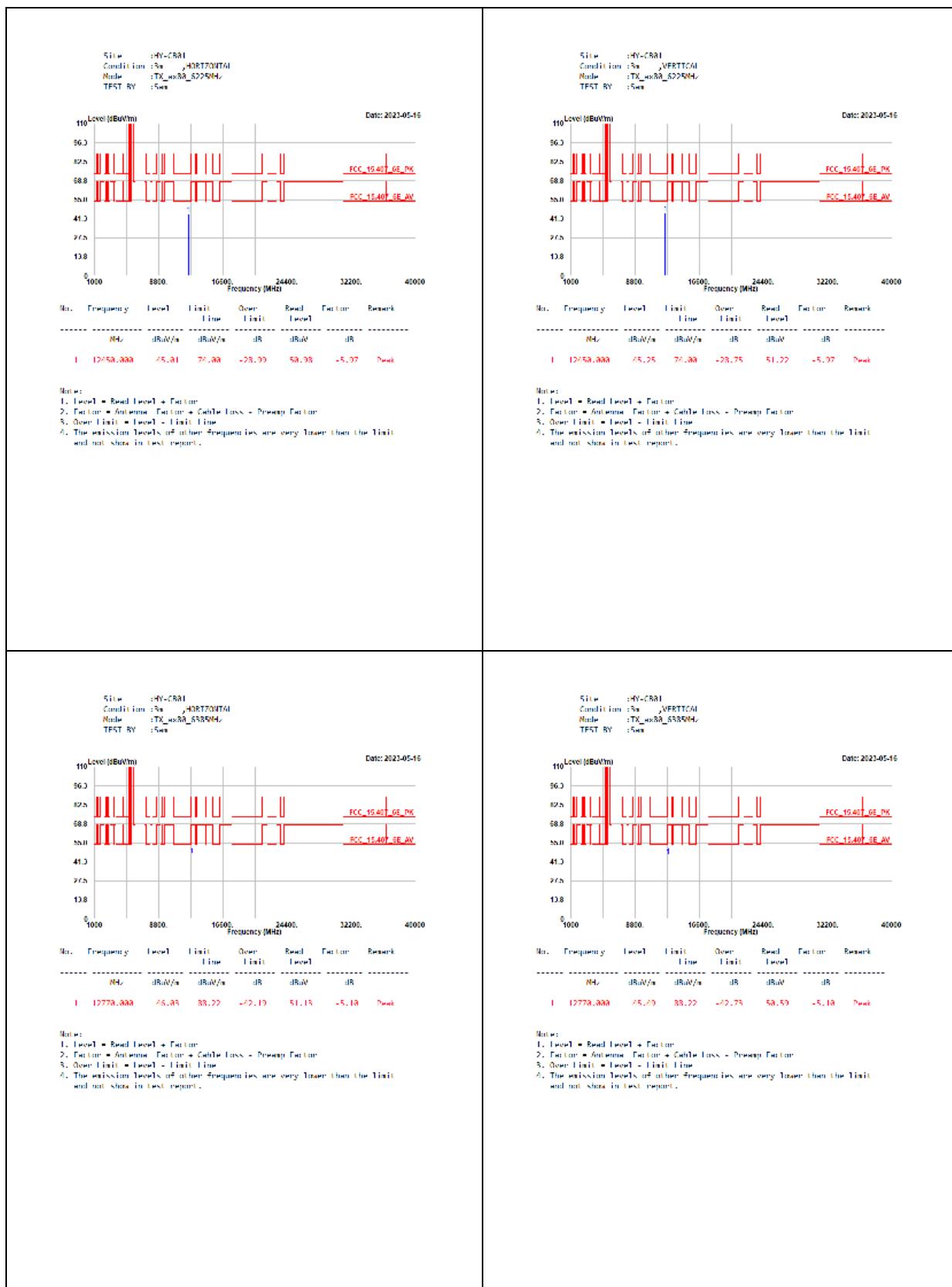


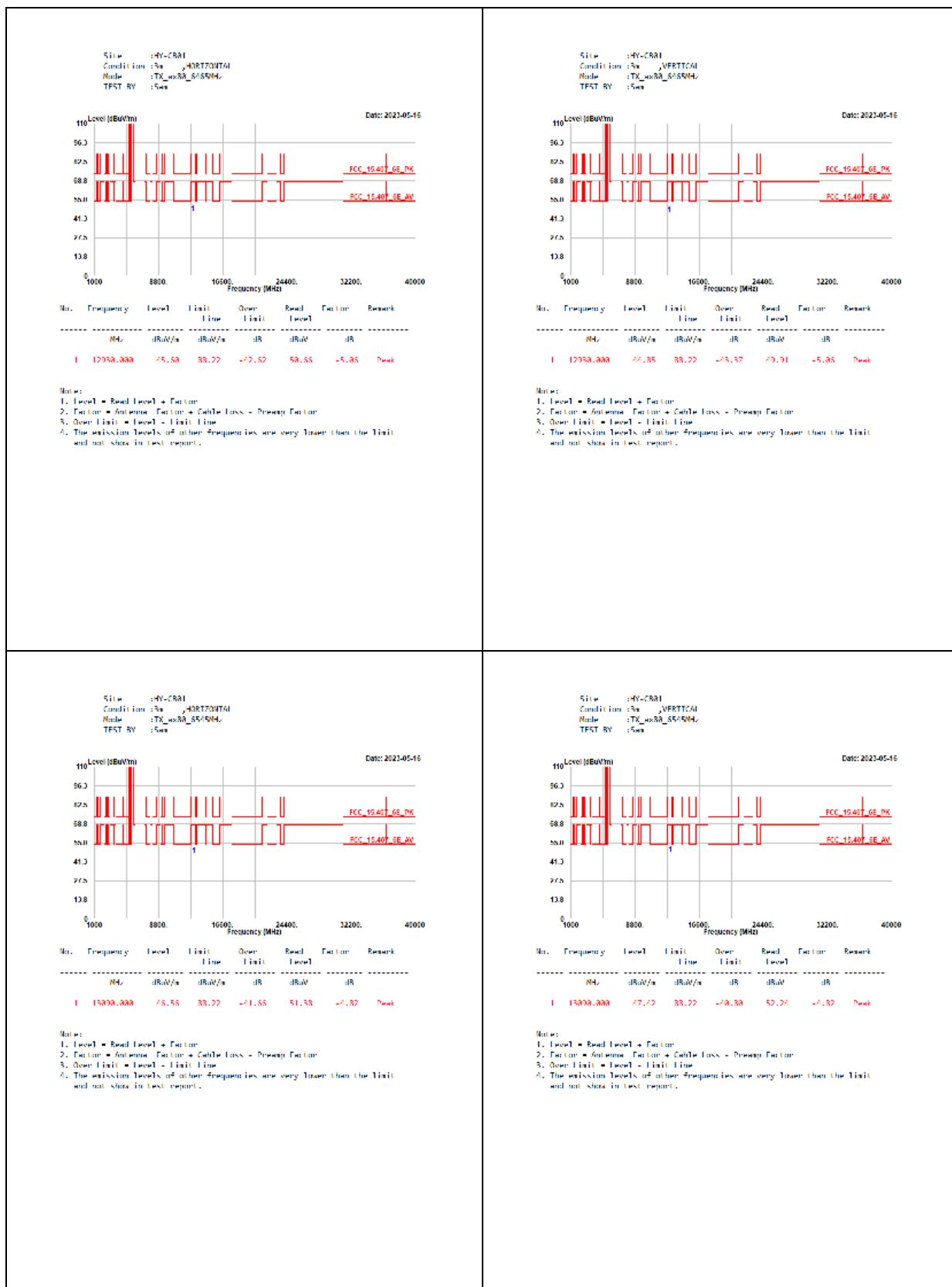


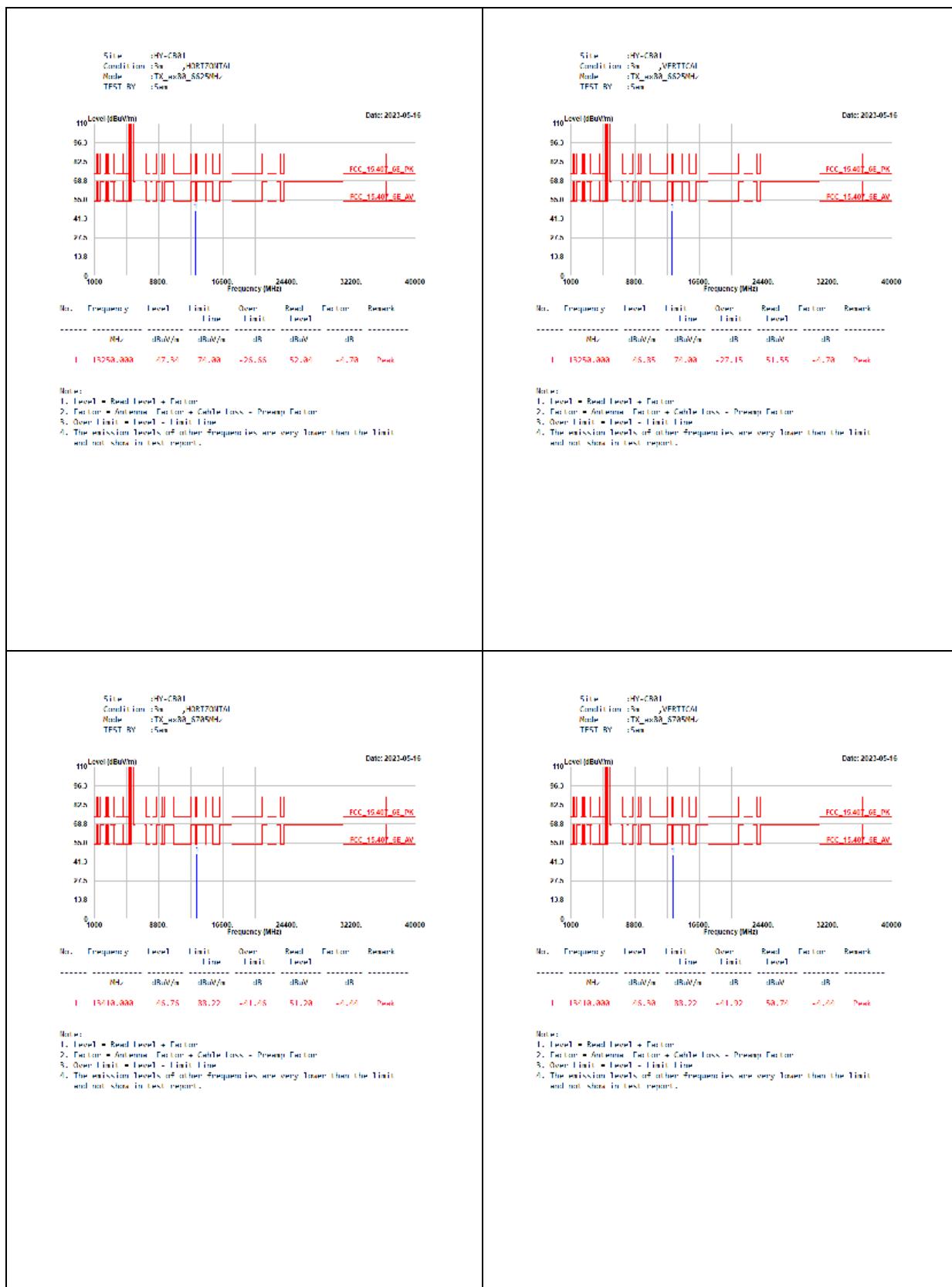


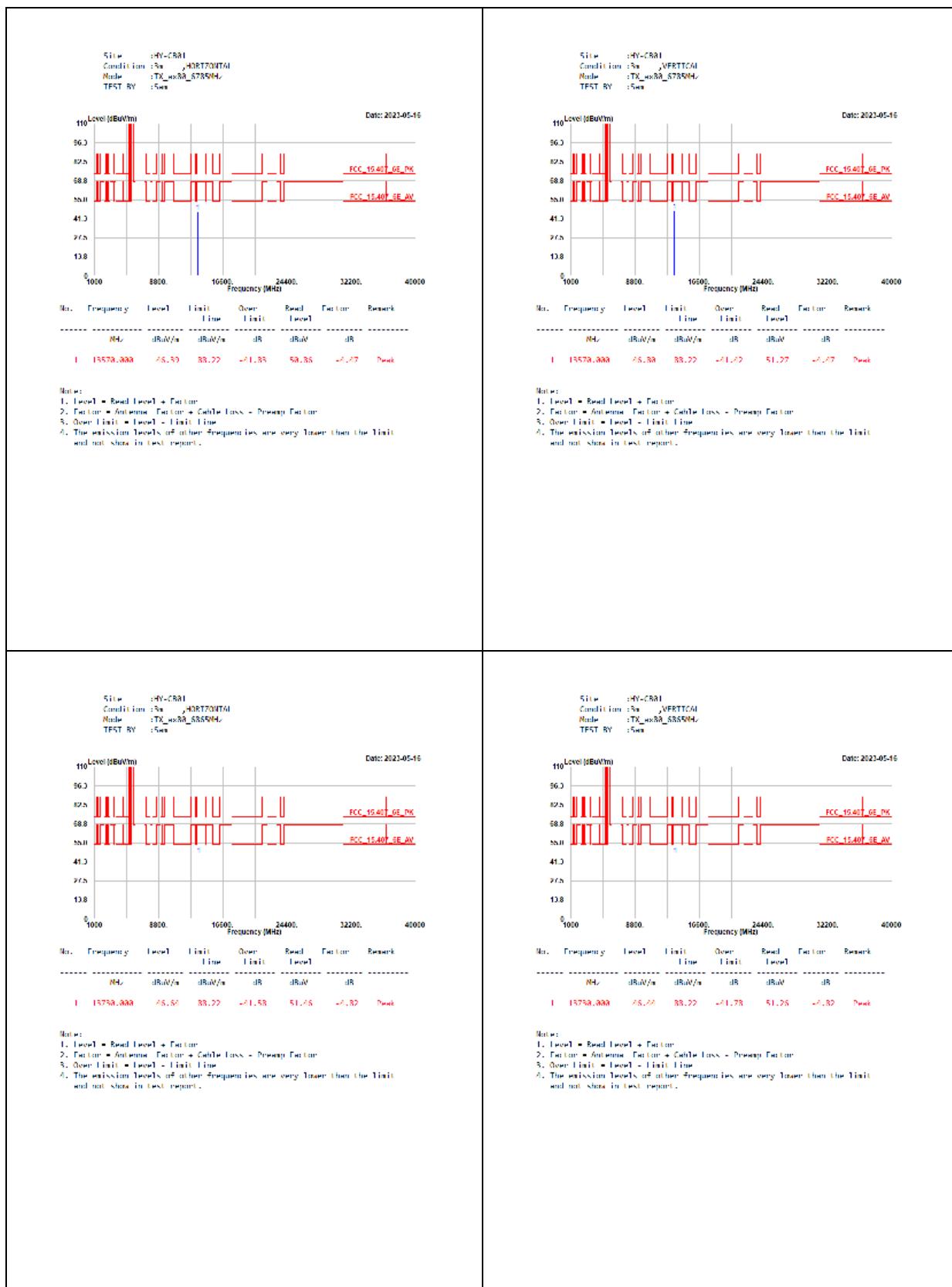


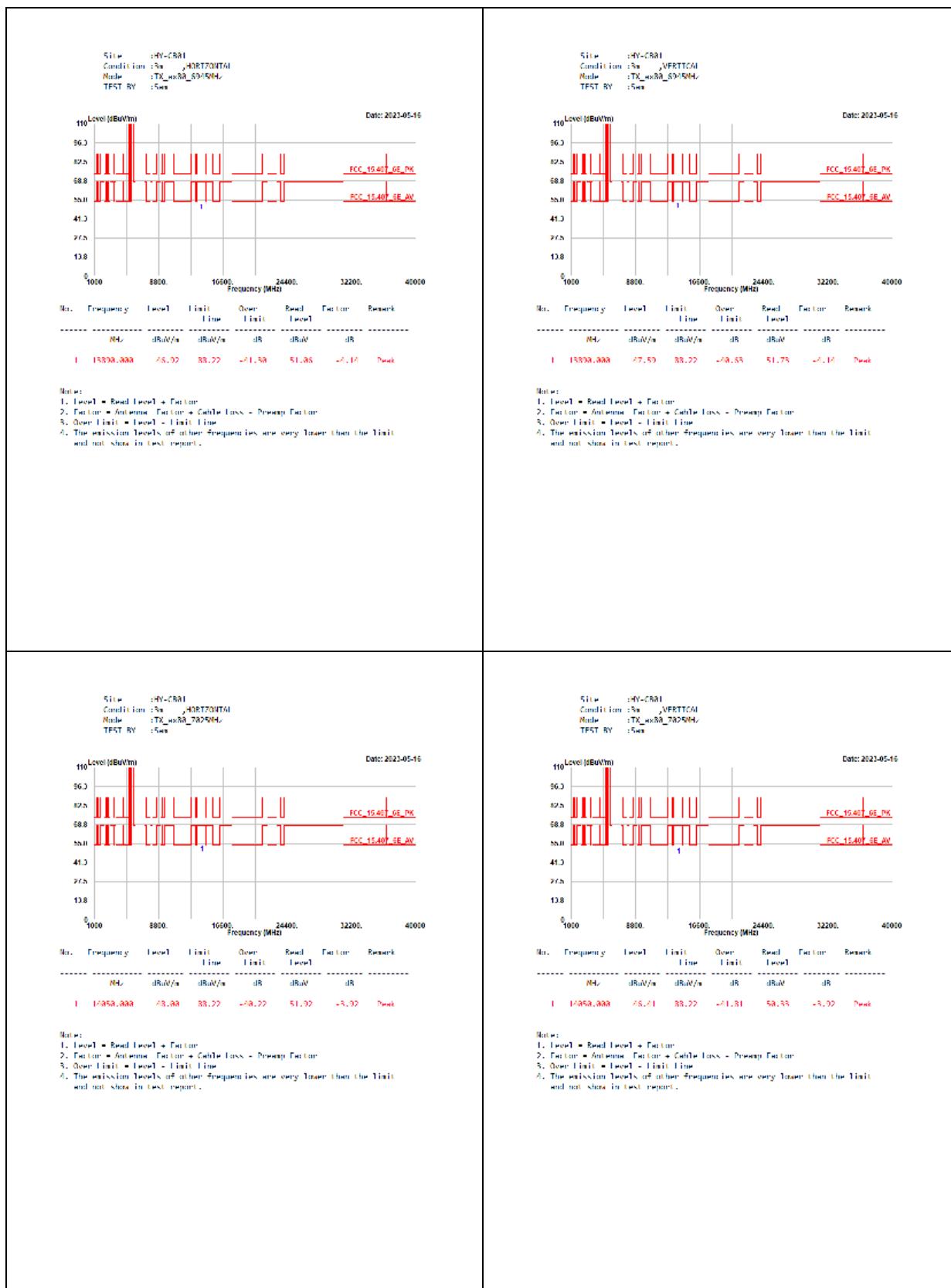


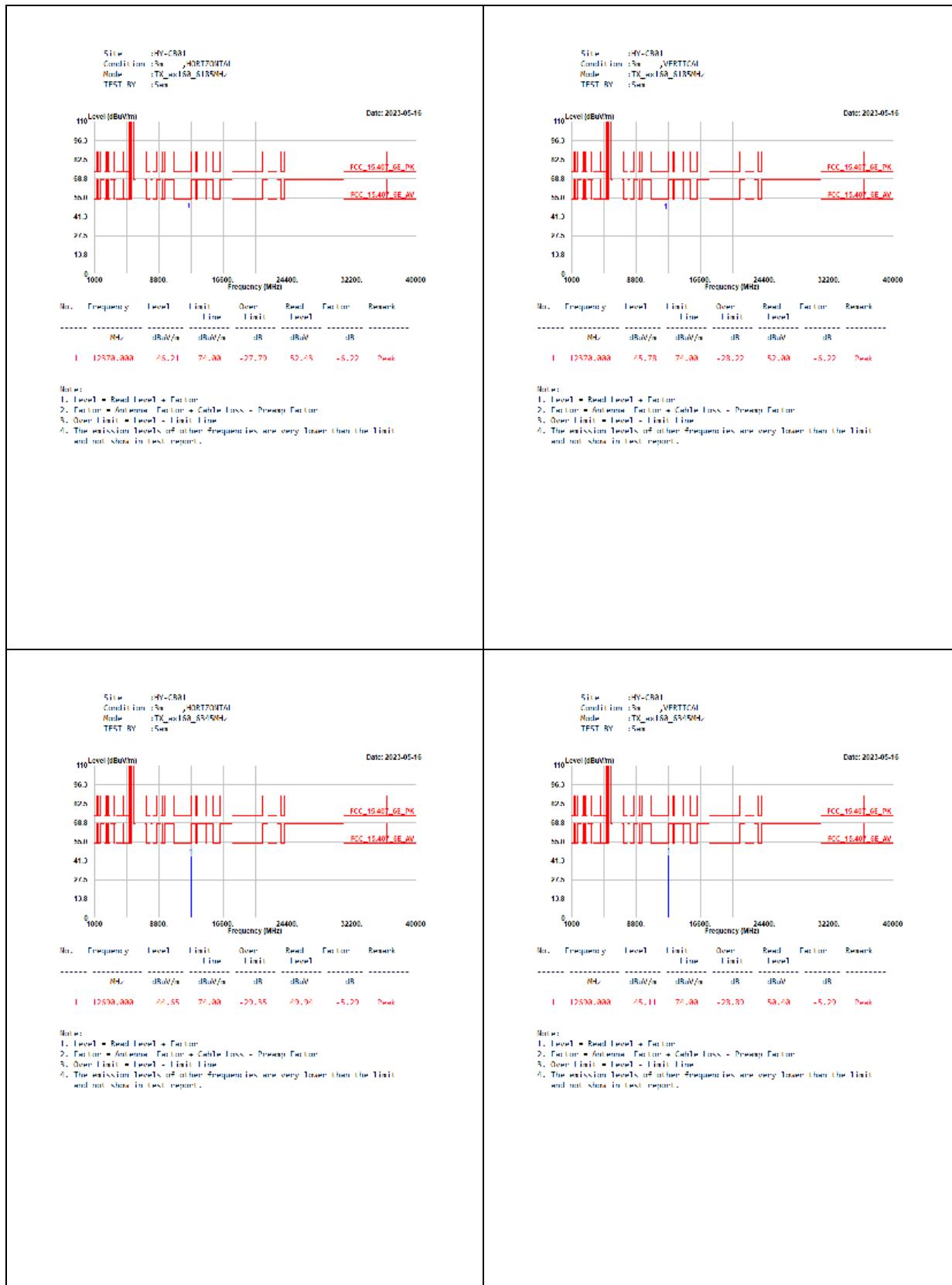


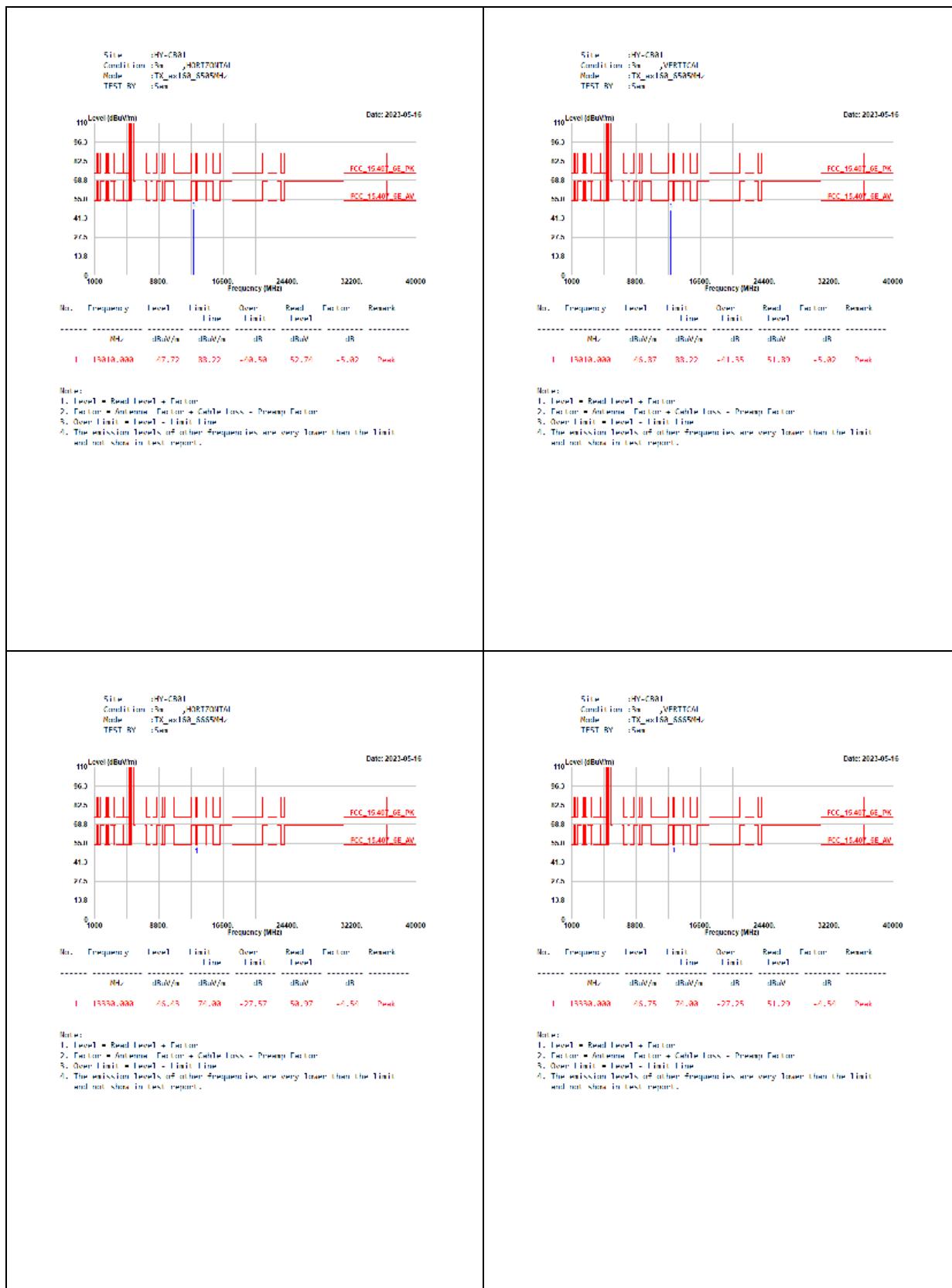


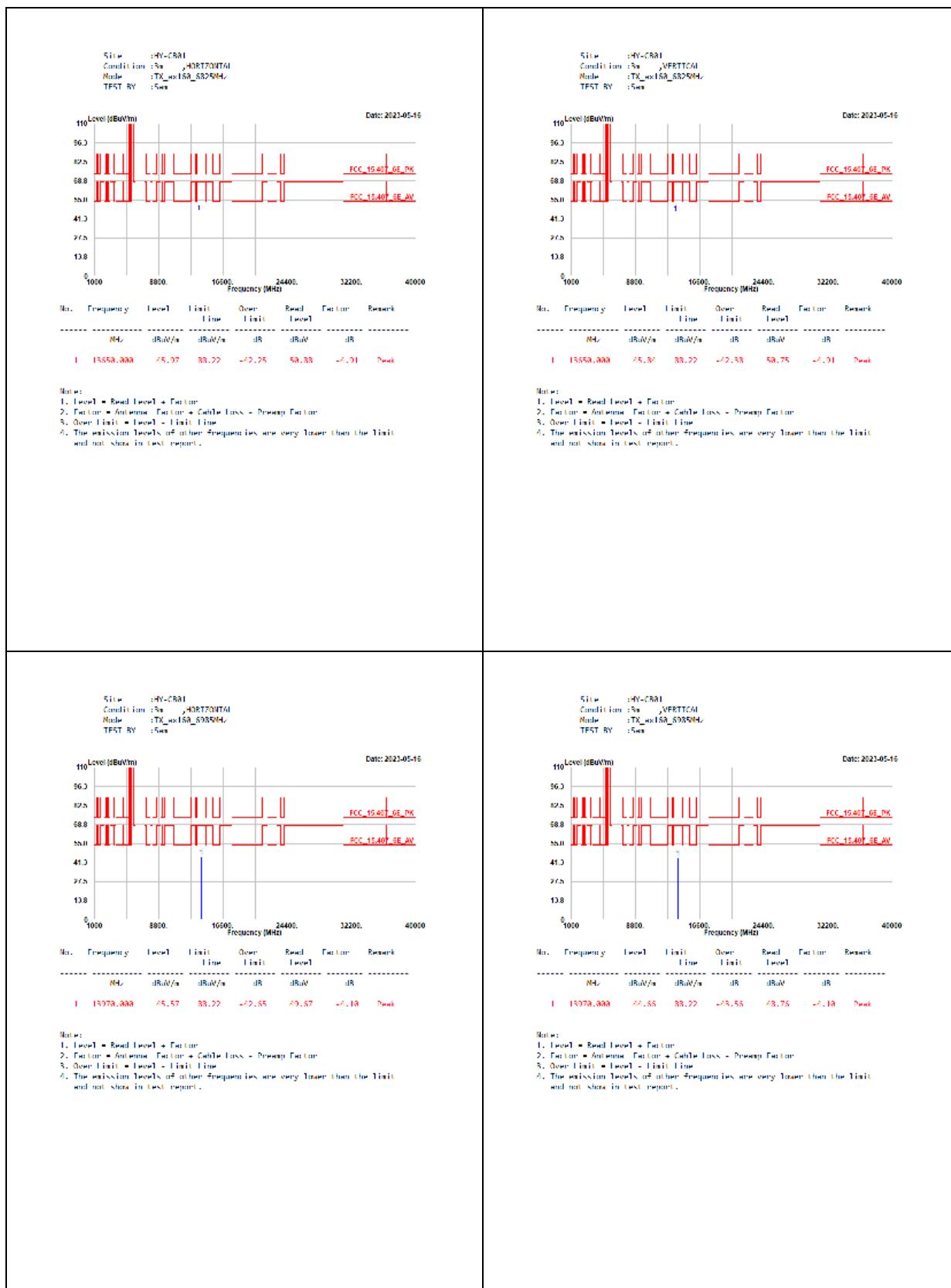




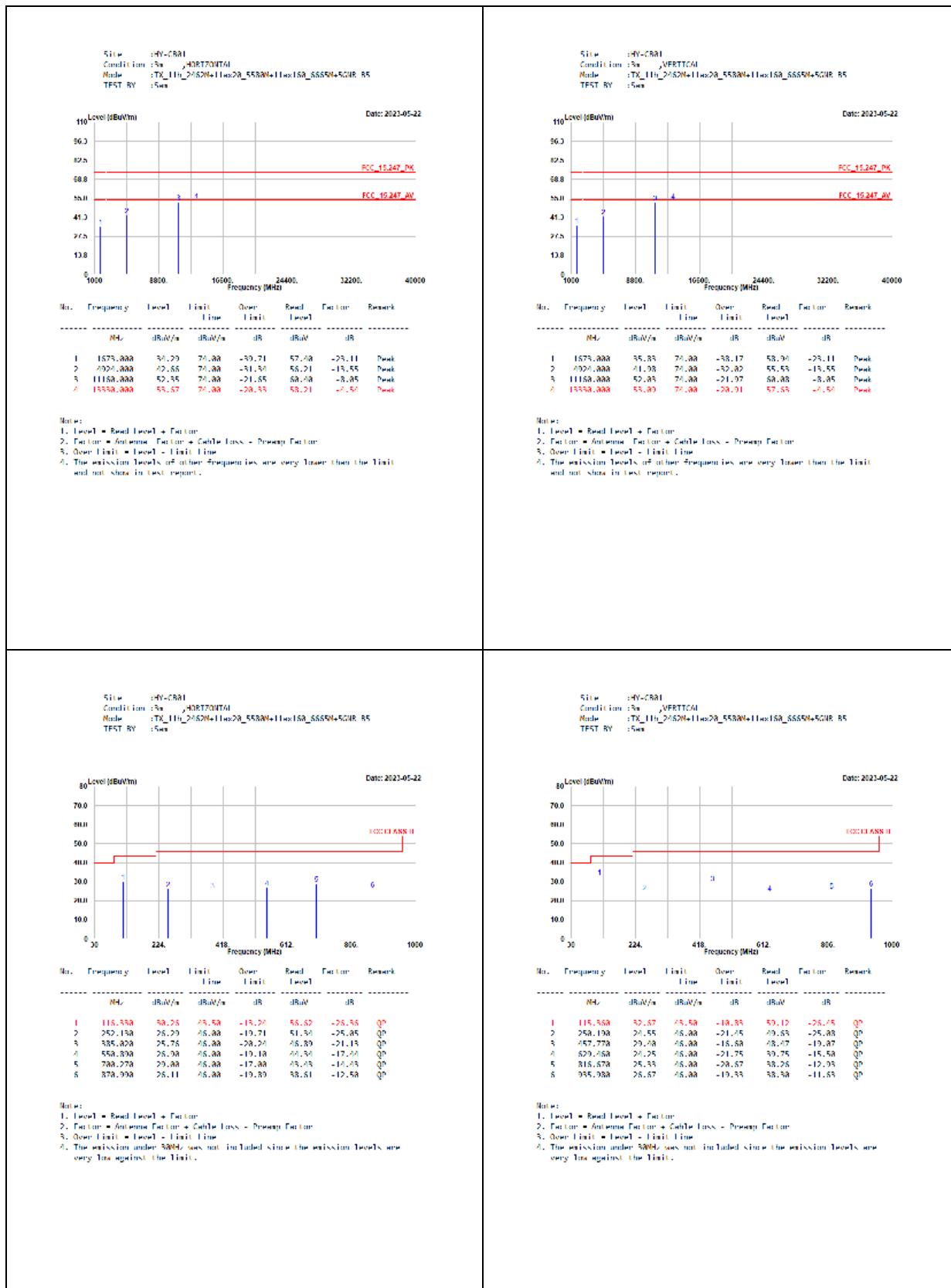


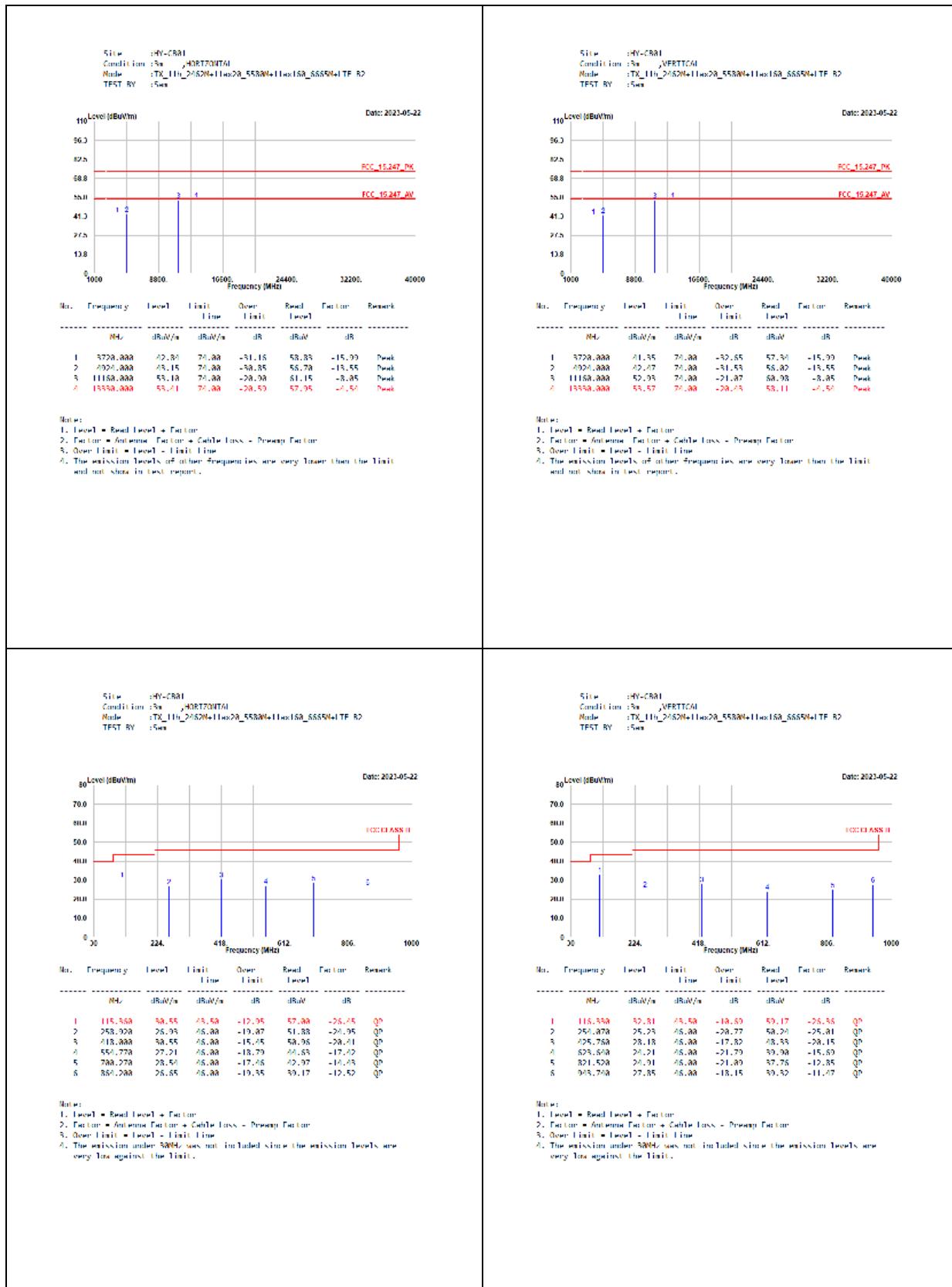






Co-location





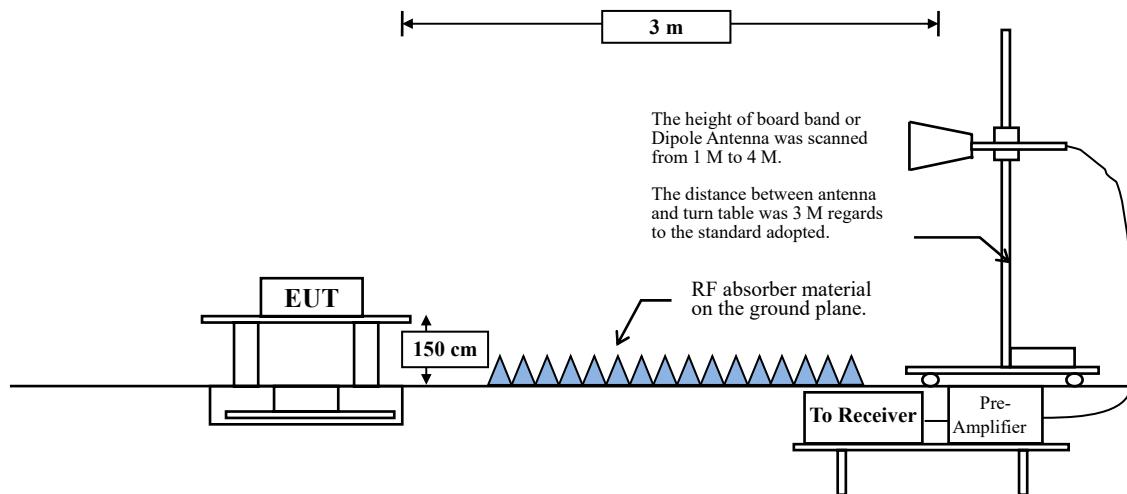




7. Band Edge

7.1. Test Setup

Radiated Emission Above 1 GHz



7.2. Limits

General Radiated Emission Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section. Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission Limits specified in Section 15.209:

FCC CFR Title 47 Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3 m	dB μ V/m@3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

Remark:

1. RF Voltage (dB μ V) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter Limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Unwanted Emission out of the restricted bands Limits

FCC CFR Title 47 Part 15 Subpart E Paragraph 15.407(b) Limits		
Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength (dB μ V/m@3m)
5925 MHz > F 7125 MHz	Peak: -7	88.2
	Average: -27	68.2

Remark:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \text{ uV/m, where } P \text{ is the eirp (Watts).}$$

7.3. Test Procedure

The EUT and its simulators are placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The bandwidth below 1 GHz setting on the field strength meter is 120 KHz, above 1GHz are 1 MHz.

CDD:

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11a	92.52	1.9800	505	1000
802.11ax-20 MHz	92.81	5.4200	185	200
802.11ax-40 MHz	92.78	5.4000	185	200
802.11ax-80 MHz	91.50	5.3800	186	200
802.11ax-160 MHz	90.85	5.3600	187	200

Note: Duty Cycle Refer to Section 10.

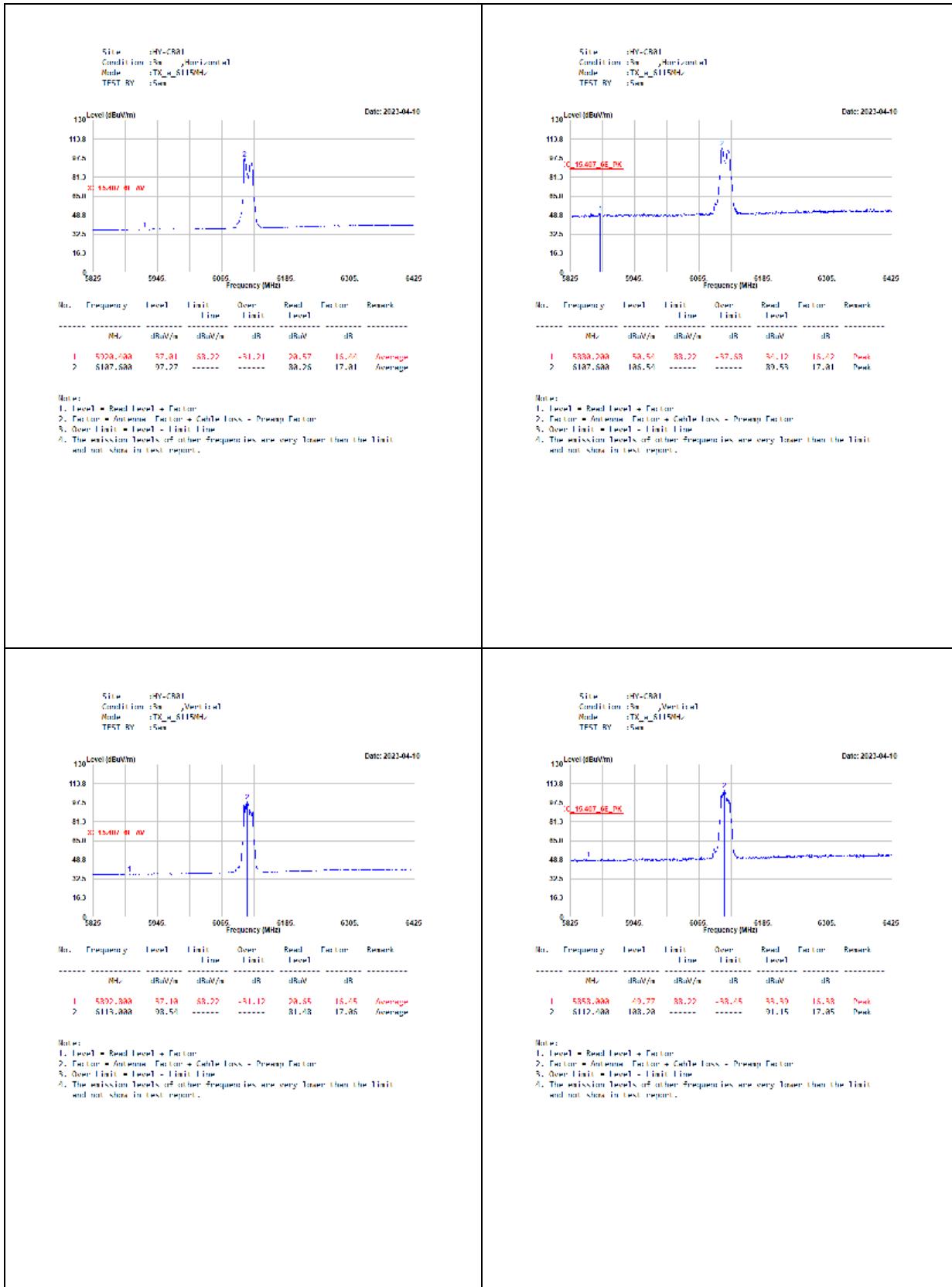
Beamforming:

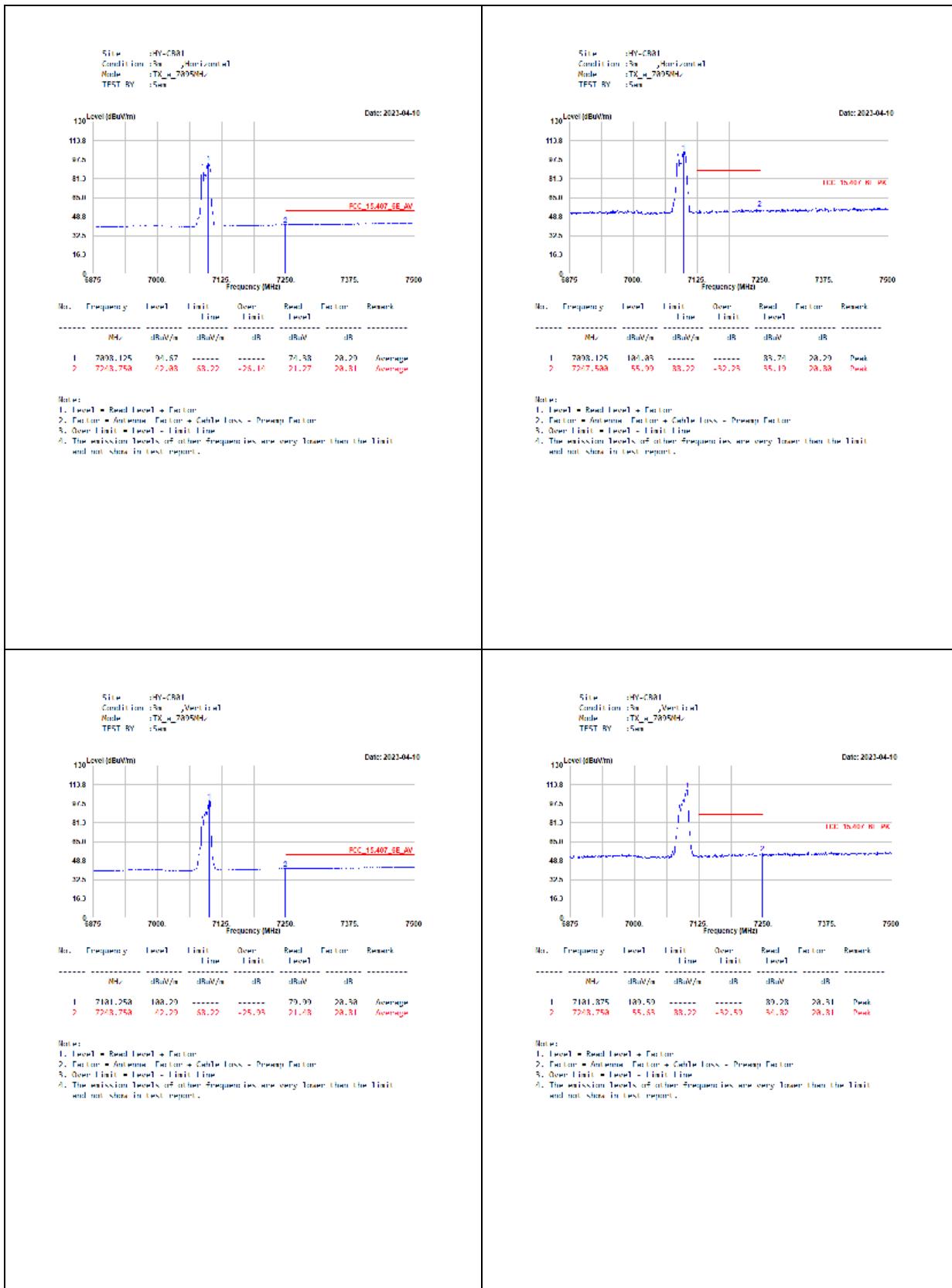
2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11ax-20 MHz	93.24	6.9000	145	200
802.11ax-40 MHz	92.92	6.8200	147	200
802.11ax-80 MHz	91.92	7.2800	137	200
802.11ax-160 MHz	96.12	7.9200	126	200

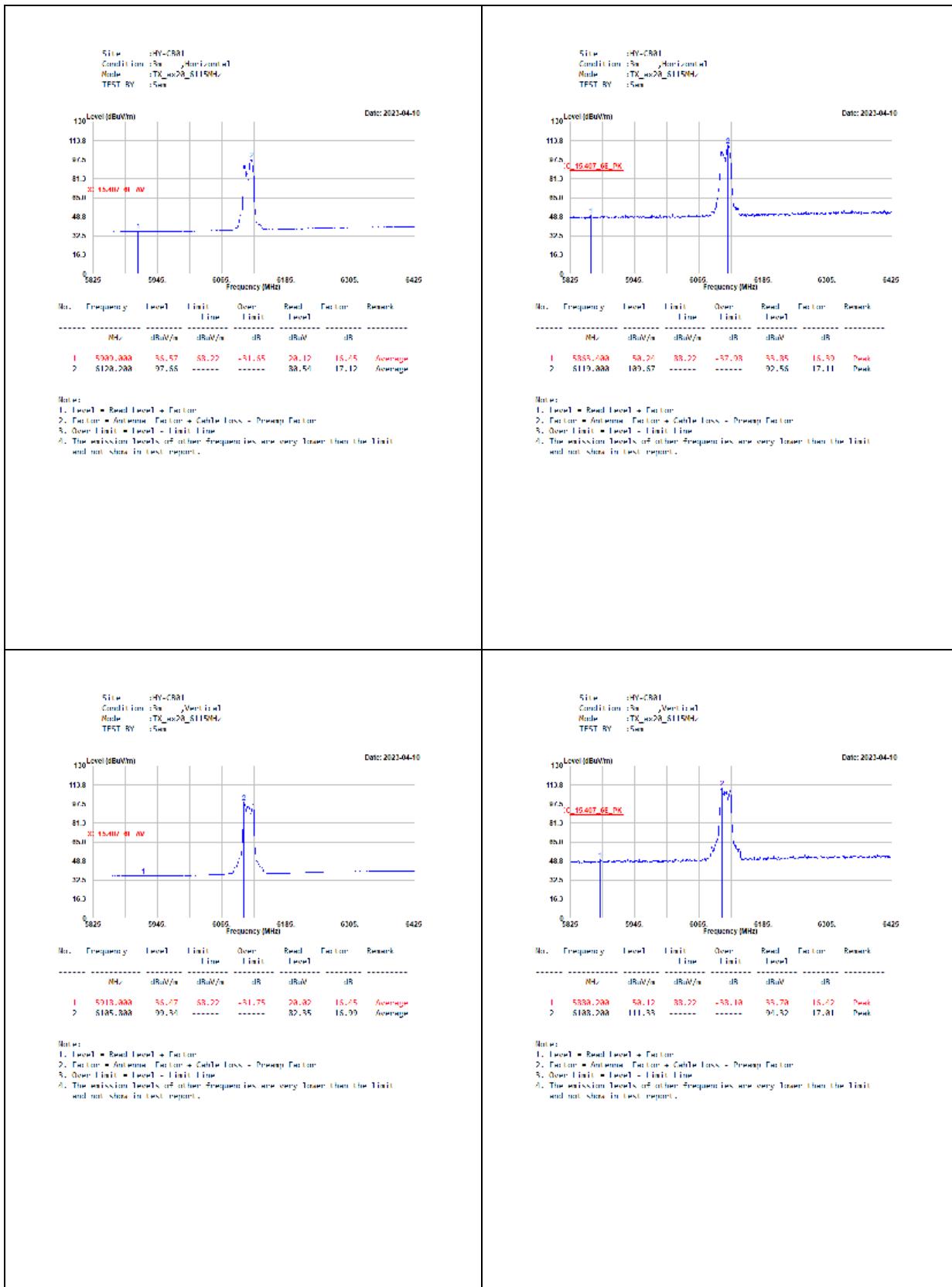
Note: Duty Cycle Refer to Section 10.

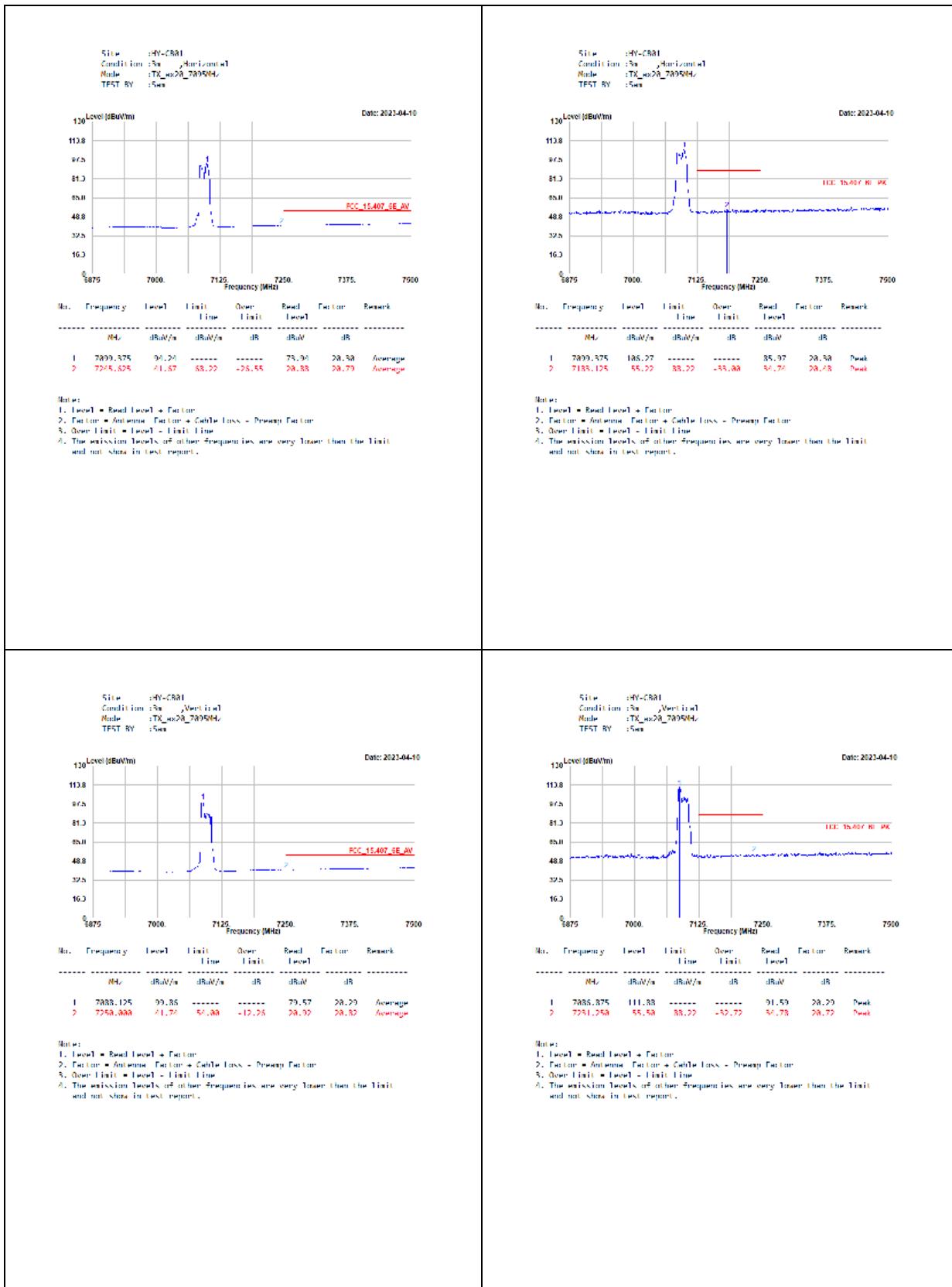
7.4. Test Result of Band Edge

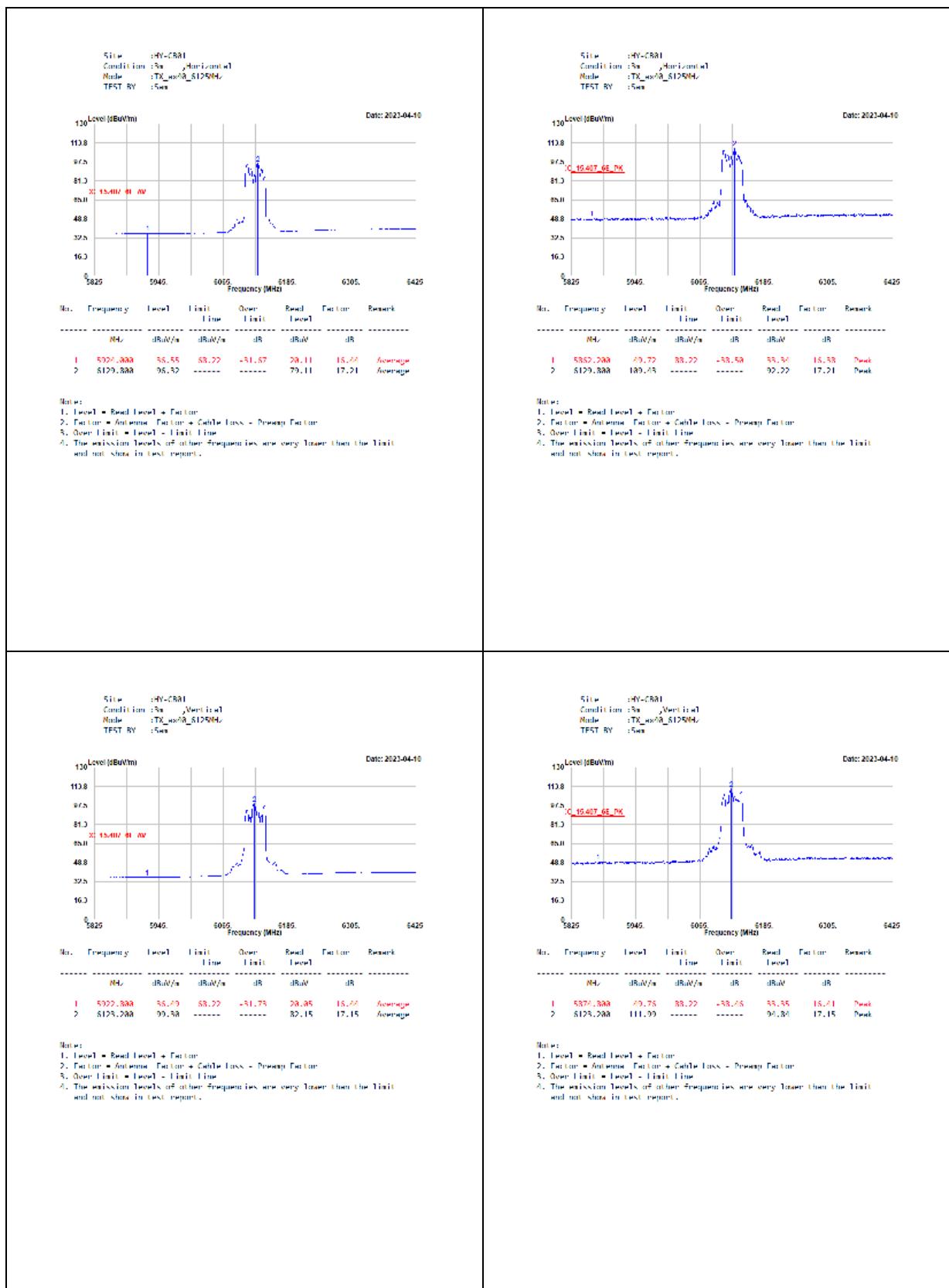
CDD

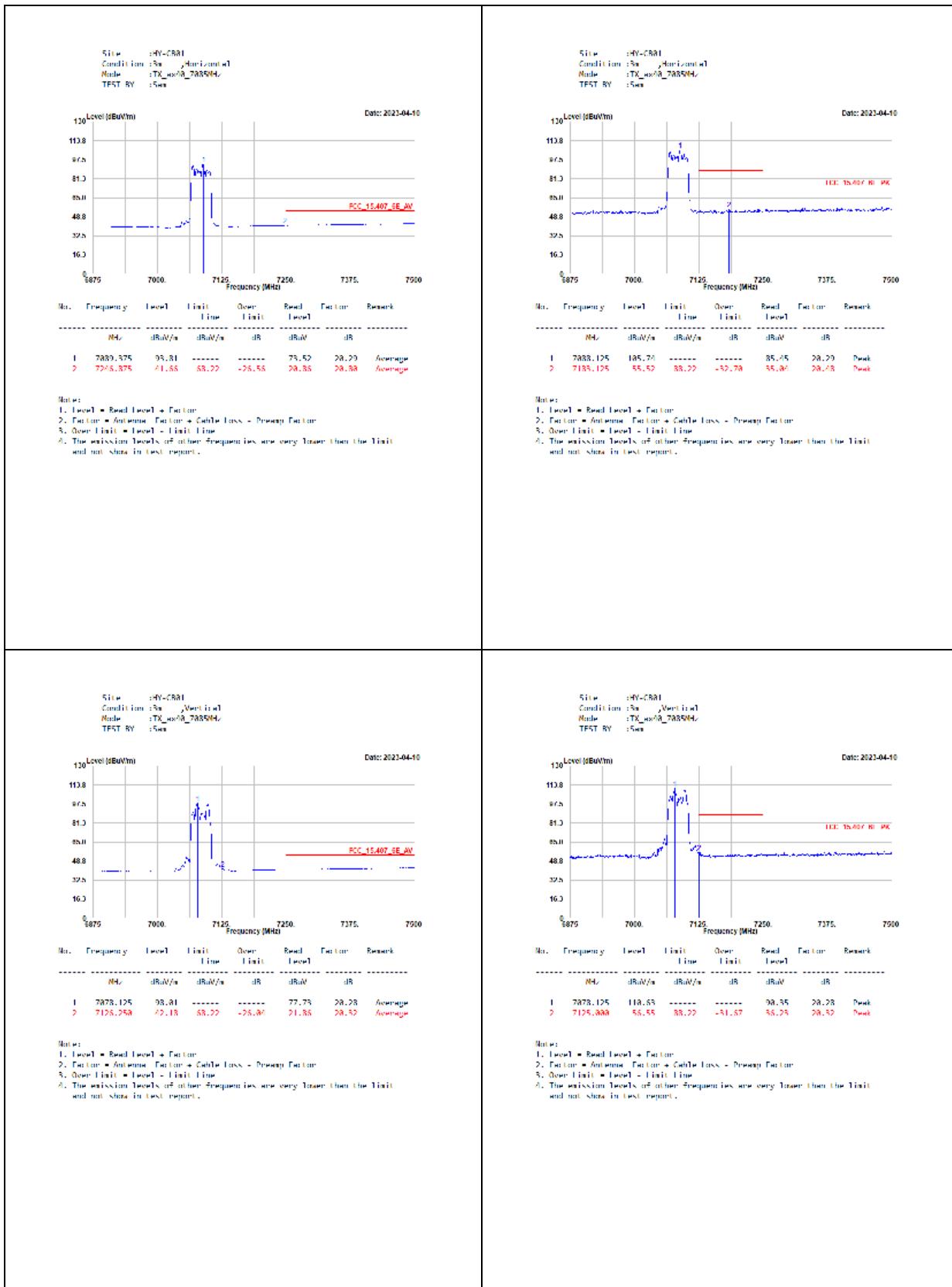


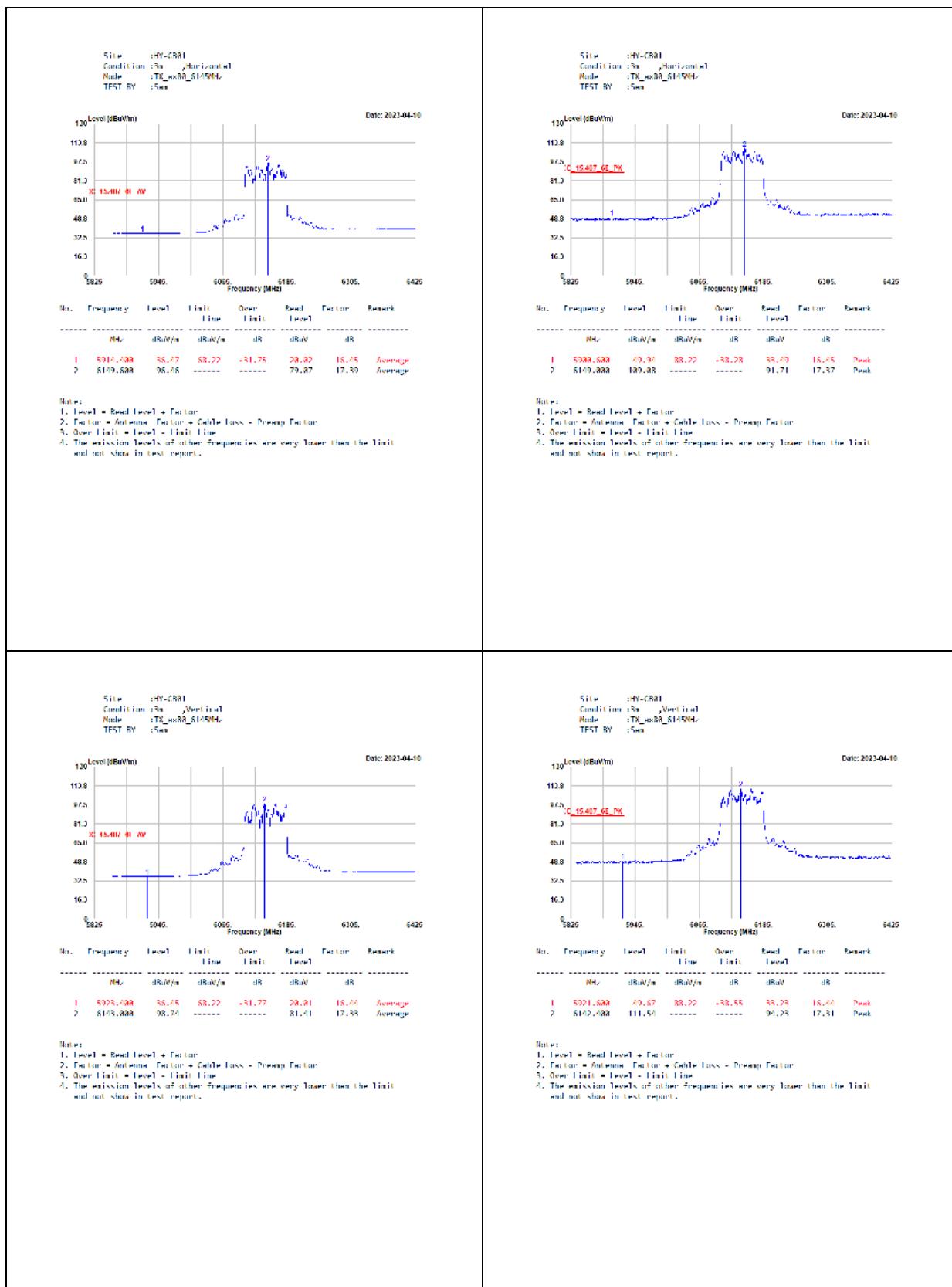


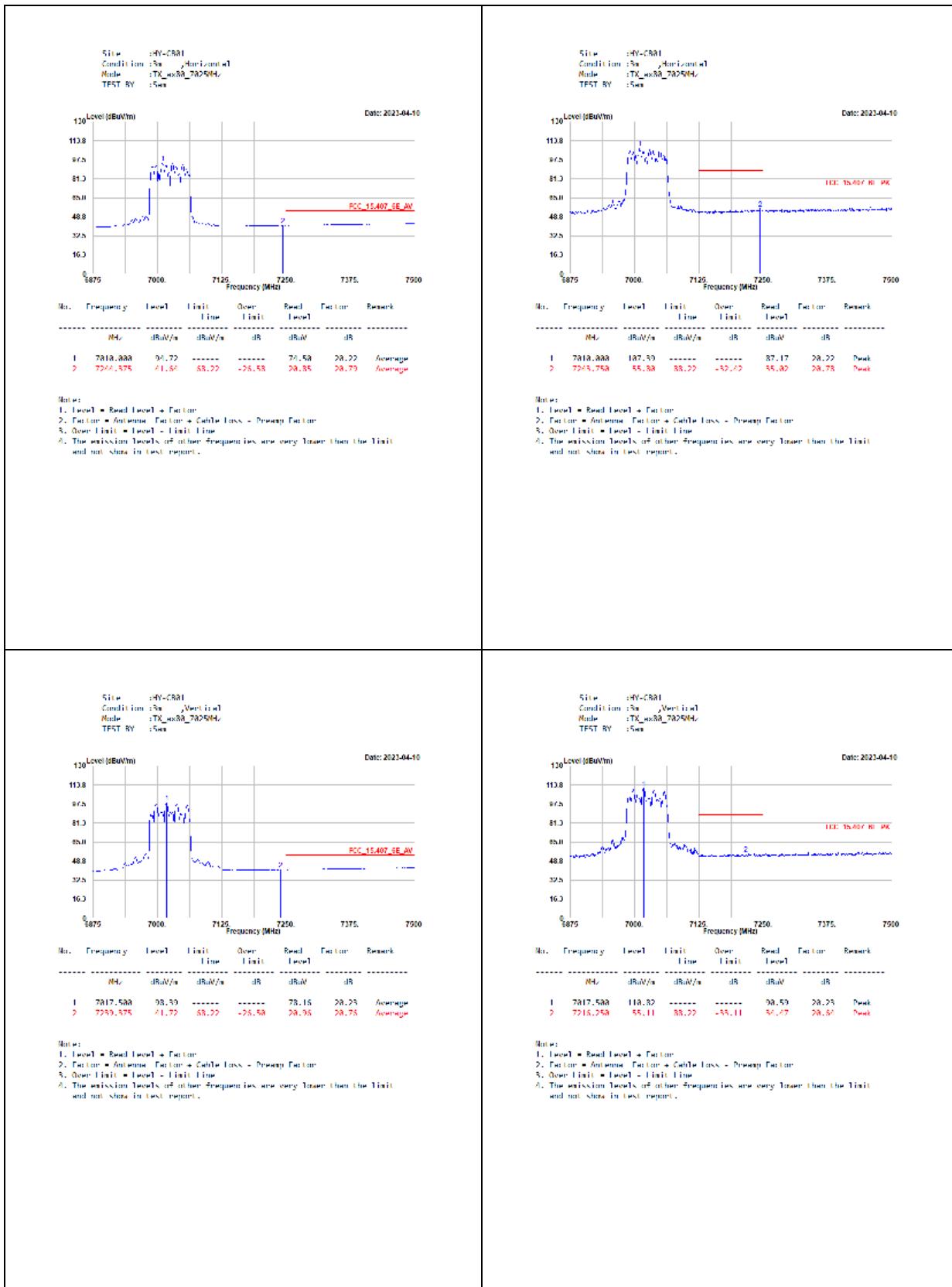


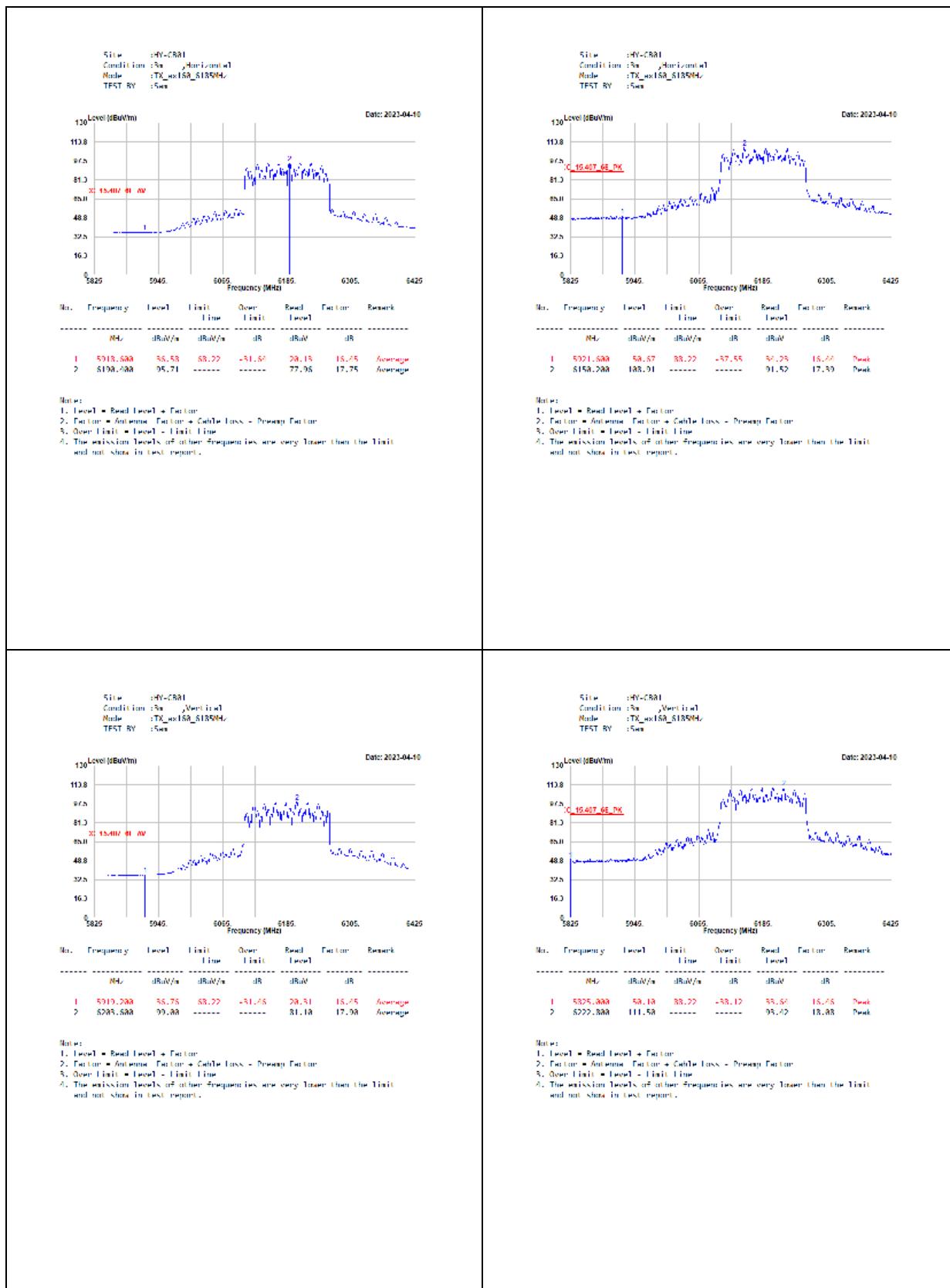


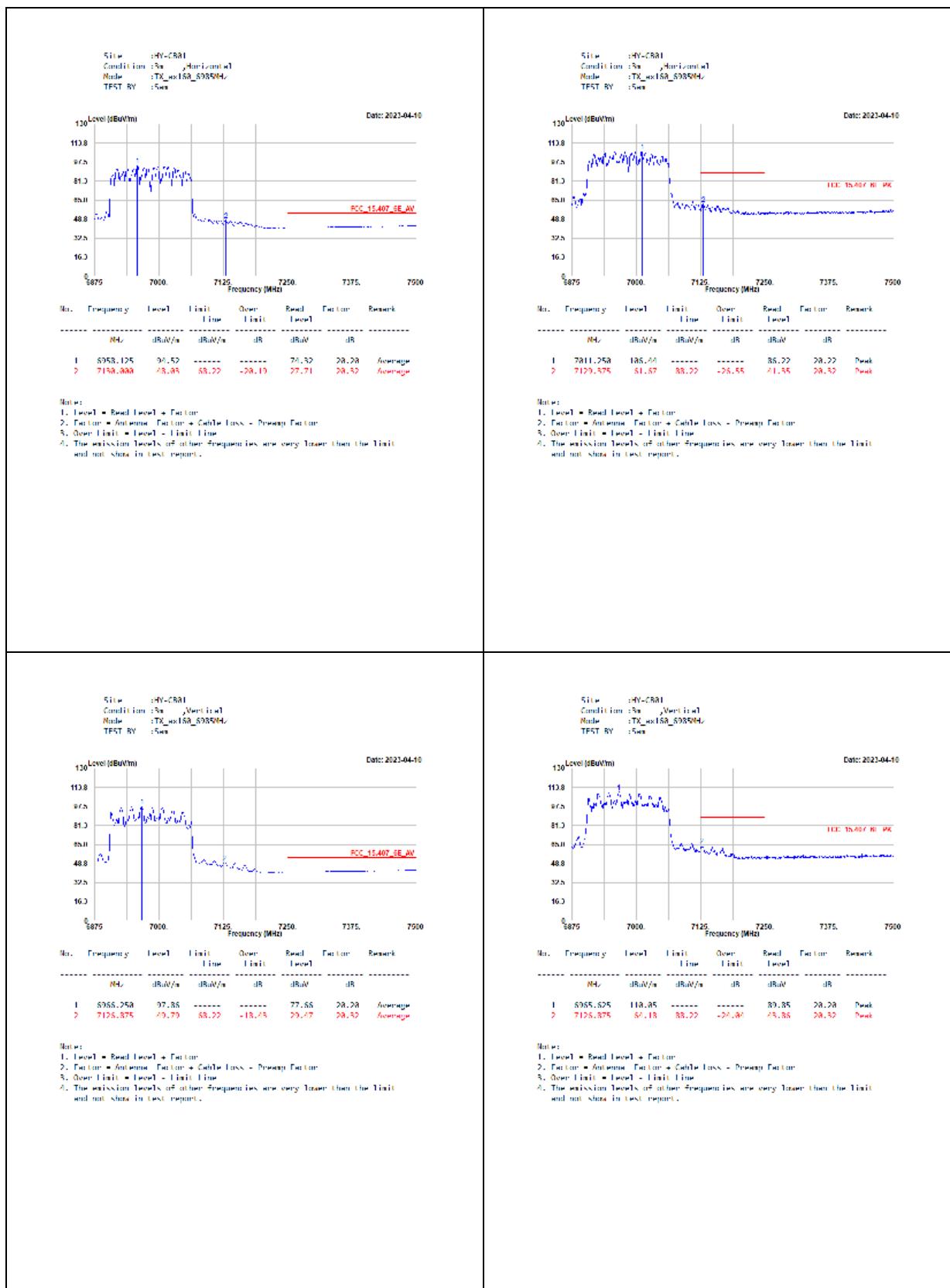




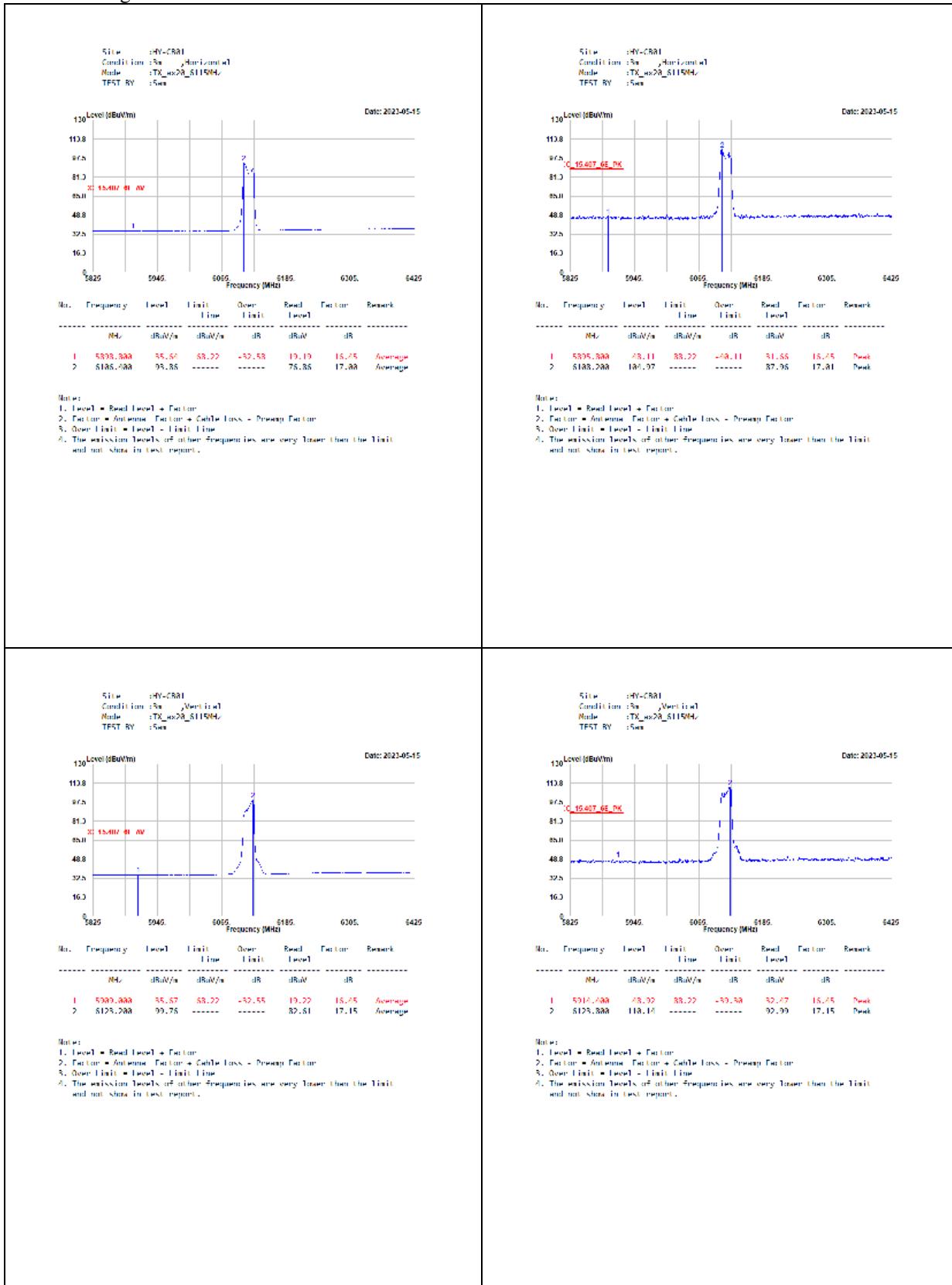


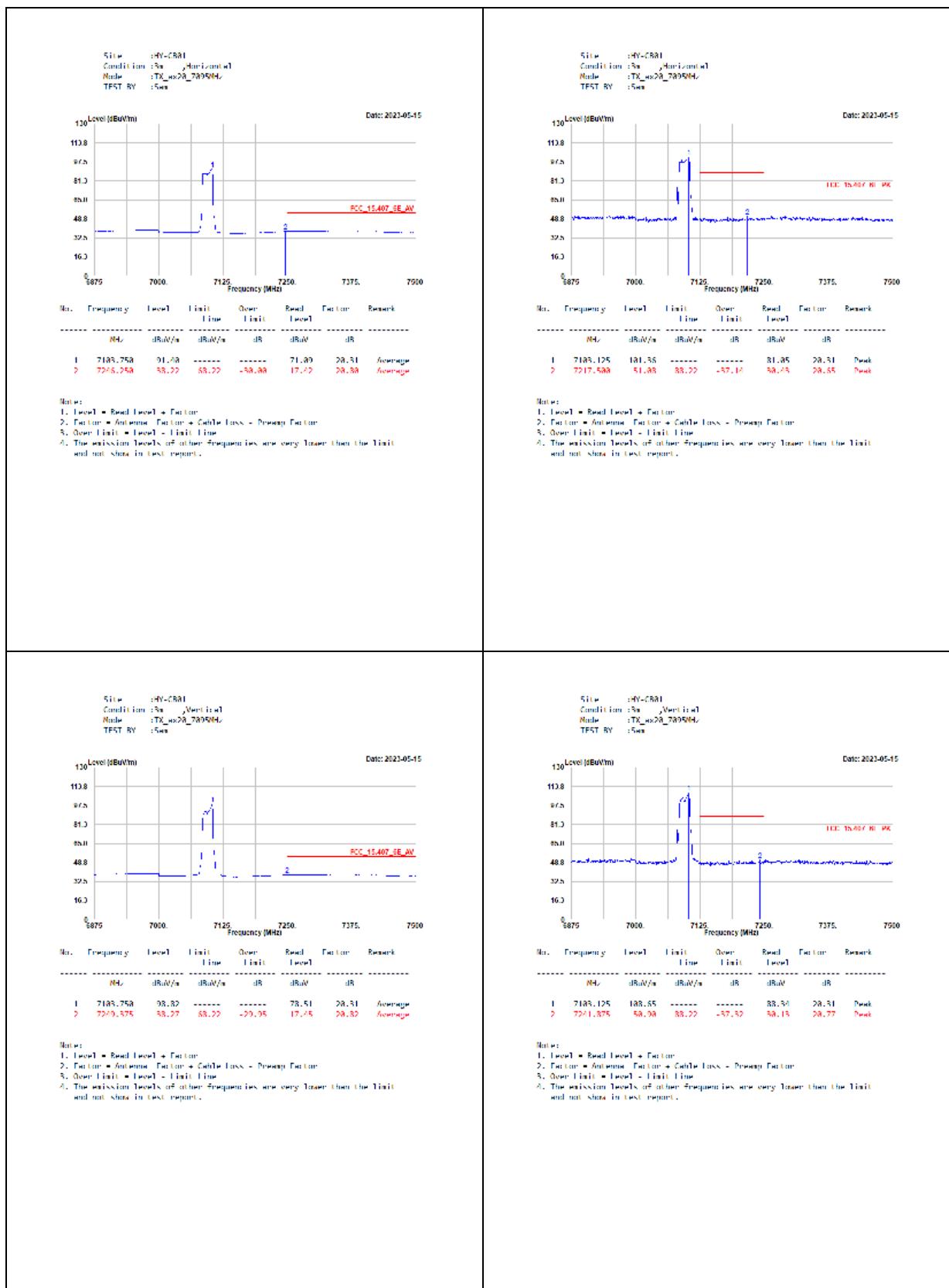


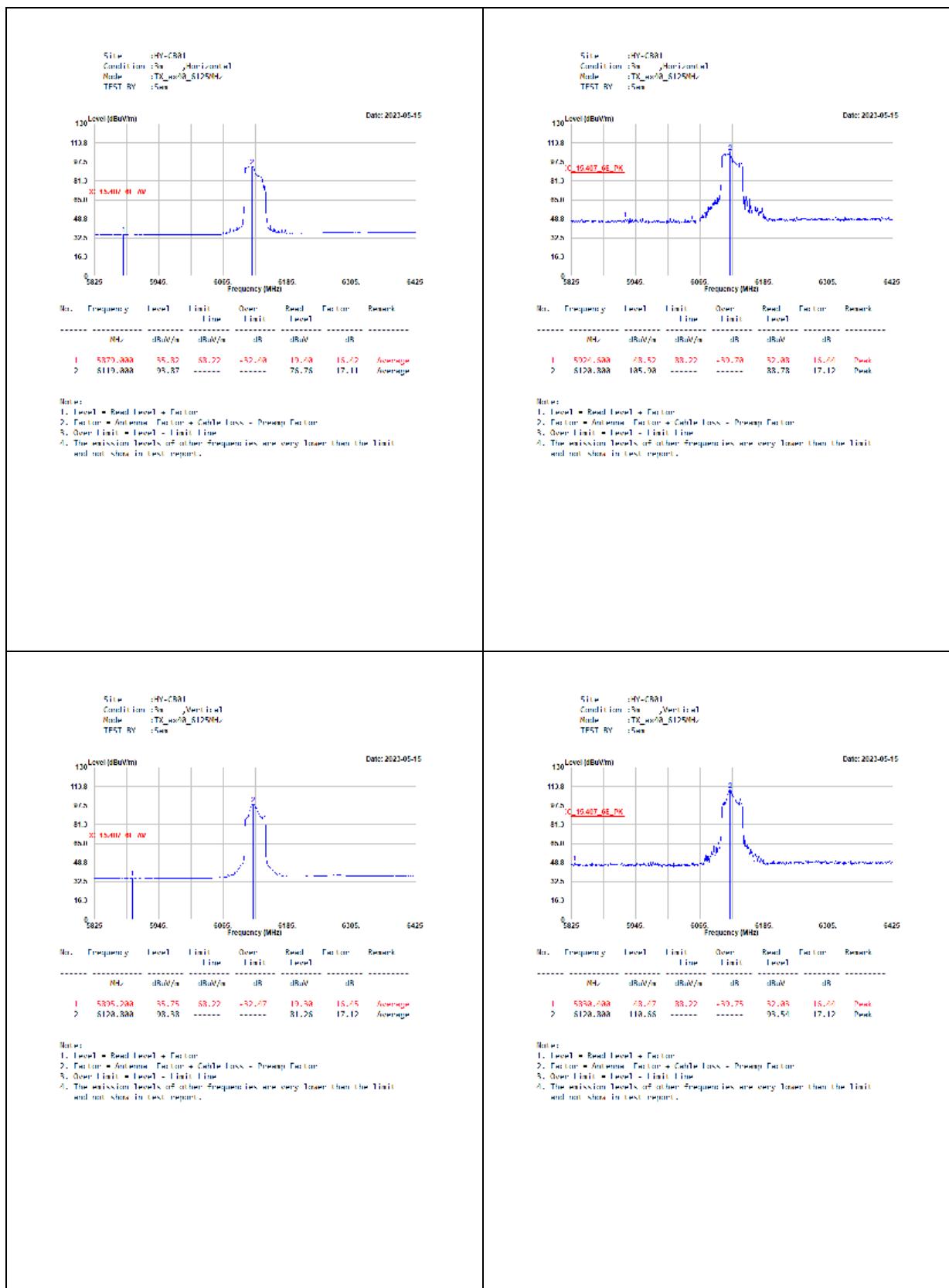


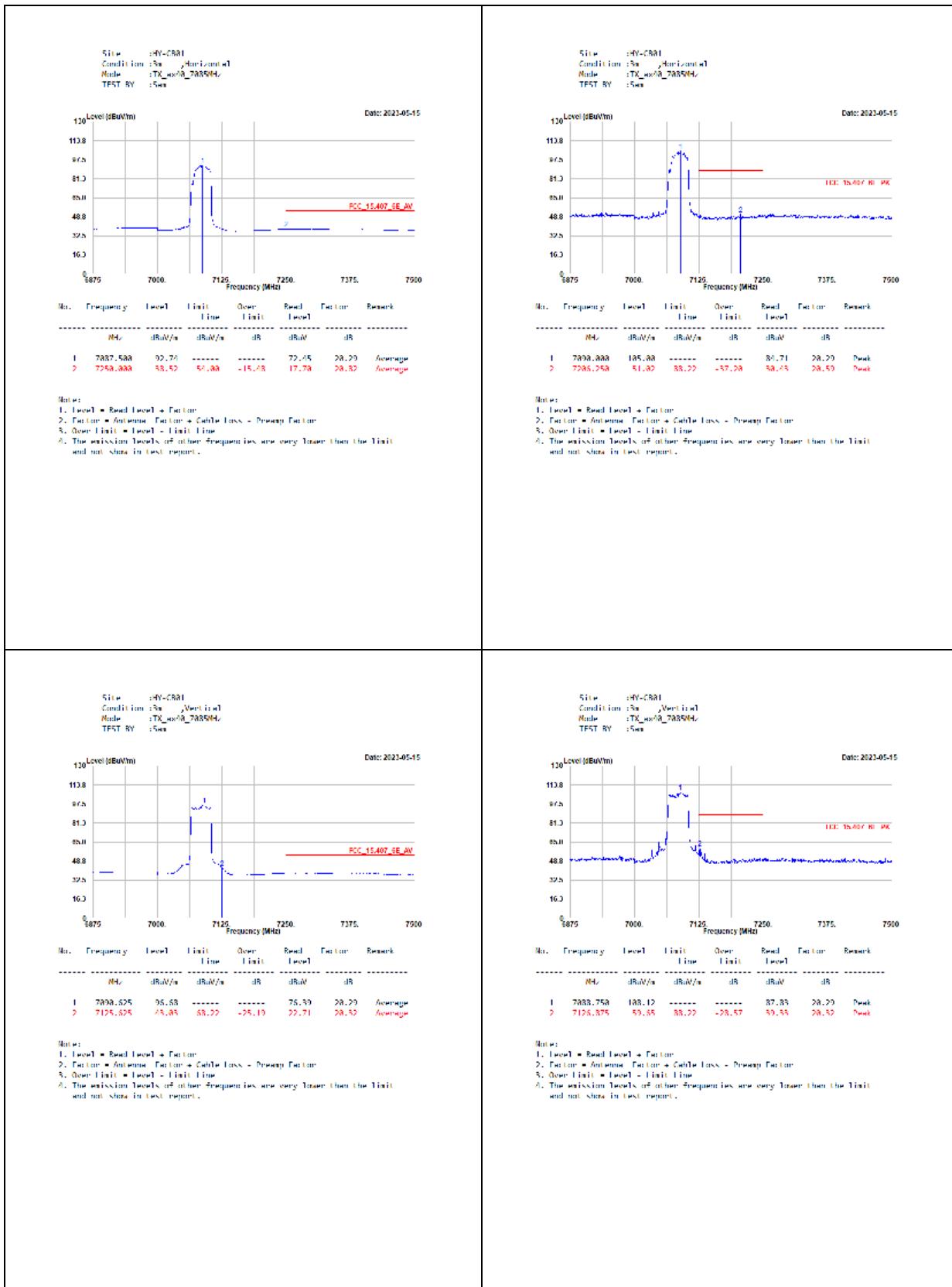


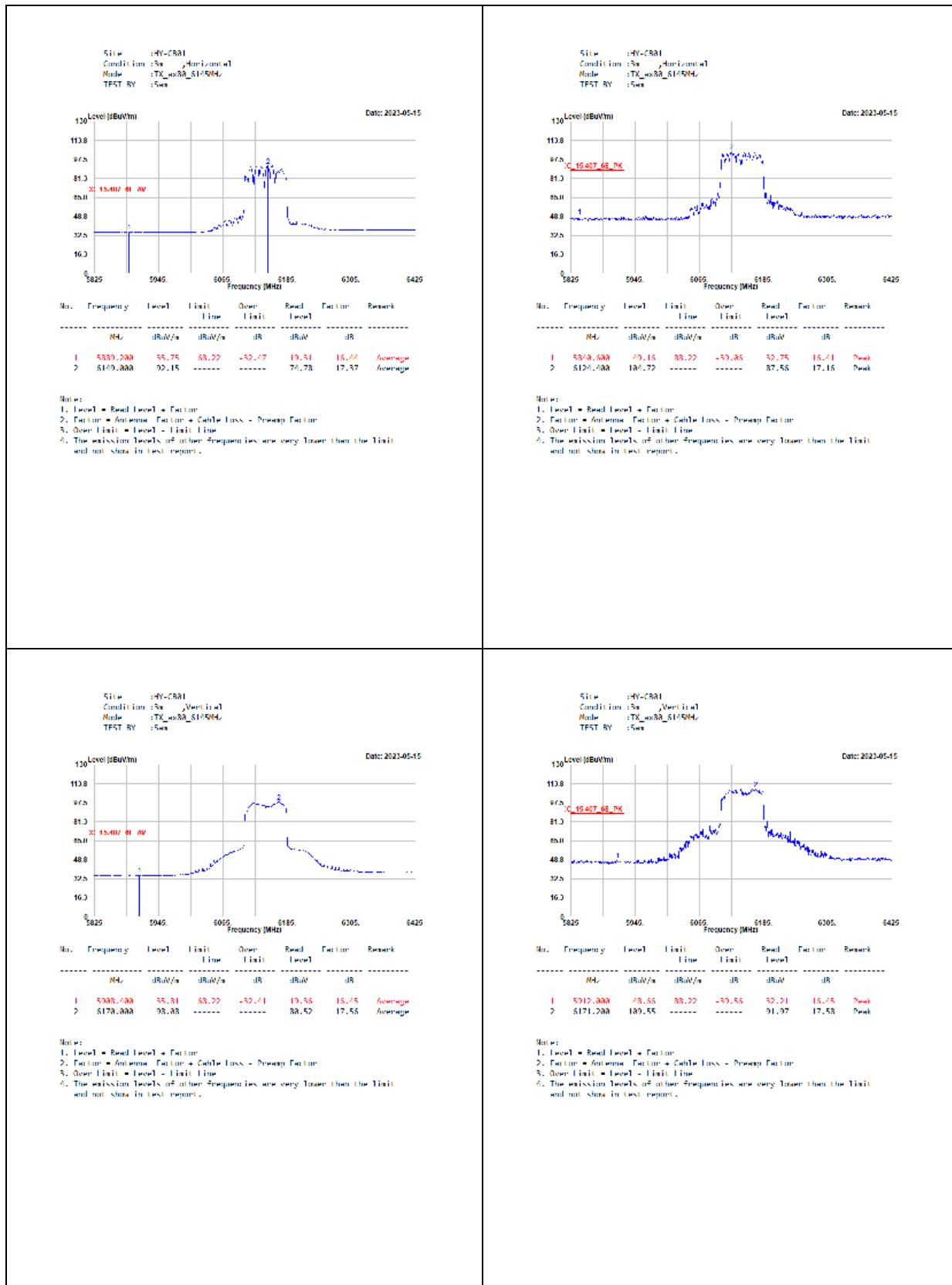
Beamforming

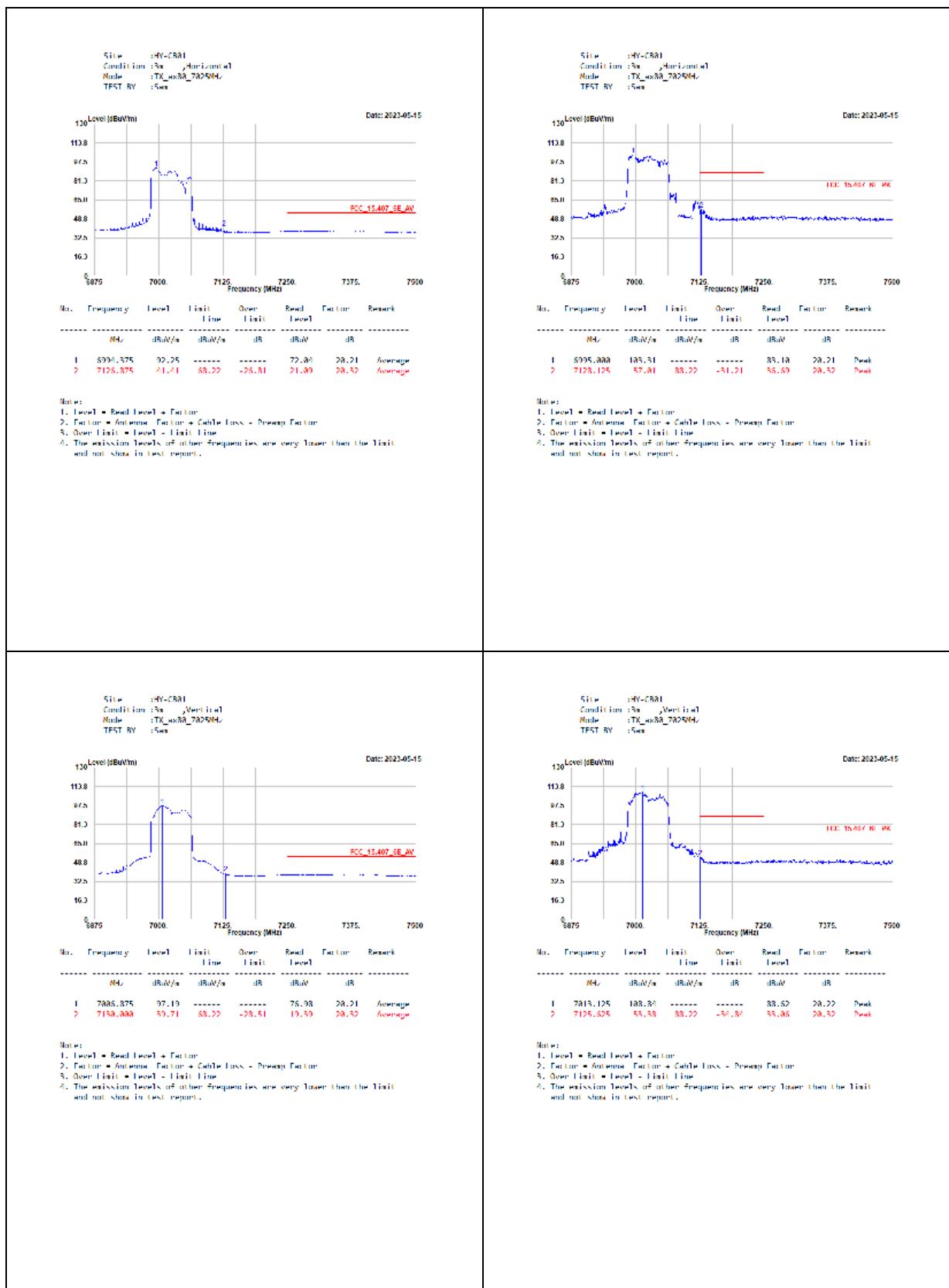


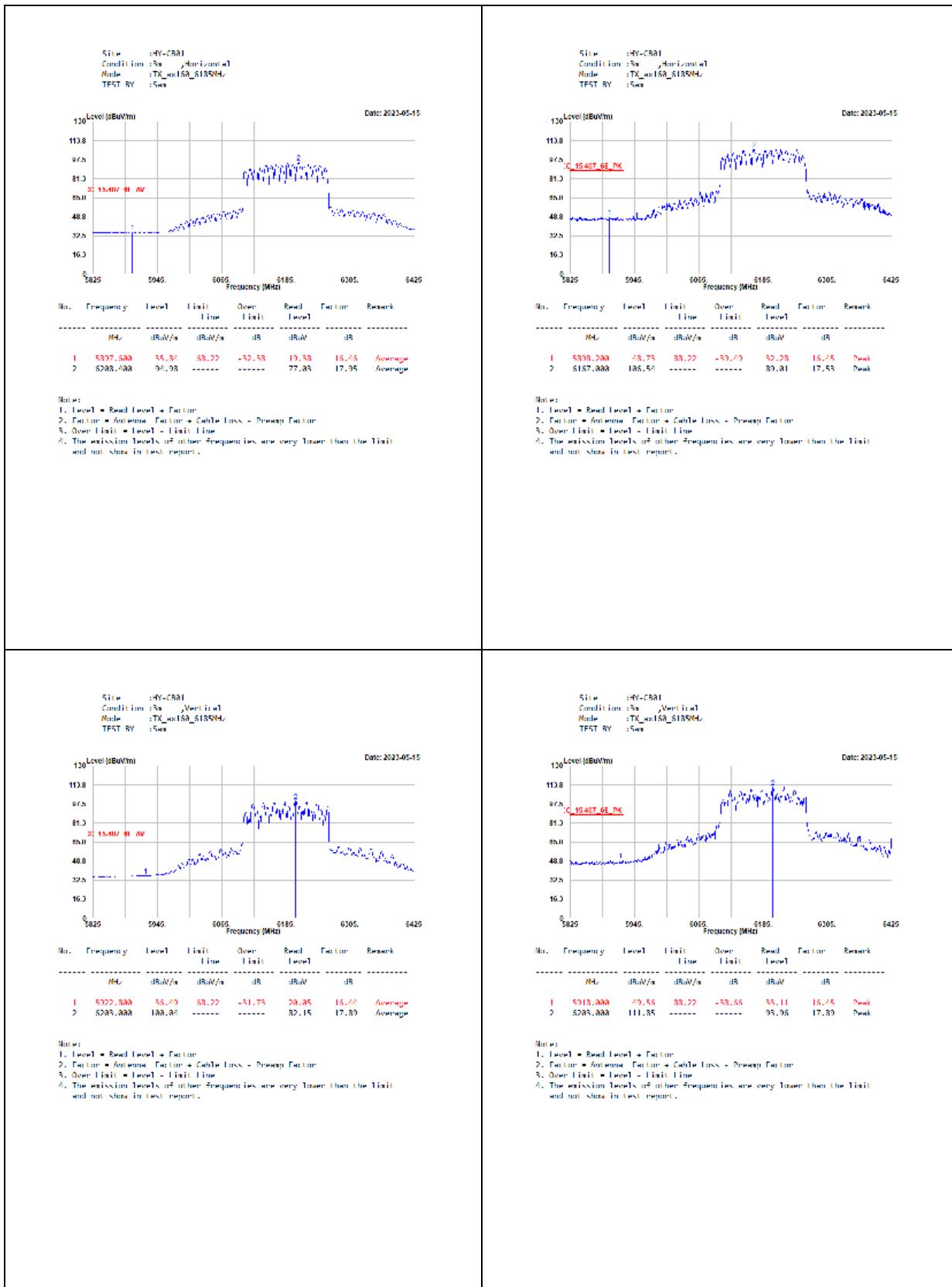


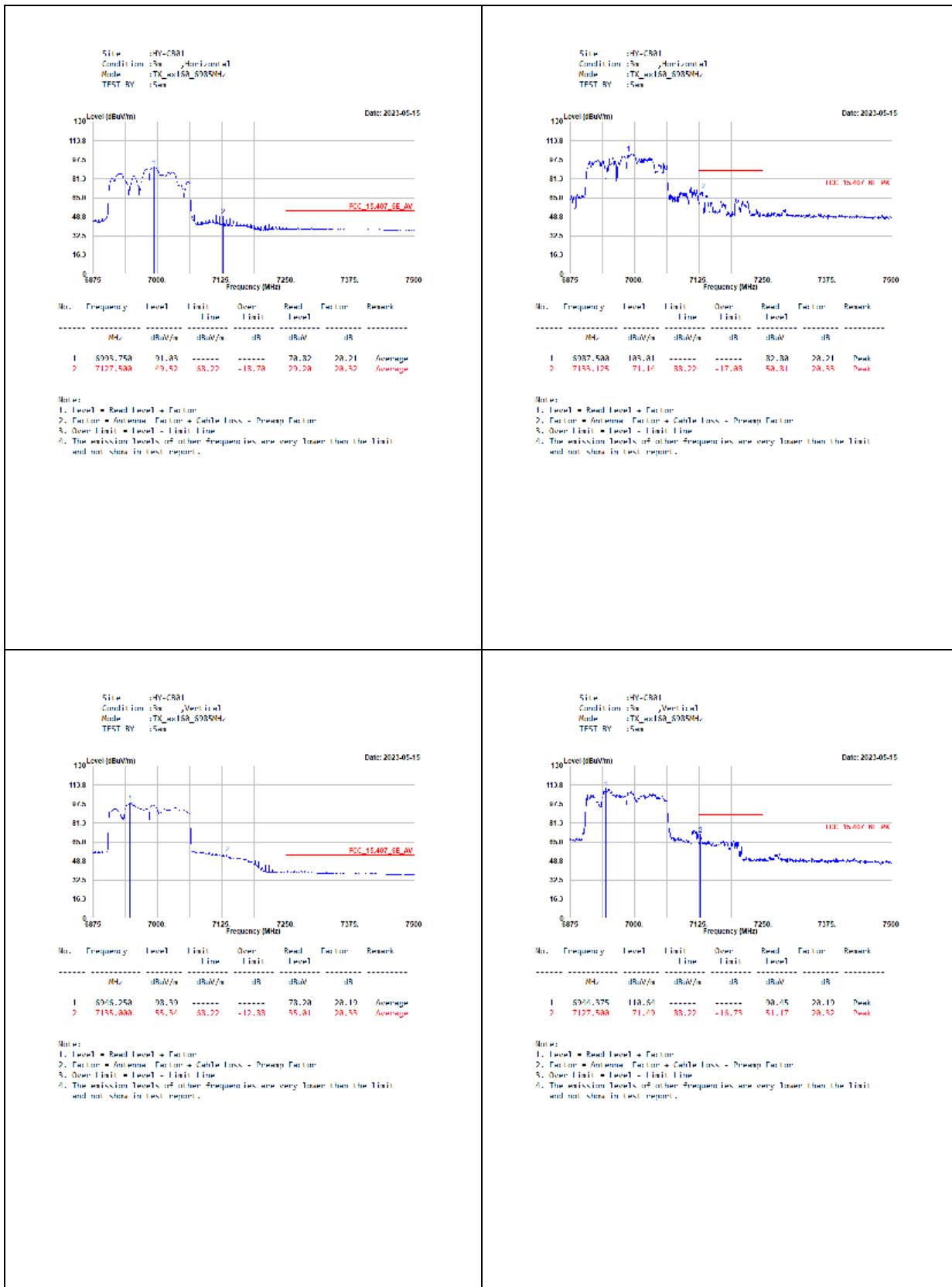






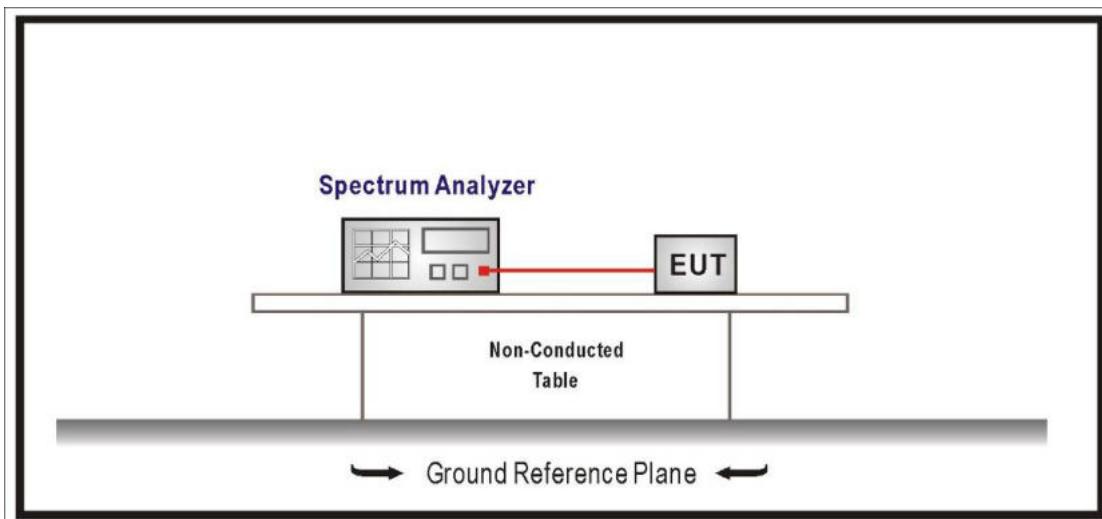






8. In-Band Emission (Mask)

8.1. Test Setup



8.2. Limits

Test Items	Frequencies (MHz)	(X) dBc ^{*1}
Emission Mask	At 1MHz outside of channel edge	20
	At one channel bandwidth from the channel center ^{*2}	28
	At one- and one-half times the channel bandwidth away from channel center ^{*3}	40
	More than one- and one-half times the channel bandwidth	40

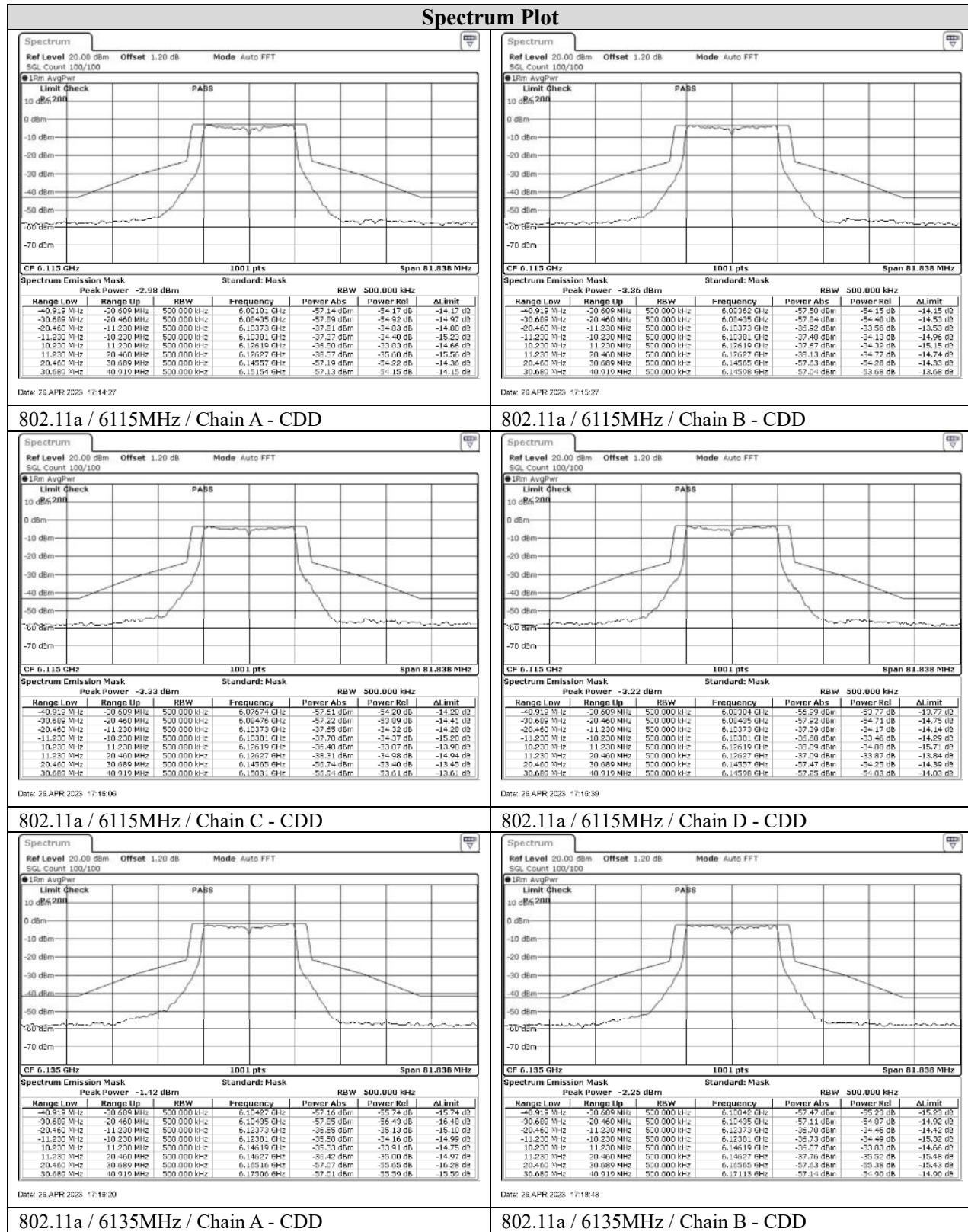
Remark:

1. The power spectral density must be suppressed by “x” dB.
2. At frequencies between one megahertz outside an unlicensed device’s channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression.
3. At frequencies between one and one- and one-half times an unlicensed device’s channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression.

8.3. Test Procedure

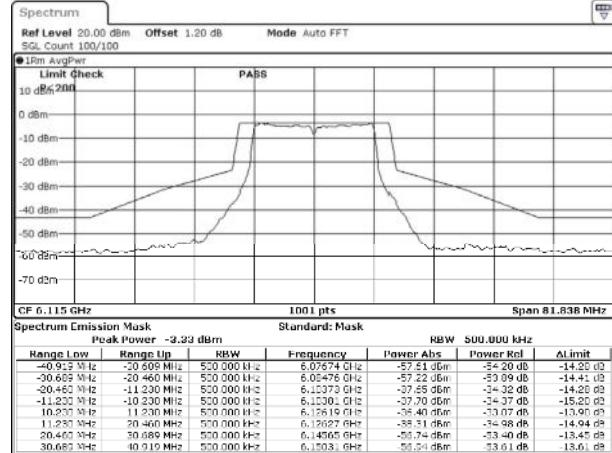
1. Connect output of the antenna port to a spectrum analyzer and adjust appropriate attenuation.
2. Measure the 26 dB EBW using the test procedure 12.4.1 of ANSI C63.10-2013. (Determine the channel edge.)
3. Measure the power spectral density (for emissions mask reference) using the following procedure:
 - (1) Set the span to encompass the entire 26 dB EBW of the signal.
 - (2) Set RBW = same RBW used for 26 dB EBW measurement.
 - (3) Set VBW $\geq 3 \times$ RBW
 - (4) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$.
 - (5) Sweep time = auto.
 - (6) Detector = RMS (i.e., power averaging)
 - (7) Trace average at least 100 traces in power averaging (rms) mode.
 - (8) Use the peak search function on the instrument to find the peak of the spectrum.
4. Using the measuring equipment Limit line function, develop the emissions mask based on the following requirements. The emissions power spectral density must be reduced below the peak power spectral density (in dB) as follows:
 - (1) Suppressed by 20 dB at 1 MHz outside of the channel edge. (The channel edge is defined as the 26-dB point on either side of the carrier center frequency.)
 - (2) Suppressed by 28 dB at one channel bandwidth from the channel center.
 - (3) Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.
5. Adjust the span to encompass the entire mask as necessary and clear trace.
6. Trace average at least 100 traces in power averaging (rms) mode.
7. Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask.

8.4. Test Result of In-Band Emission (Mask)



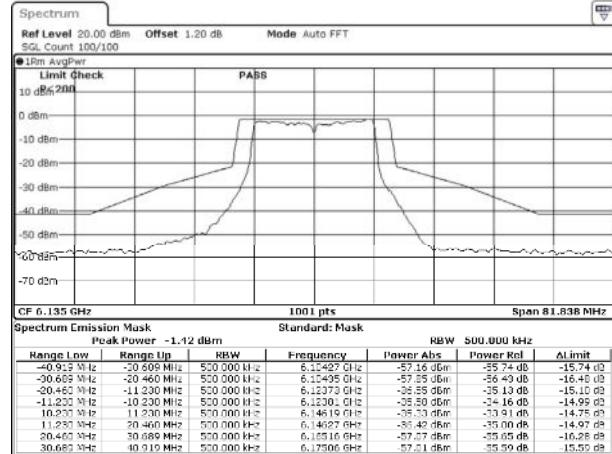
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802.11a / 6115MHz / Chain A - CDD



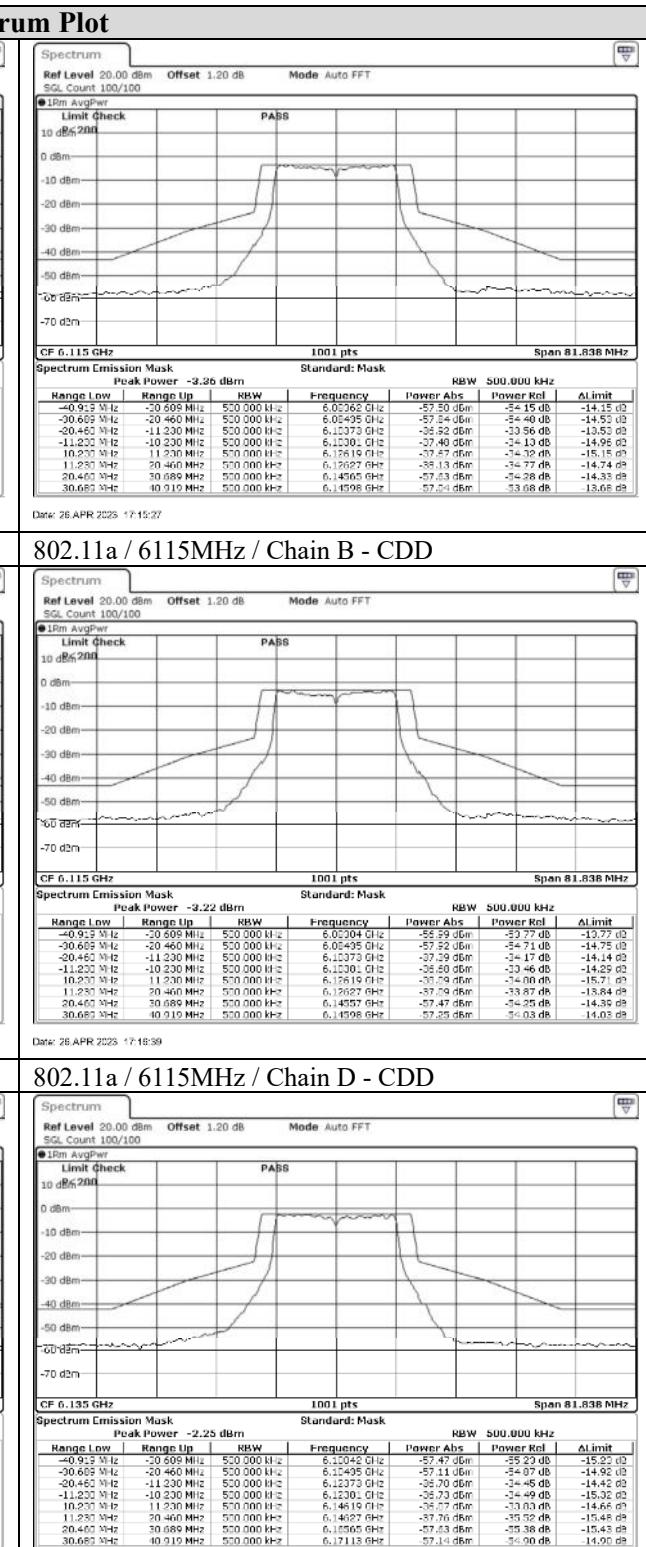
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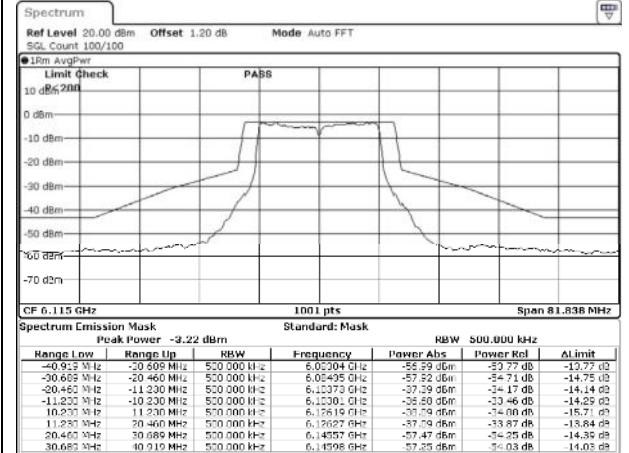
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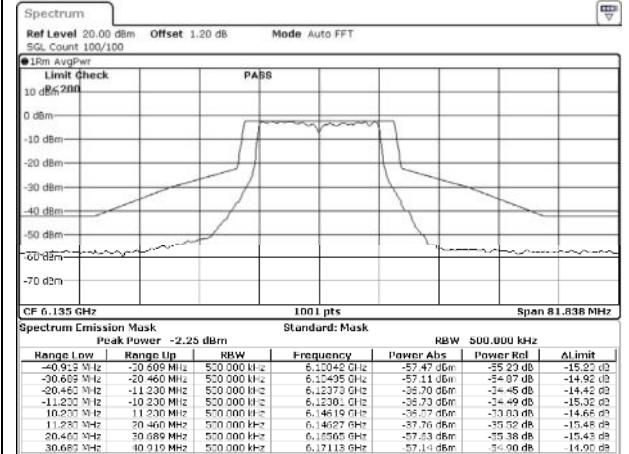
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802.11a / 6115MHz / Chain B - CDD



Date: 26 APR 2023 17:18:39

802.11a / 6115MHz / Chain D - CDD



Date: 26 APR 2023 17:19:48

802.11a / 6135MHz / Chain B - CDD

