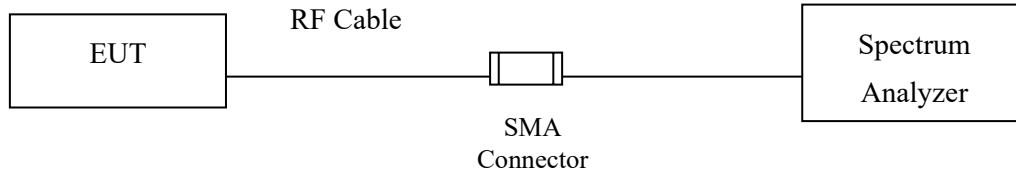


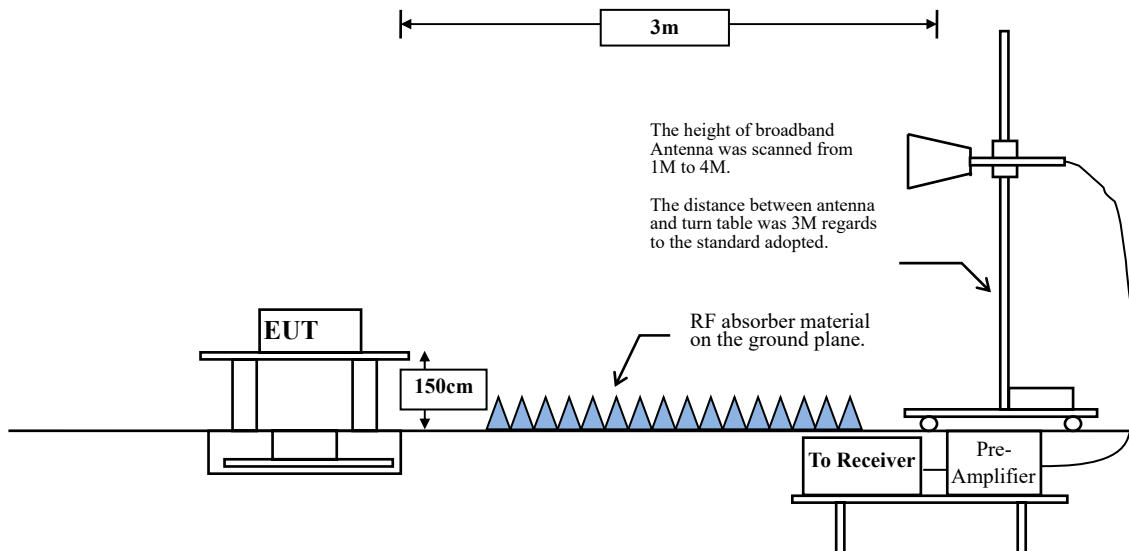
6. Band Edge

6.1. Test Setup

RF Conducted Measurement:



RF Radiated Measurement:



6.2. 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 Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	$\mu\text{V/m @3m}$	$\text{dB}\mu\text{V/m@3m}$
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks :

1. RF Voltage ($\text{dB}\mu\text{V}$) = $20 \log \text{RF Voltage } (\mu\text{V})$
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.

- 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 .
- 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 .
- 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 .
- For transmitters operating in the 5.725-5.85 GHz band:
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.
- For transmitters operating in the 5.850-5.895 GHz band:
 - (i) For an indoor access point or subordinate device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of 15 dBm/MHz and shall decrease linearly to an e.i.r.p. of -7 dBm/MHz at or above 5.925 GHz.
 - (ii) For a client device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of -5 dBm/MHz and shall decrease linearly to an e.i.r.p. of -27 dBm/MHz at or above 5.925 GHz.
 - (iii) For a client device or indoor access point or subordinate device, all emissions below 5.725 GHz shall not exceed an e.i.r.p. of -27 dBm/MHz at 5.65 GHz increasing linearly to 10 dBm/MHz at 5.7 GHz, and from 5.7 GHz increasing linearly to a level of 15.6 dBm/MHz at 5.72 GHz, and from 5.72 GHz increasing linearly to a level of 27 dBm/MHz at 5.725 GHz.
- For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of -27 dBm/MHz .

Based on ANSI C63.10-2013 Section 12.7.3 d) provides the conversion formula between field strength and EIRP, if distance is 3m, -27dBm is equivalent to 68.22dBuV/m .

6.3. Test Procedure

The EUT is 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 1 GHz are 1 MHz. The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

RBW and VBW Parameter setting:

According to KDB 789033 section II.G.5 Procedure for Unwanted Maximum Emissions Measurements above 1000 MHz.

RBW = 1 MHz.

VBW \geq 3 MHz.

According to KDB 789033 section II.G.6 Procedures for Average Unwanted Emissions Measurements above 1000 MHz.

RBW = 1 MHz.

VBW = 10 Hz, when duty cycle \geq 98 %

VBW \geq 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

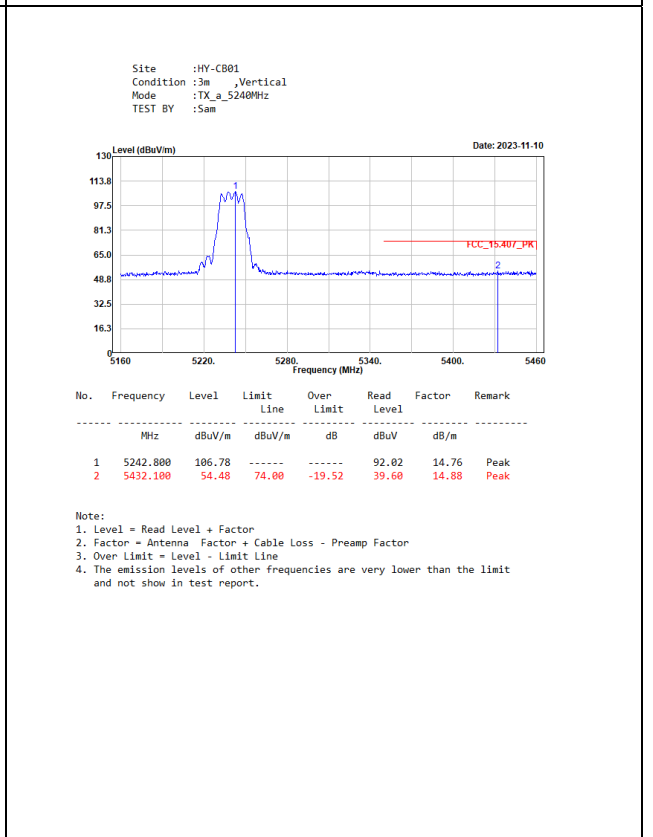
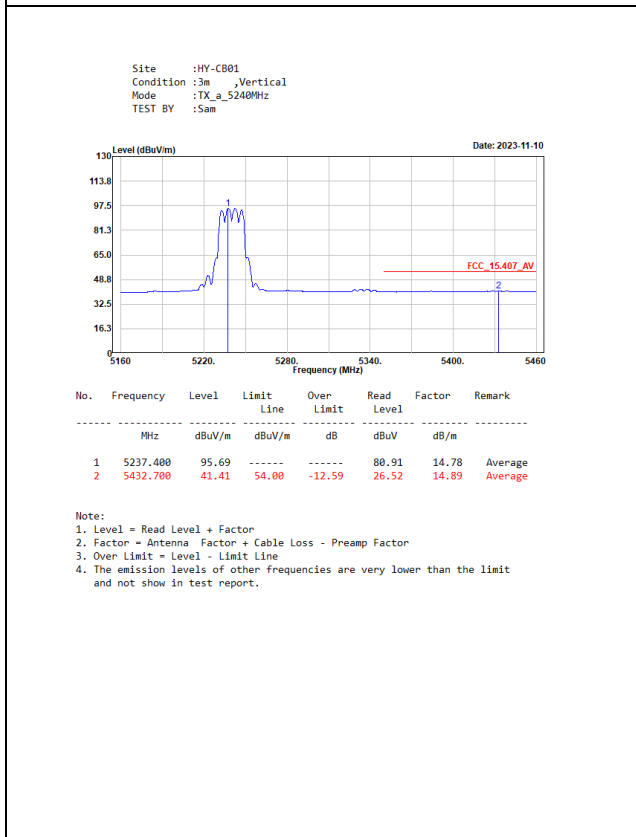
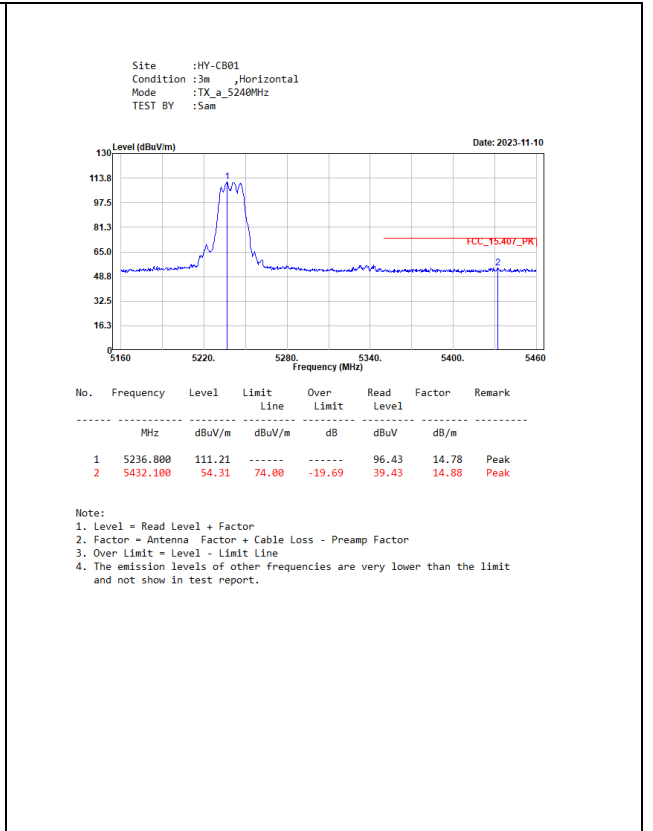
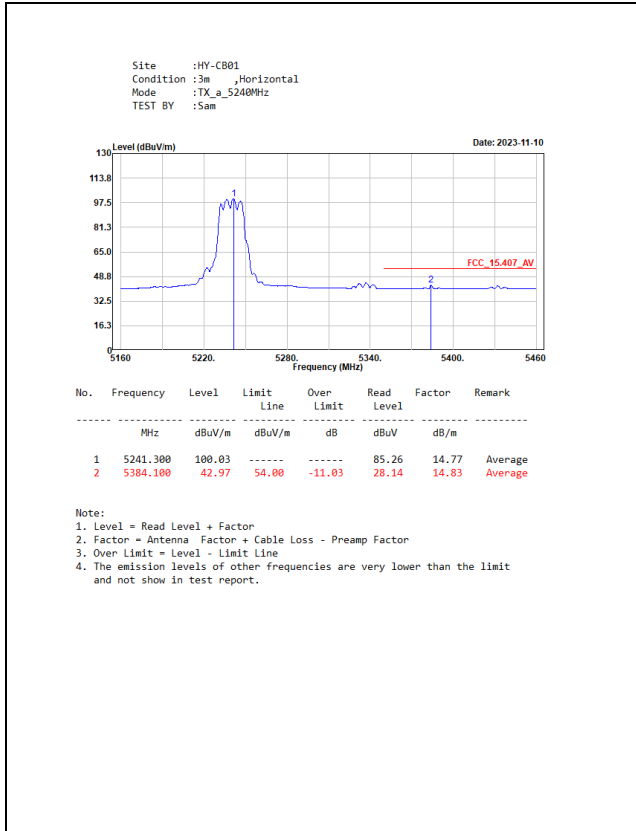
5 GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11a	98.10	2.0640	484	10
802.11ac-20 MHz	96.11	0.9880	1012	2000
802.11ac-40 MHz	92.91	0.4980	2008	3000

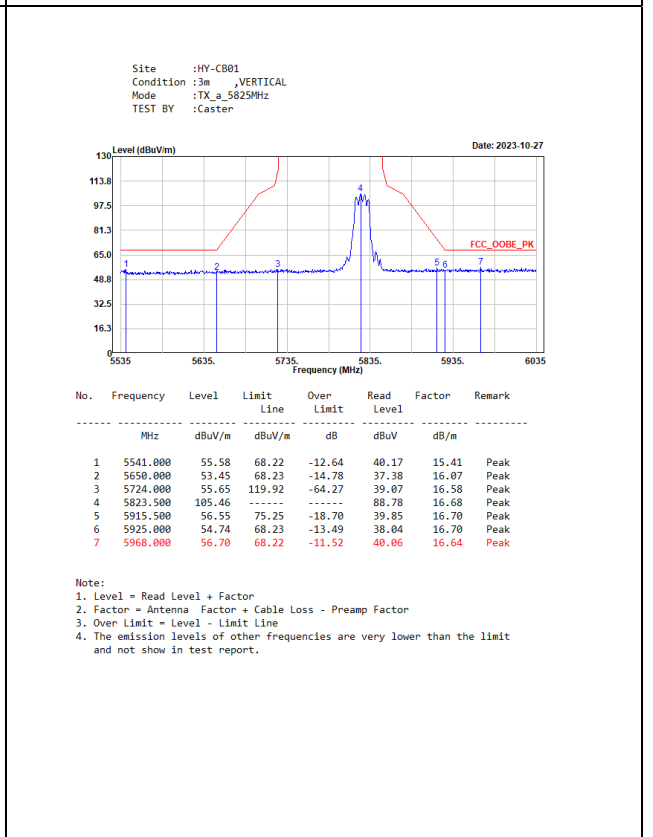
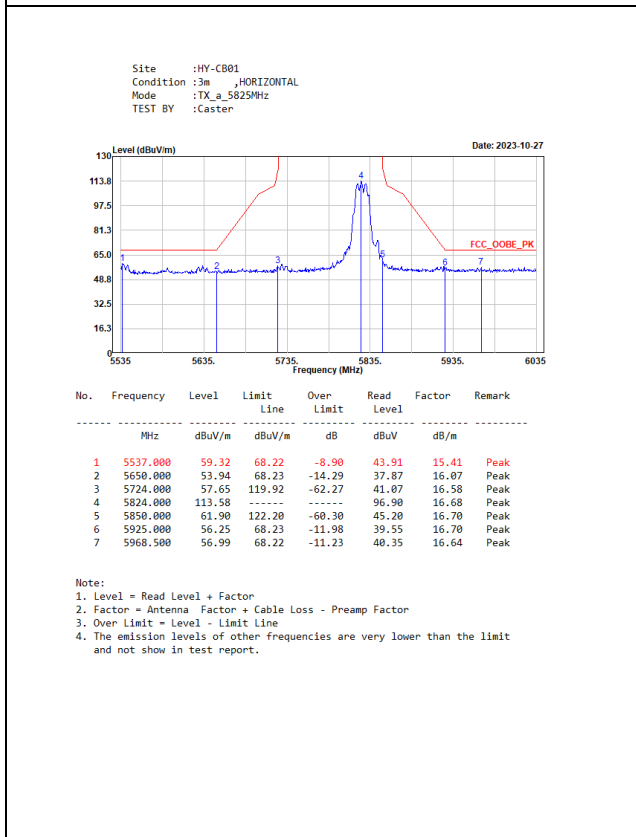
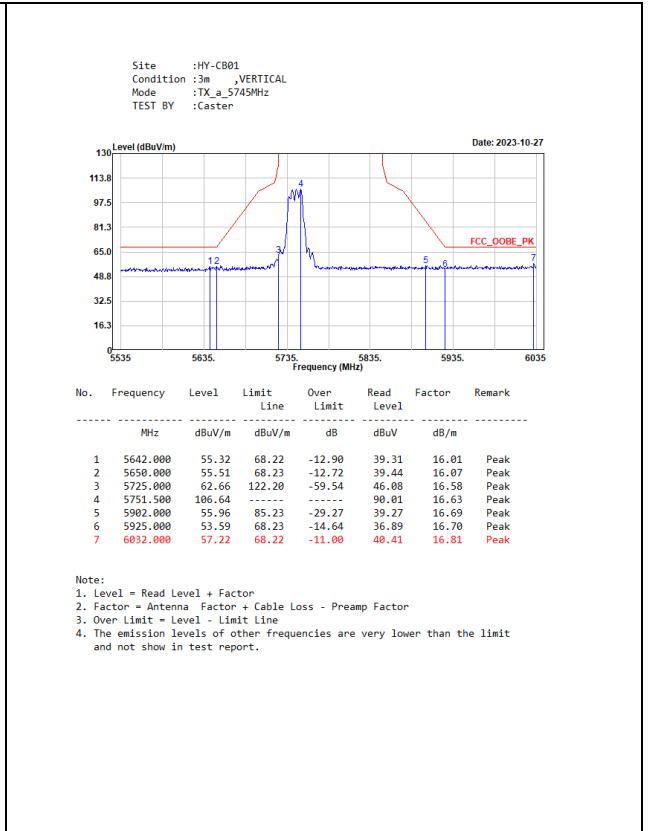
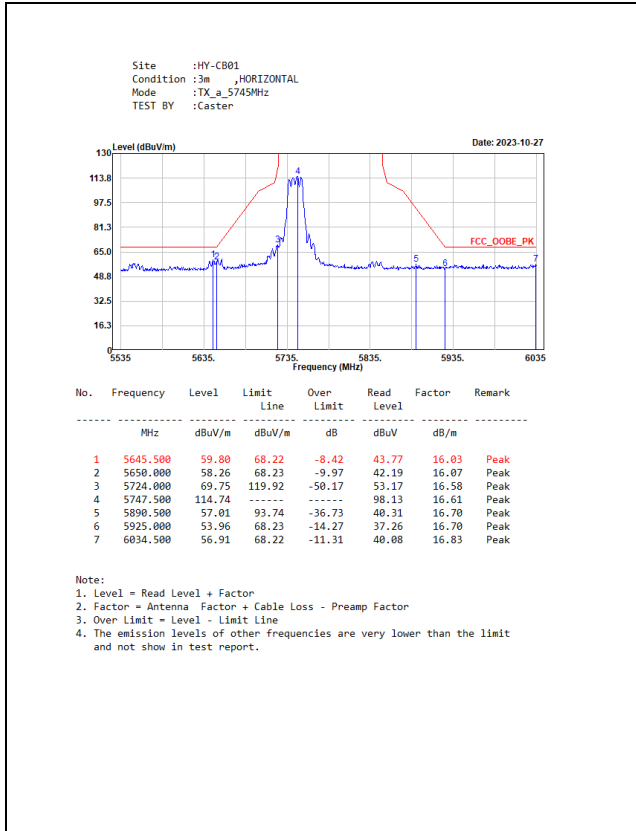
Note: Duty Cycle Refer to Section 8.

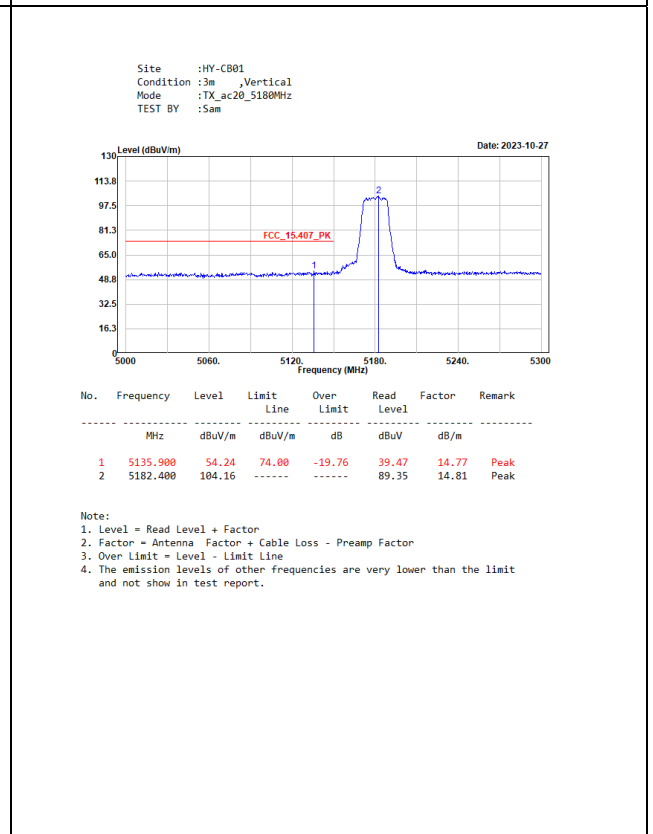
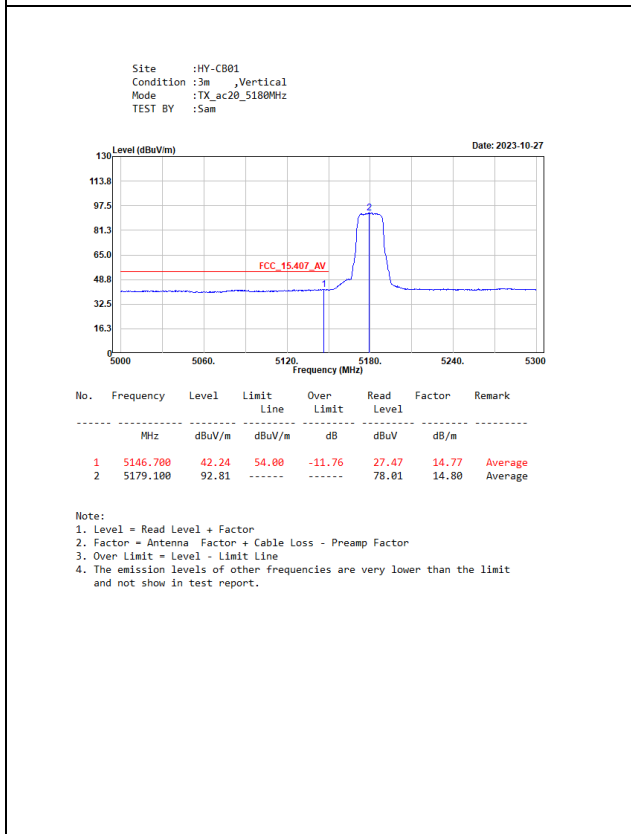
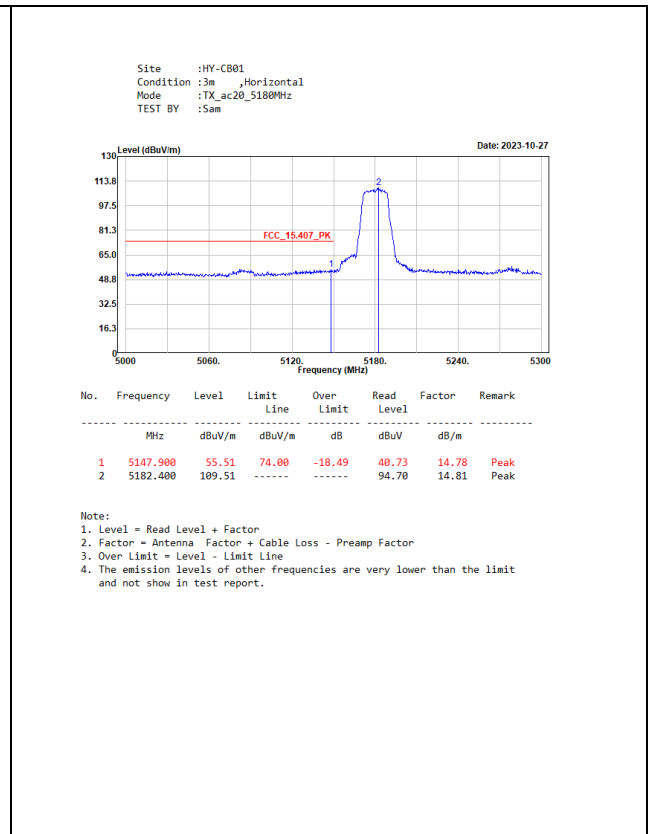
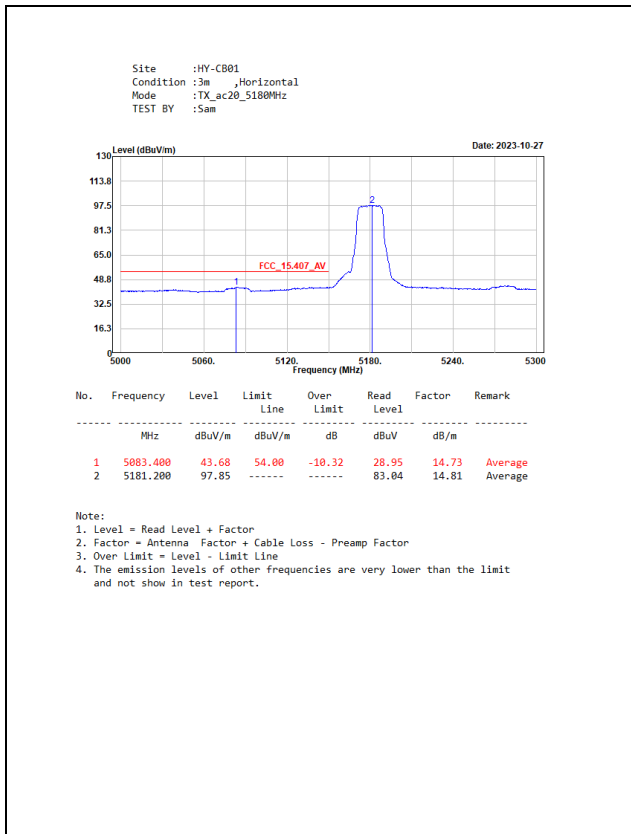
6.4. Test Result of Band Edge

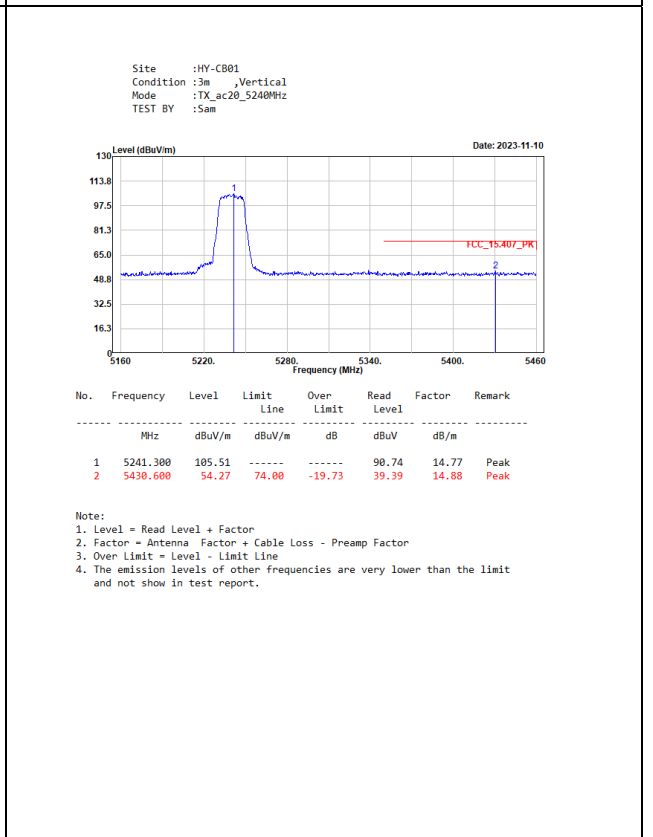
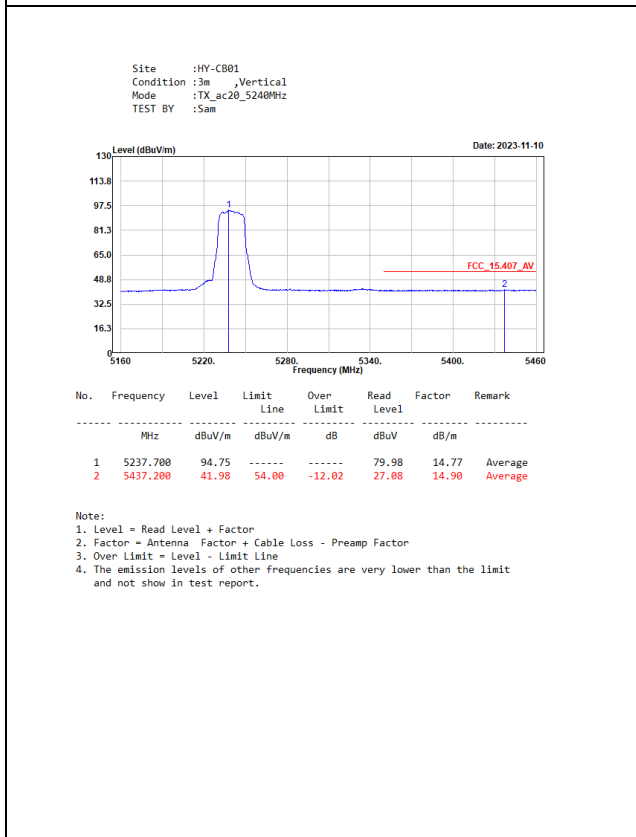
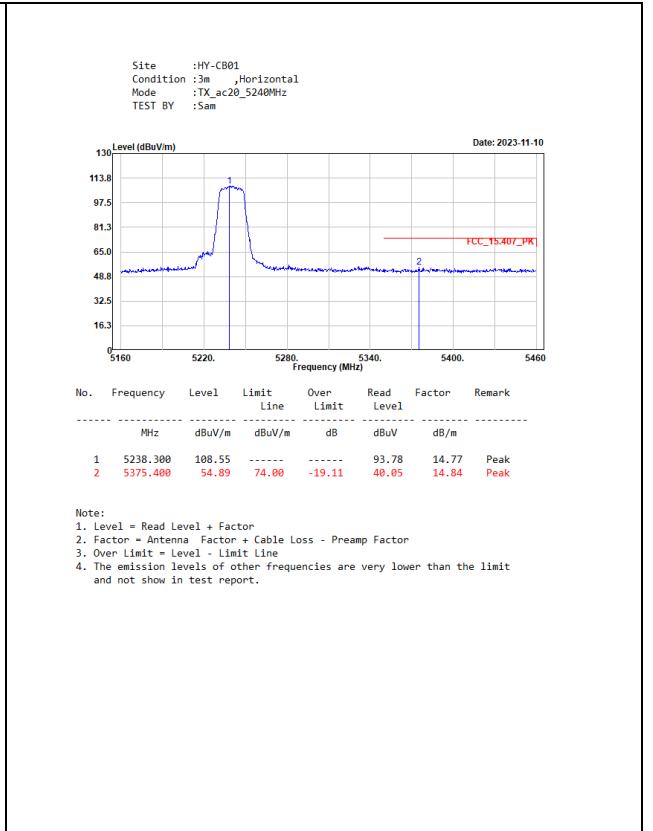
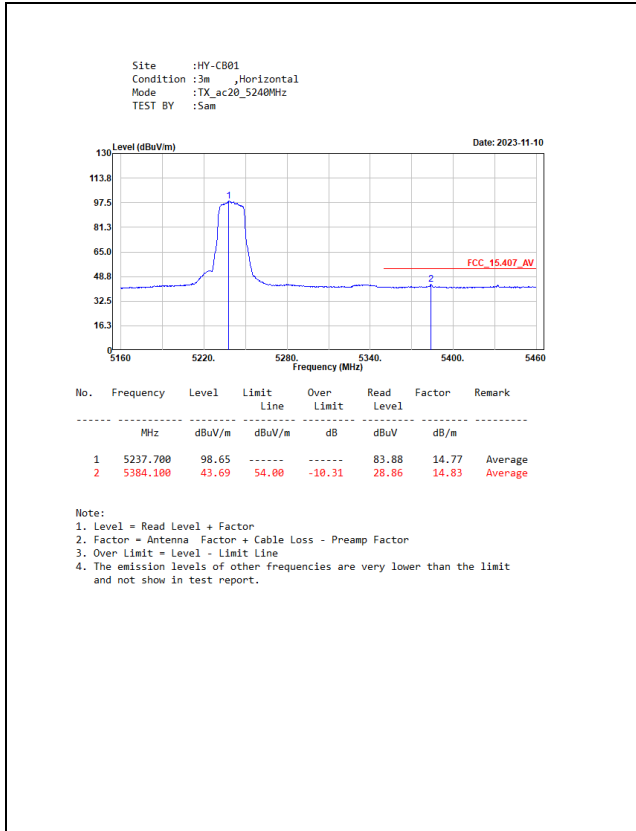
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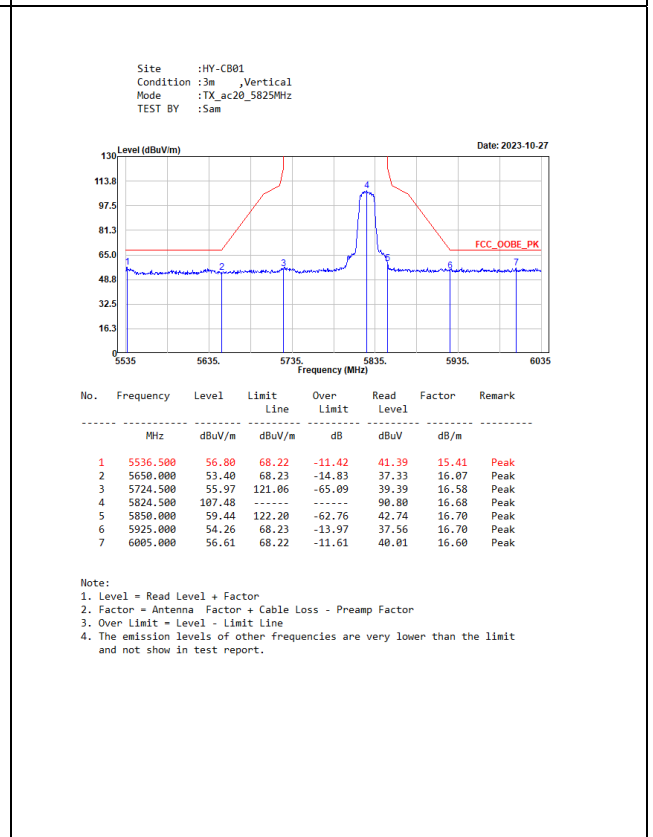
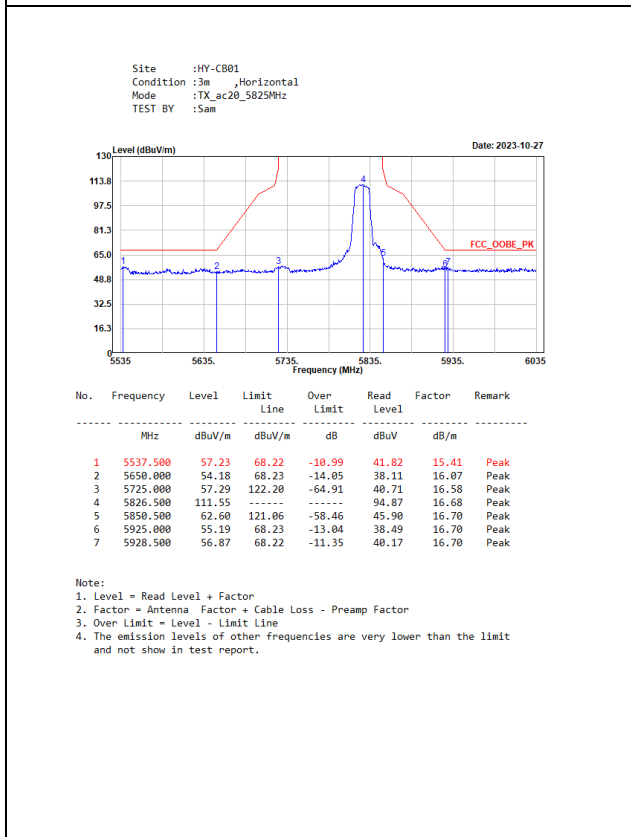
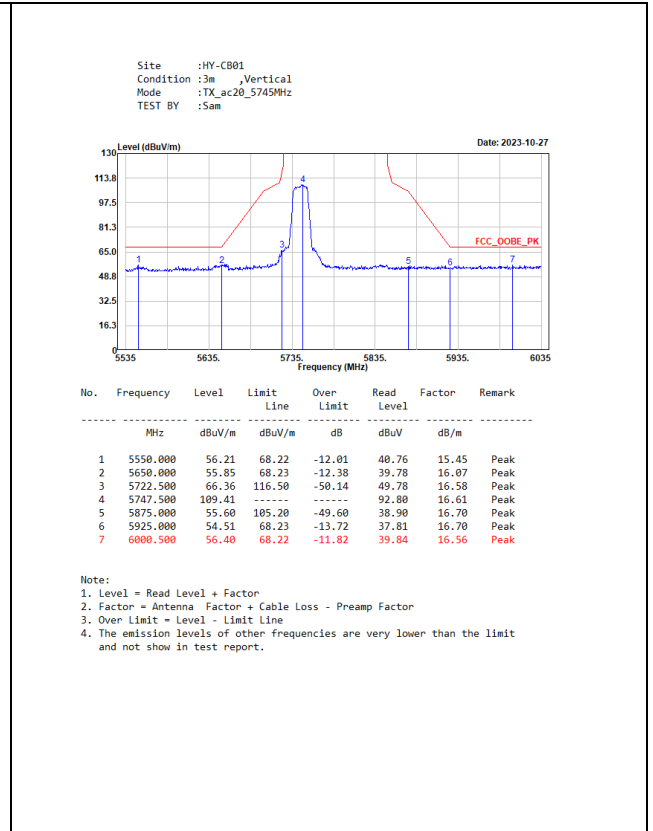
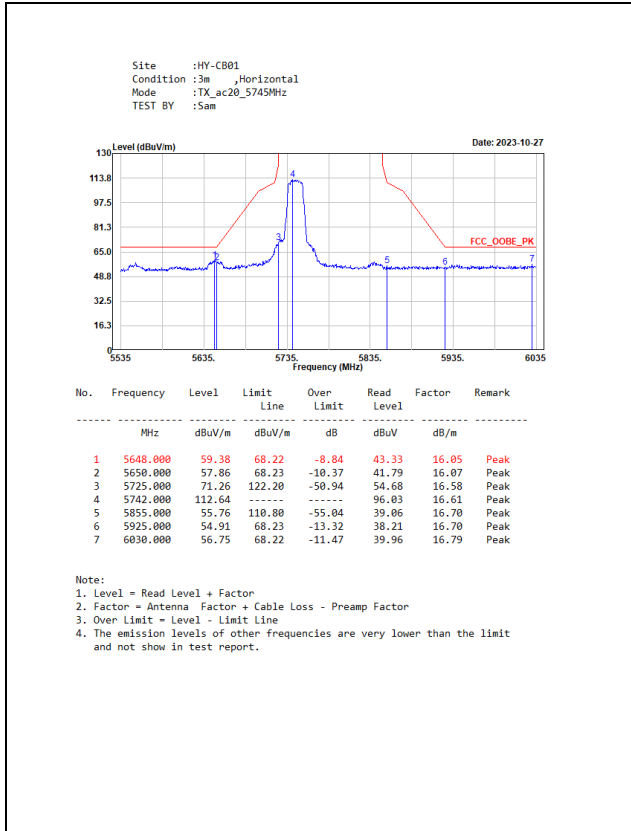
<p>Site :HY-CB01 Condition :3m ,Horizontal Mode :TX_a_5180MHz TEST BY :Caster</p> <p style="text-align: right;">Date: 2023-10-26</p> <table border="1"> <thead> <tr> <th>No.</th> <th>Frequency</th> <th>Level</th> <th>Limit</th> <th>Over</th> <th>Read</th> <th>Factor</th> <th>Remark</th> </tr> <tr> <th></th> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB/m</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5084.000</td> <td>46.13</td> <td>54.00</td> <td>-7.87</td> <td>31.40</td> <td>14.73</td> <td>Average</td> </tr> <tr> <td>2</td> <td>5181.200</td> <td>100.60</td> <td>-----</td> <td>-----</td> <td>85.79</td> <td>14.81</td> <td>Average</td> </tr> </tbody> </table> <p>Note: 1. Level = Read Level + Factor 2. Factor = Antenna Factor + Cable Loss - Preamp Factor 3. Over Limit = Level - Limit Line 4. The emission levels of other frequencies are very lower than the limit and not show in test report.</p>	No.	Frequency	Level	Limit	Over	Read	Factor	Remark		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		1	5084.000	46.13	54.00	-7.87	31.40	14.73	Average	2	5181.200	100.60	-----	-----	85.79	14.81	Average	<p>Site :HY-CB01 Condition :3m ,Horizontal Mode :TX_a_5180MHz TEST BY :Caster</p> <p style="text-align: right;">Date: 2023-10-26</p> <table border="1"> <thead> <tr> <th>No.</th> <th>Frequency</th> <th>Level</th> <th>Limit</th> <th>Over</th> <th>Read</th> <th>Factor</th> <th>Remark</th> </tr> <tr> <th></th> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB/m</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5083.700</td> <td>56.97</td> <td>74.00</td> <td>-17.03</td> <td>42.24</td> <td>14.73</td> <td>Peak</td> </tr> <tr> <td>2</td> <td>5180.900</td> <td>111.68</td> <td>-----</td> <td>-----</td> <td>96.87</td> <td>14.81</td> <td>Peak</td> </tr> </tbody> </table> <p>Note: 1. Level = Read Level + Factor 2. Factor = Antenna Factor + Cable Loss - Preamp Factor 3. Over Limit = Level - Limit Line 4. The emission levels of other frequencies are very lower than the limit and not show in test report.</p>	No.	Frequency	Level	Limit	Over	Read	Factor	Remark		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		1	5083.700	56.97	74.00	-17.03	42.24	14.73	Peak	2	5180.900	111.68	-----	-----	96.87	14.81	Peak
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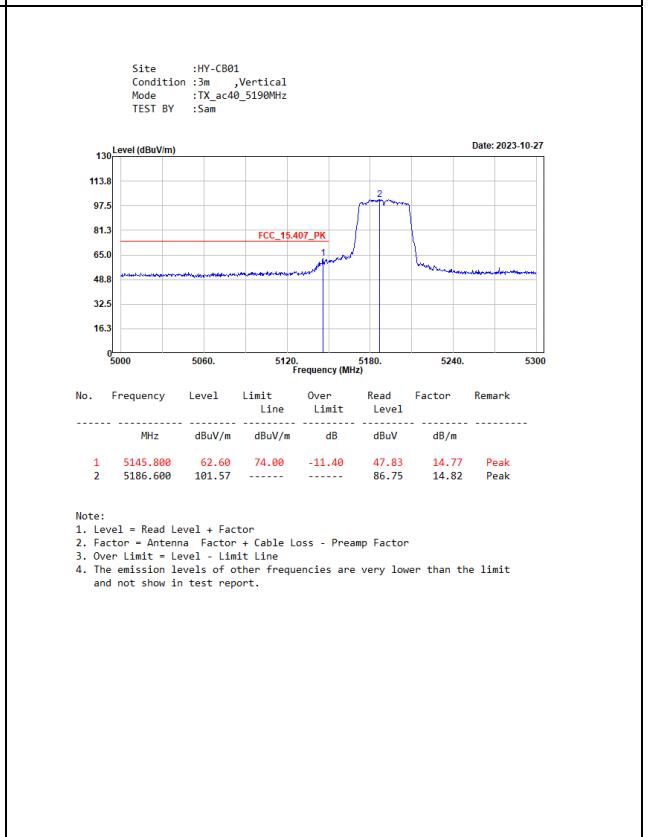
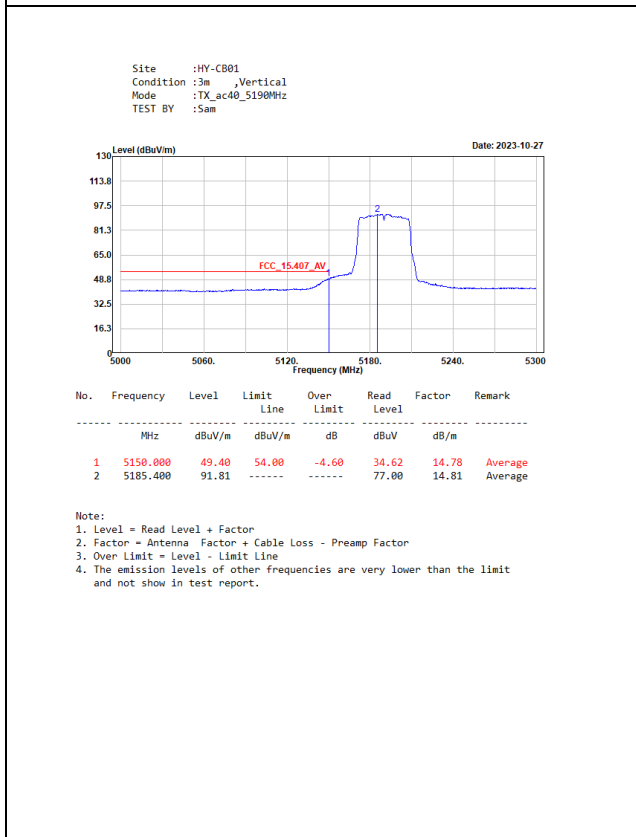
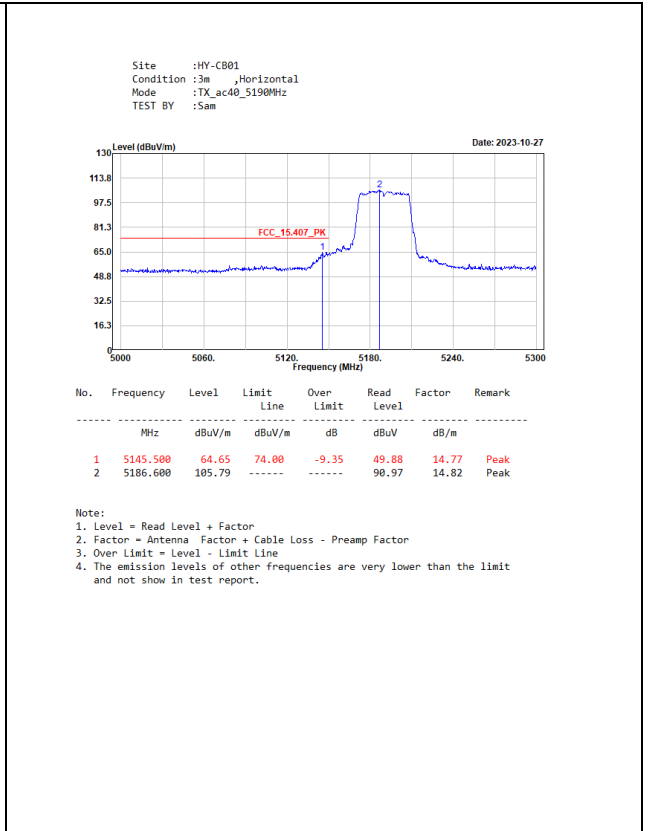
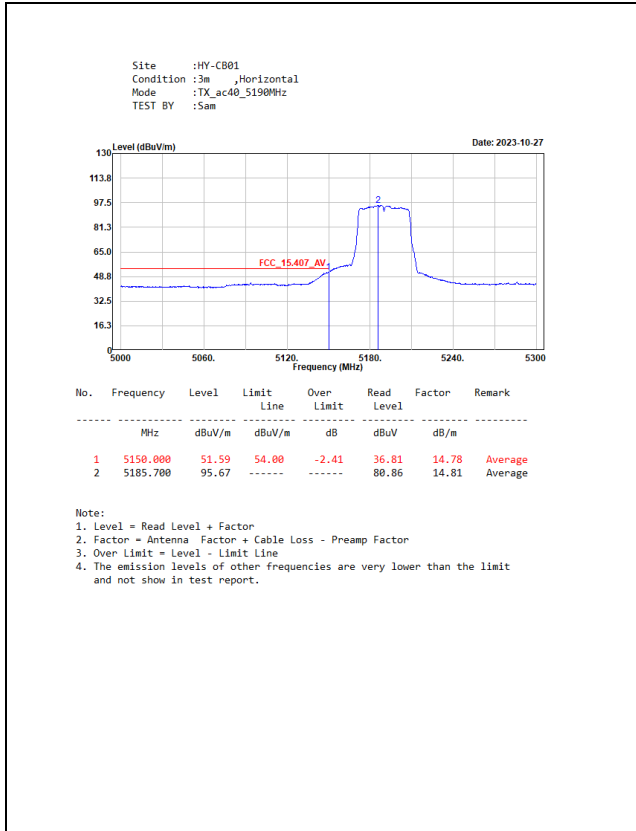


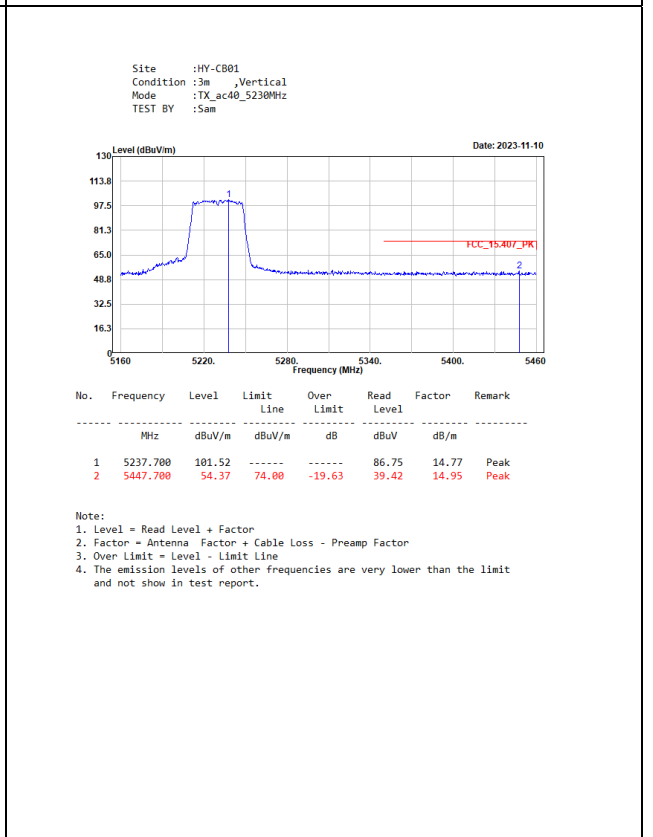
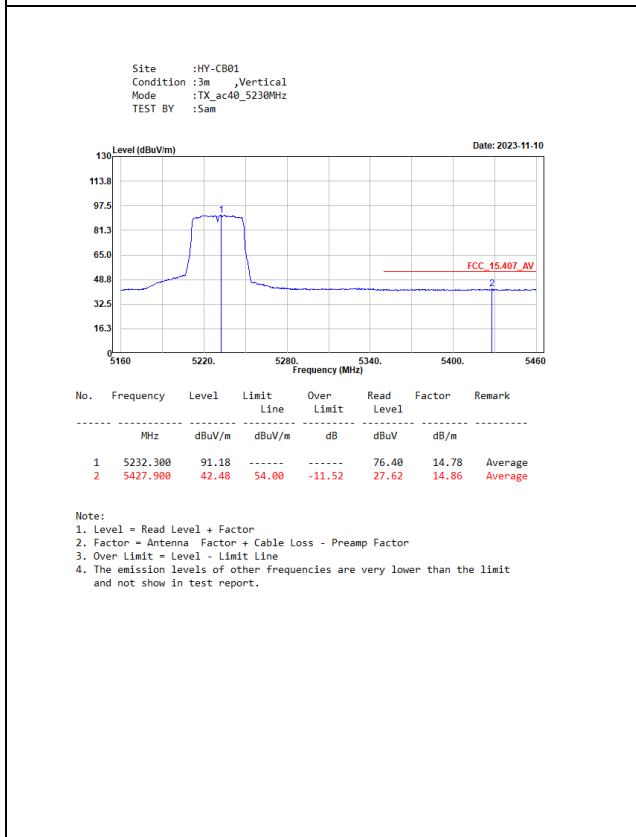
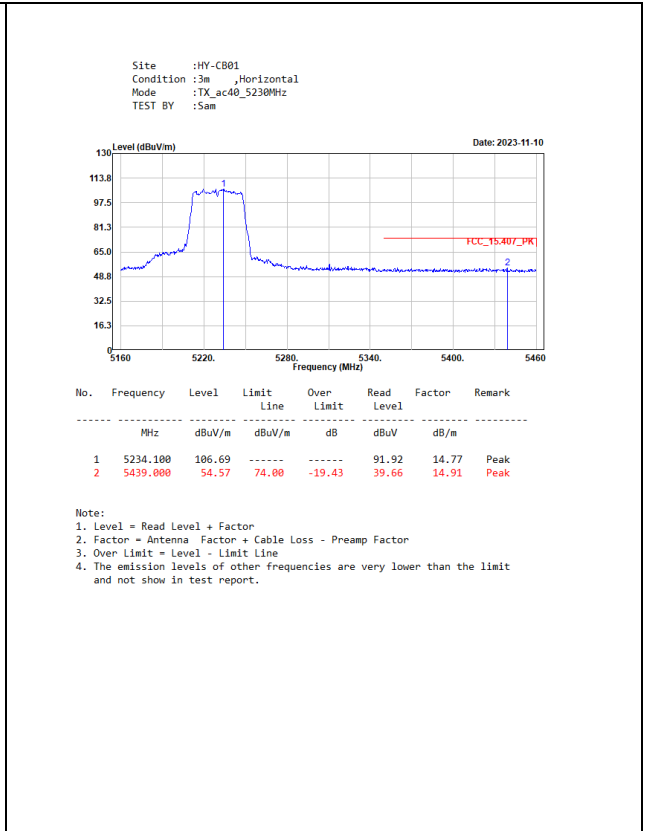
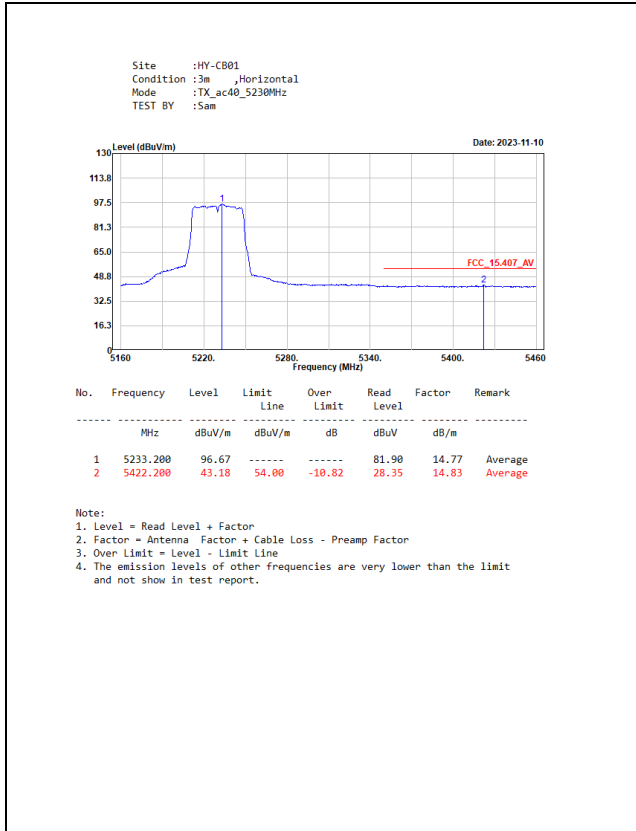


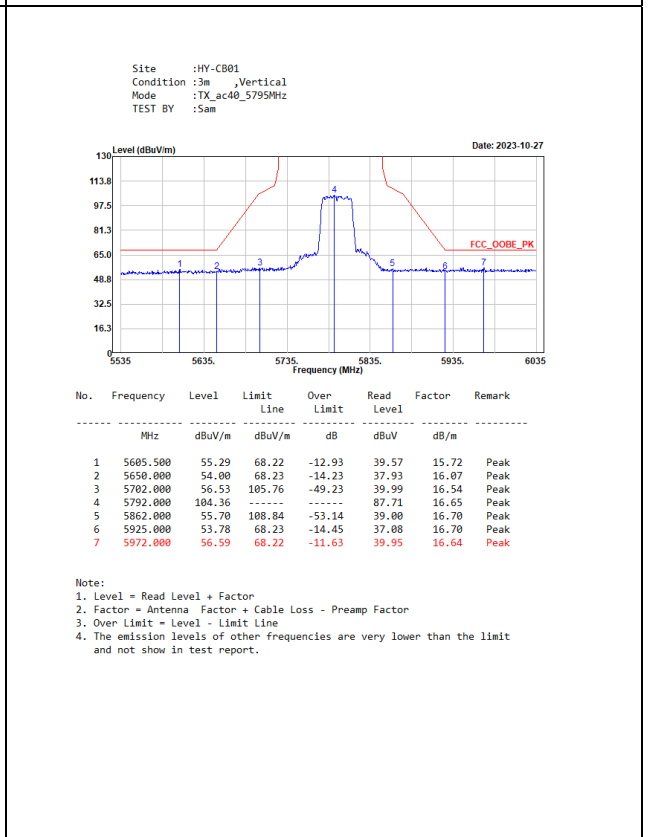
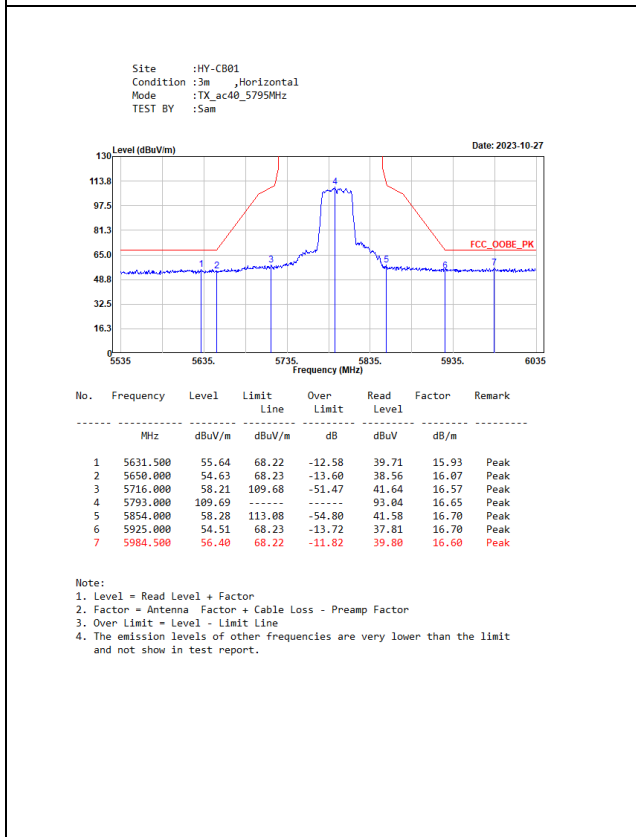
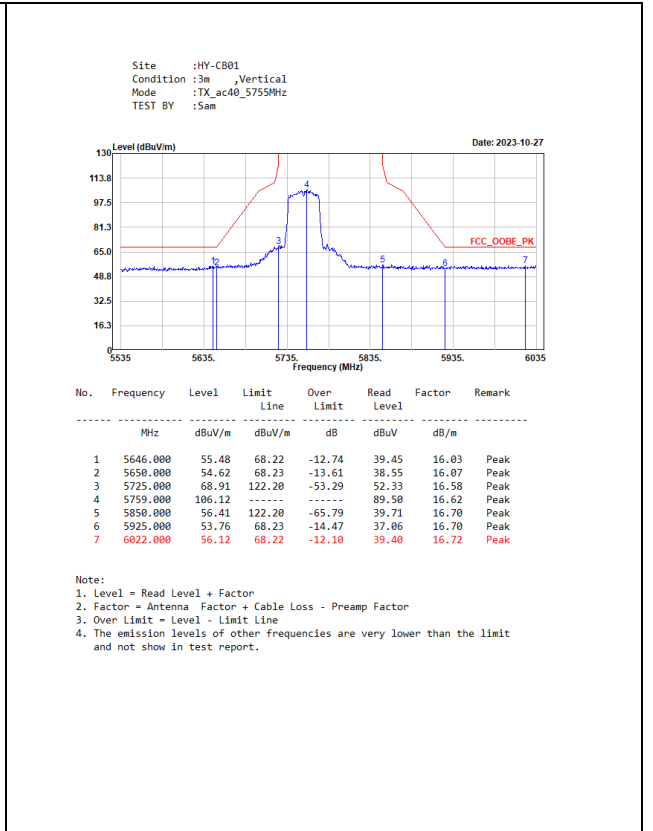
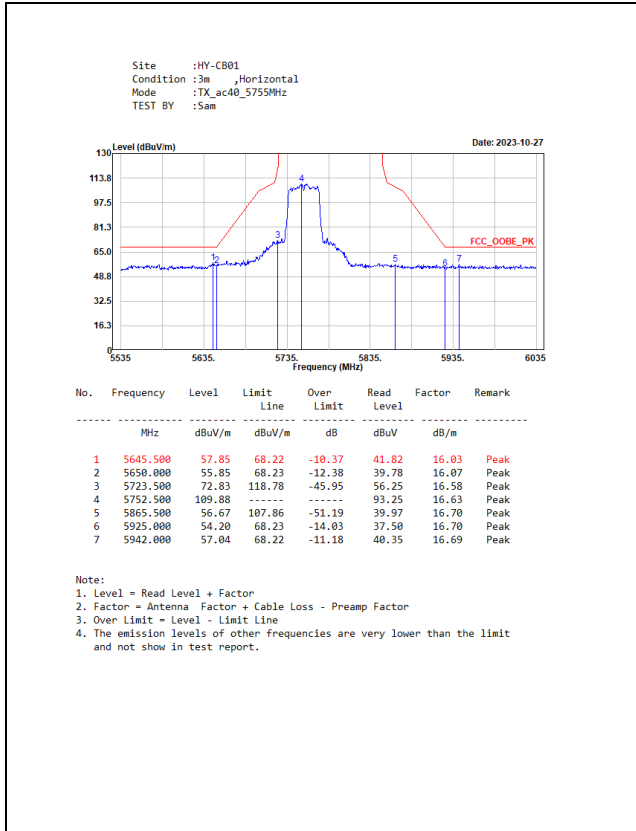




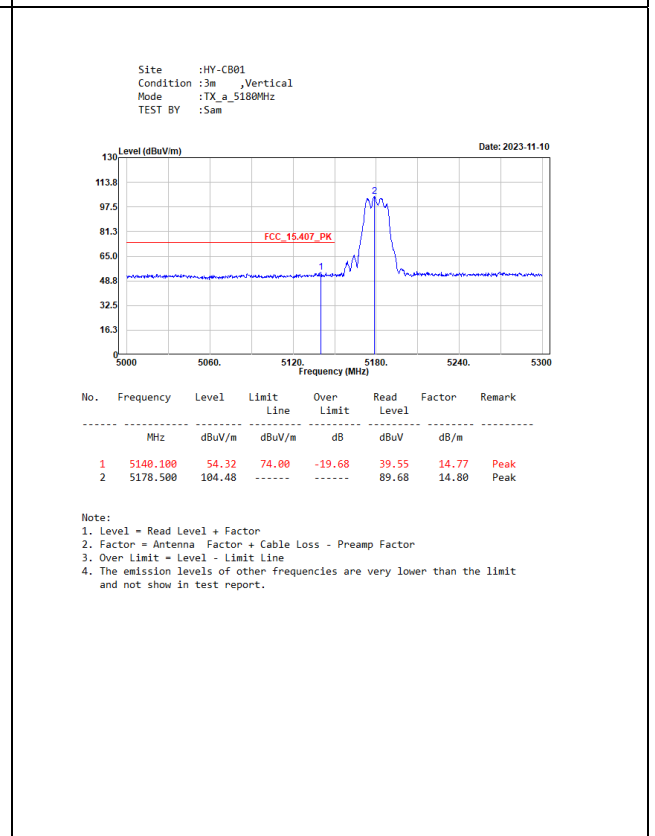
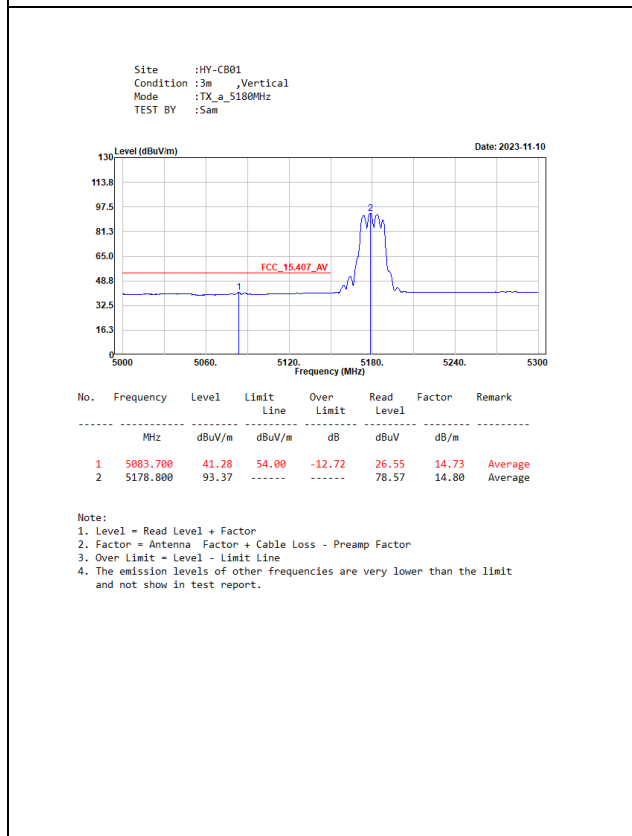
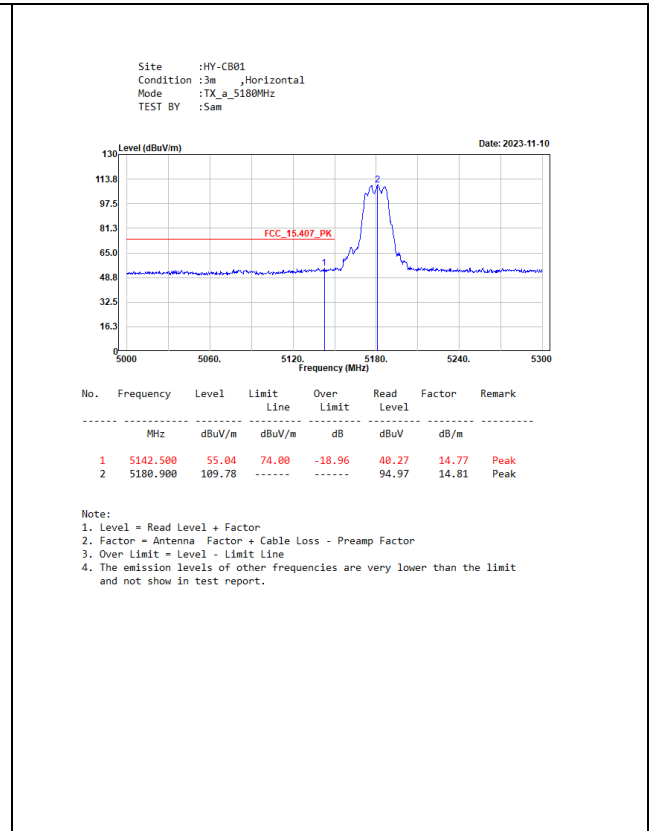
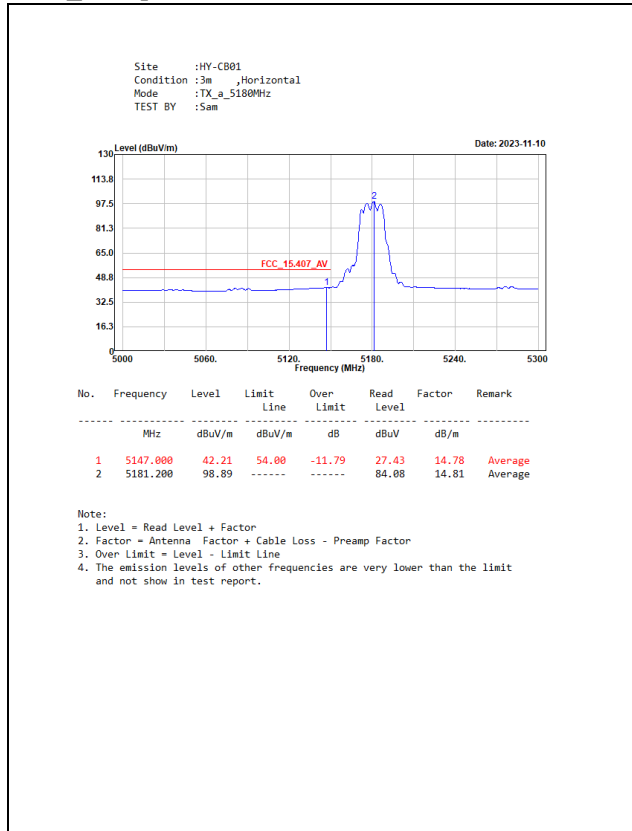


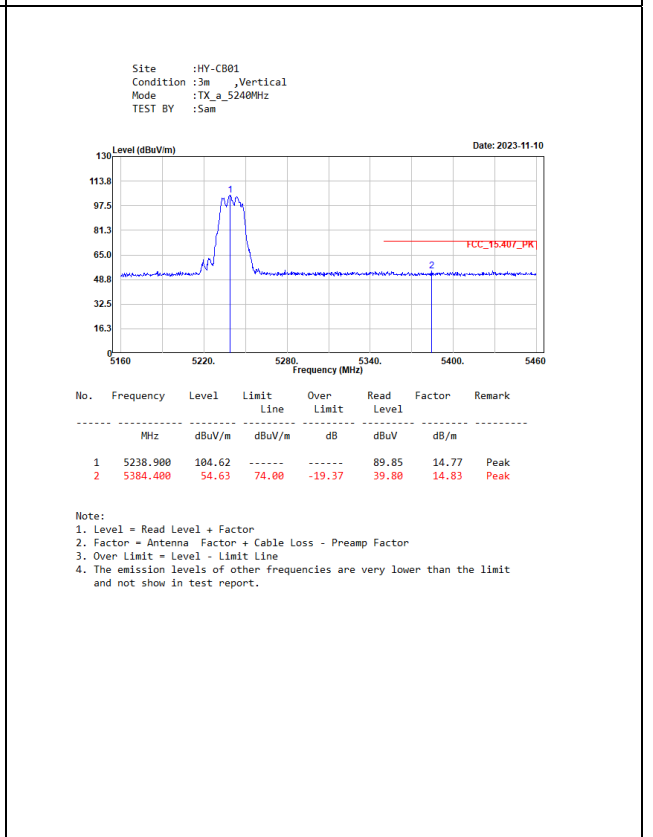
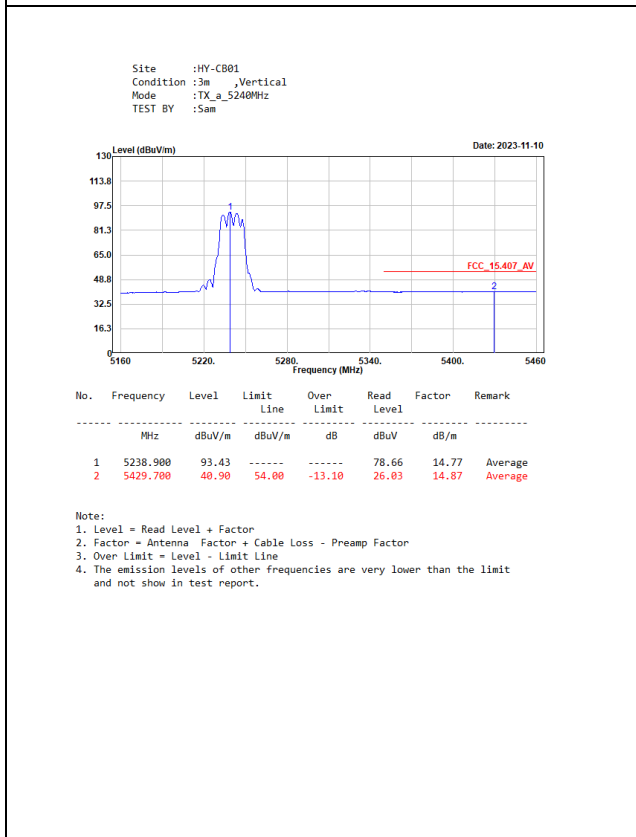
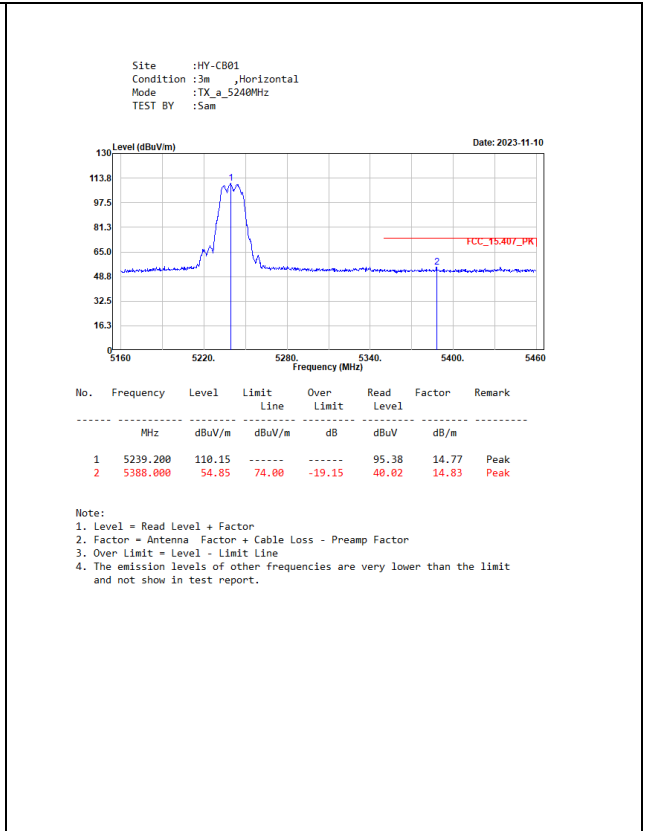
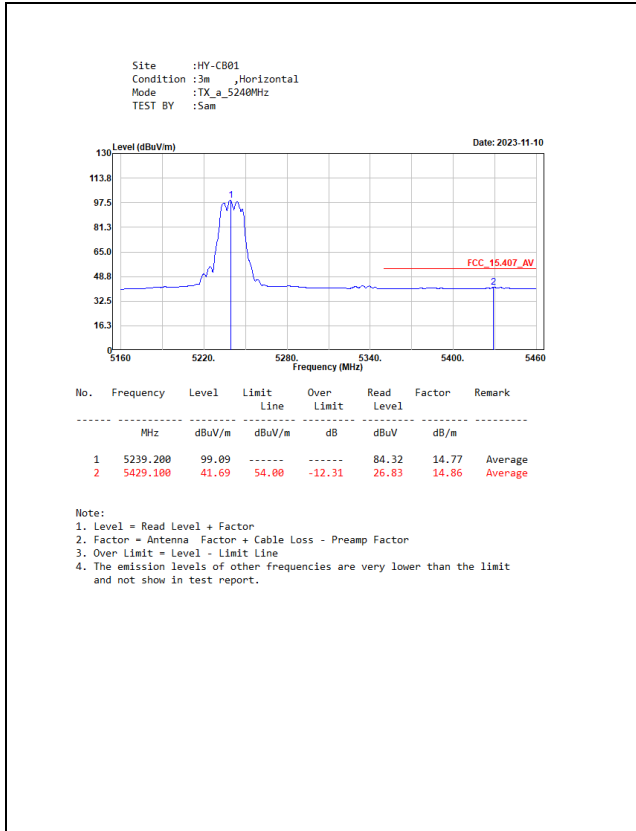


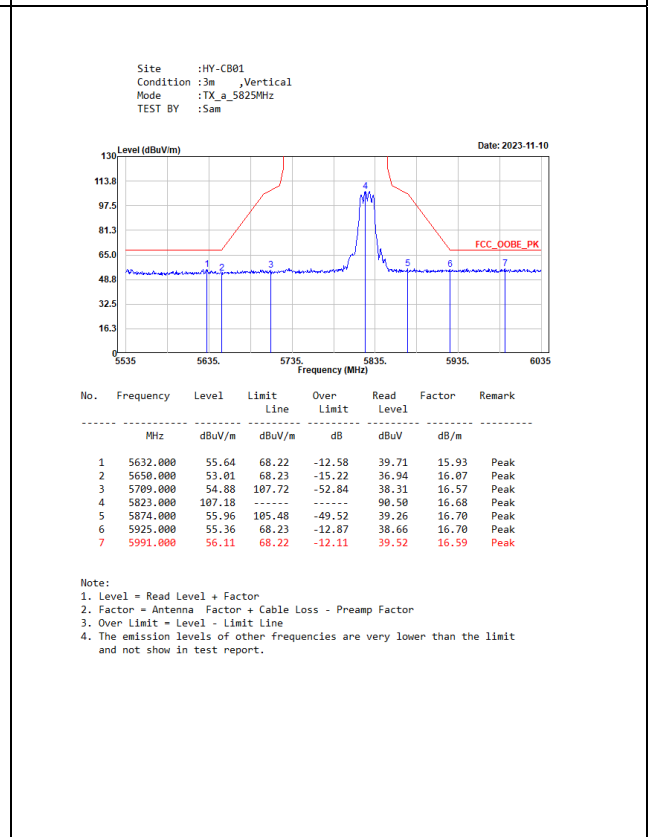
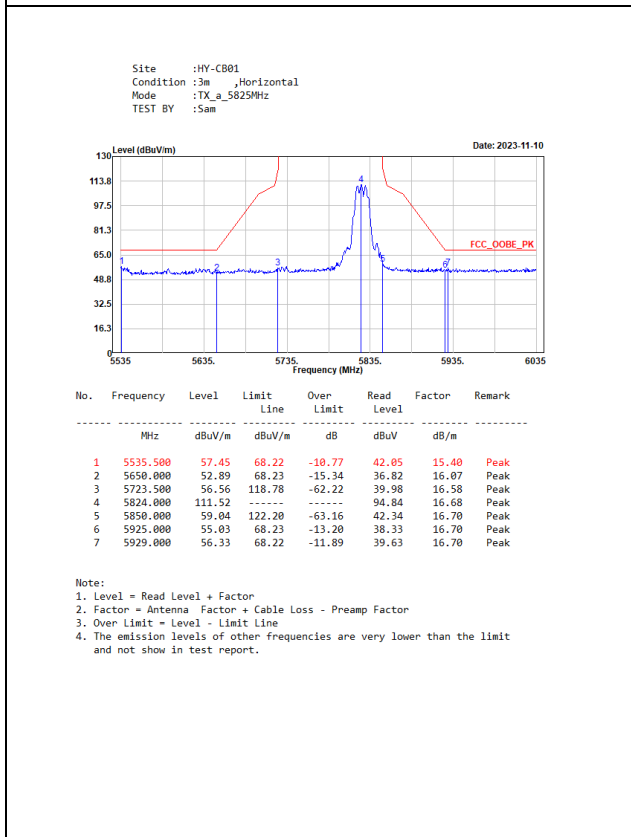
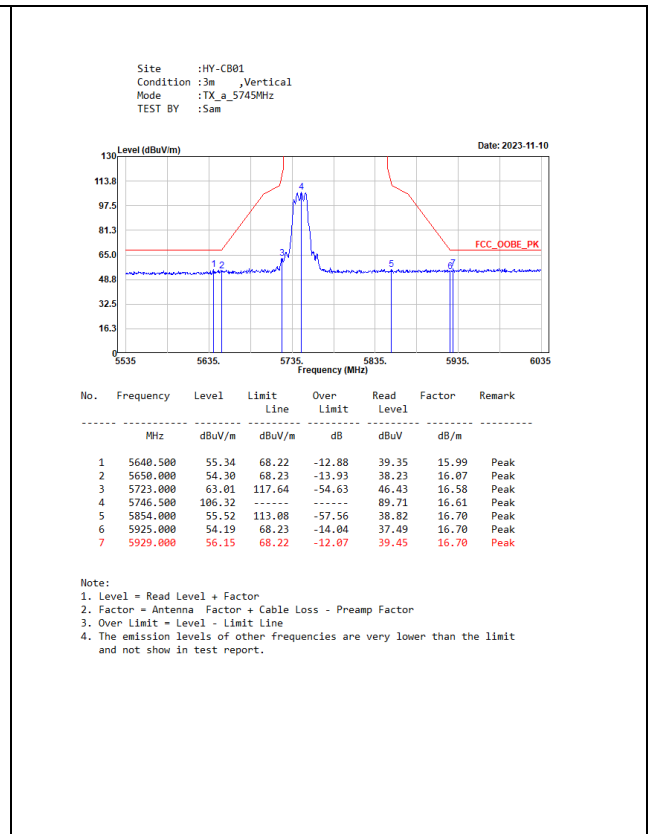
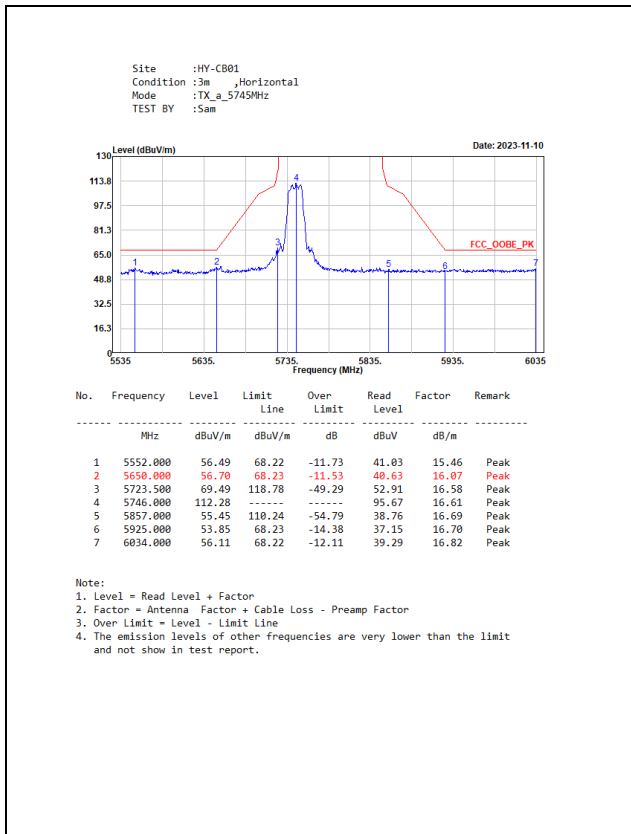


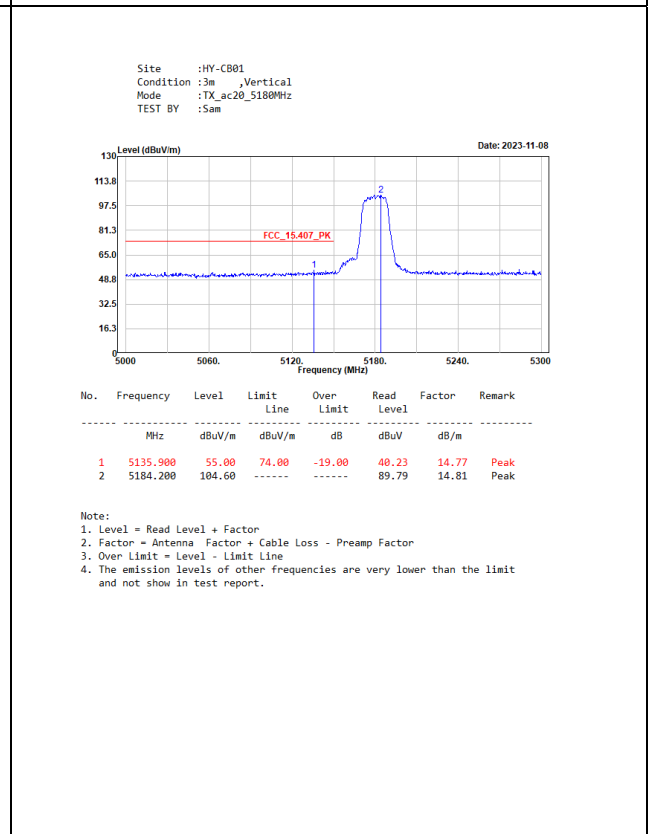
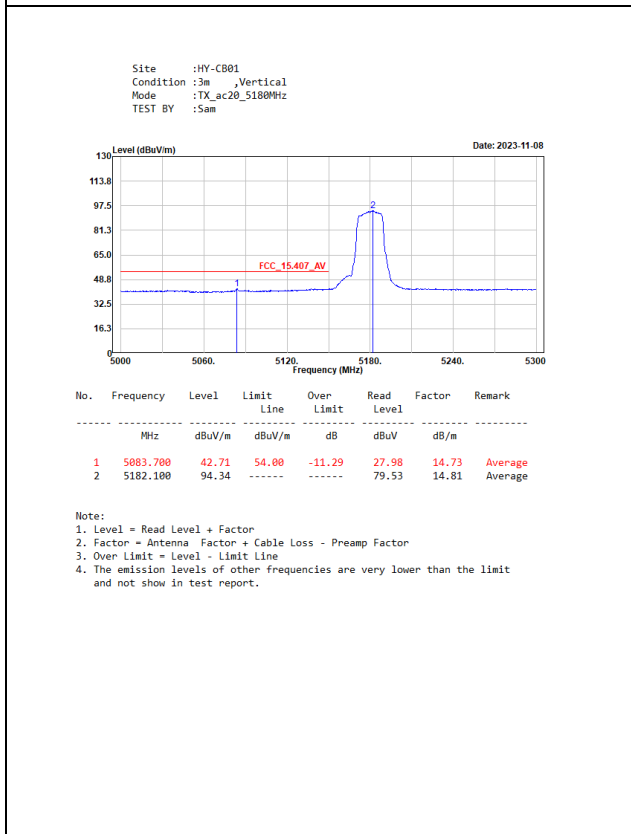
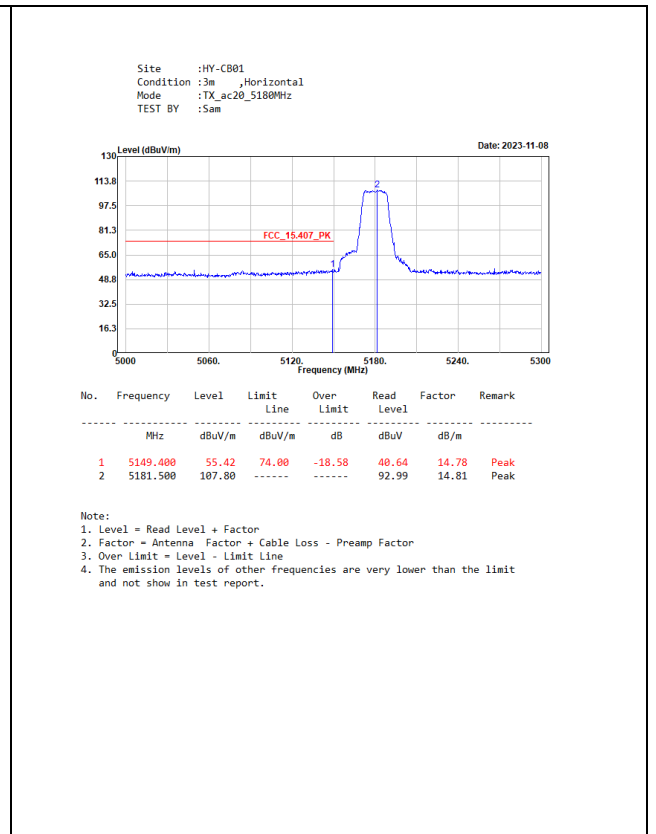
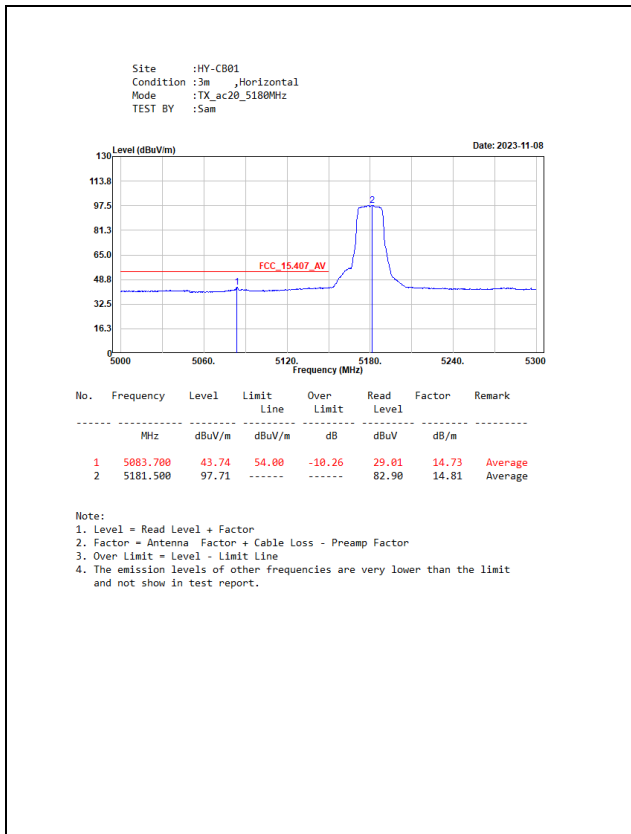


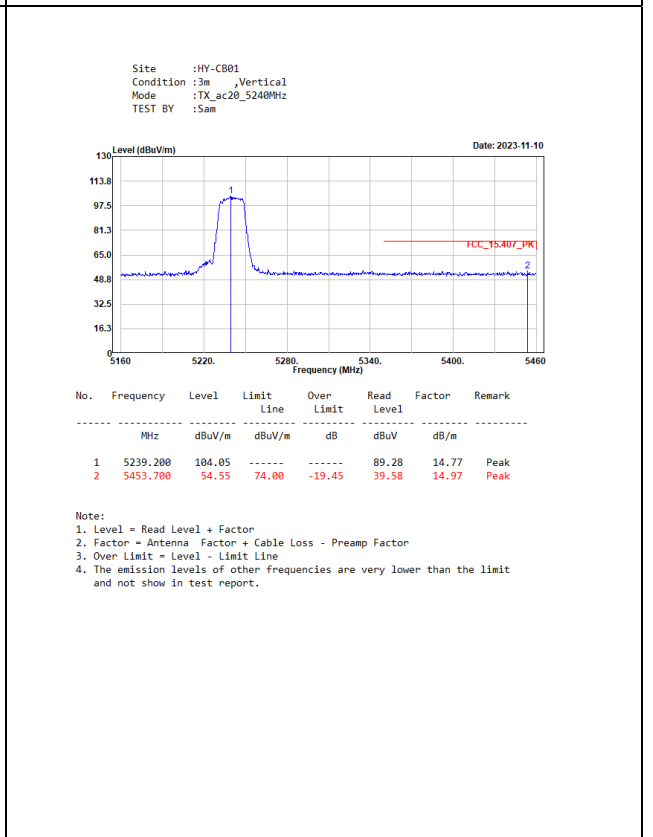
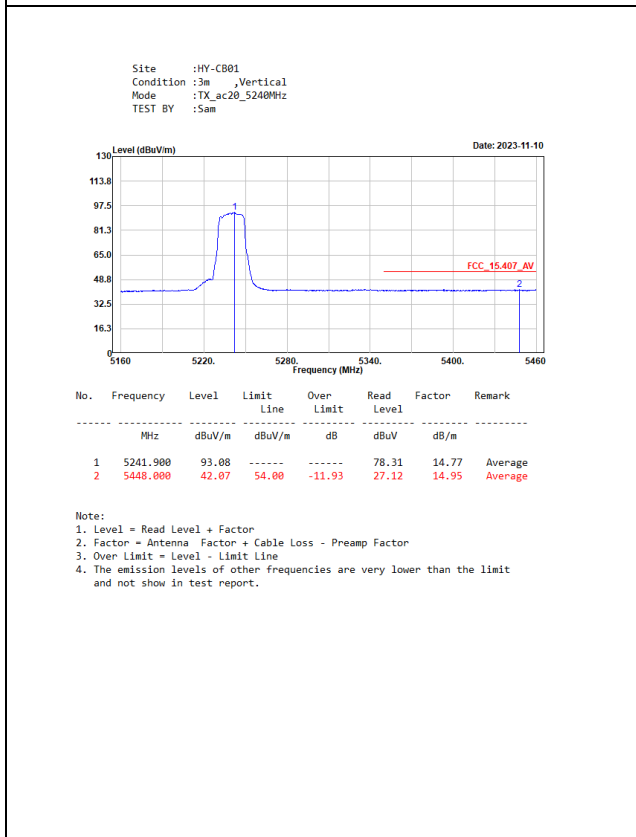
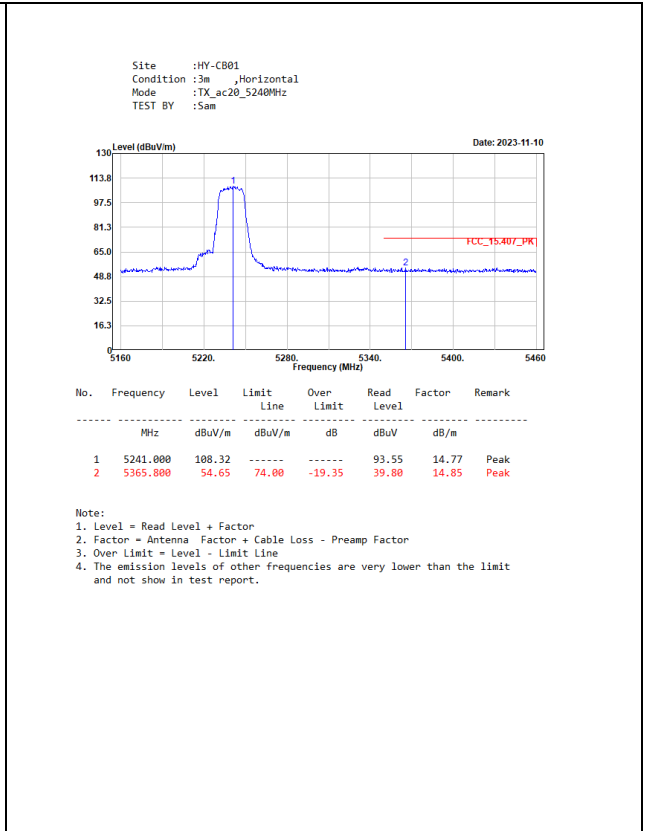
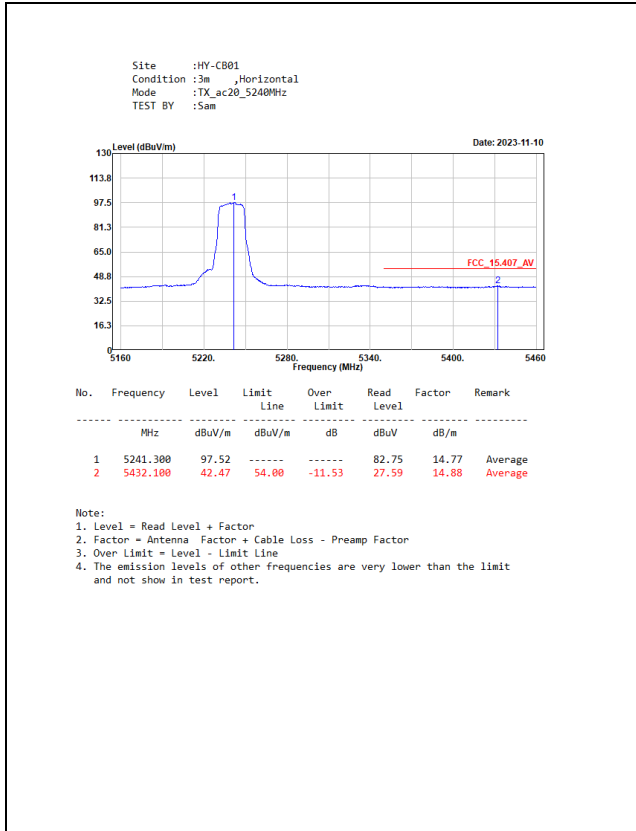
NA1_Sample ID 01

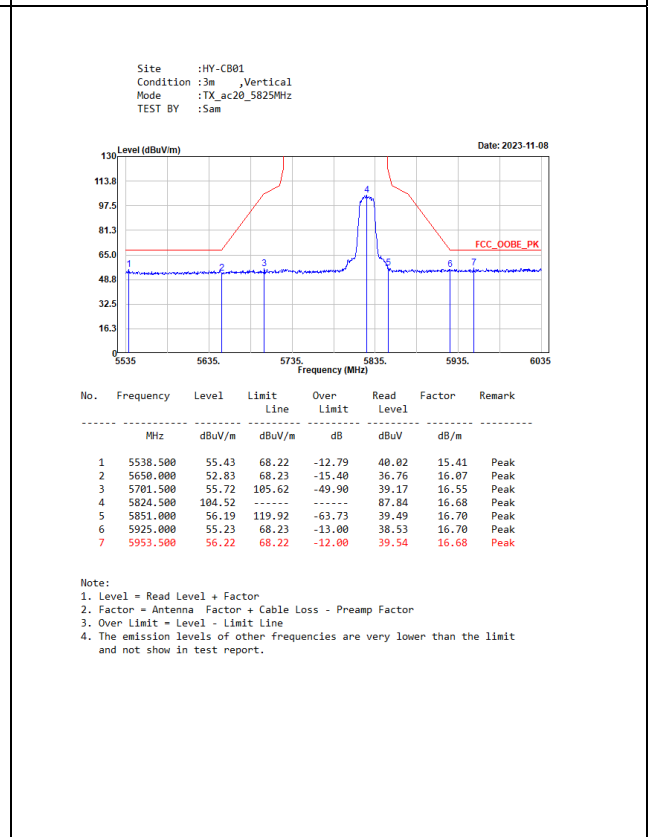
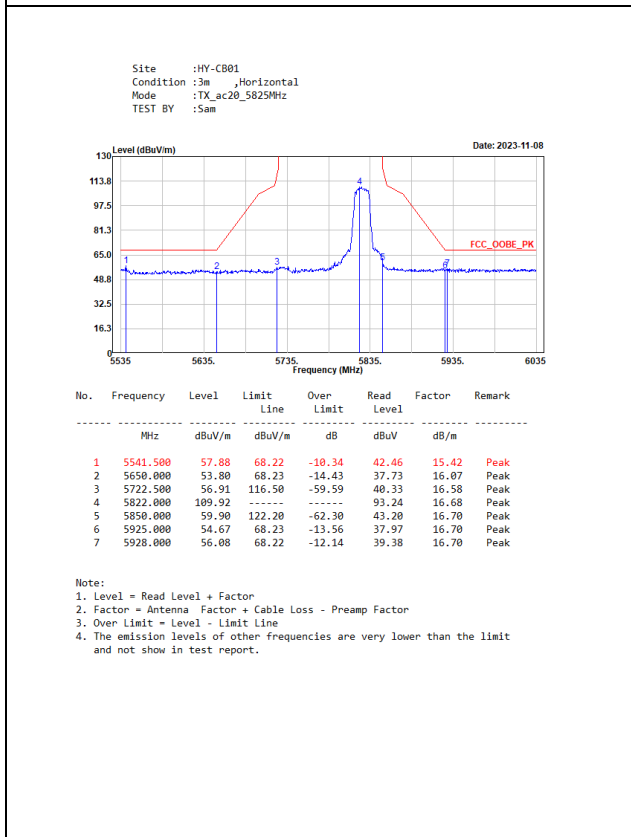
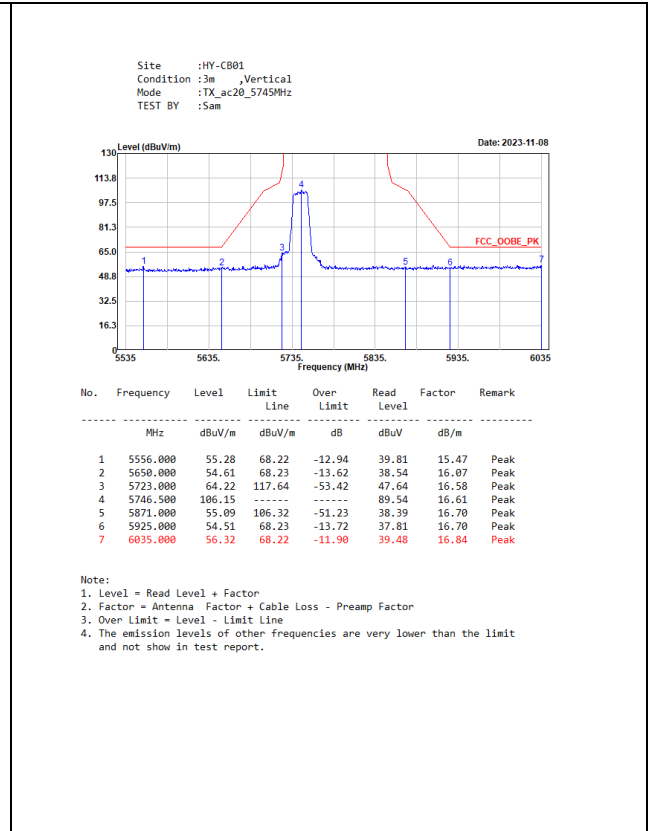
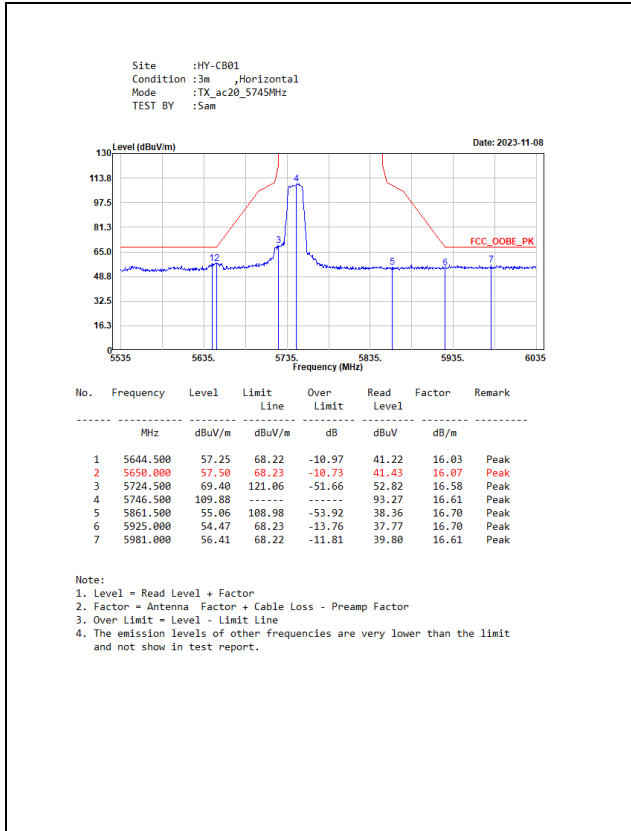


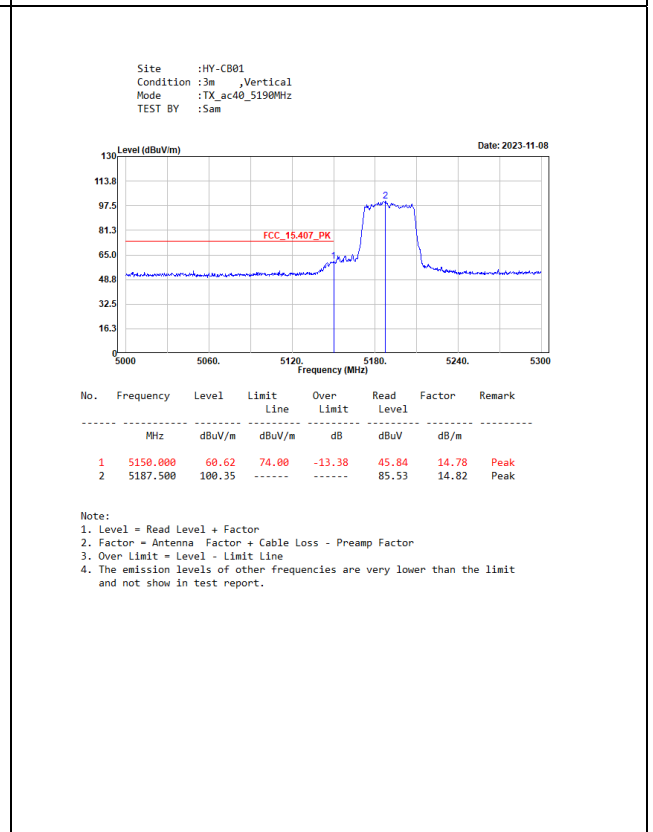
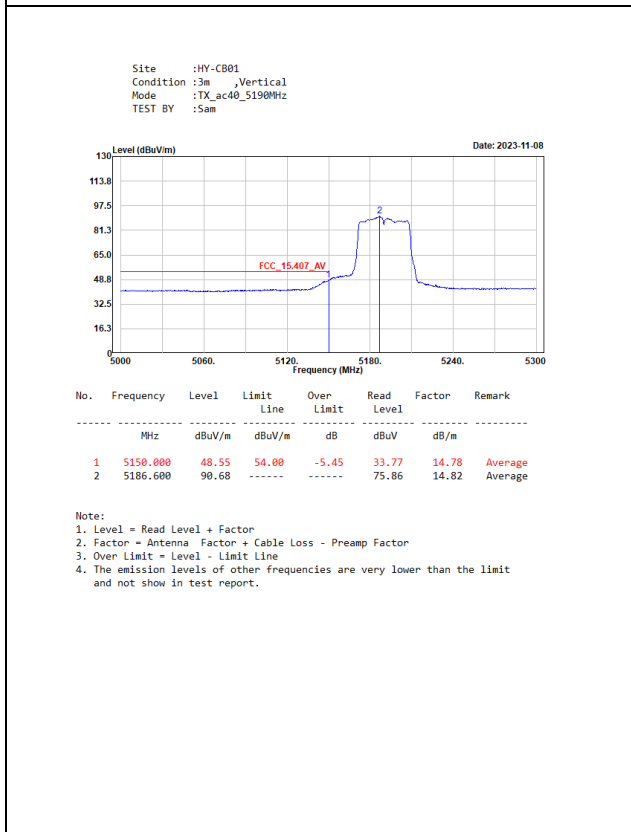
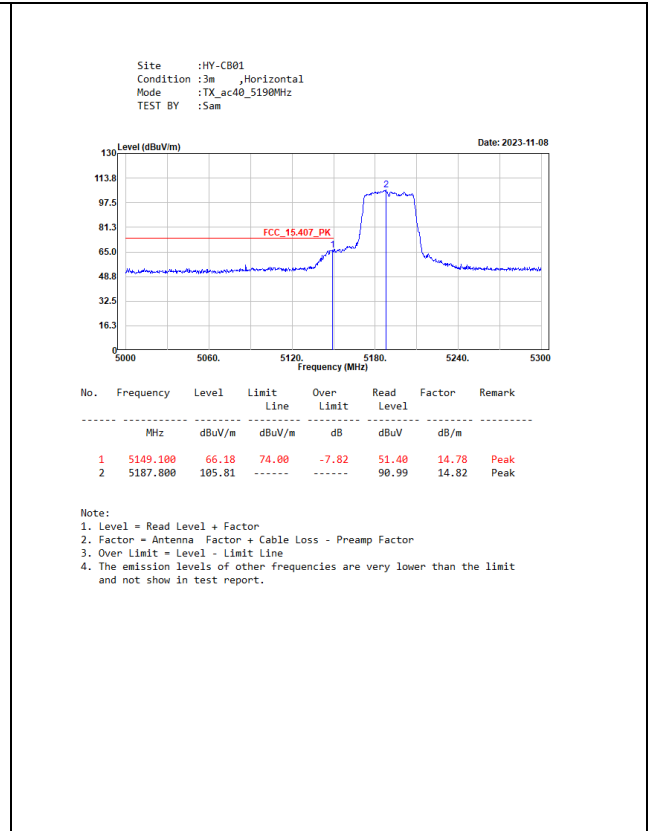
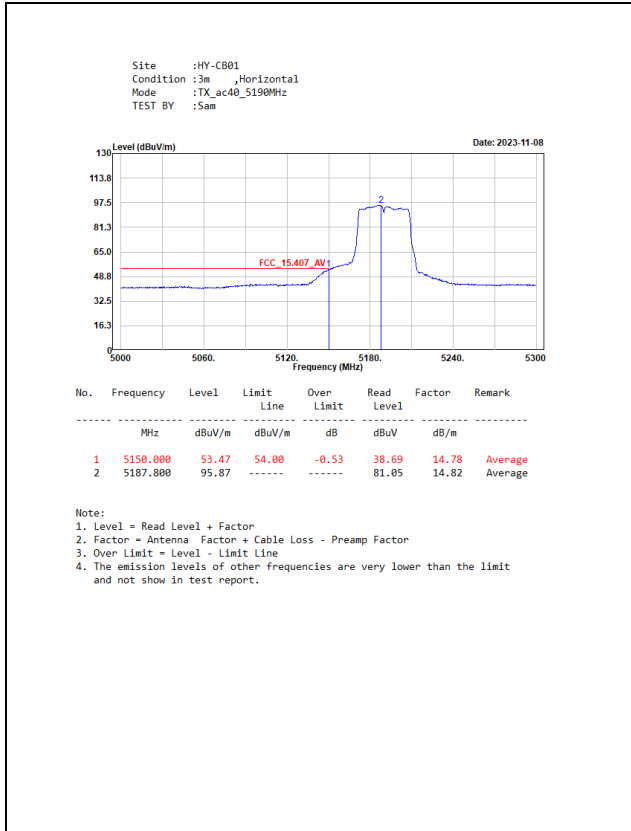


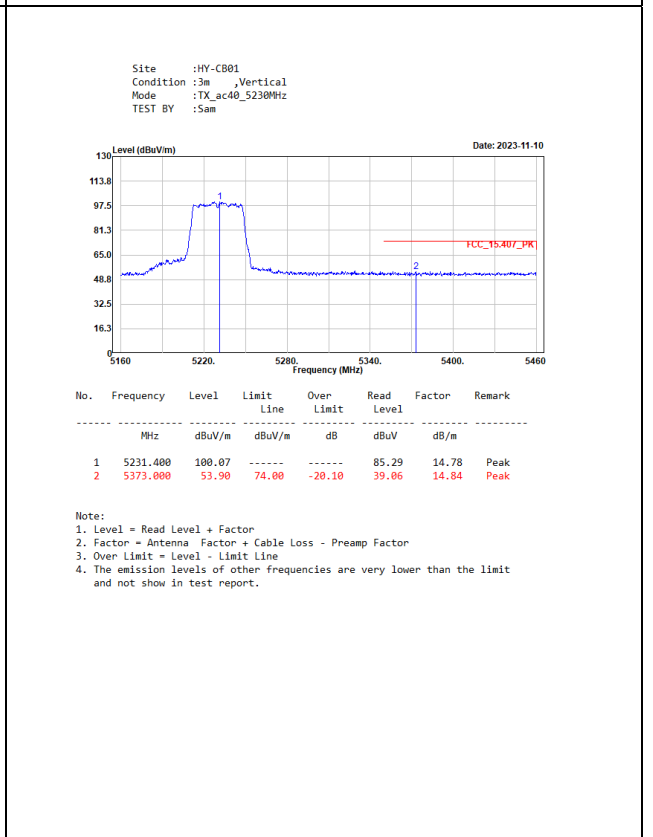
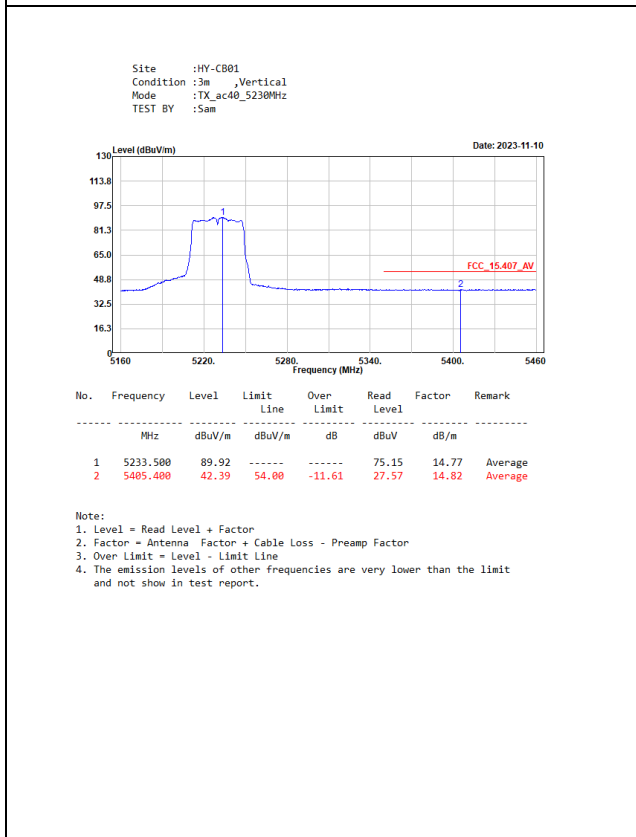
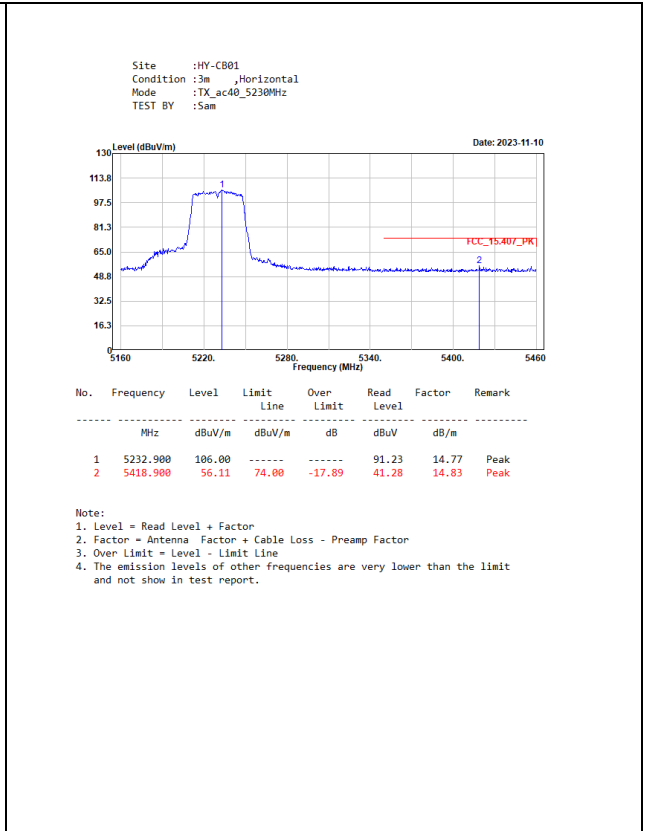
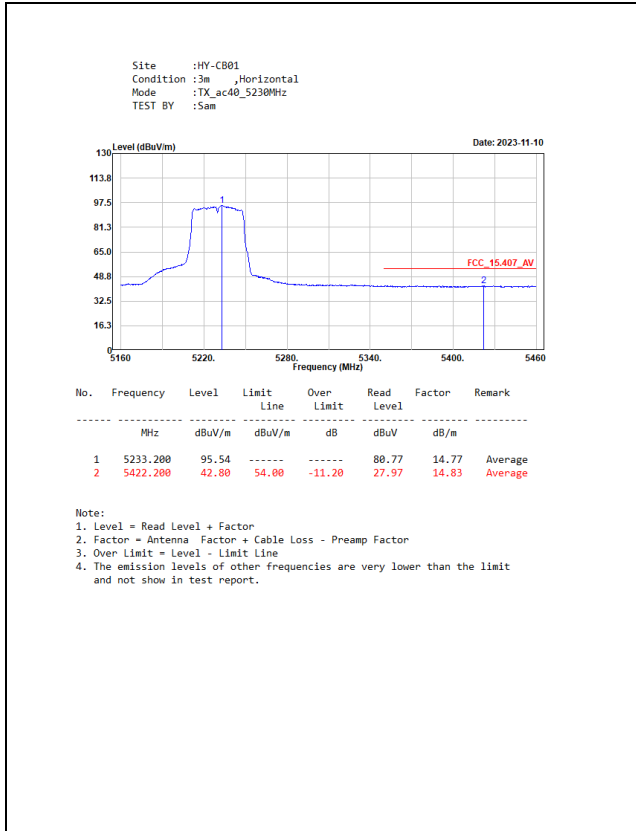


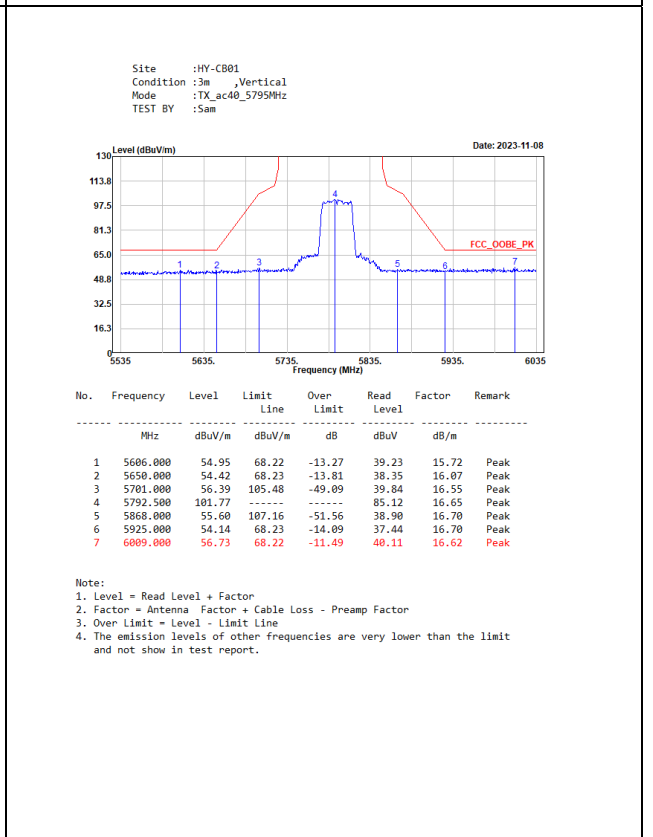
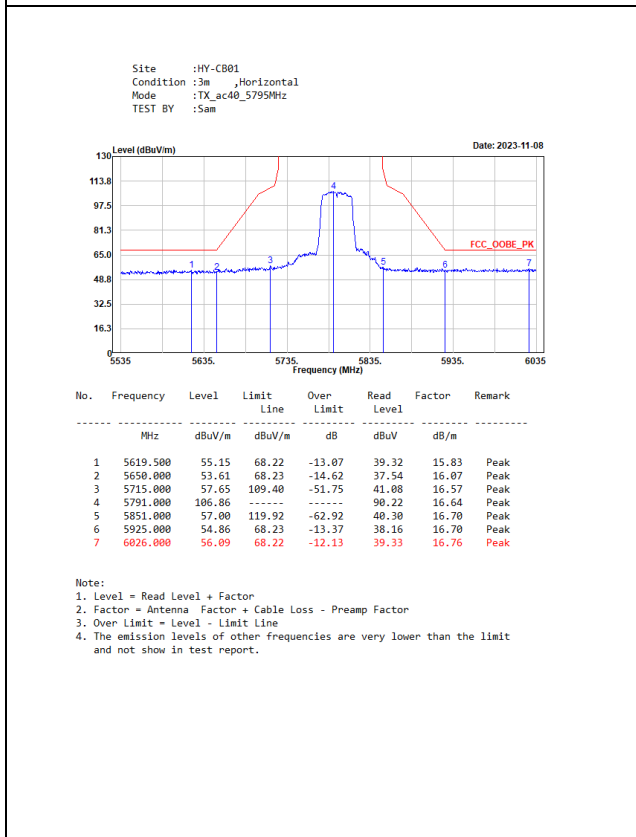
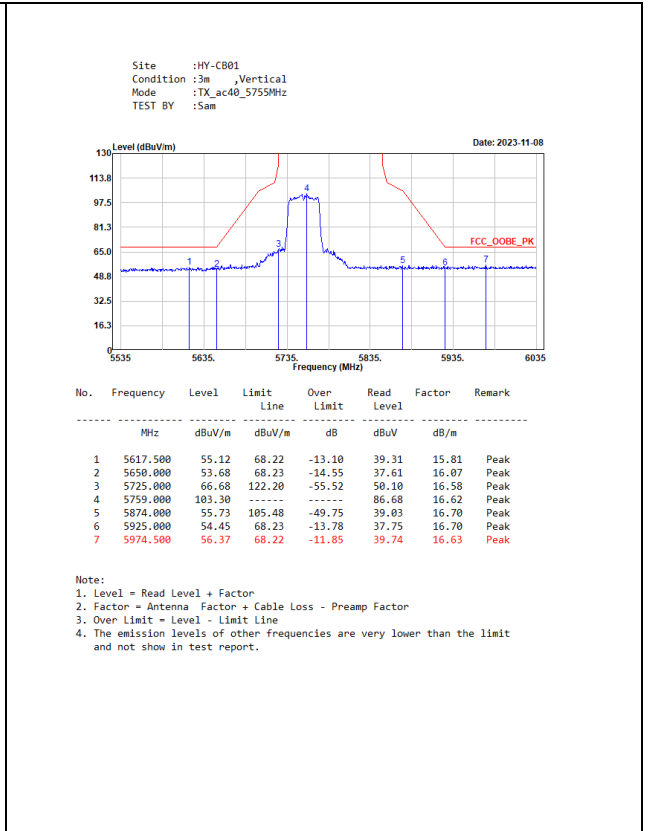
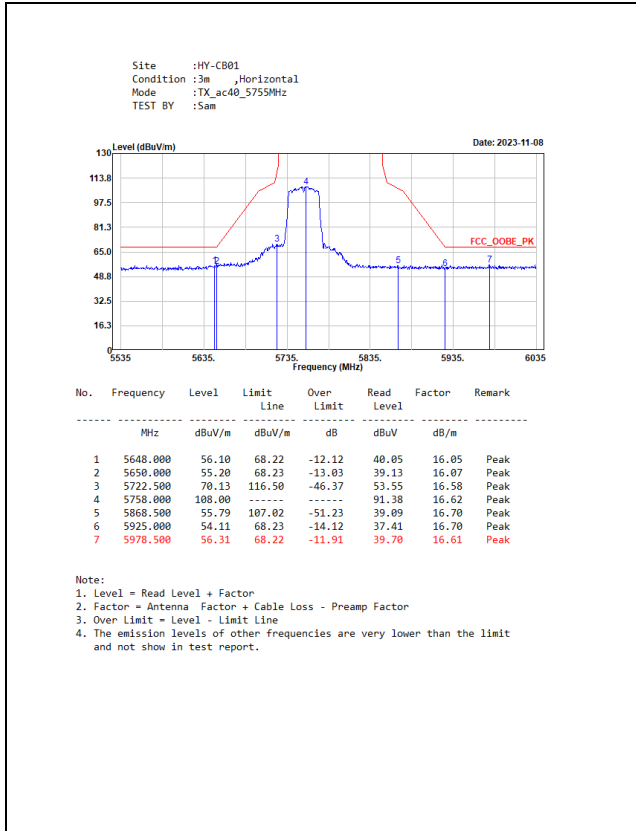






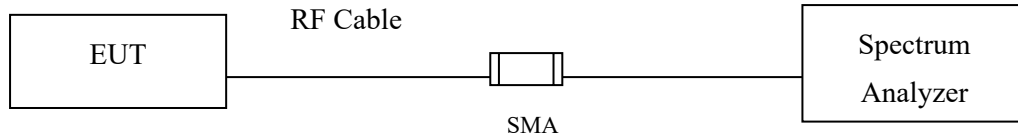






7. 6dB Bandwidth

7.1. Test Setup



7.2. Limits

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

7.3. Test Procedure

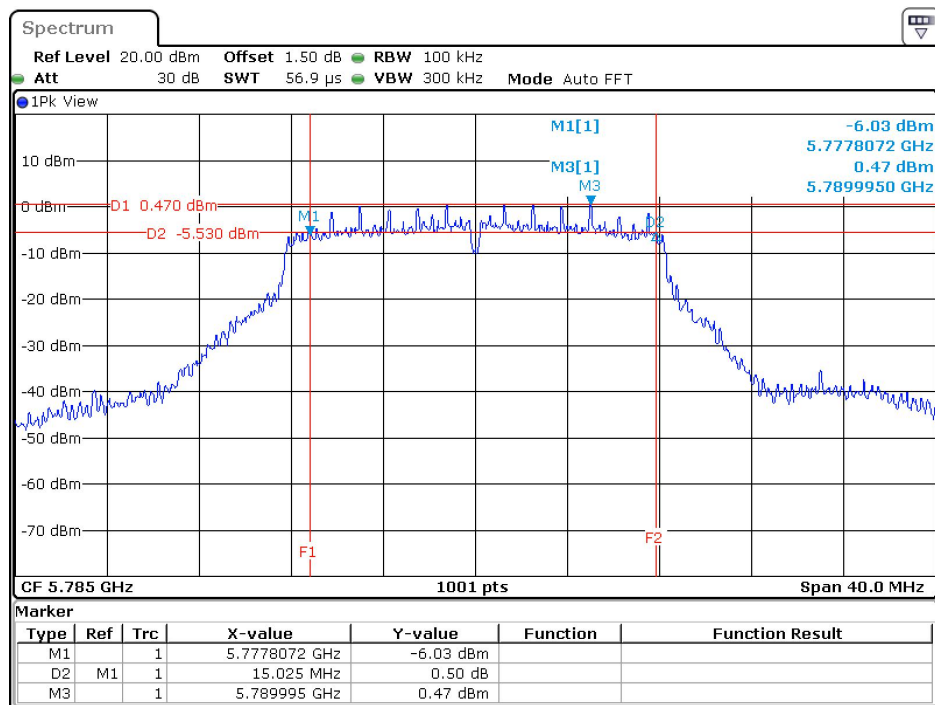
The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

7.4. Test Result of 6dB Bandwidth

Product : Multimedia device with Bluetooth and WLAN
 Test Item : 6dB Bandwidth
 Test Mode : Transmit (802.11a)
 Test Date : 2023/10/19
 Test Sample : ID 02

Channel No.	Frequency (MHz)	Chain	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745	A	15624	>500	Pass
157	5785	A	15984	>500	Pass
165	5825	A	16304	>500	Pass
149	5745	B	15664	>500	Pass
157	5785	B	15025	>500	Pass
165	5825	B	15704	>500	Pass

Channel 157 (Chain B)

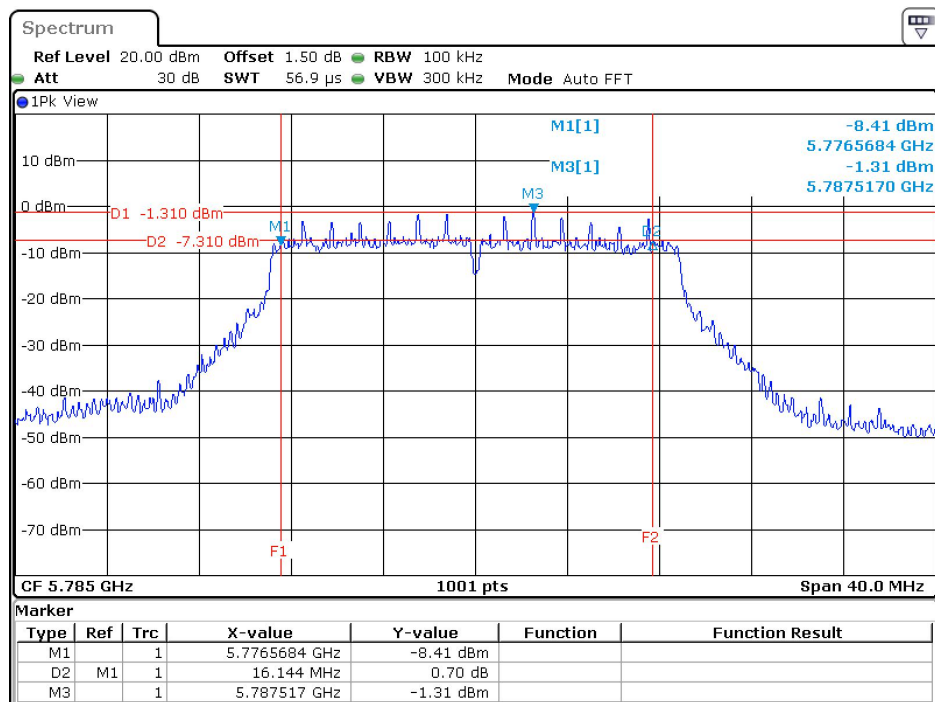


Date: 19.OCT.2023 22:33:05

Product : Multimedia device with Bluetooth and WLAN
 Test Item : 6dB Bandwidth
 Test Mode : Transmit (802.11ac-20 MHz)
 Test Date : 2023/10/19
 Test Sample : ID 02

Channel No.	Frequency (MHz)	Chain	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745	A	16224	>500	Pass
157	5785	A	16144	>500	Pass
165	5825	A	16144	>500	Pass
149	5745	B	17183	>500	Pass
157	5785	B	16503	>500	Pass
165	5825	B	16144	>500	Pass

Channel 157 (Chain A)

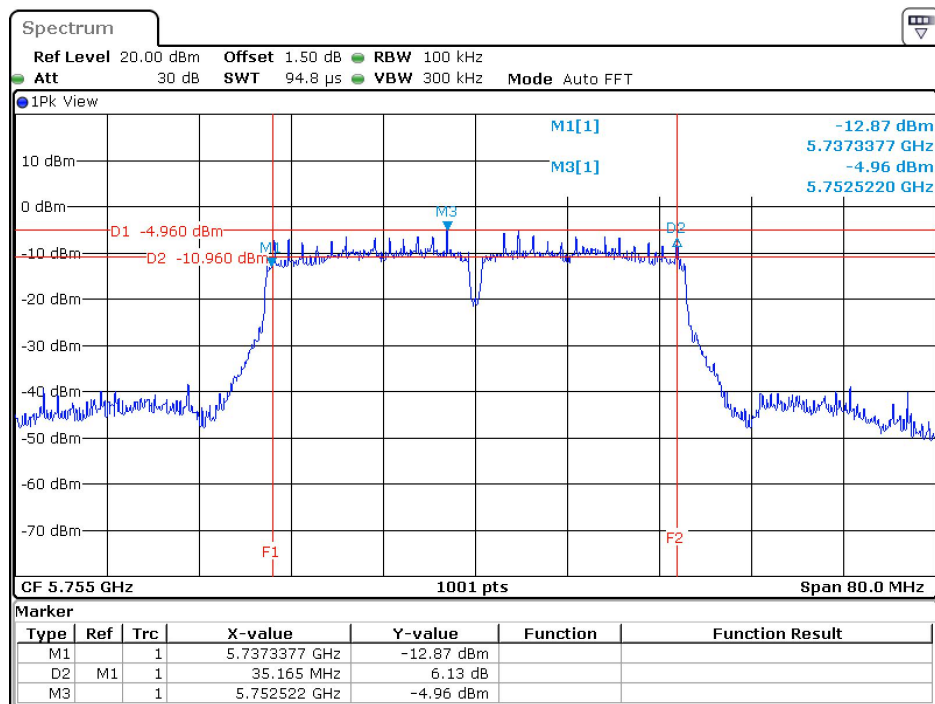


Date: 19.OCT.2023 19:32:16

Product : Multimedia device with Bluetooth and WLAN
 Test Item : 6dB Bandwidth
 Test Mode : Transmit (802.11ac-40 MHz)
 Test Date : 2023/10/19
 Test Sample : ID 02

Channel No.	Frequency (MHz)	Chain	Measurement Level (kHz)	Required Limit (kHz)	Result
151	5755	A	35165	>500	Pass
159	5795	A	35405	>500	Pass
151	5755	B	35165	>500	Pass
159	5795	B	35165	>500	Pass

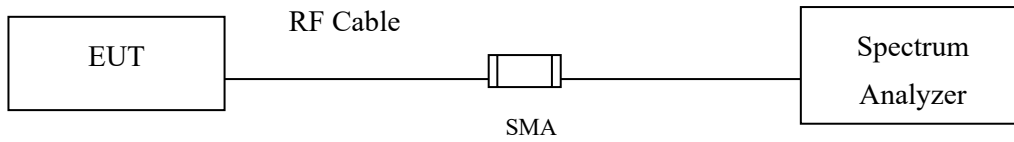
Channel 151 (Chain A)



Date: 19.OCT.2023 19:44:09

8. Duty Cycle

8.1. Test Setup



8.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to U-NII test procedure of KDB789033 for compliance to FCC 47CFR 15.407 requirements.

8.3. Test Result of Duty Cycle

Product : Multimedia device with Bluetooth and WLAN
 Test Item : Duty Cycle
 Test Mode : Transmit
 Test Sample : ID 02

Duty Cycle Formula:

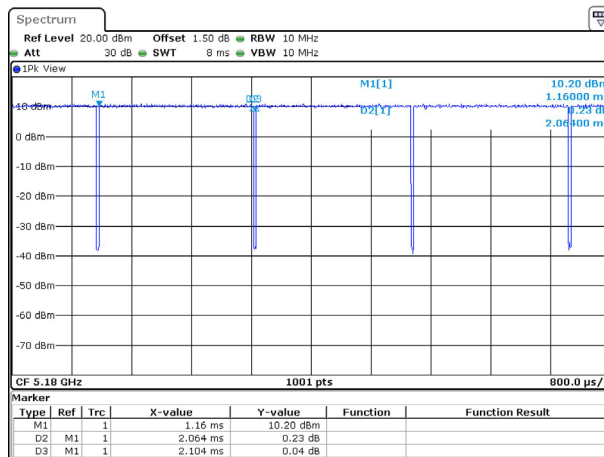
$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

$$\text{Duty Factor} = 10 \text{ Log} (1/\text{Duty Cycle})$$

Results:

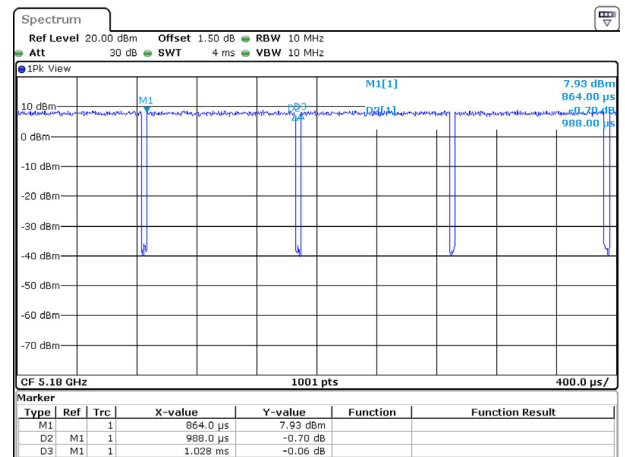
5 GHz band	Time On (ms)	Time On + Time Off (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11a	2.0640	2.1040	98.10	0.08
802.11ac-20 MHz	0.9880	1.0280	96.11	0.17
802.11ac-40 MHz	0.4980	0.5360	92.91	0.32

802.11a



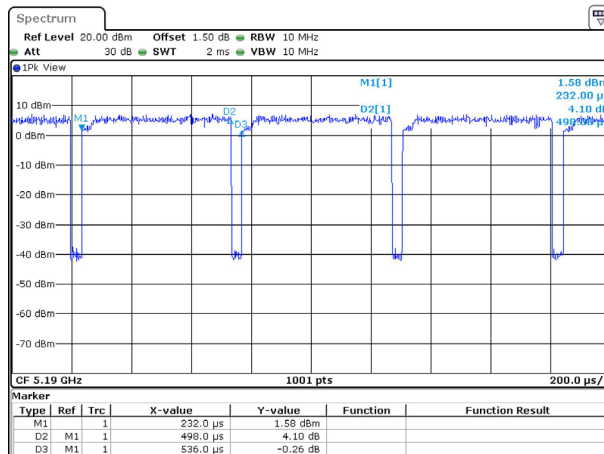
Date: 19.OCT.2023 19:08:02

802.11ac-20 MHz



Date: 19.OCT.2023 19:46:53

802.11ac-40 MHz



Date: 19.OCT.2023 19:58:57