



### 9 kHz ~ 30 MHz Data:

For 9 kHz to 30 MHz radiated emission have performed all modes of operation were investigated. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

No non-compliance noted:

### **KDB 414788 D01 OATS and Chamber Correlation Justification**

- Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

- OATs and chamber correlation testing had been performed and chamber measured test results is the worst case test result.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

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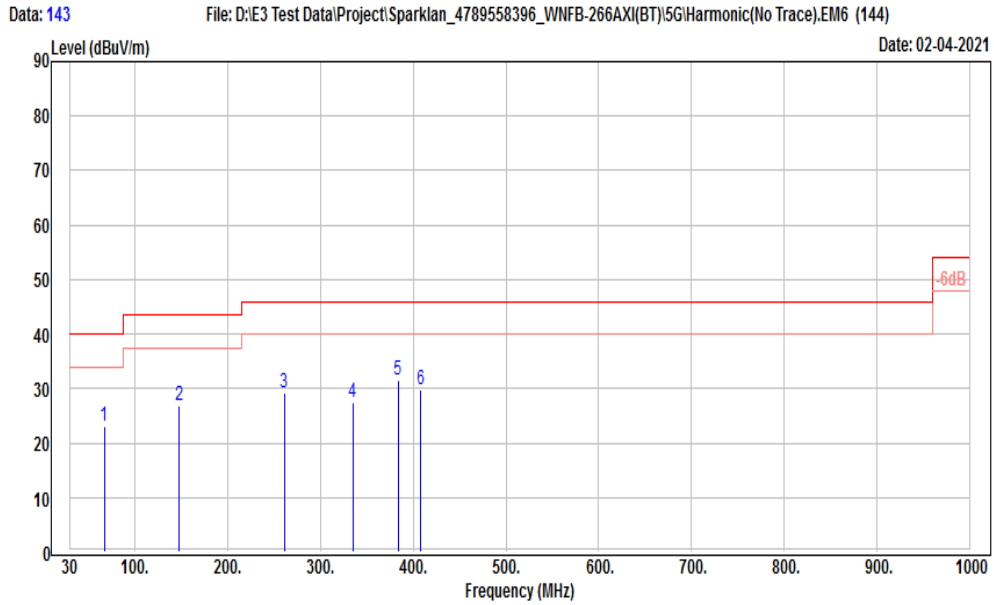
30 MHz ~ 1 GHz Data

Non-Beamforming mode

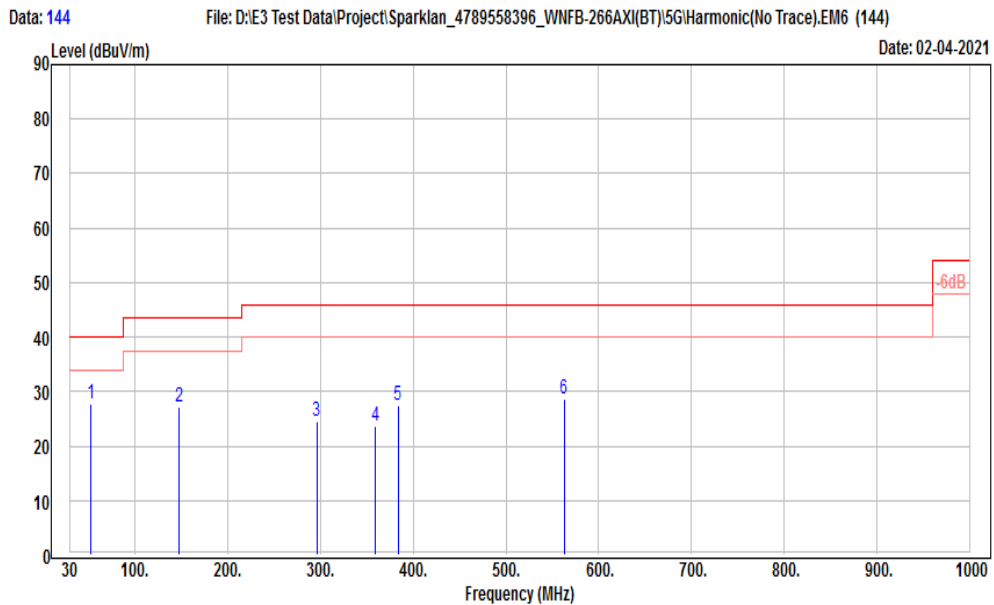
802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	30 MHz ~ 1 GHz

Horizontal



Vertical



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Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	67.83	36.49	-13.5	22.99	40	-17.01	Peak
-	148.34	38.7	-11.84	26.86	43.5	-16.64	Peak
-	261.83	40.93	-11.58	29.35	46	-16.65	Peak
-	335.55	36.69	-9.17	27.52	46	-18.48	Peak
-	384.05	39.4	-7.89	31.51	46	-14.49	Peak
-	408.3	37.04	-7.17	29.87	46	-16.13	Peak

Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	53.28	39.37	-11.51	27.86	40	-12.14	Peak
-	148.34	38.88	-11.84	27.04	43.5	-16.46	Peak
-	296.75	34.83	-10.37	24.46	46	-21.54	Peak
-	359.8	32.02	-8.33	23.69	46	-22.31	Peak
-	384.05	35.5	-7.89	27.61	46	-18.39	Peak
-	562.53	31.99	-3.3	28.69	46	-17.31	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The peak result complies with QP limit, QP result is deemed to comply with QP limit.
5. The other emission levels were very low against the limit.

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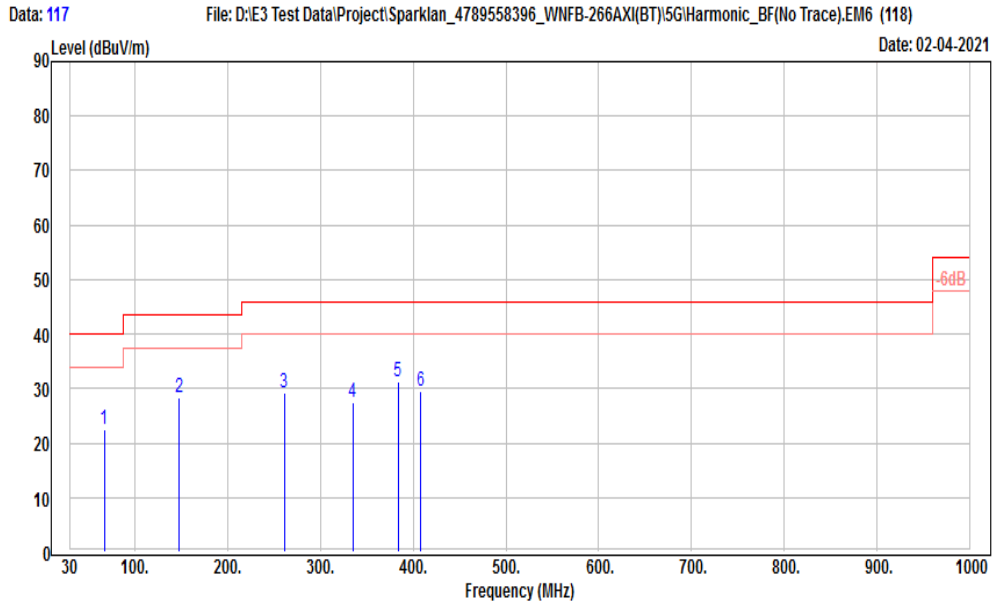


### Beamforming mode

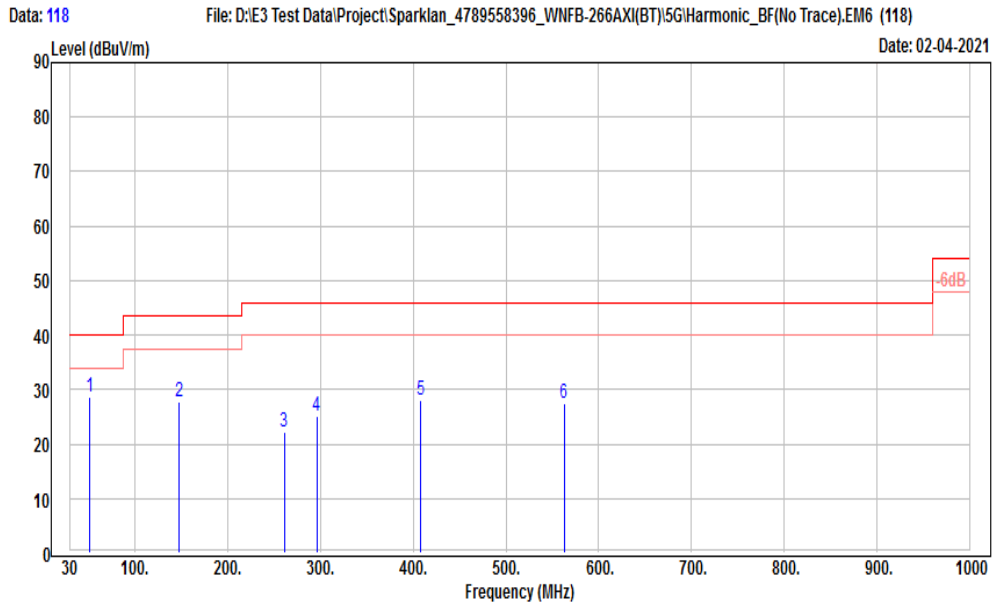
### 802.11ax (HE20)

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	30 MHz ~ 1 GHz

### Horizontal



### Vertical



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Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	67.83	35.91	-13.5	22.41	40	-17.59	Peak
-	148.34	40.08	-11.84	28.24	43.5	-15.26	Peak
-	261.83	40.8	-11.58	29.22	46	-16.78	Peak
-	335.55	36.66	-9.17	27.49	46	-18.51	Peak
-	384.05	39.04	-7.89	31.15	46	-14.85	Peak
-	408.3	36.83	-7.17	29.66	46	-16.34	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	52.31	40.28	-11.53	28.75	40	-11.25	Peak
-	148.34	39.6	-11.84	27.76	43.5	-15.74	Peak
-	261.83	33.68	-11.58	22.1	46	-23.9	Peak
-	296.75	35.56	-10.37	25.19	46	-20.81	Peak
-	408.3	35.25	-7.17	28.08	46	-17.92	Peak
-	562.53	30.9	-3.3	27.6	46	-18.4	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The peak result complies with QP limit, QP result is deemed to comply with QP limit.
5. The other emission levels were very low against the limit.

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## 9.8. AC Power Line Conducted Emission

### Requirements

Frequency (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### Test Procedures

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

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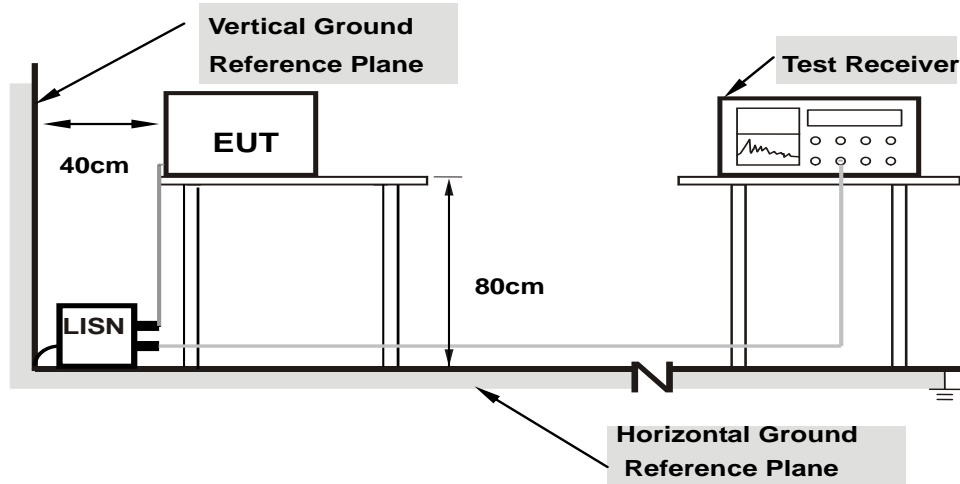
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## Test Setup



**Note: 1.Support units were connected to second LISN.**

For the actual test configuration, please refer to the Setup Configurations.

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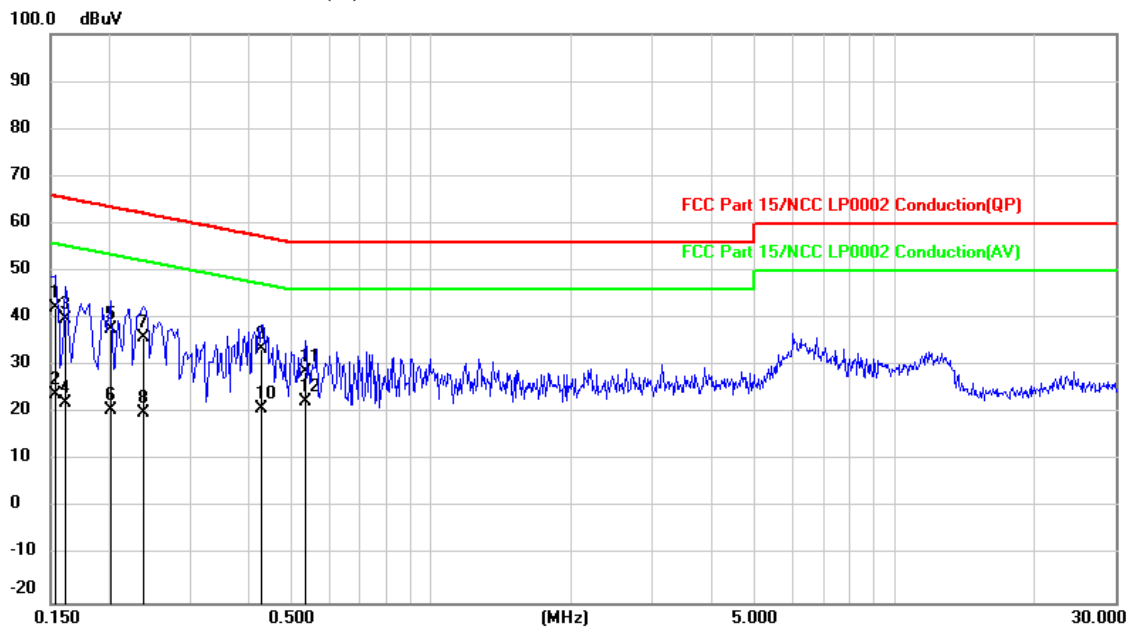
## Test Data

### Non-Beamforming mode

#### 802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	150 kHz ~ 30 MHz

#### Phase of Power : Line (L)



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No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1539	22.60	19.54	42.14	65.79	-23.65	QP
2	0.1539	4.35	19.54	23.89	55.79	-31.90	AVG
3	0.1620	20.42	19.54	39.96	65.36	-25.40	QP
4	0.1620	2.74	19.54	22.28	55.36	-33.08	AVG
5	0.2020	18.29	19.53	37.82	63.53	-25.71	QP
6	0.2020	0.98	19.53	20.51	53.53	-33.02	AVG
7	0.2380	16.35	19.53	35.88	62.17	-26.29	QP
8	0.2380	0.61	19.53	20.14	52.17	-32.03	AVG
9	0.4300	14.17	19.51	33.68	57.25	-23.57	QP
10	0.4300	1.36	19.51	20.87	47.25	-26.38	AVG
11	0.5340	9.30	19.52	28.82	56.00	-27.18	QP
12	0.5340	2.97	19.52	22.49	46.00	-23.51	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

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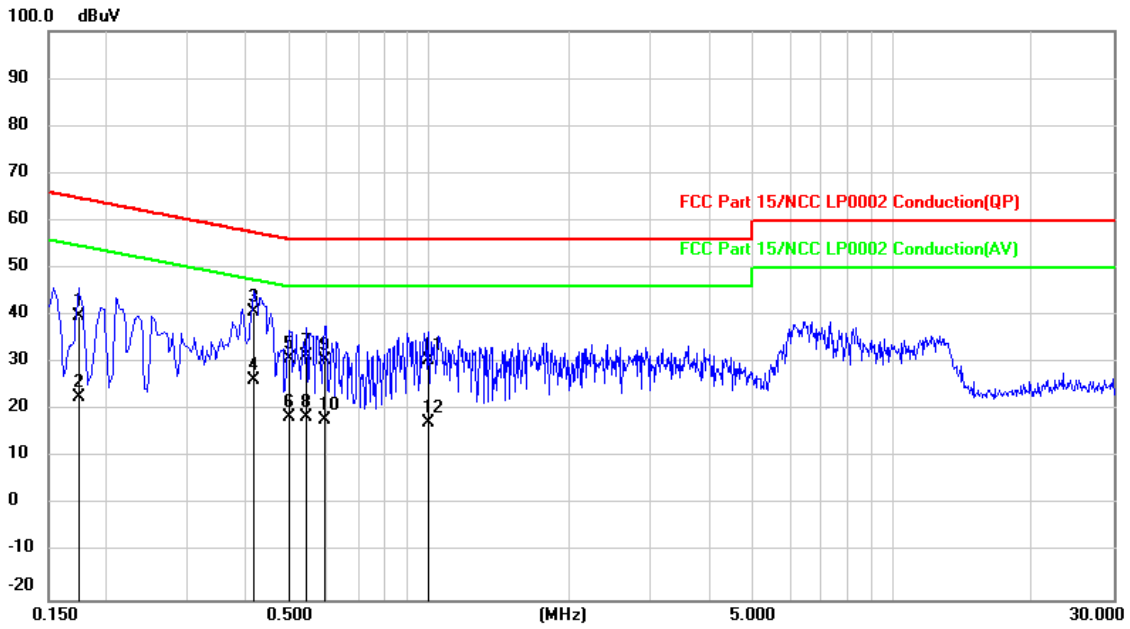
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### Phase of Power : Neutral (N)



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No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1740	20.19	19.54	39.73	64.77	-25.04	QP
2	0.1740	3.28	19.54	22.82	54.77	-31.95	AVG
3	0.4180	21.26	19.51	40.77	57.49	-16.72	QP
4	0.4180	6.82	19.51	26.33	47.49	-21.16	AVG
5	0.4980	11.37	19.51	30.88	56.03	-25.15	QP
6	0.4980	-0.81	19.51	18.70	46.03	-27.33	AVG
7	0.5420	11.93	19.52	31.45	56.00	-24.55	QP
8	0.5420	-1.09	19.52	18.43	46.00	-27.57	AVG
9	0.5940	11.10	19.52	30.62	56.00	-25.38	QP
10	0.5940	-1.72	19.52	17.80	46.00	-28.20	AVG
11	0.9940	11.00	19.53	30.53	56.00	-25.47	QP
12	0.9940	-2.20	19.53	17.33	46.00	-28.67	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

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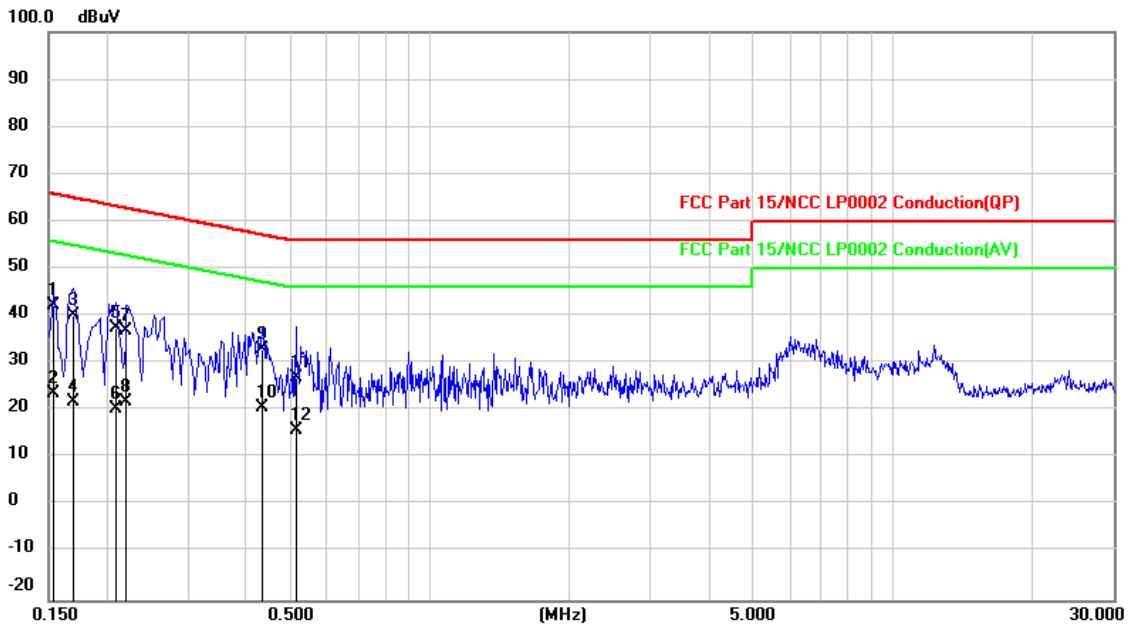


### Beamforming mode

#### 802.11ax (HE20)

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	150 kHz ~ 30 MHz

#### Phase of Power : Line (L)



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No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1539	22.72	19.54	42.26	65.79	-23.53	QP
2	0.1539	4.25	19.54	23.79	55.79	-32.00	AVG
3	0.1700	20.61	19.54	40.15	64.96	-24.81	QP
4	0.1700	2.41	19.54	21.95	54.96	-33.01	AVG
5	0.2100	18.04	19.53	37.57	63.21	-25.64	QP
6	0.2100	0.93	19.53	20.46	53.21	-32.75	AVG
7	0.2220	17.45	19.53	36.98	62.74	-25.76	QP
8	0.2220	2.20	19.53	21.73	52.74	-31.01	AVG
9	0.4340	13.43	19.51	32.94	57.18	-24.24	QP
10	0.4340	1.12	19.51	20.63	47.18	-26.55	AVG
11	0.5140	7.38	19.52	26.90	56.00	-29.10	QP
12	0.5140	-3.66	19.52	15.86	46.00	-30.14	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

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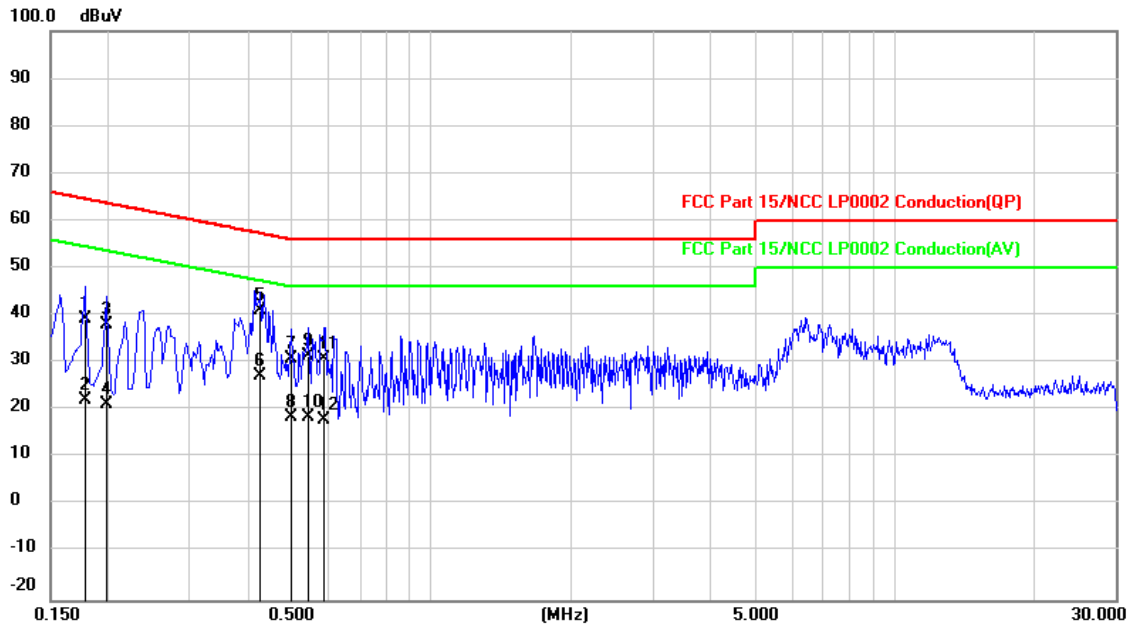
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### Phase of Power : Neutral (N)



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No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1780	19.66	19.53	39.19	64.58	-25.39	QP
2	0.1780	2.58	19.53	22.11	54.58	-32.47	AVG
3	0.1980	18.58	19.53	38.11	63.69	-25.58	QP
4	0.1980	1.63	19.53	21.16	53.69	-32.53	AVG
5	0.4260	21.60	19.51	41.11	57.33	-16.22	QP
6	0.4260	7.60	19.51	27.11	47.33	-20.22	AVG
7	0.4980	11.42	19.51	30.93	56.03	-25.10	QP
8	0.4980	-0.84	19.51	18.67	46.03	-27.36	AVG
9	0.5420	12.02	19.52	31.54	56.00	-24.46	QP
10	0.5420	-0.89	19.52	18.63	46.00	-27.37	AVG
11	0.5860	11.19	19.52	30.71	56.00	-25.29	QP
12	0.5860	-1.54	19.52	17.98	46.00	-28.02	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

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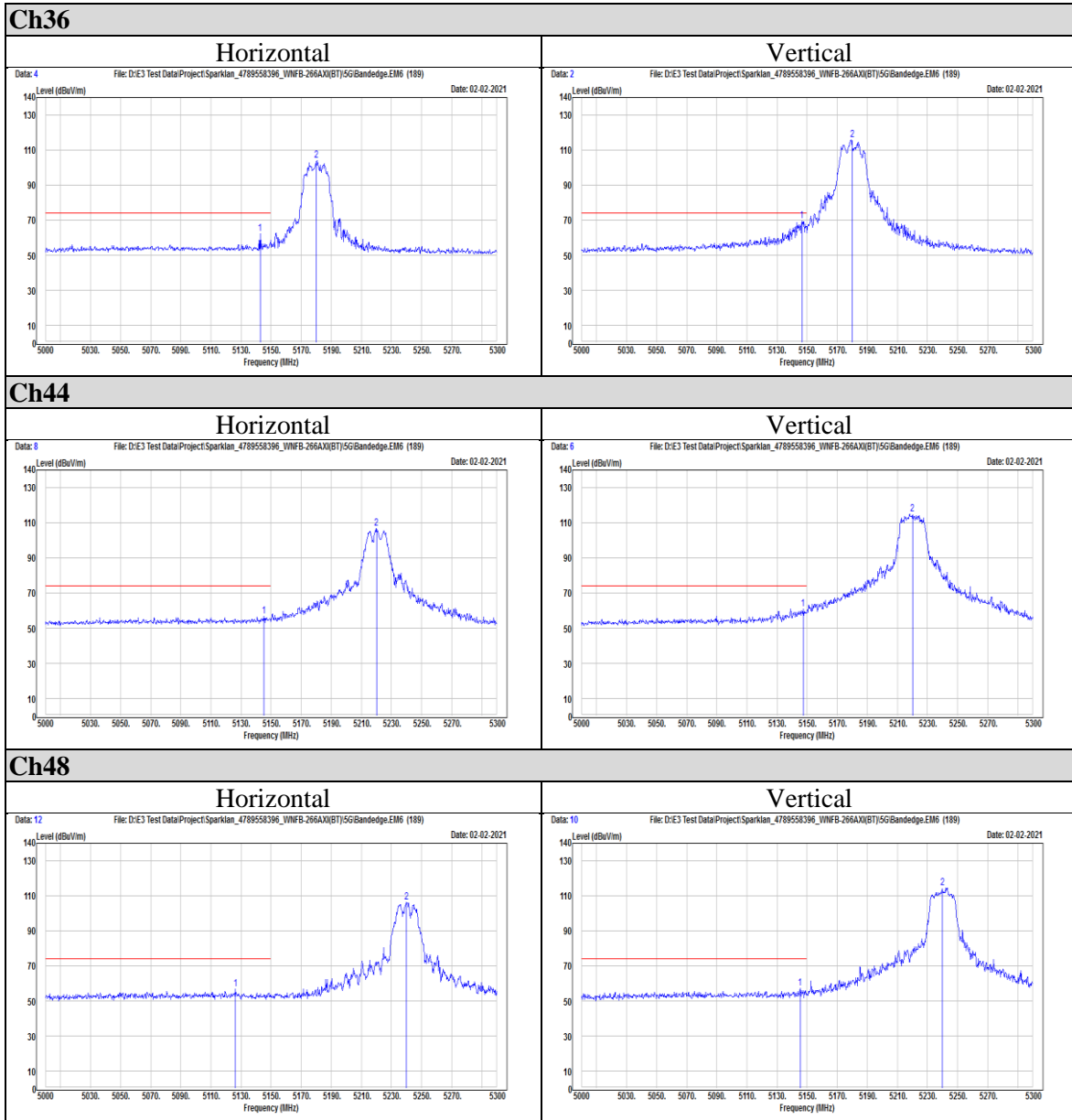


## Appendix I Radiated Band Edge and OOB Measurement

### Non-Beamforming mode

### 802.11a

### Peak



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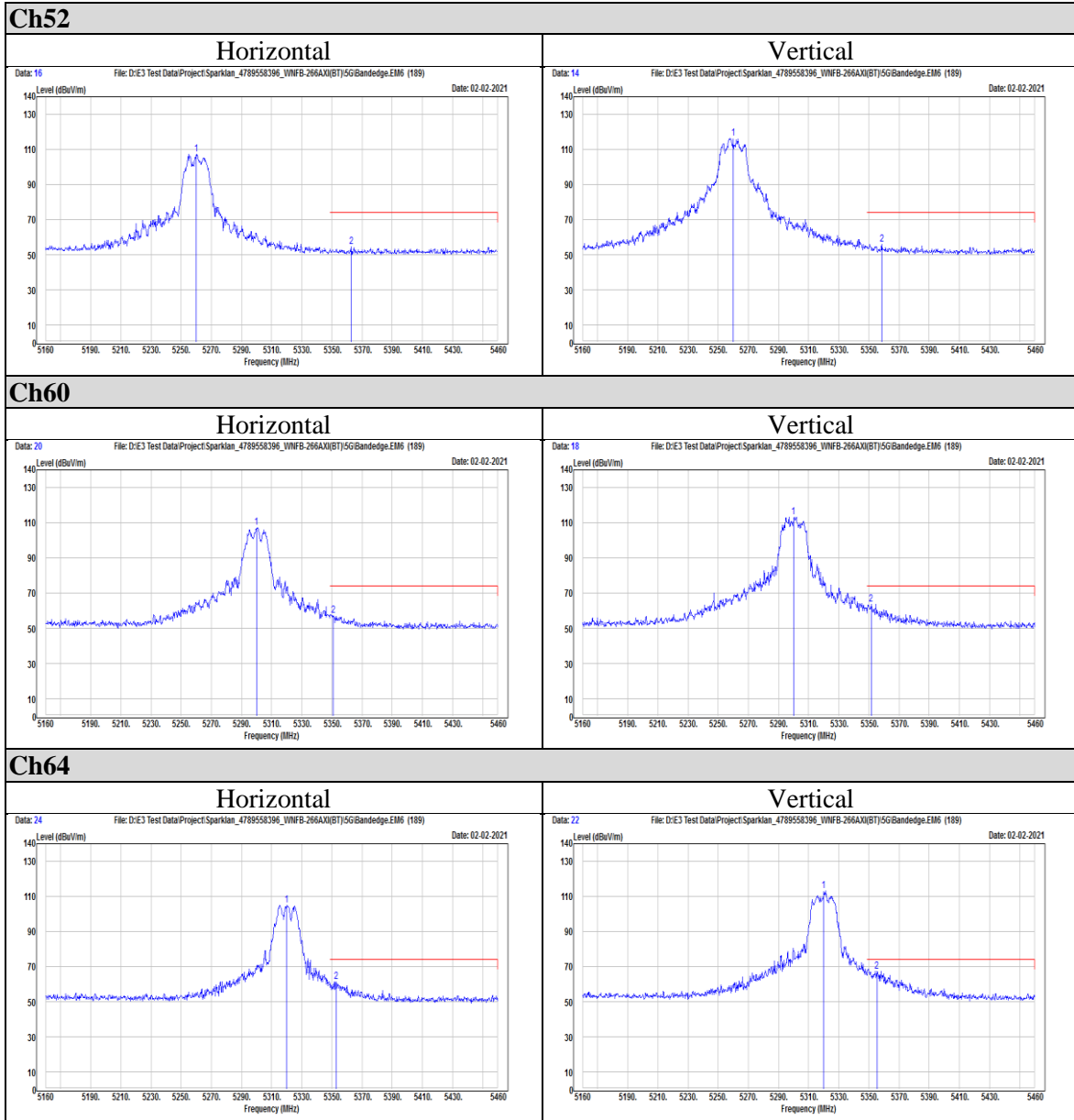
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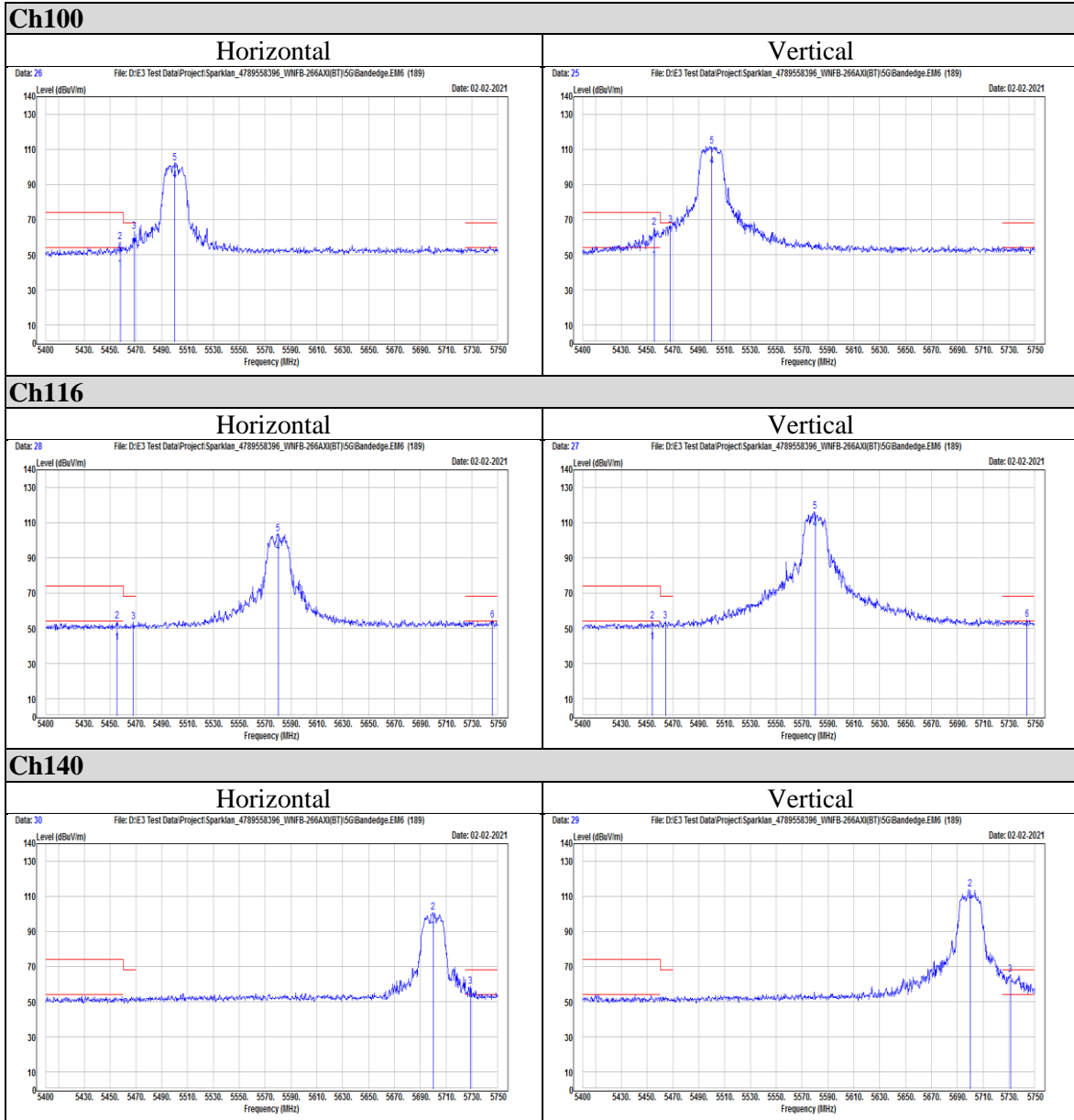
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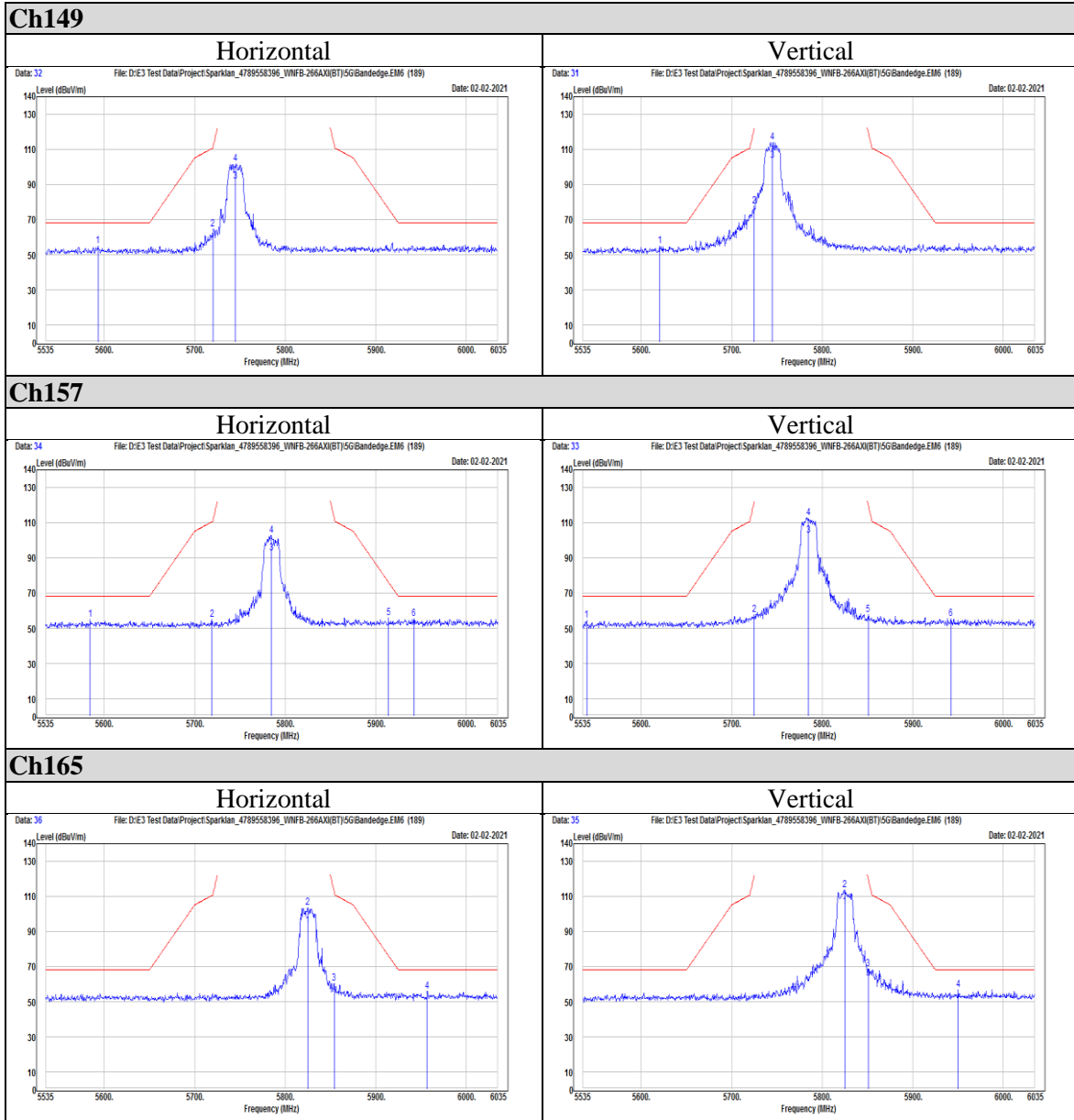
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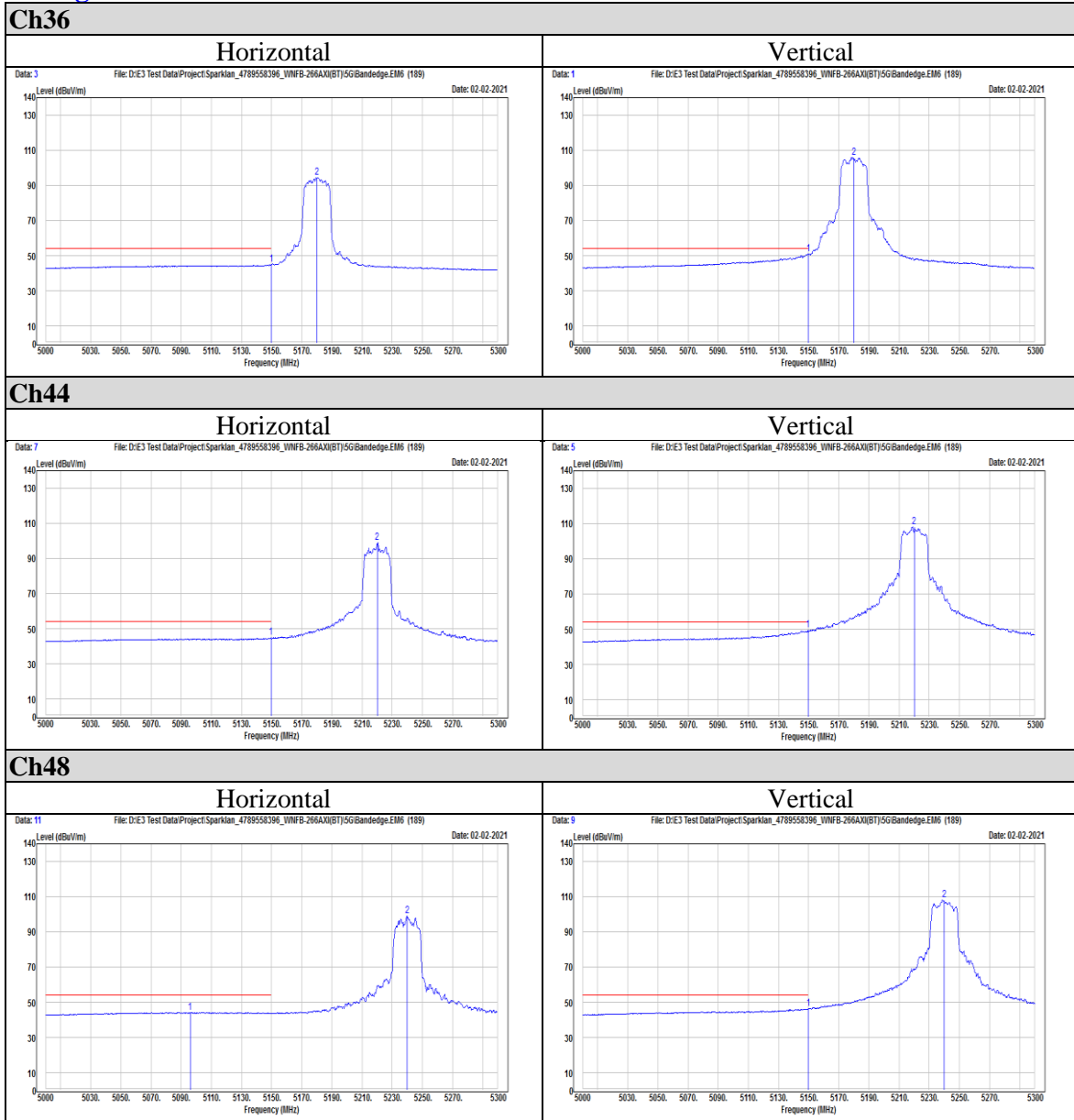


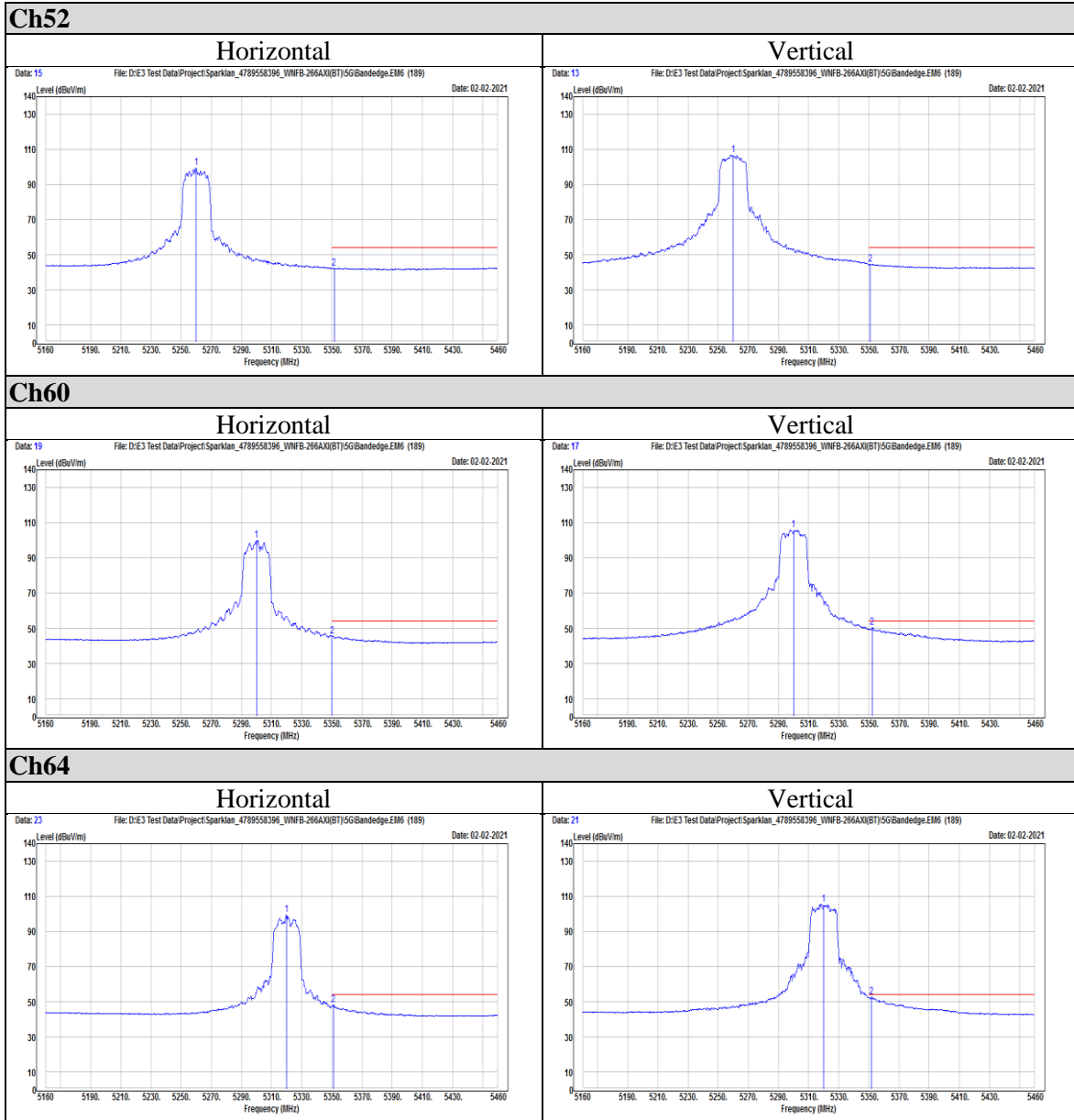






### Average



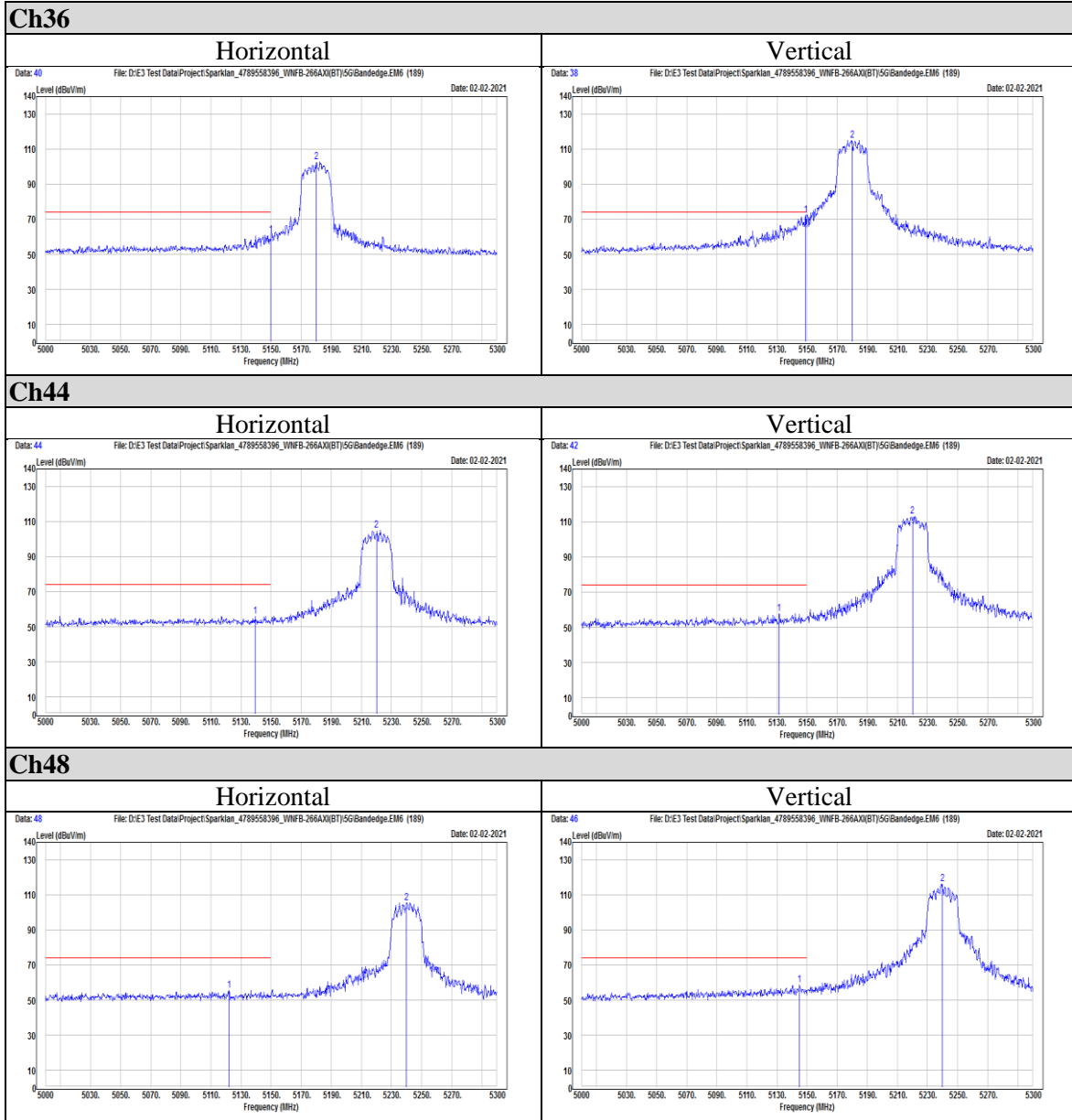


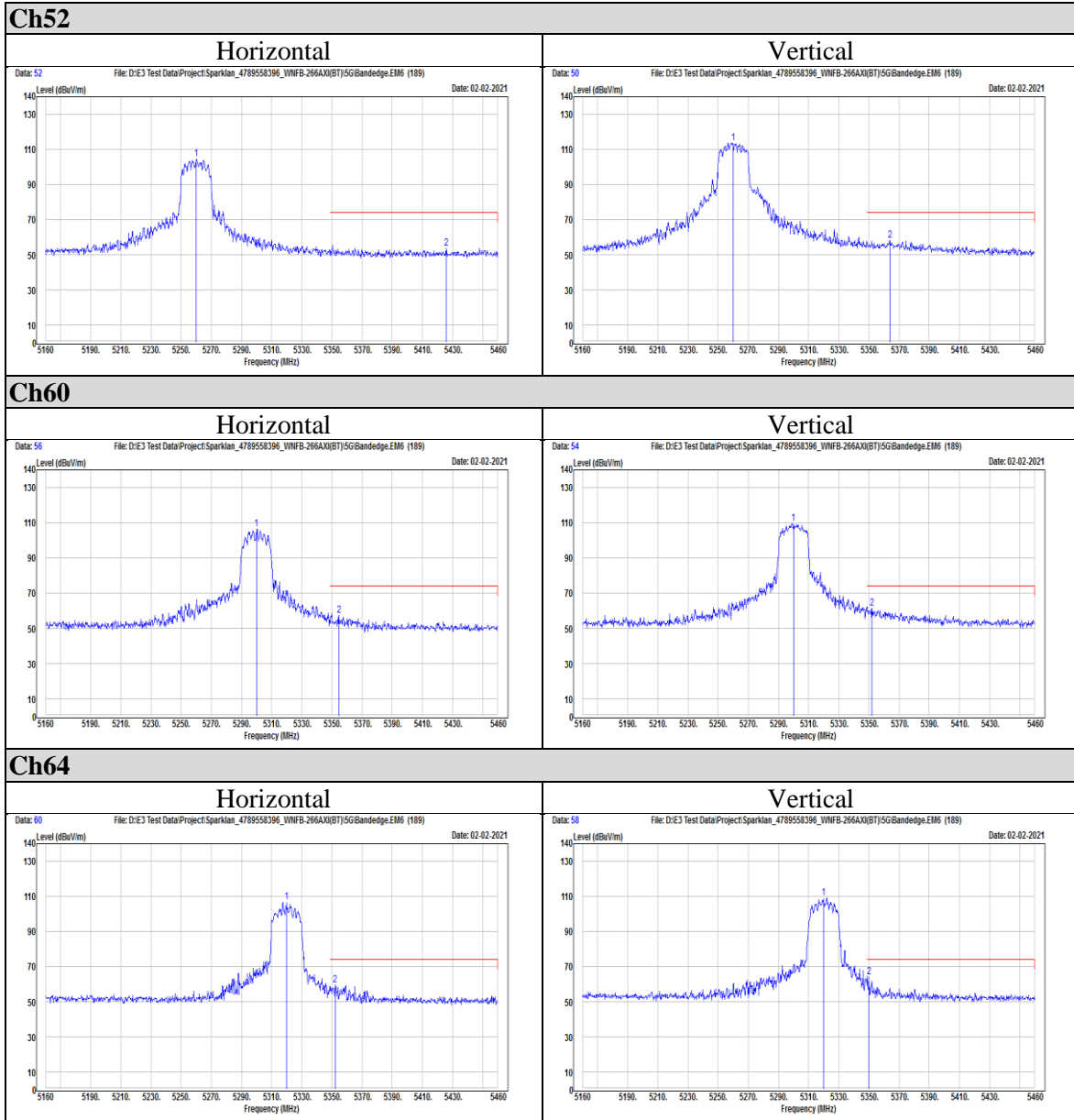


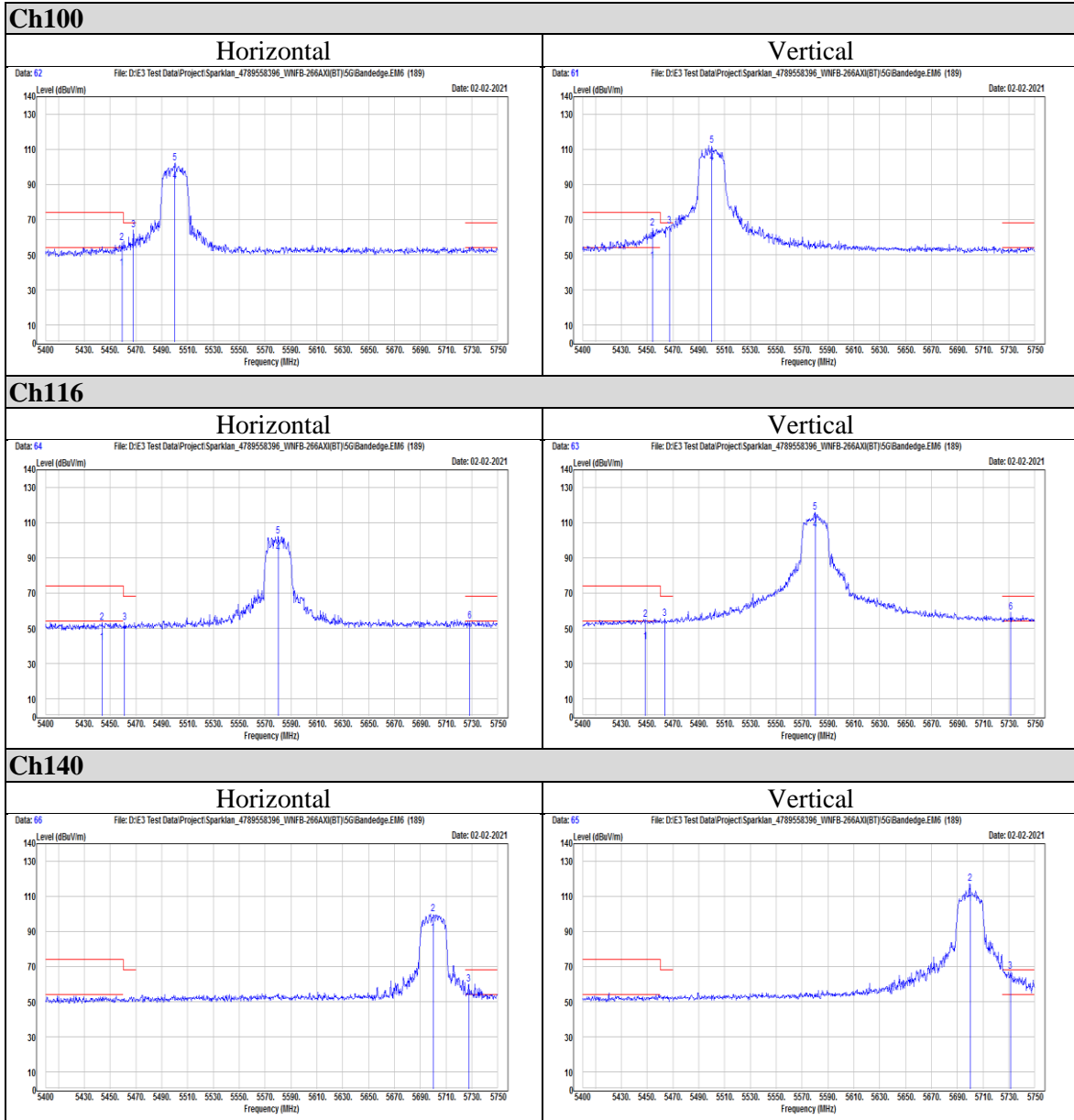
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**802.11ax (HE20)**

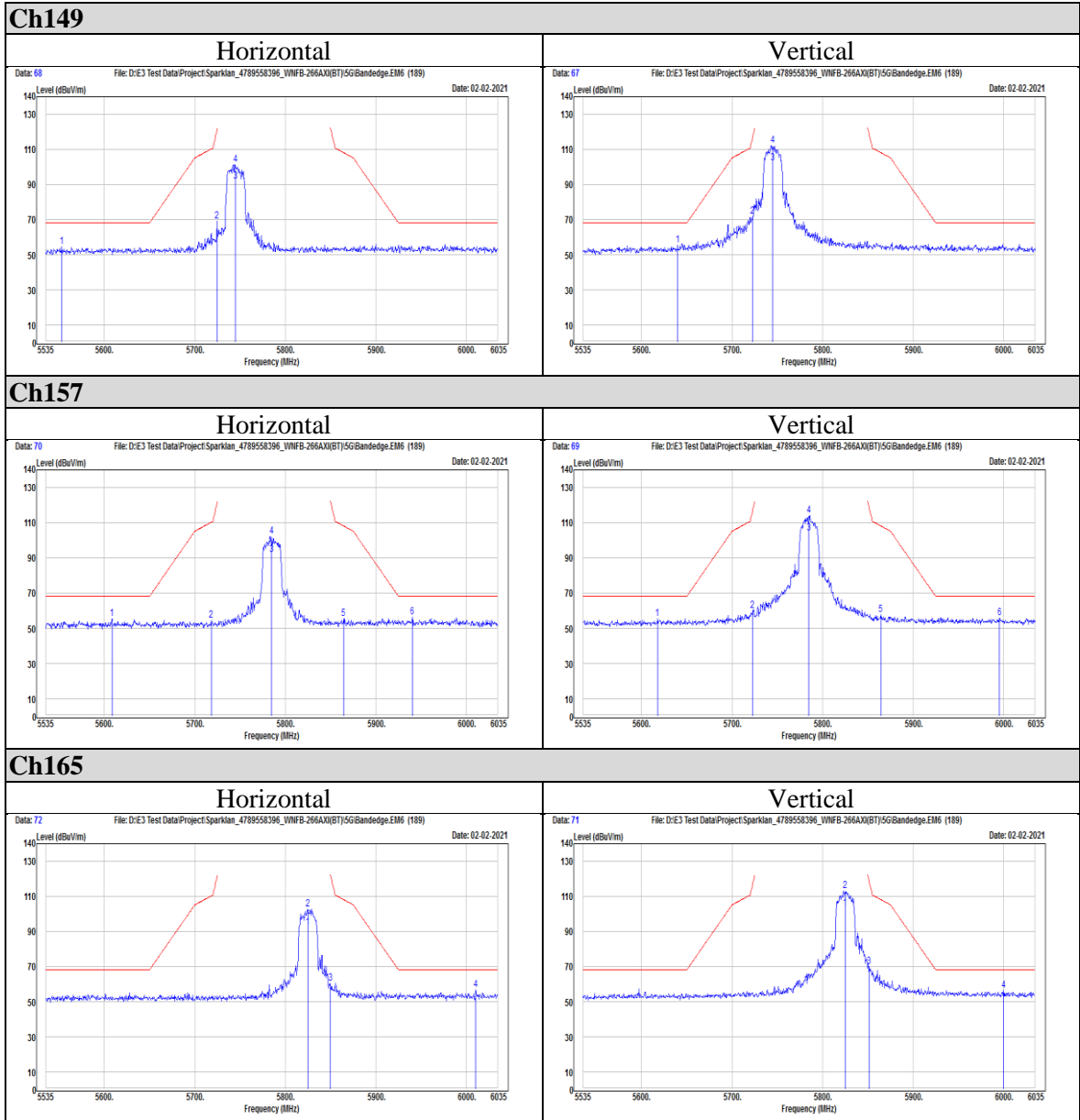
**Peak**





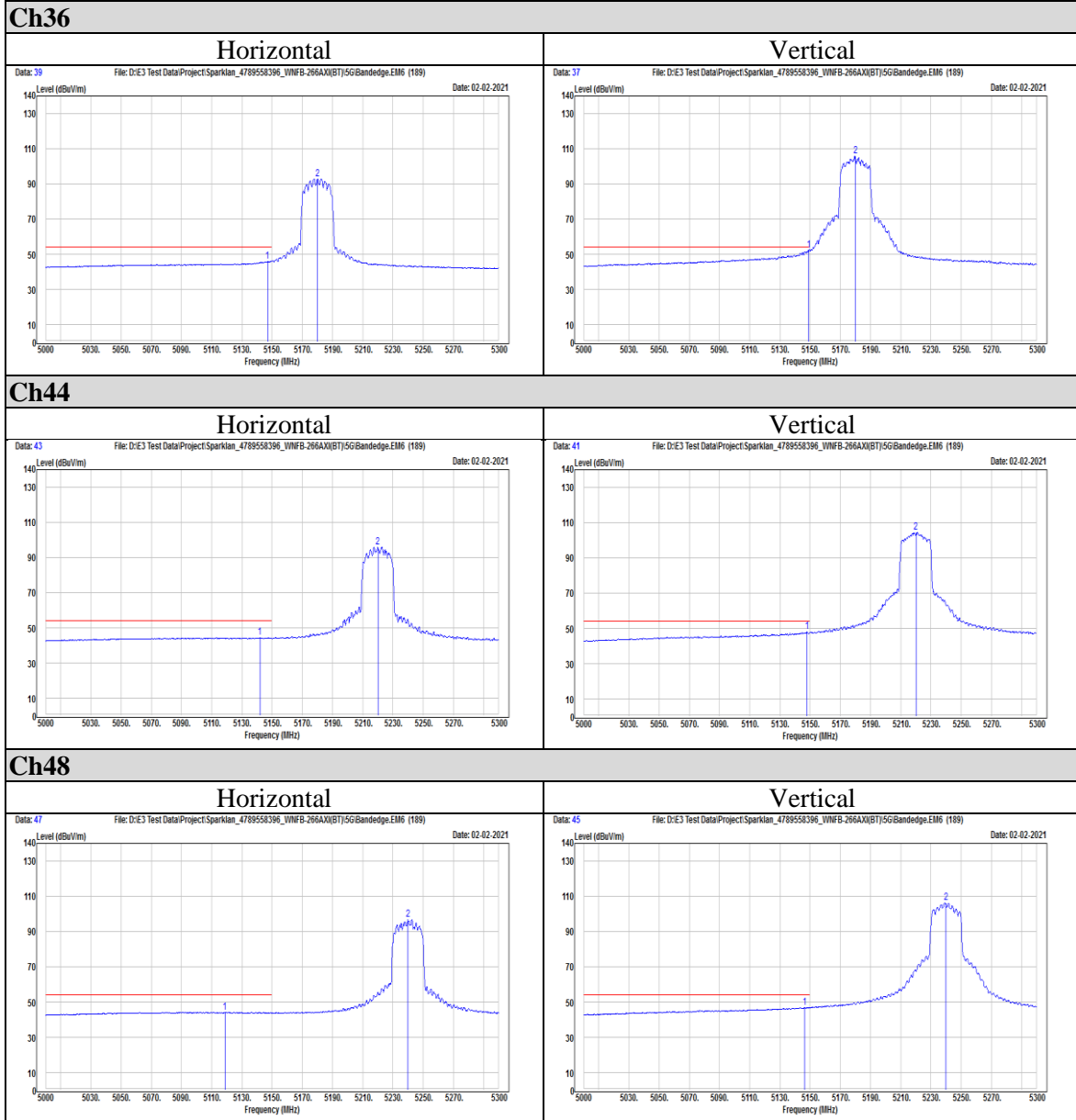


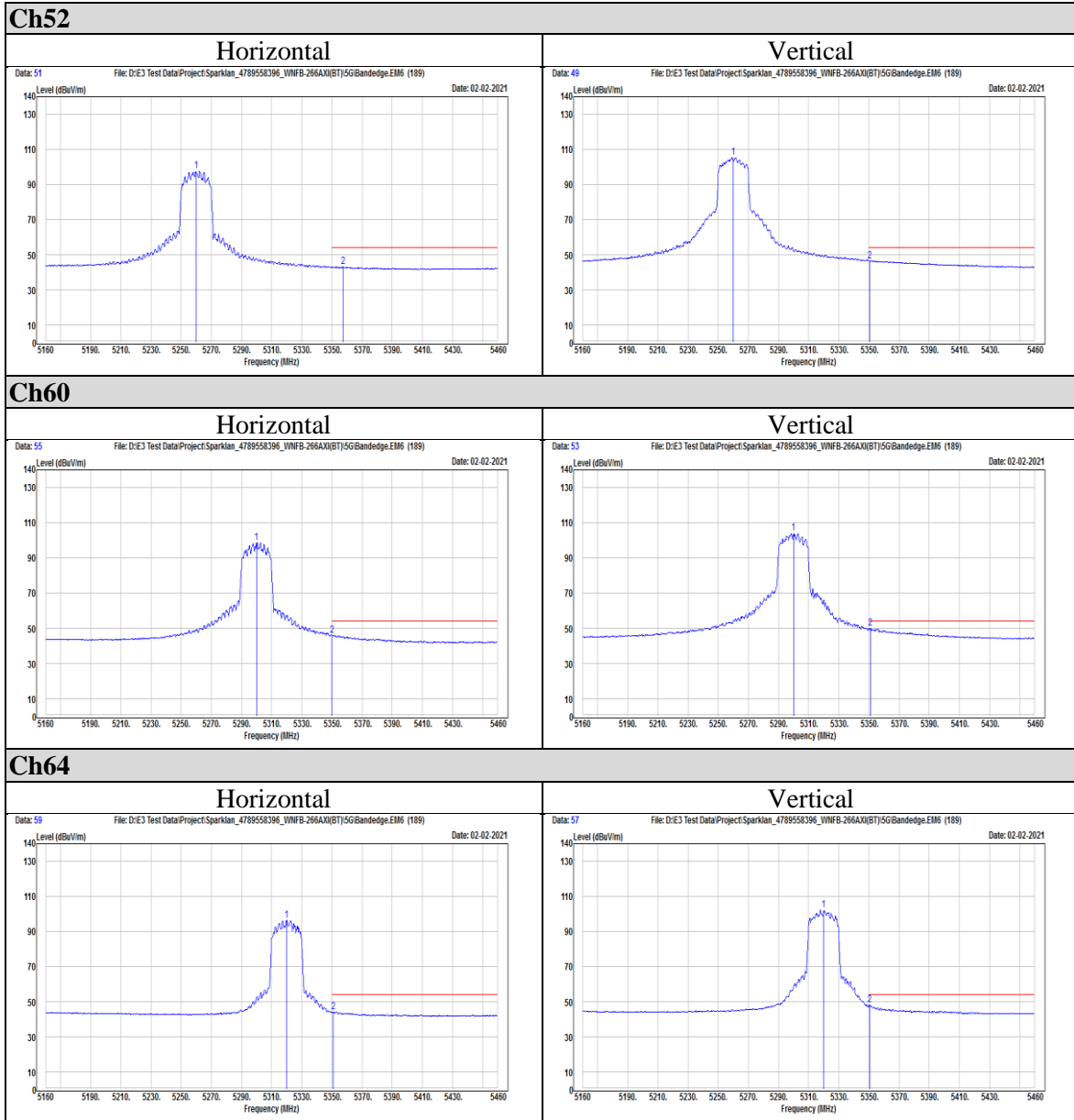






### Average

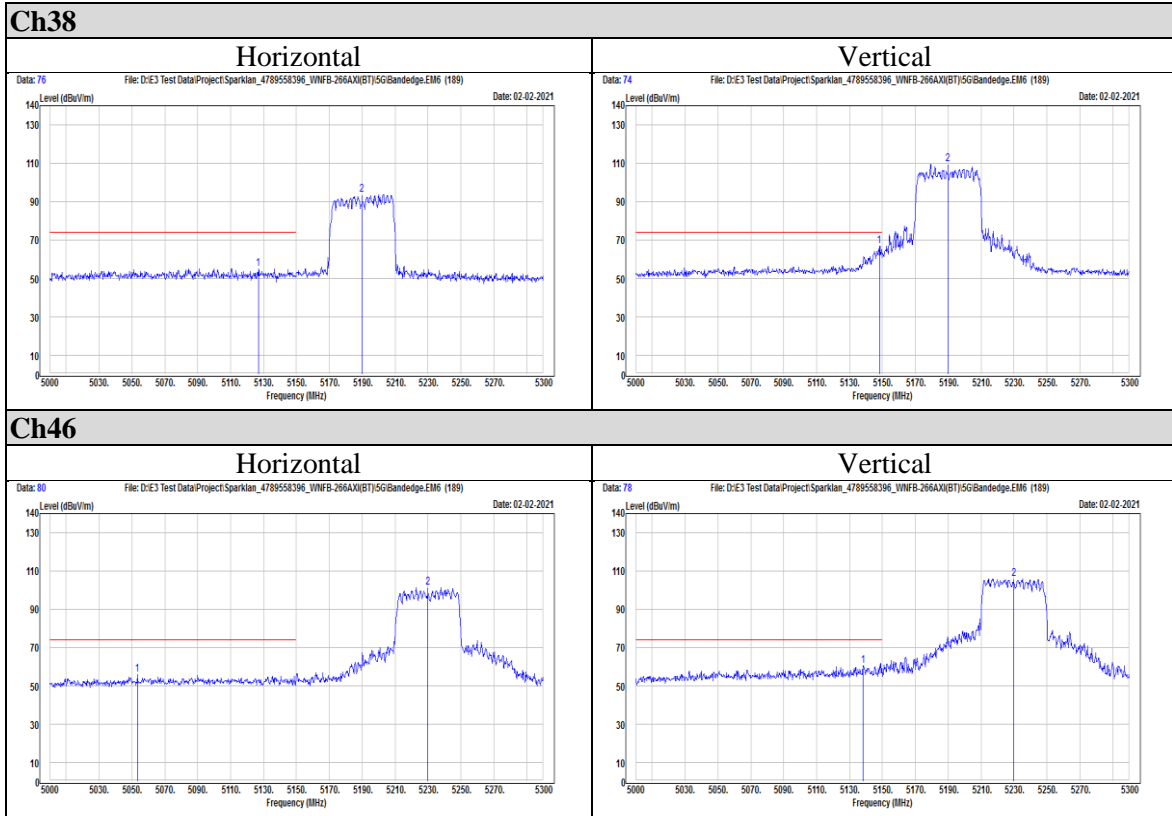


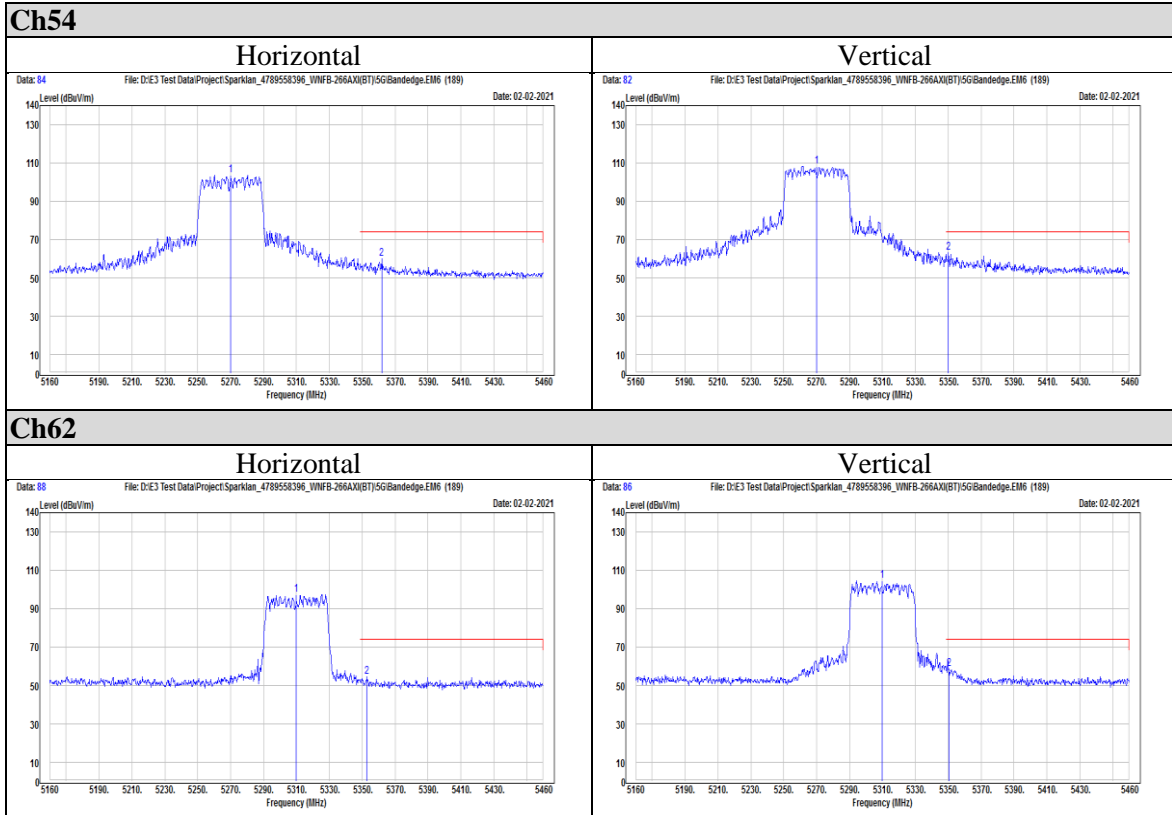




## 802.11ax (HE40)

### Peak



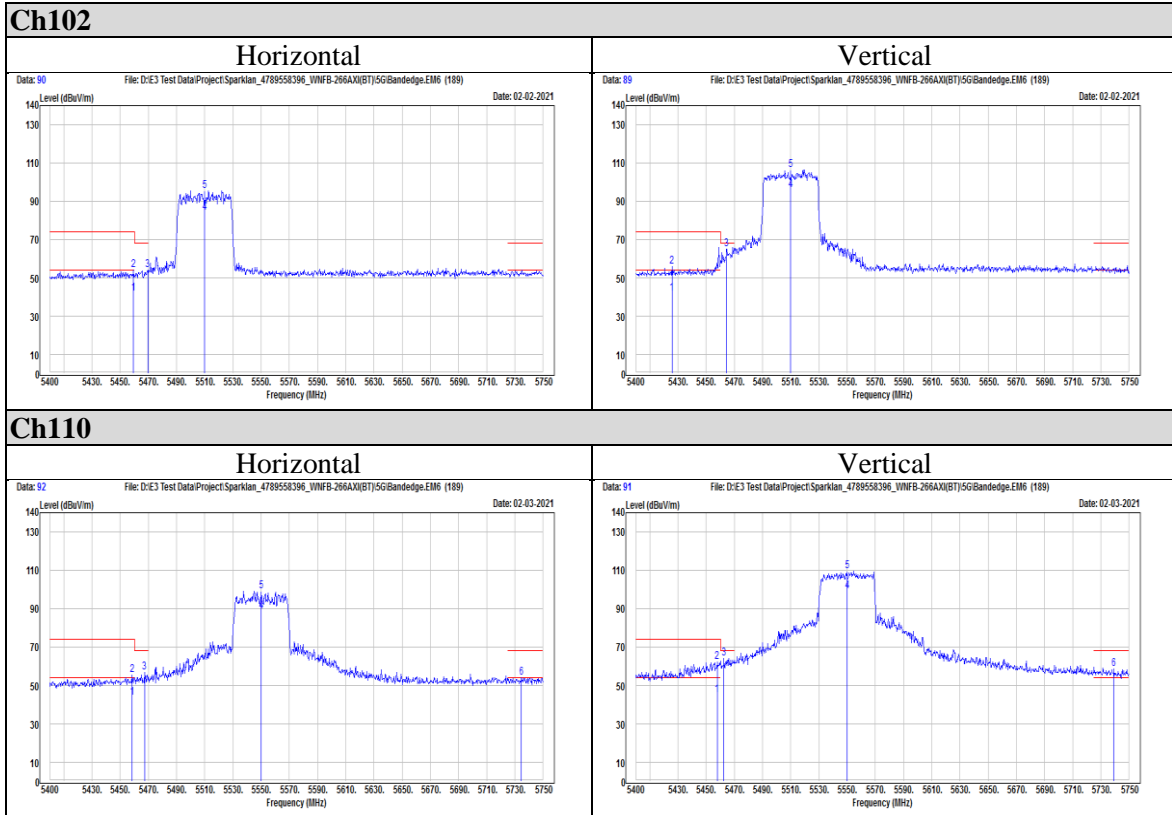


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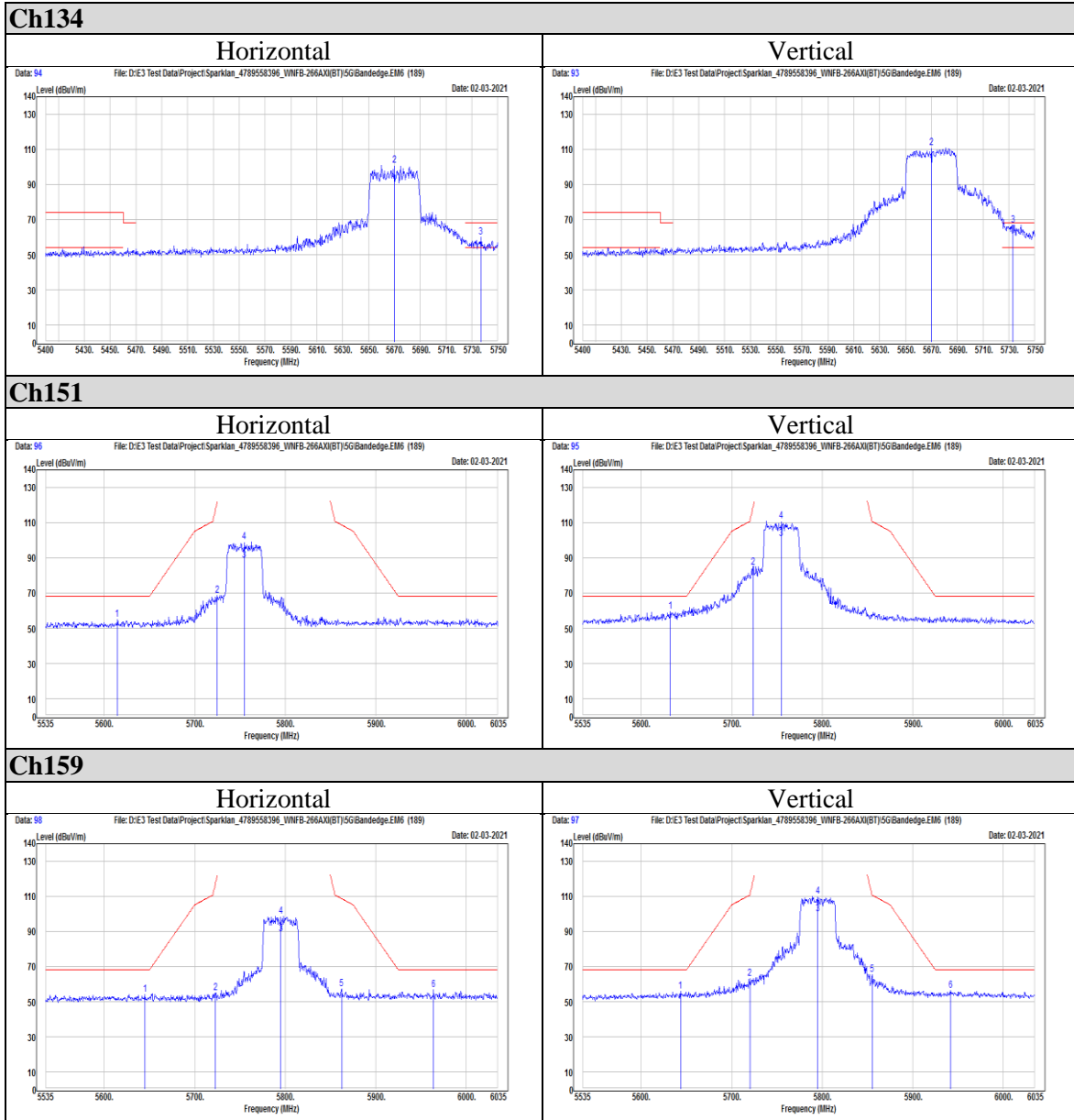


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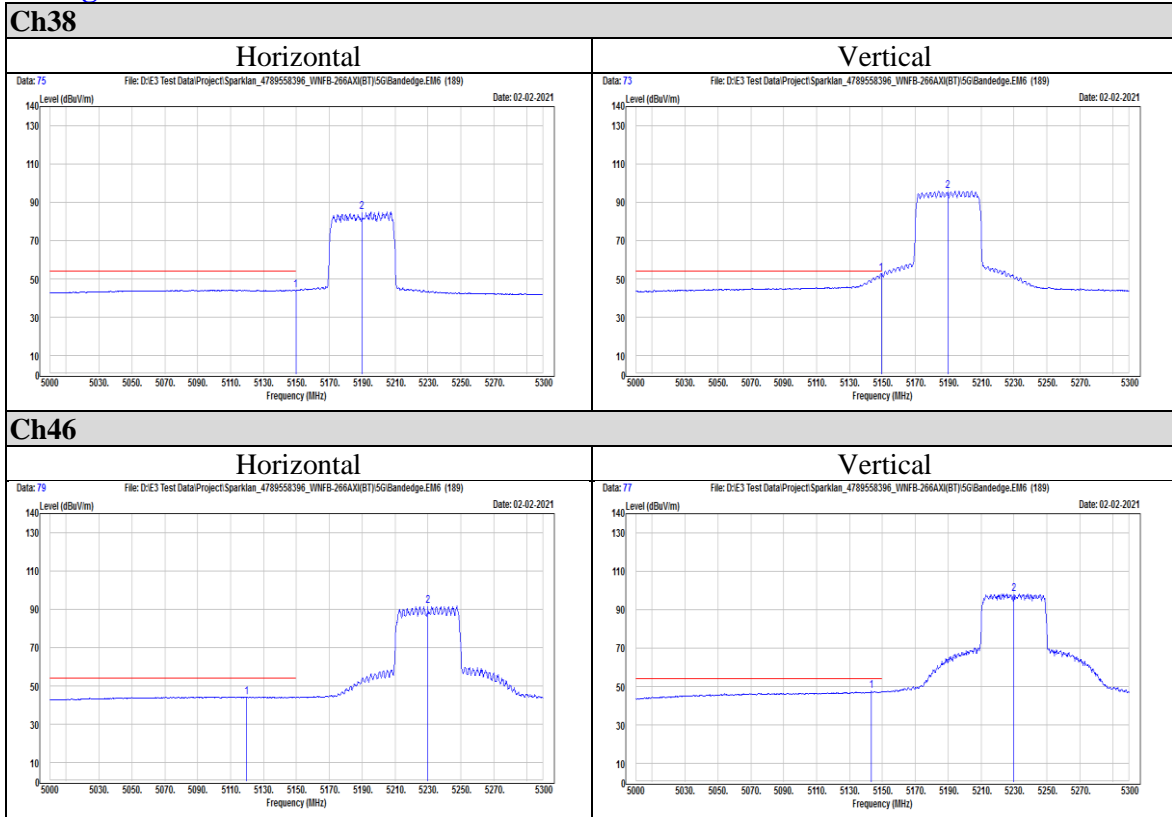
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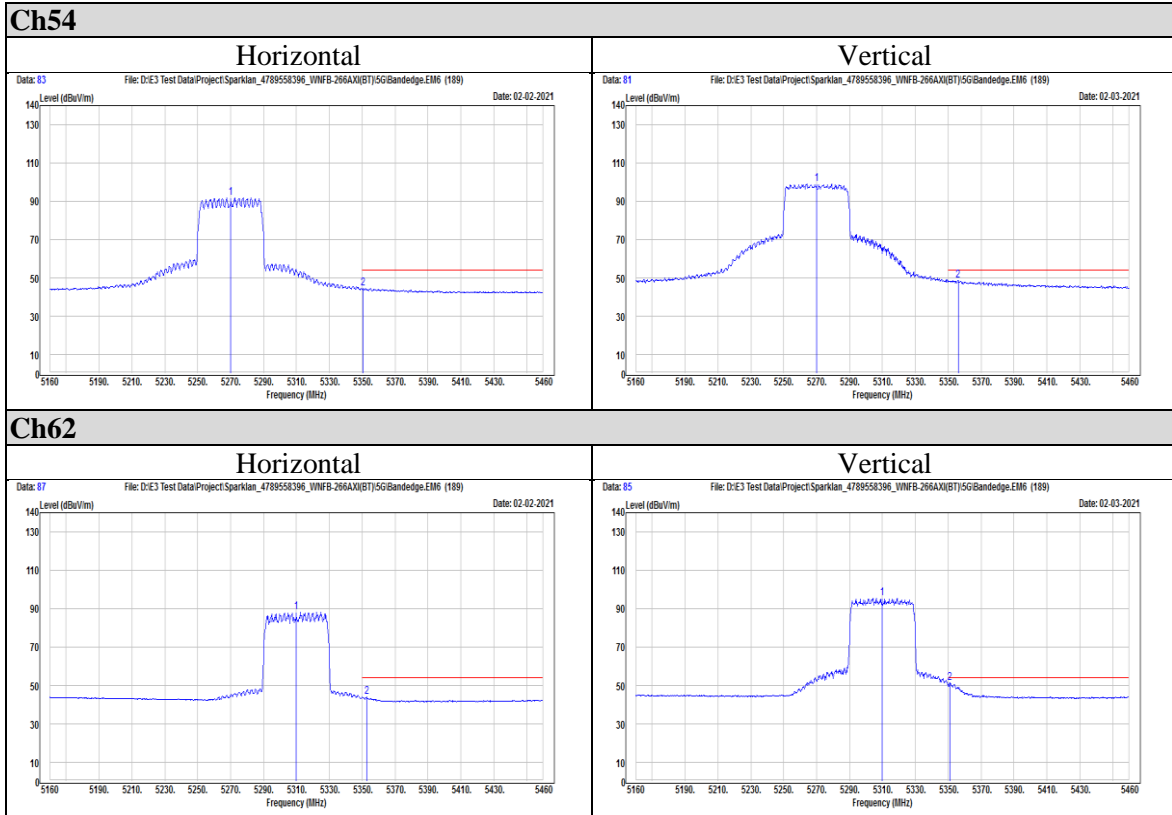




### Average







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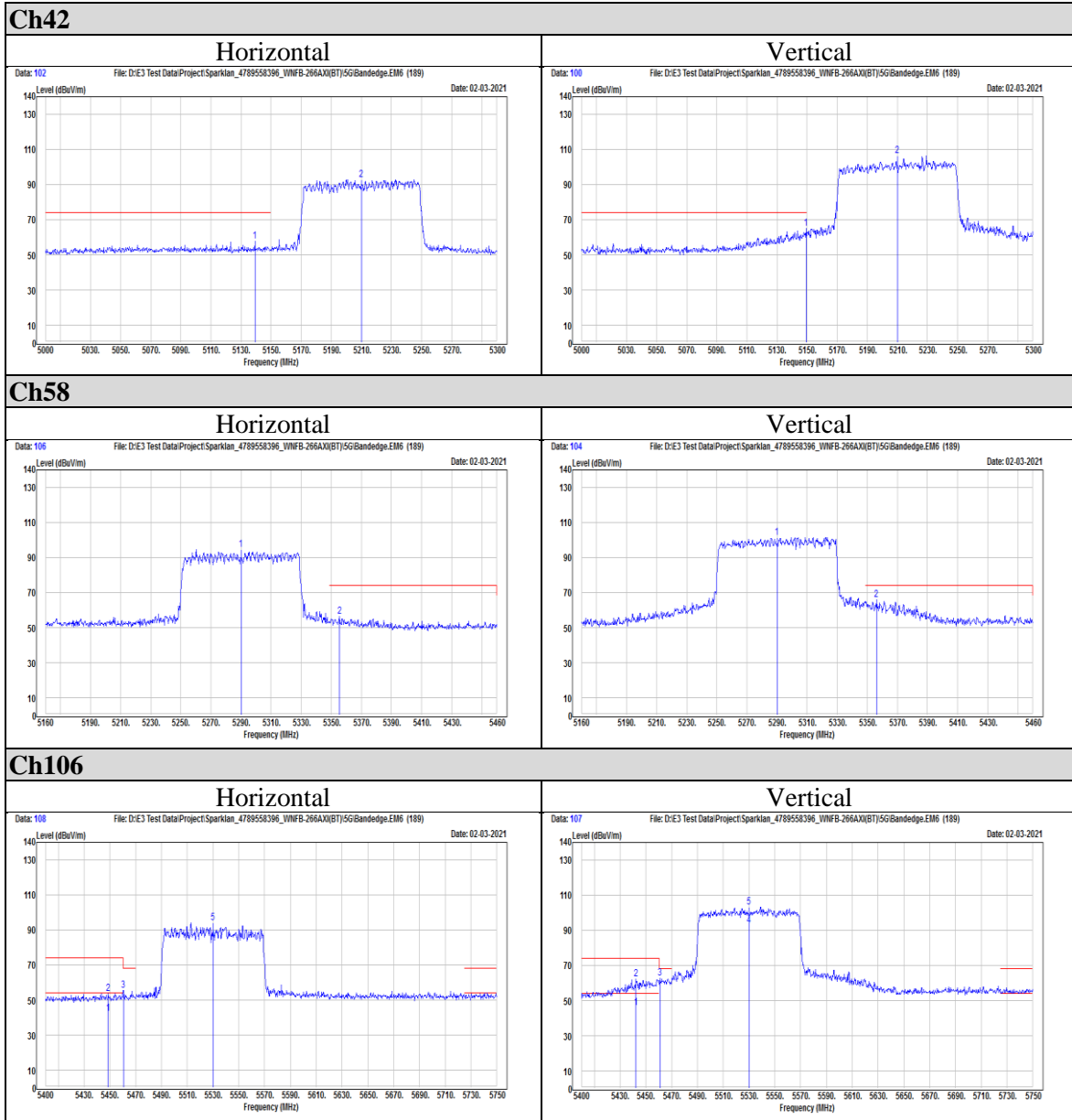
Telephone : +886-2-7737-3000

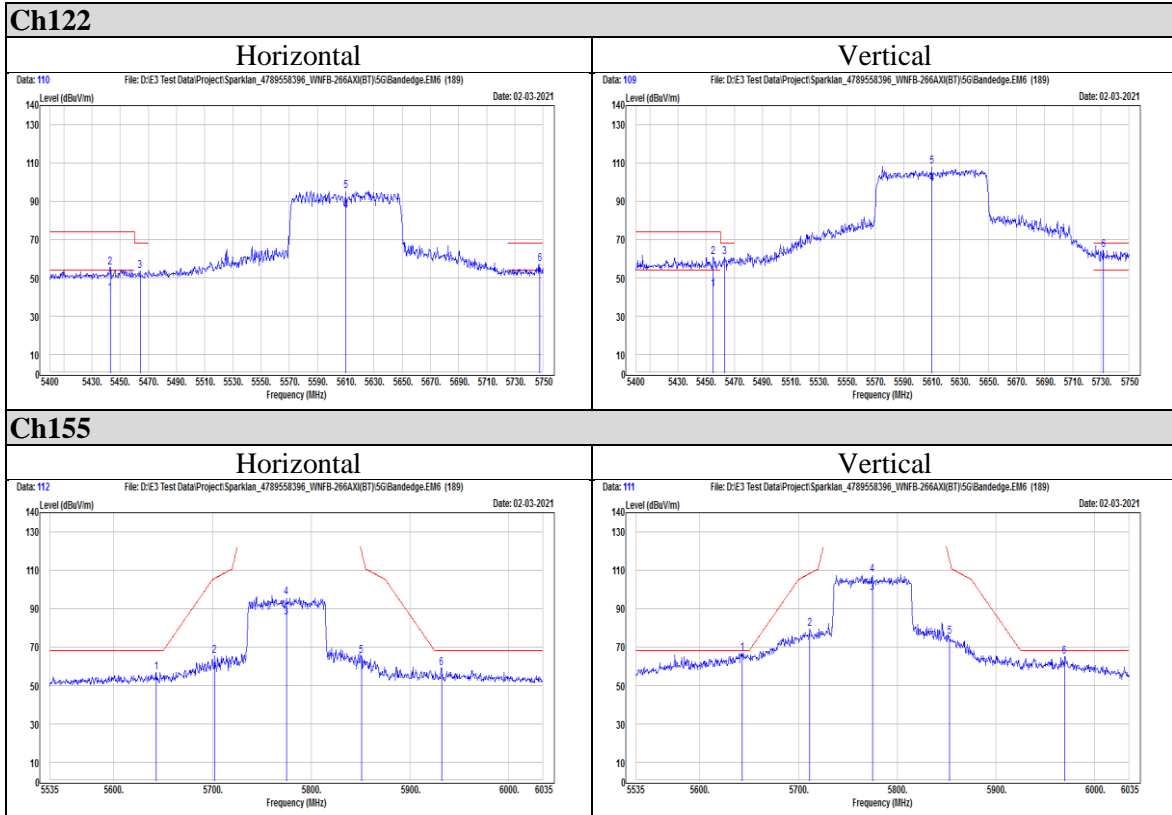
Facsimile (FAX) : +886-3-583-7948



## 802.11ax (HE80)

### Peak





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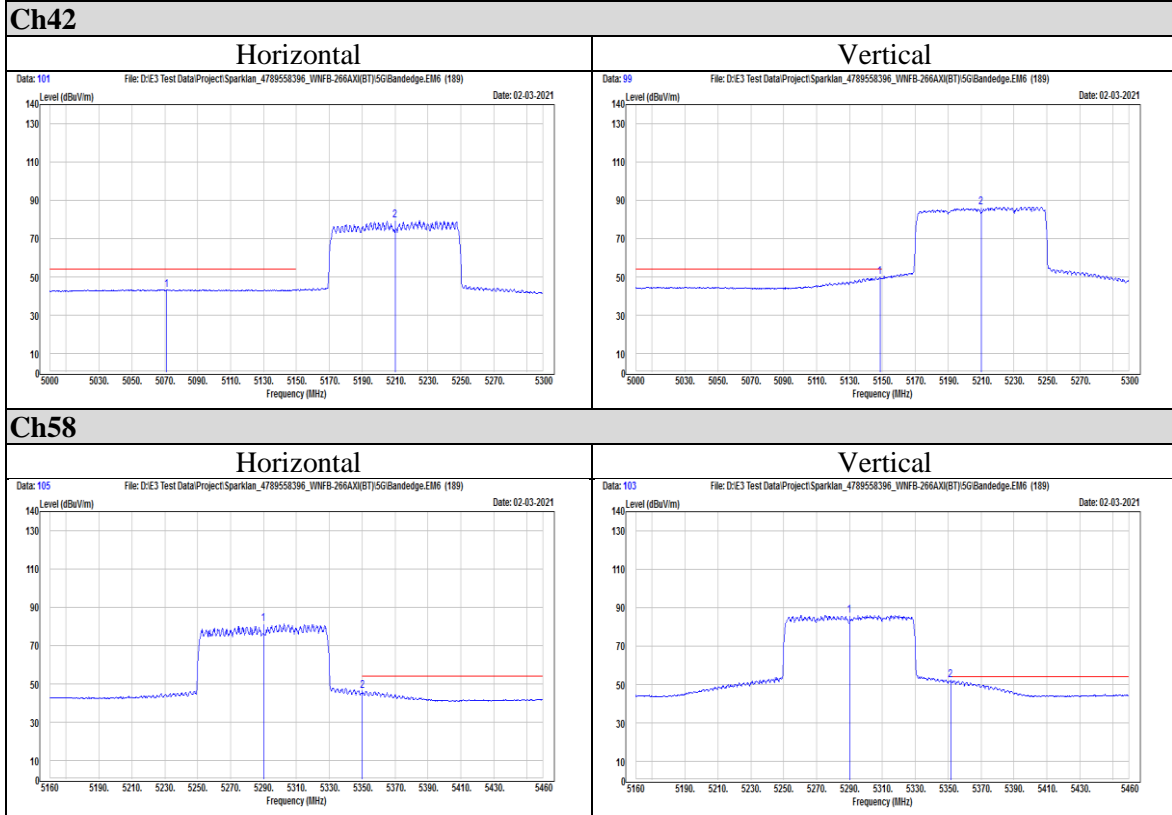
Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

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### Average

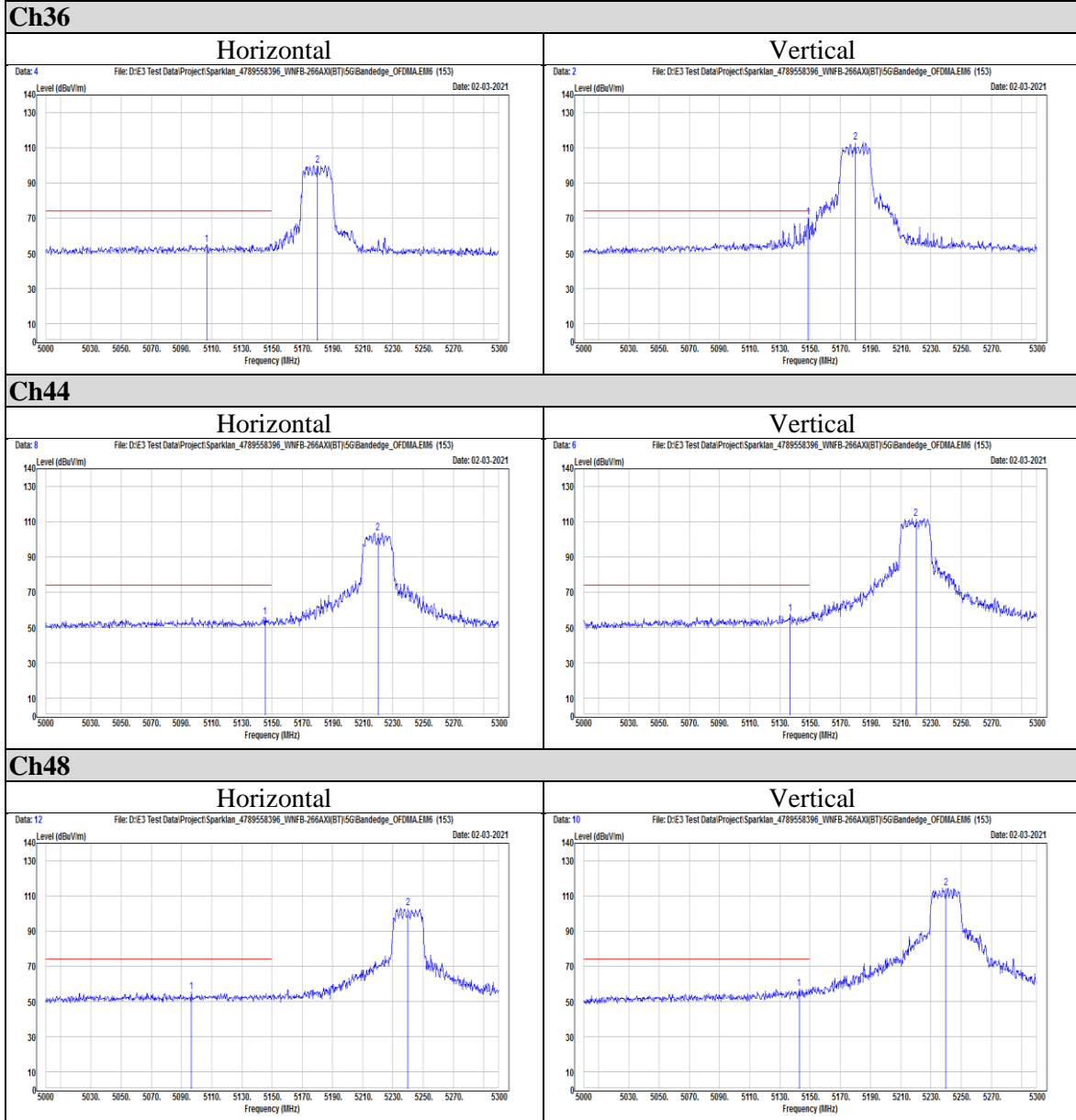




OFDMA

802.11ax (HE20)

Peak

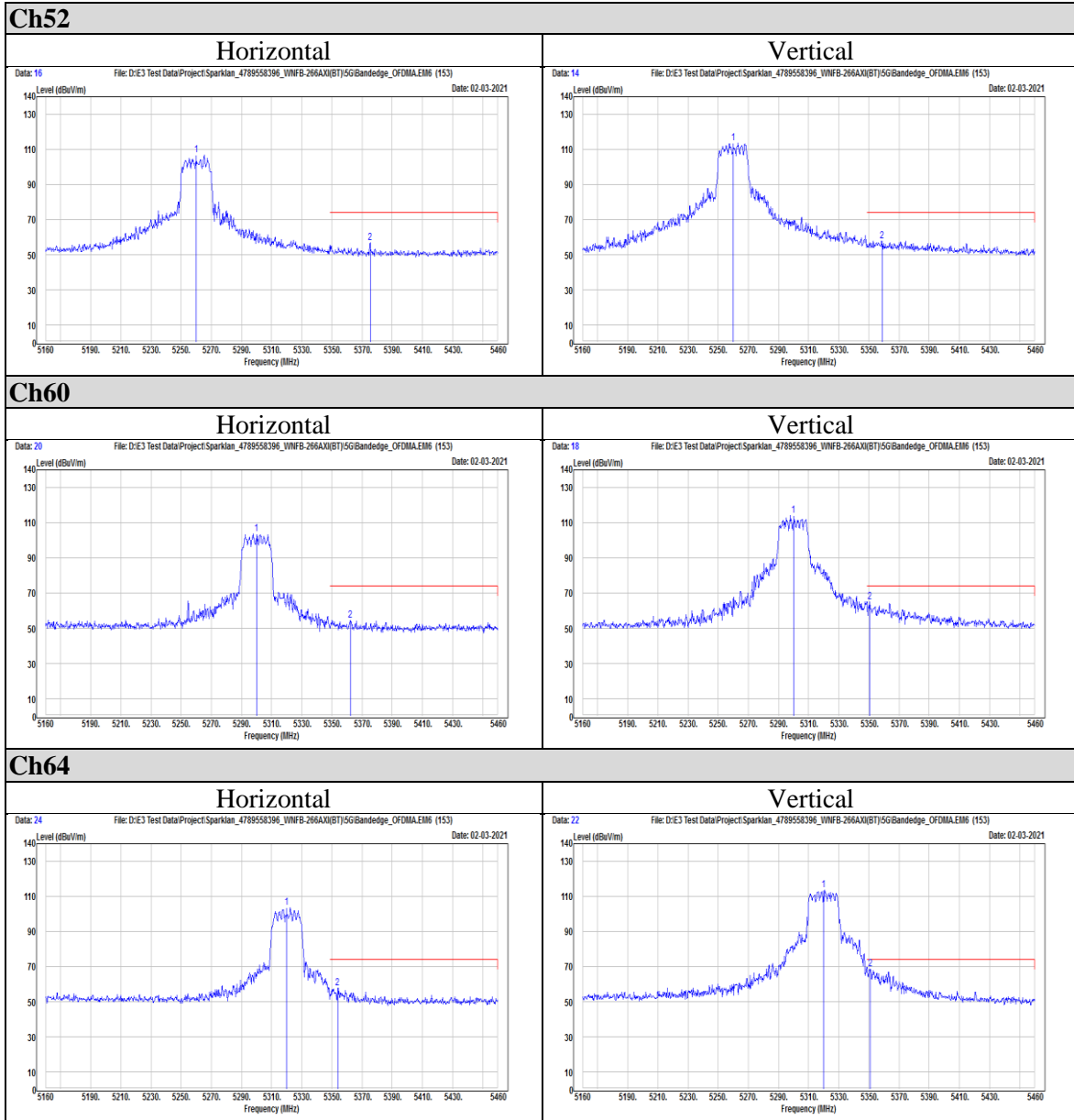


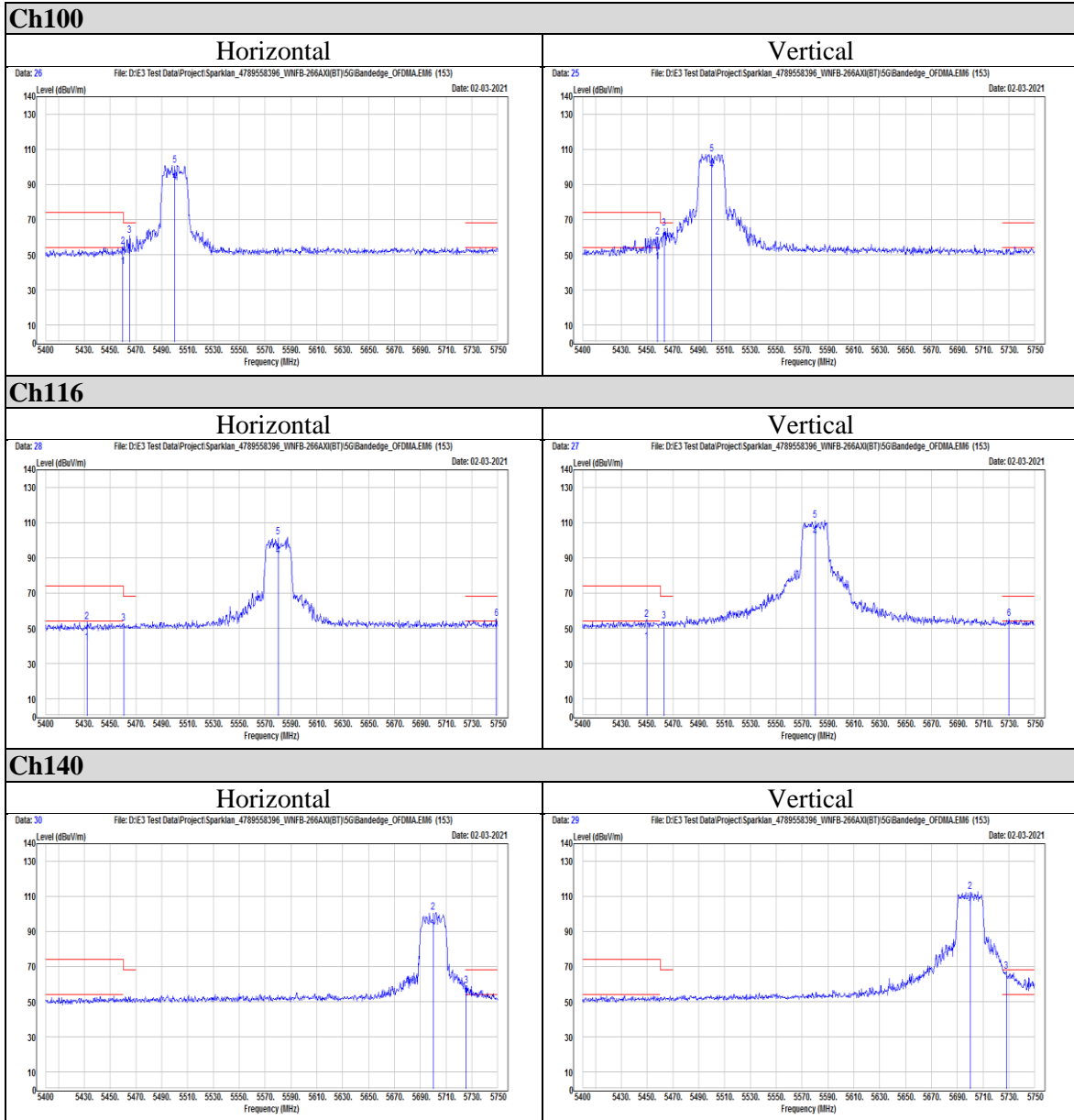
Underwriters Laboratories Taiwan Co., Ltd.

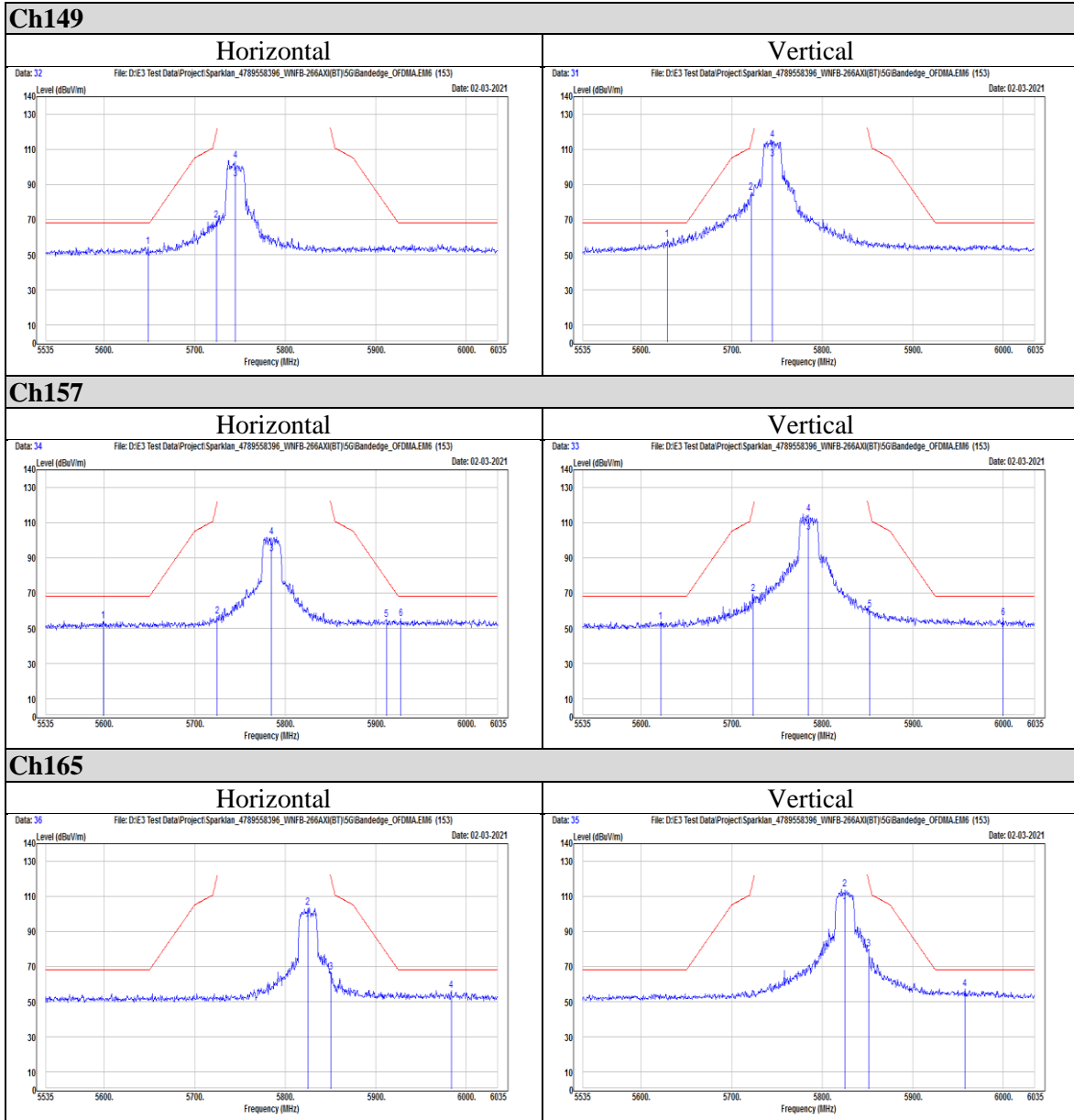
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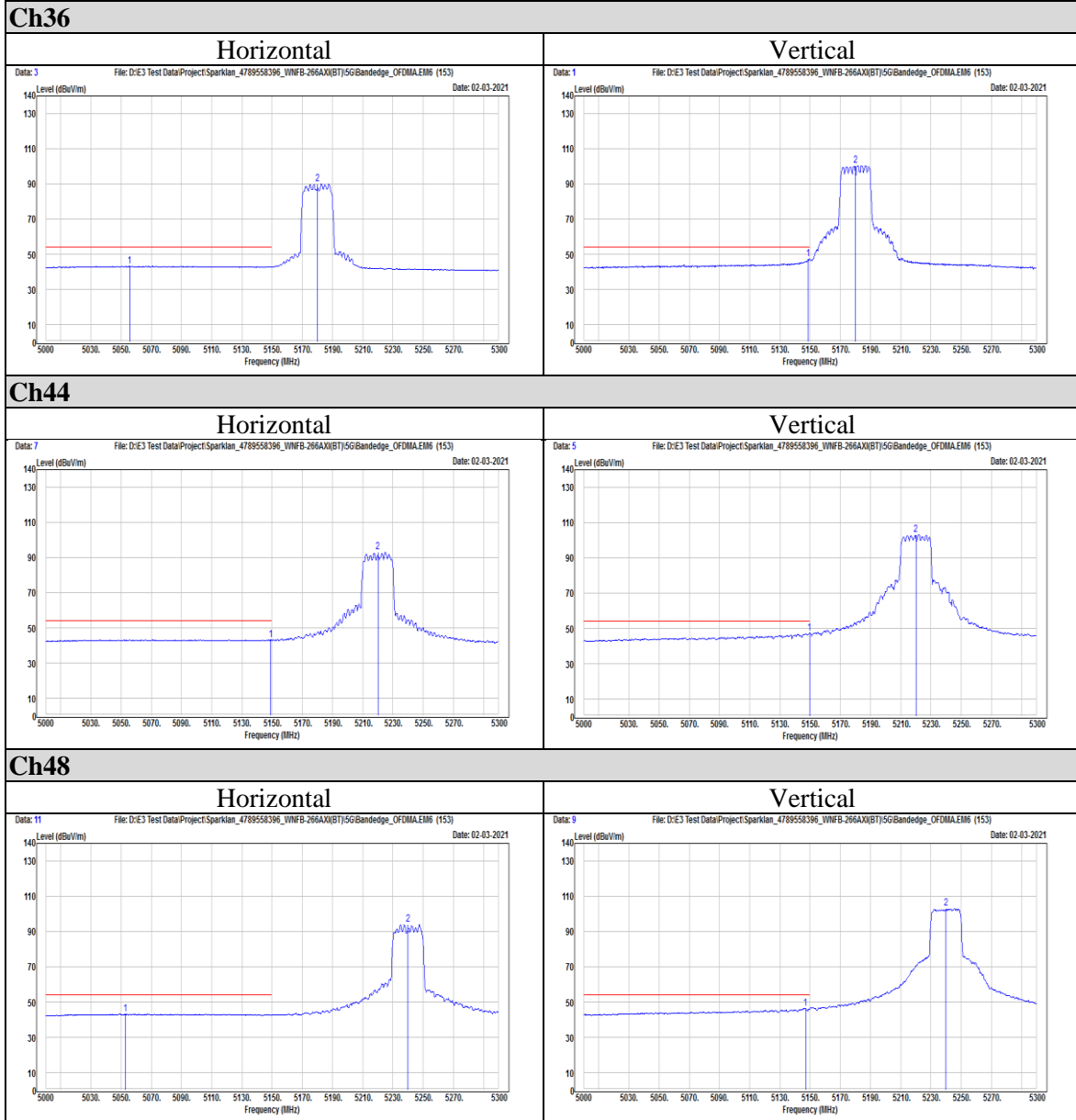


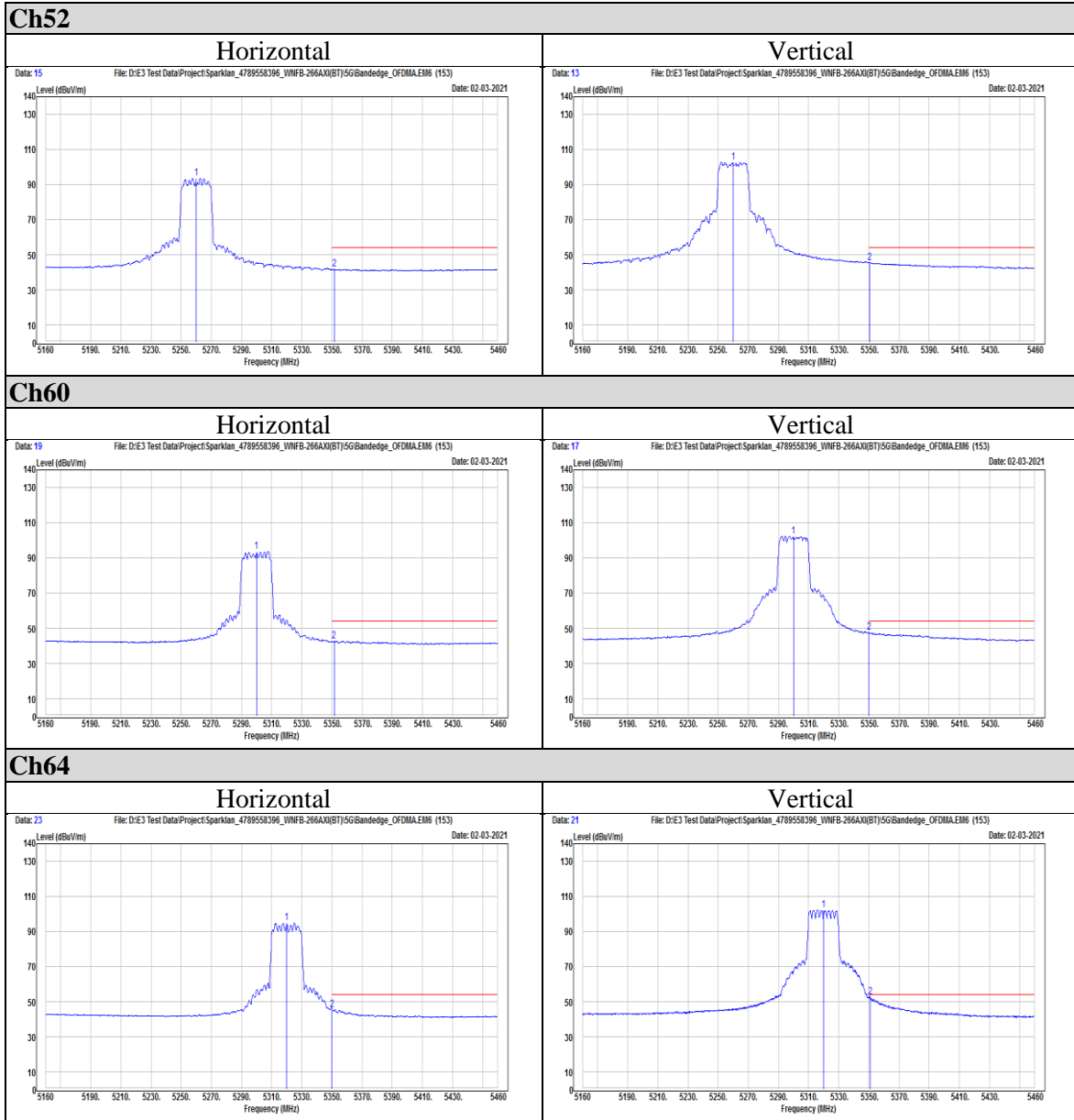






### Average

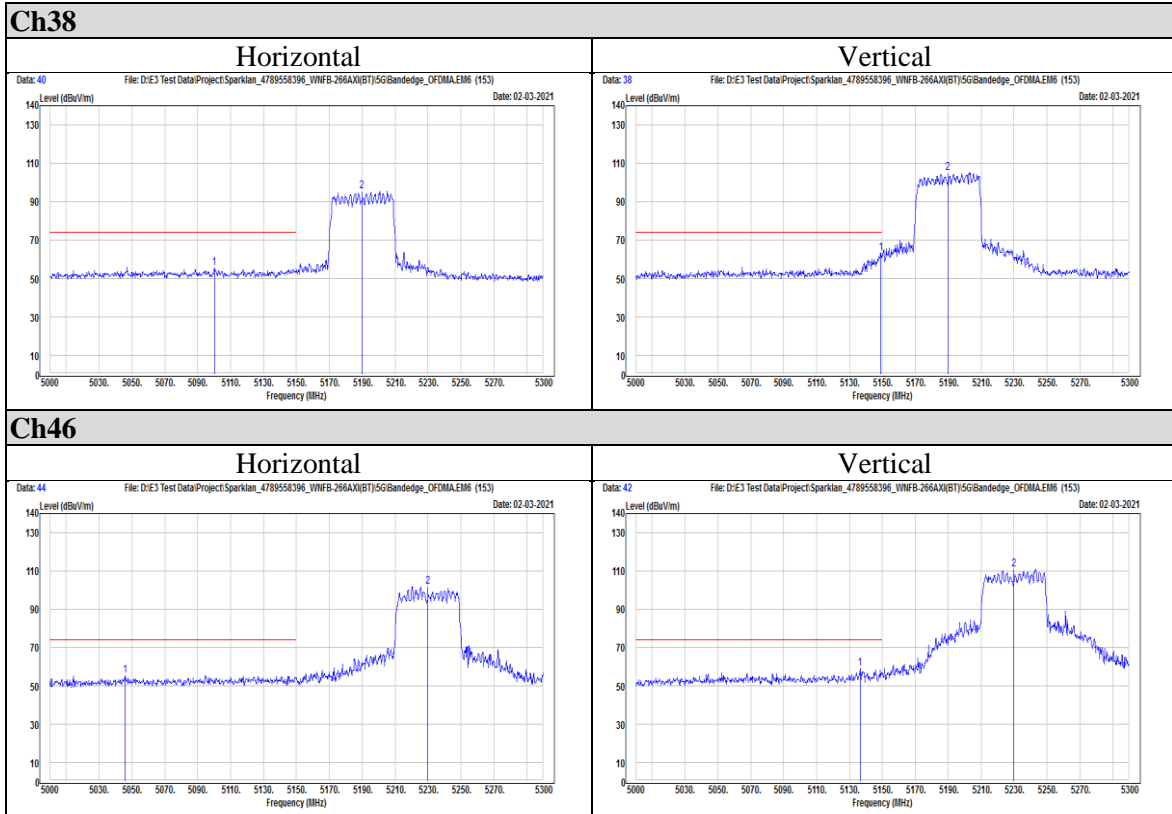


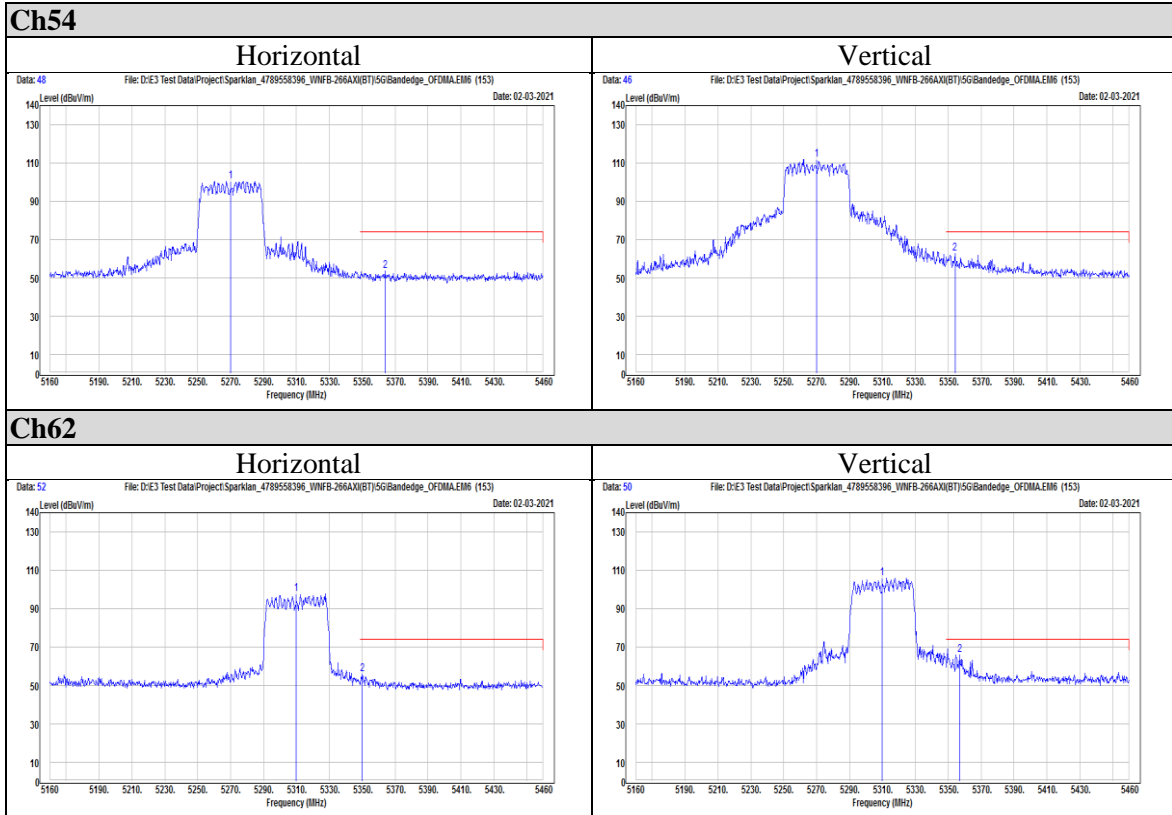




## 802.11ax (HE40)

### Peak



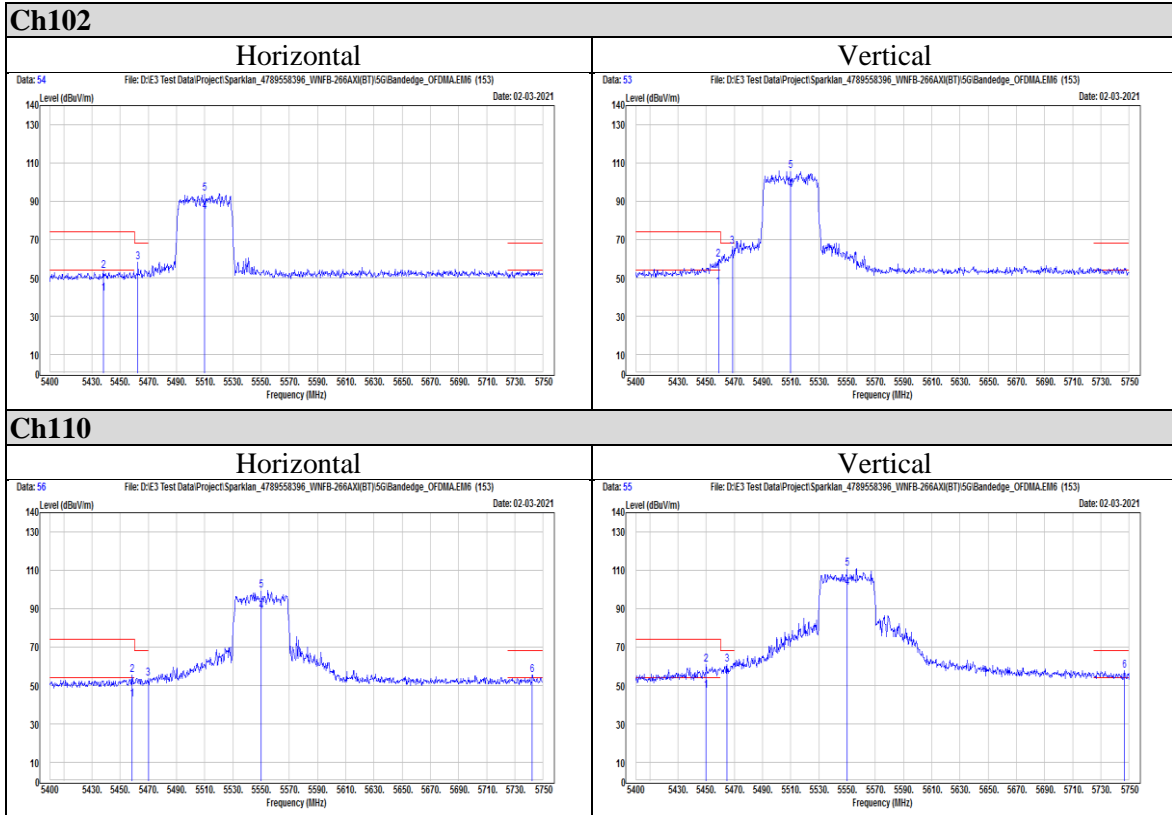


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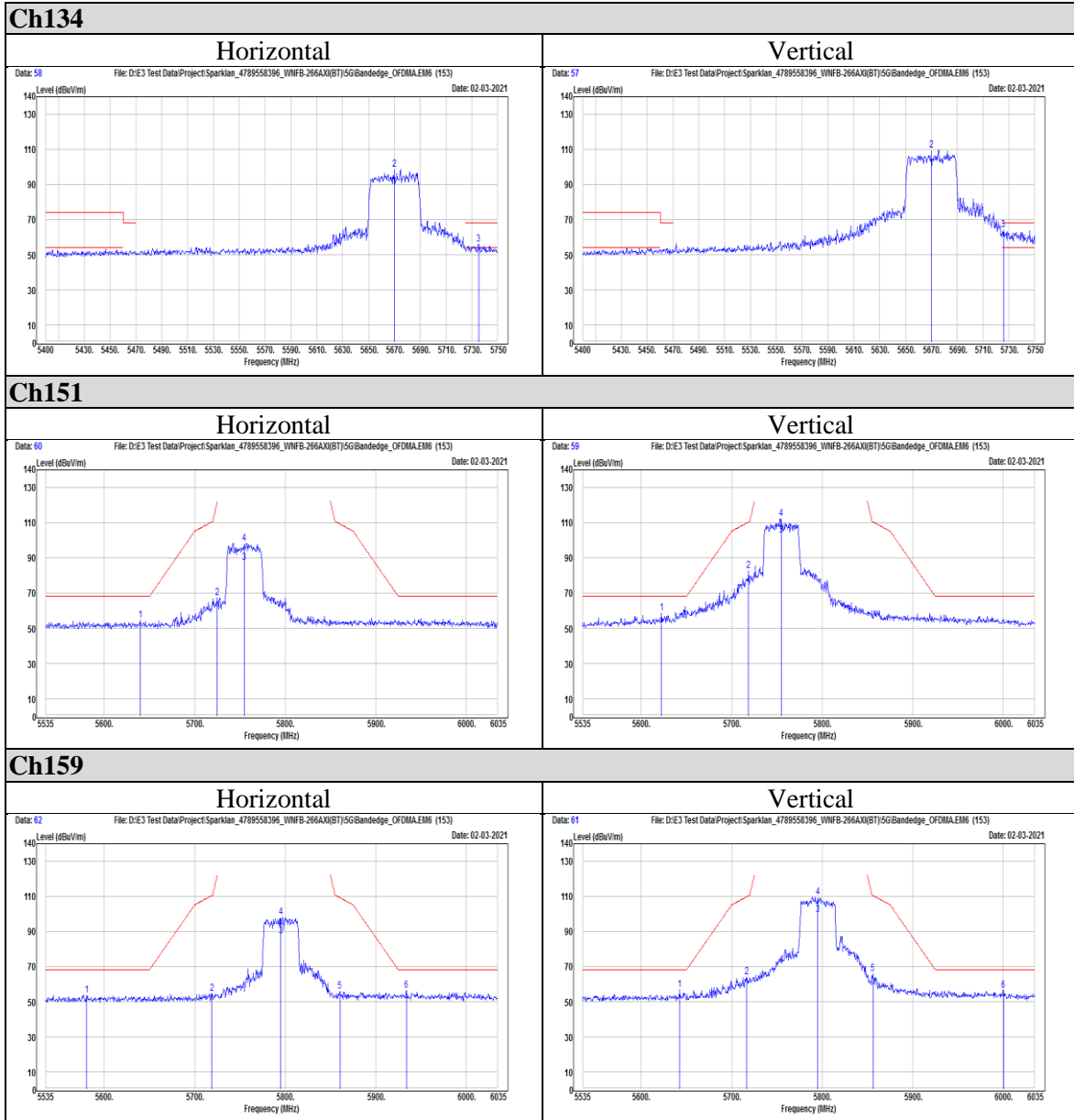


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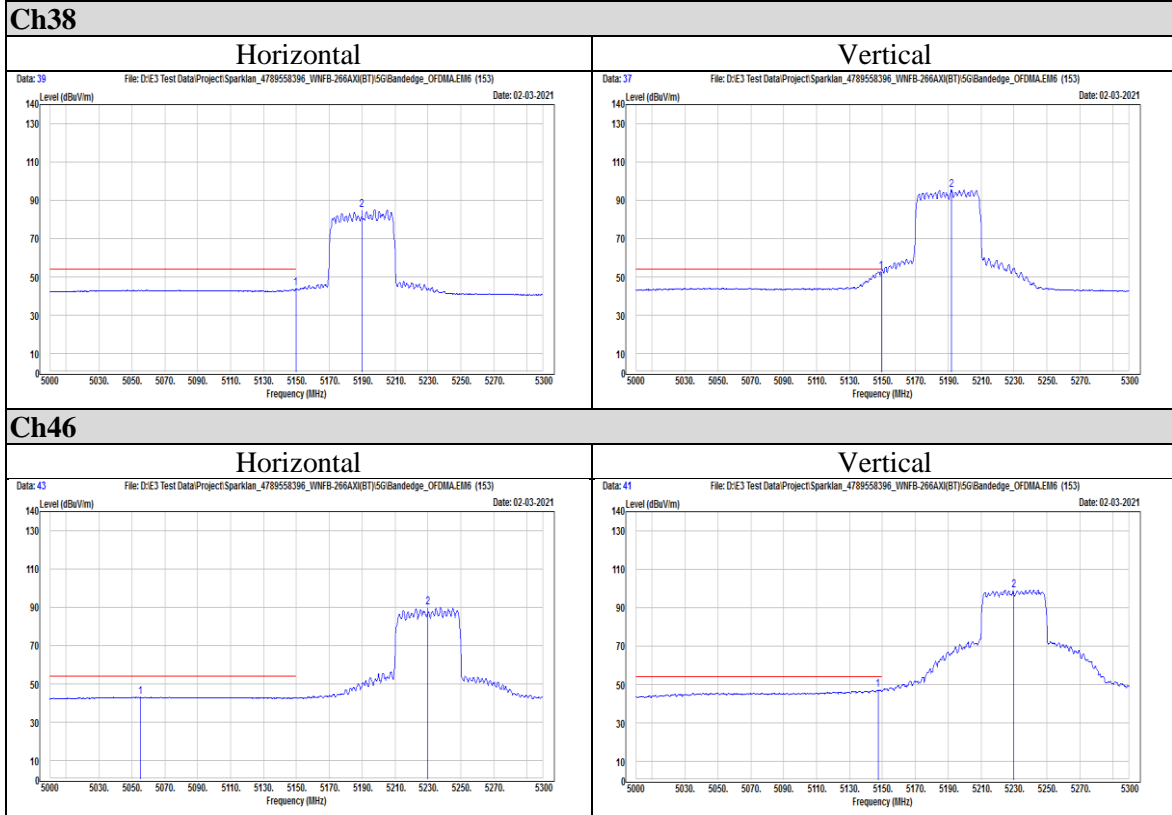
Telephone : +886-2-7737-3000

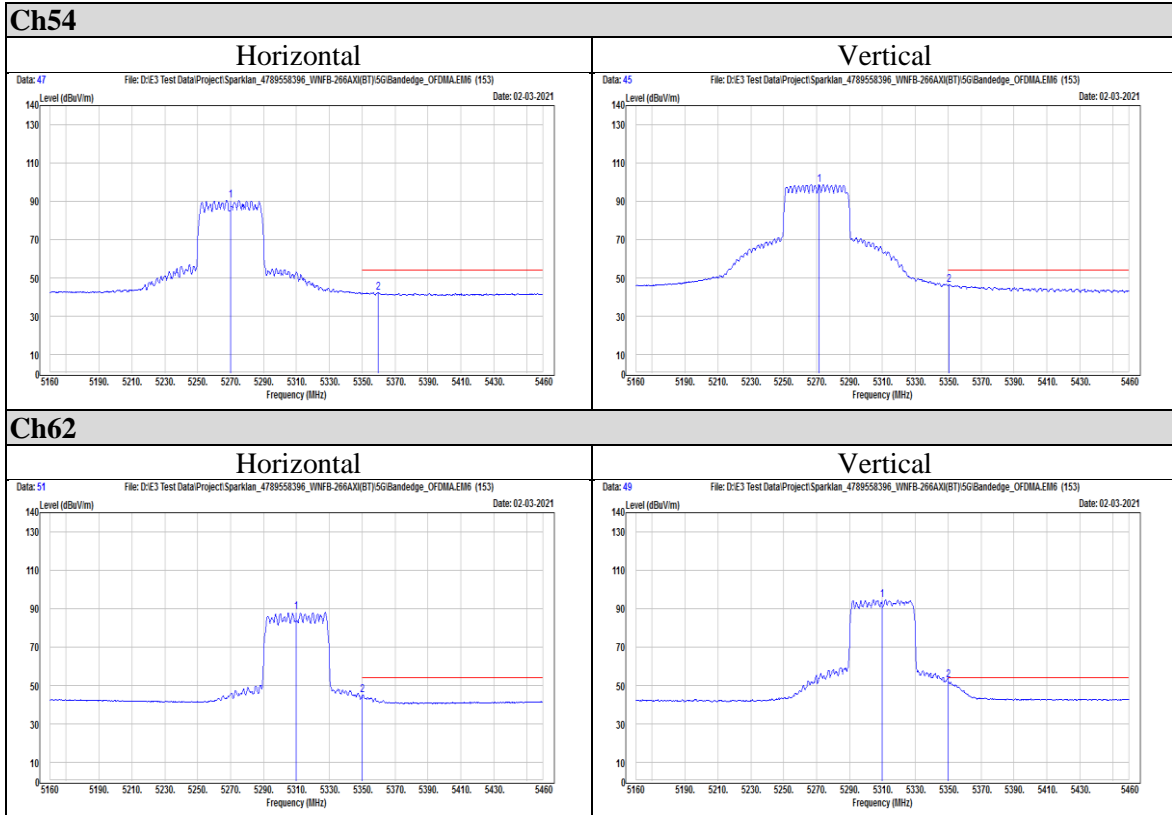
Facsimile (FAX) : +886-3-583-7948





### Average



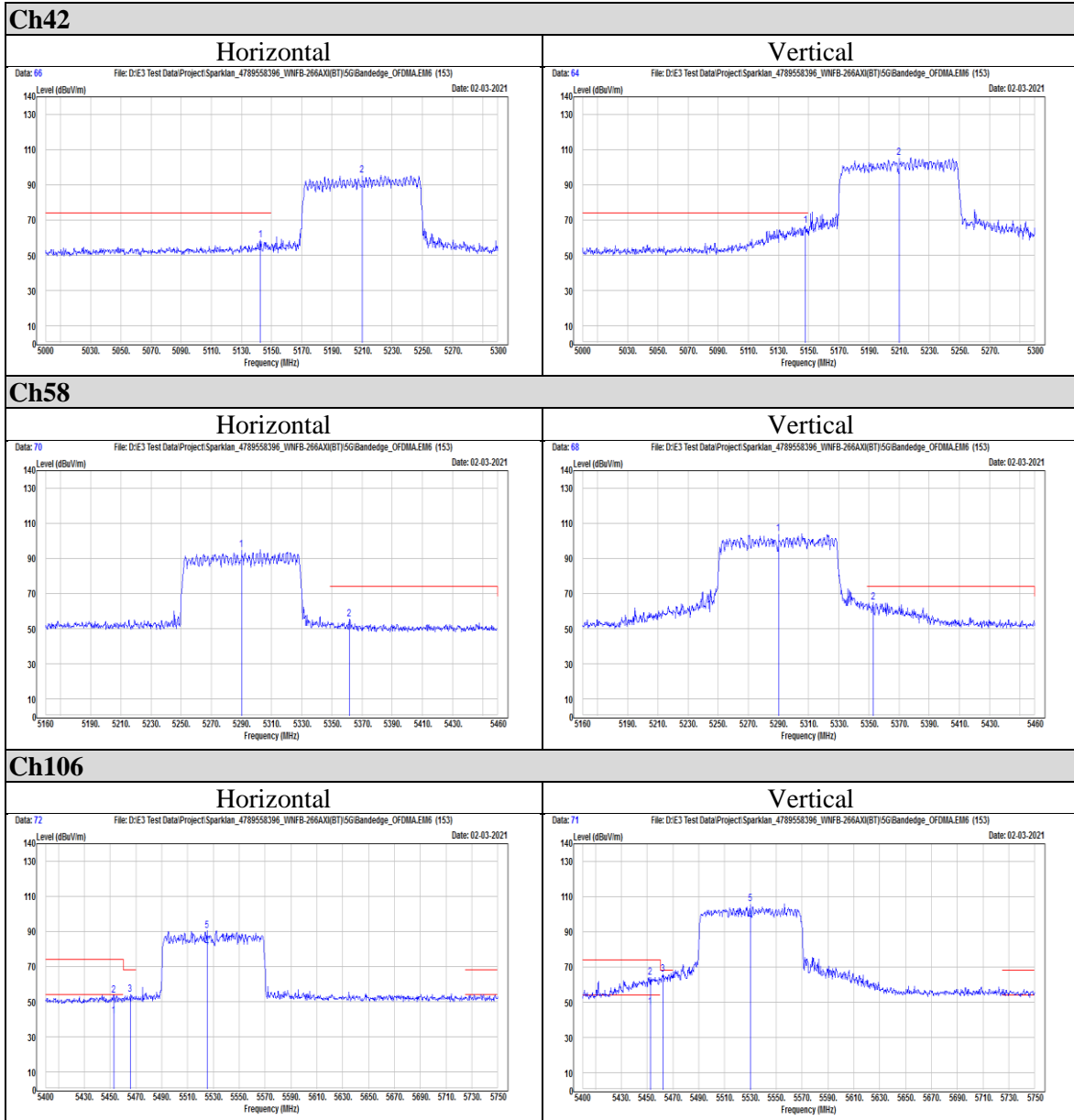


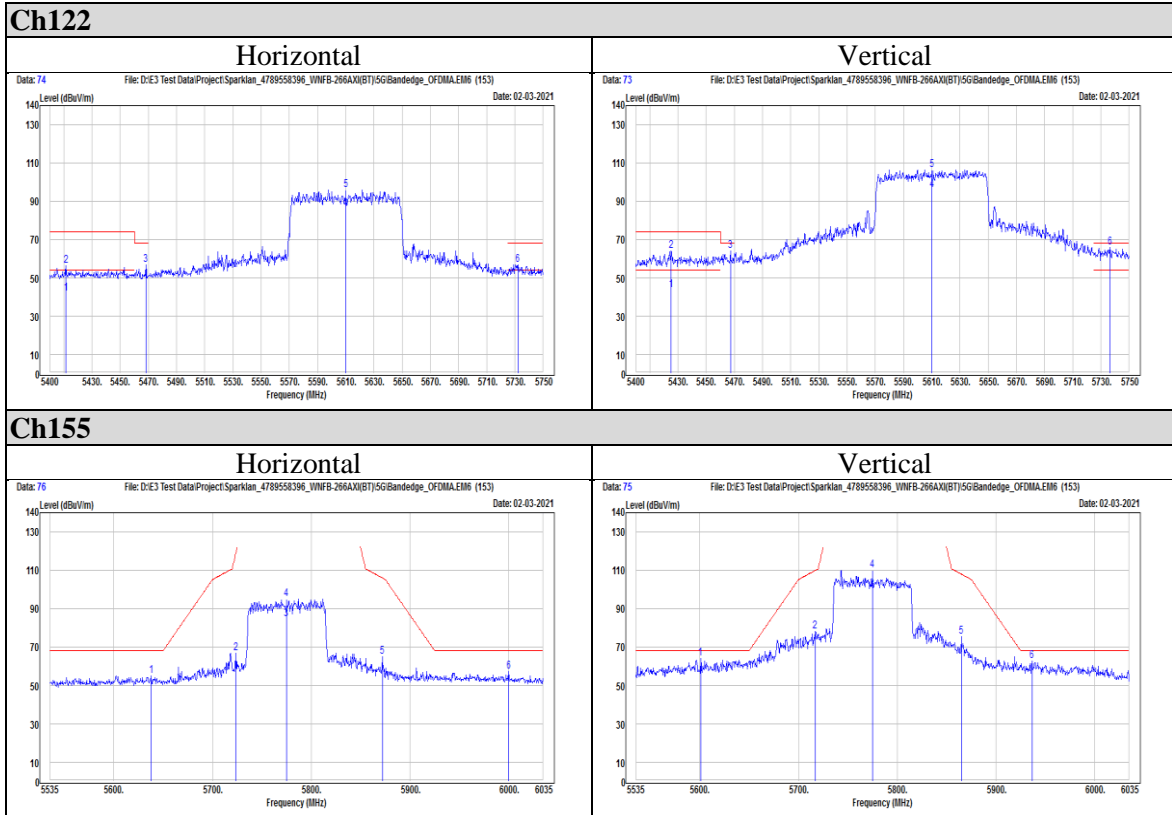




## 802.11ax (HE80)

### Peak





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Beamforming mode

OFDM

802.11ax (HE20)

Peak

