



9.5. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

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Doc No: 17-EM-F0876 / 5.0



Test Procedures

[For 9 kHz ~ 30 MHz]

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. For measurement below 30MHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

[For above 30 MHz]

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
- f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

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Note:

- a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.

Configuration	Average	
	RBW	VBW
802.11b	1MHz	10 Hz
802.11g		1 kHz
802.11n (HT20)		1 kHz
802.11n (HT40)		2 kHz

Note: Refer to section 6.6 for duty cycle.

- d. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported.

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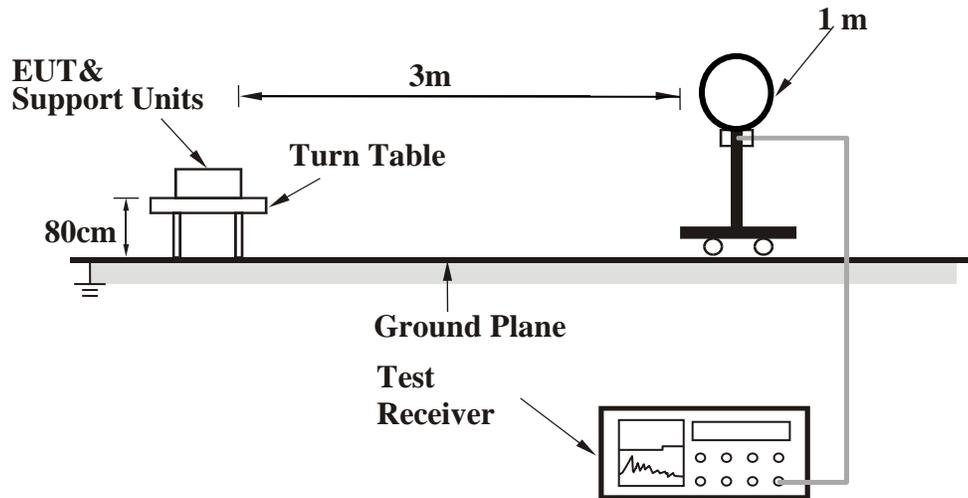
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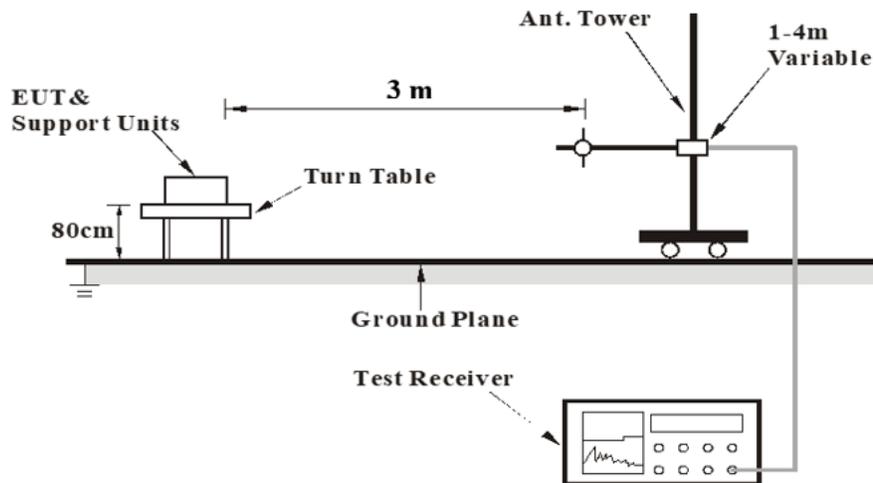
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Test Setup

<Frequency Range 9 kHz ~ 30 MHz>

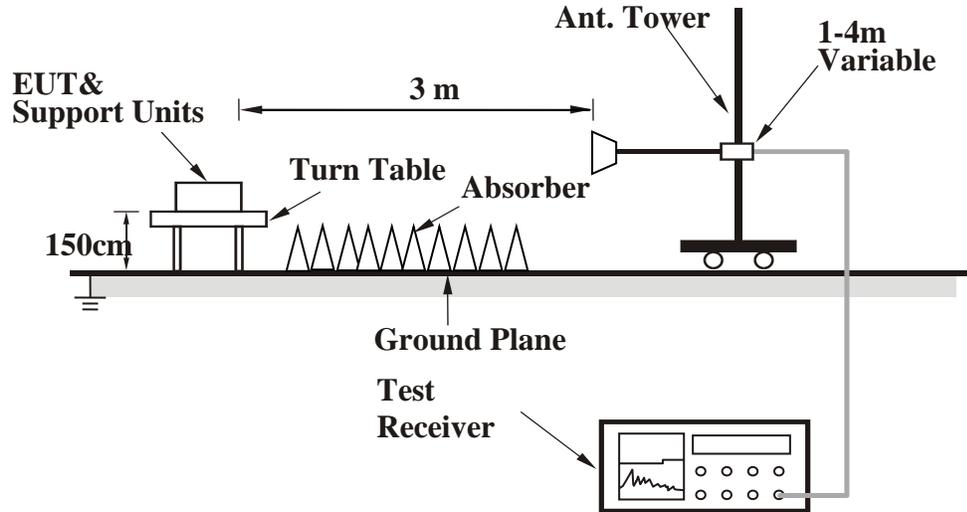


<Frequency Range 30 MHz ~ 1 GHz >





<Frequency Range above 1 GHz>



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



Test Data

Above 1GHz Data

802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 26.5 GHz

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)	
-	2386.4	41.78	6.74	48.52	74	-25.48	Peak
@	2412	95.85	6.68	102.53	-	-	Peak
-	2387	34.14	6.74	40.88	54	-13.12	Average
@	2412	93.87	6.68	100.55	-	-	Average
*	4824	42.61	3.53	46.14	74	-27.86	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)	
-	2389.6	40.57	6.74	47.31	74	-26.69	Peak
@	2412	91.94	6.68	98.62	-	-	Peak
-	2387	30.07	6.74	36.81	54	-17.19	Average
@	2412	88.79	6.68	95.47	-	-	Average
*	4824	37.33	3.53	40.86	74	-33.14	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. "@": Fundamental Frequency.
5. "*": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

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EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 26.5 GHz

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)	
-	2381.2	41.65	6.74	48.39	74	-25.61	Peak
@	2437	94.99	6.59	101.58	-	-	Peak
-	2488.6	40.13	6.53	46.66	74	-27.34	Peak
-	2389	30.38	6.73	37.11	54	-16.89	Average
@	2437	92.14	6.59	98.73	-	-	Average
-	2483.6	29.3	6.53	35.83	54	-18.17	Average
*	4874	43.04	3.63	46.67	74	-27.33	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)	
-	2350	42.5	6.73	49.23	74	-24.77	Peak
@	2437	92.87	6.59	99.46	-	-	Peak
-	2494.4	40.25	6.53	46.78	74	-27.22	Peak
-	2389.8	29.52	6.74	36.26	54	-17.74	Average
@	2437	89.61	6.59	96.2	-	-	Average
-	2493.8	28.85	6.53	35.38	54	-18.62	Average
*	4874	37.39	3.63	41.02	74	-32.98	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).
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EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 26.5 GHz

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)	
@	2462	94.15	6.54	100.69	-	-	Peak
-	2484.8	40.63	6.53	47.16	74	-26.84	Peak
@	2462	90.79	6.54	97.33	-	-	Average
-	2485	29.81	6.53	36.34	54	-17.66	Average
*	4924	44.05	3.69	47.74	74	-26.26	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)	
@	2462	92.05	6.54	98.59	-	-	Peak
-	2483.6	40.22	6.53	46.75	74	-27.25	Peak
@	2462	88.6	6.54	95.14	-	-	Average
-	2484.6	29.15	6.53	35.68	54	-18.32	Average
*	4924	38.3	3.69	41.99	74	-32.01	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).
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802.11g

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 26.5 GHz

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)	
-	2389.8	44.58	6.74	51.32	74	-22.68	Peak
@	2412	93.95	6.68	100.63	-	-	Peak
-	2390	34.33	6.74	41.07	54	-12.93	Average
@	2412	85.1	6.68	91.78	-	-	Average
*	4824	37.01	3.53	40.54	74	-33.46	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)	
-	2389.4	41.63	6.73	48.36	74	-25.64	Peak
@	2412	90.65	6.68	97.33	-	-	Peak
-	2390	33.11	6.74	39.85	54	-14.15	Average
@	2412	81.17	6.68	87.85	-	-	Average
*	4824	35.24	3.53	38.77	74	-35.23	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. "@": Fundamental Frequency.
5. "* *": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

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EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 26.5 GHz

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)	
-	2350.8	41.66	6.73	48.39	74	-25.61	Peak
@	2437	95.48	6.59	102.07	-	-	Peak
-	2488.4	40.91	6.53	47.44	74	-26.56	Peak
-	2388.8	30.46	6.73	37.19	54	-16.81	Average
@	2437	86.92	6.59	93.51	-	-	Average
-	2491.8	29.17	6.53	35.7	54	-18.3	Average
*	4874	38.48	3.63	42.11	74	-31.89	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)	
-	2321	40.24	6.73	46.97	74	-27.03	Peak
@	2437	92.82	6.59	99.41	-	-	Peak
-	2486.8	40.24	6.53	46.77	74	-27.23	Peak
-	2389.8	29.6	6.74	36.34	54	-17.66	Average
@	2437	84.5	6.59	91.09	-	-	Average
-	2483.6	28.99	6.53	35.52	54	-18.48	Average
*	4874	35.65	3.63	39.28	74	-34.72	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. "@": Fundamental Frequency.
5. "*": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
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EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 26.5 GHz

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)	
@	2462	93.11	6.54	99.65	-	-	Peak
-	2489.2	41.78	6.53	48.31	74	-25.69	Peak
@	2462	84.08	6.54	90.62	-	-	Average
-	2483.5	31.81	6.53	38.34	54	-15.66	Average
*	4924	39.7	3.69	43.39	74	-30.61	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)	
@	2462	89.85	6.54	96.39	-	-	Peak
-	2496.4	41.55	6.53	48.08	74	-25.92	Peak
@	2462	81.77	6.54	88.31	-	-	Average
-	2483.6	30.85	6.53	37.38	54	-16.62	Average
*	4924	36.04	3.69	39.73	74	-34.27	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. "@": Fundamental Frequency.
5. "*": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

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802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 26.5 GHz

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)	
-	2374.6	41.55	6.73	48.28	74	-25.72	Peak
@	2412	92.45	6.68	99.13	-	-	Peak
-	2390	35.31	6.74	42.05	54	-11.95	Average
@	2412	86.34	6.68	93.02	-	-	Average
*	4824	36.36	3.53	39.89	74	-34.11	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)	
-	2372	40.76	6.74	47.5	74	-26.5	Peak
@	2412	89.06	6.68	95.74	-	-	Peak
-	2390	30	6.74	36.74	54	-17.26	Average
@	2412	81.73	6.68	88.41	-	-	Average
*	4824	35.44	3.53	38.97	74	-35.03	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. "@": Fundamental Frequency.
5. "* * ": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

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EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 26.5 GHz

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)	
-	2365.4	41.14	6.73	47.87	74	-26.13	Peak
@	2437	93.25	6.59	99.84	-	-	Peak
-	2492.8	40.44	6.53	46.97	74	-27.03	Peak
-	2378	29.54	6.73	36.27	54	-17.73	Average
@	2437	86.18	6.59	92.77	-	-	Average
-	2497.8	29.19	6.53	35.72	54	-18.28	Average
*	4874	35.83	3.63	39.46	74	-34.54	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)	
-	2319.4	40.7	6.73	47.43	74	-26.57	Peak
@	2437	93.02	6.59	99.61	-	-	Peak
-	2493.6	40.08	6.53	46.61	74	-27.39	Peak
-	2389.2	29.31	6.73	36.04	54	-17.96	Average
@	2437	85.77	6.59	92.36	-	-	Average
-	2485	29.27	6.53	35.8	54	-18.2	Average
*	4874	35.47	3.63	39.1	74	-34.9	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. "@": Fundamental Frequency.
5. "*": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
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EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 26.5 GHz

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)	
@	2462	88.61	6.54	95.15	-	-	Peak
-	2495.2	41.5	6.53	48.03	74	-25.97	Peak
@	2462	80.57	6.54	87.11	-	-	Average
-	2483.6	29.54	6.53	36.07	54	-17.93	Average
*	4924	35.92	3.69	39.61	74	-34.39	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)	
@	2462	87.85	6.54	94.39	-	-	Peak
-	2489.4	40.45	6.53	46.98	74	-27.02	Peak
@	2462	80.96	6.54	87.5	-	-	Average
-	2484.4	29.34	6.53	35.87	54	-18.13	Average
*	4924	35.42	3.69	39.11	74	-34.89	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. "@": Fundamental Frequency.
5. "* *": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

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Doc No: 17-EM-F0876 / 5.0



802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	Frequency Range	1 GHz ~ 26.5 GHz

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)	
-	2368.2	42.16	6.73	48.89	74	-25.11	Peak
@	2422	87.7	6.65	94.35	-	-	Peak
-	2390	31.26	6.74	38	54	-16	Average
@	2422	78.72	6.65	85.37	-	-	Average
*	4844	36.78	3.6	40.38	74	-33.62	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)	
-	2386.4	41.53	6.74	48.27	74	-25.73	Peak
@	2422	84.8	6.65	91.45	-	-	Peak
-	2389.6	29.75	6.74	36.49	54	-17.51	Average
@	2422	77.38	6.65	84.03	-	-	Average
*	4844	34.97	3.6	38.57	74	-35.43	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. "@": Fundamental Frequency.
5. "* *": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

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EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 26.5 GHz

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)	
-	2382	42.2	6.74	48.94	74	-25.06	Peak
@	2437	89.16	6.59	95.75	-	-	Peak
-	2495.8	40.17	6.53	46.7	74	-27.3	Peak
-	2389.2	30.41	6.73	37.14	54	-16.86	Average
@	2437	80.48	6.59	87.07	-	-	Average
-	2483.6	29.51	6.53	36.04	54	-17.96	Average
*	4874	35.85	3.63	39.48	74	-34.52	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)	
-	2385	40.43	6.74	47.17	74	-26.83	Peak
@	2437	86.62	6.59	93.21	-	-	Peak
-	2496.2	40.17	6.53	46.7	74	-27.3	Peak
-	2389.4	29.27	6.73	36	54	-18	Average
@	2437	78.22	6.59	84.81	-	-	Average
-	2485.8	29.49	6.53	36.02	54	-17.98	Average
*	4874	35.75	3.63	39.38	74	-34.62	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. "@": Fundamental Frequency.
5. "*": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

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EUT Test Condition		Measurement Detail	
Channel	Channel 9	Frequency Range	1 GHz ~ 26.5 GHz

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)	
@	2452	84.51	6.54	91.05	-	-	Peak
-	2492	40.25	6.53	46.78	74	-27.22	Peak
@	2452	76.63	6.54	83.17	-	-	Average
-	2483.6	28.97	6.53	35.5	54	-18.5	Average
*	4904	36.34	3.67	40.01	74	-33.99	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)	
@	2452	85	6.54	91.54	-	-	Peak
-	2483.6	42.46	6.53	48.99	74	-25.01	Peak
@	2452	76.35	6.54	82.89	-	-	Average
-	2483.8	29.15	6.53	35.68	54	-18.32	Average
*	4904	35.59	3.67	39.26	74	-34.74	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. "@": Fundamental Frequency.
5. "*": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

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Co-Location Mode

802.11b + BT

EUT Test Condition		Measurement Detail	
Channel	Channel 11 + Channel 0	Frequency Range	1 GHz ~ 26.5 GHz

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)	
*	4804	35.37	3.47	38.84	74	-35.16	Peak
*	4924	38.85	3.69	42.54	74	-31.46	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)	
*	4804	36.15	3.47	39.62	74	-34.38	Peak
*	4924	36.19	3.69	39.88	74	-34.12	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. "@": Fundamental Frequency.
5. "* * ": The peak result complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

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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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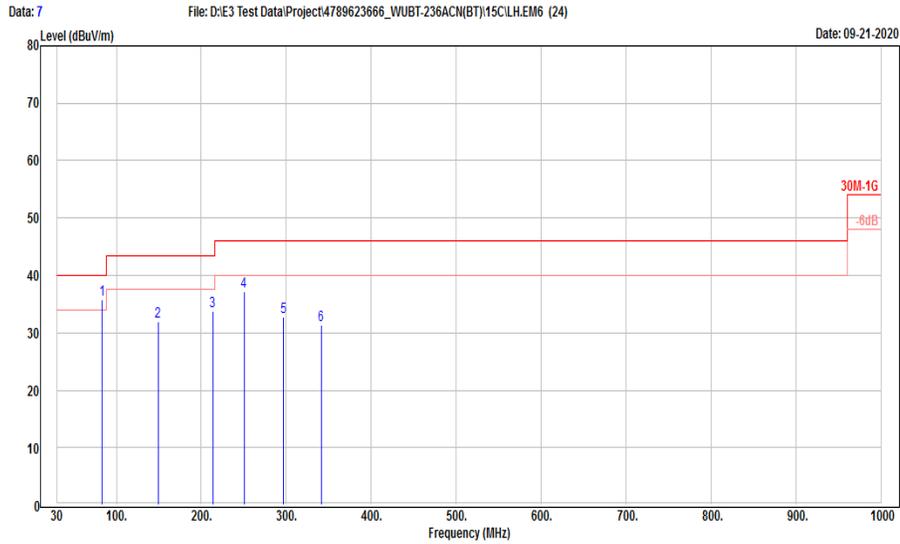


30 MHz ~ 1 GHz Data

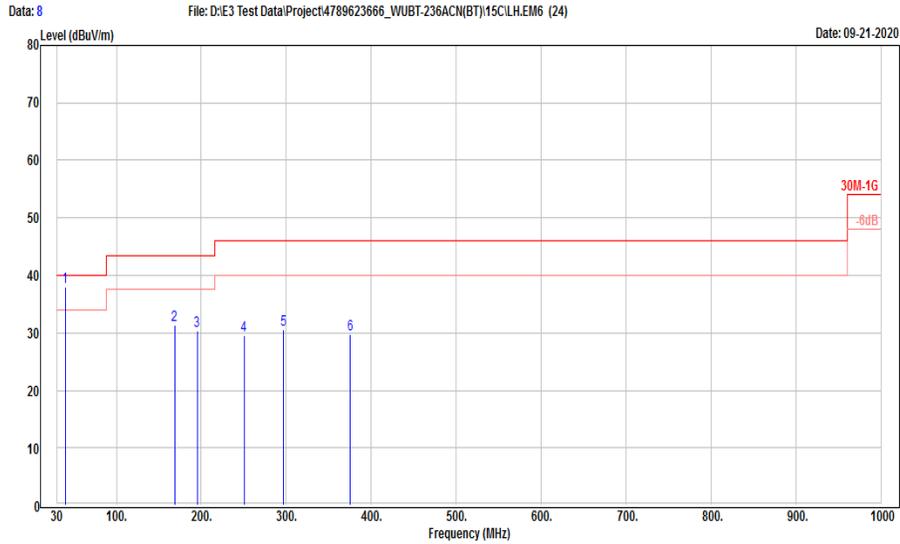
802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 11	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)	
-	83.35	52.87	-17.17	35.7	40	-4.3	Peak
-	149.31	43.54	-11.64	31.9	43.5	-11.6	Peak
-	213.33	47.36	-13.66	33.7	43.5	-9.8	Peak
-	250.19	49.09	-11.84	37.25	46	-8.75	Peak
-	296.75	42.98	-10.17	32.81	46	-13.19	Peak
-	341.37	40.06	-8.78	31.28	46	-14.72	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)	
-	39.7	49.97	-11.91	38.06	40	-1.94	Peak
-	168.71	42.43	-11.15	31.28	43.5	-12.22	Peak
-	194.9	43.64	-13.25	30.39	43.5	-13.11	Peak
-	250.19	41.44	-11.84	29.6	46	-16.4	Peak
-	296.75	40.67	-10.17	30.5	46	-15.5	Peak
-	375.32	37.35	-7.69	29.66	46	-16.34	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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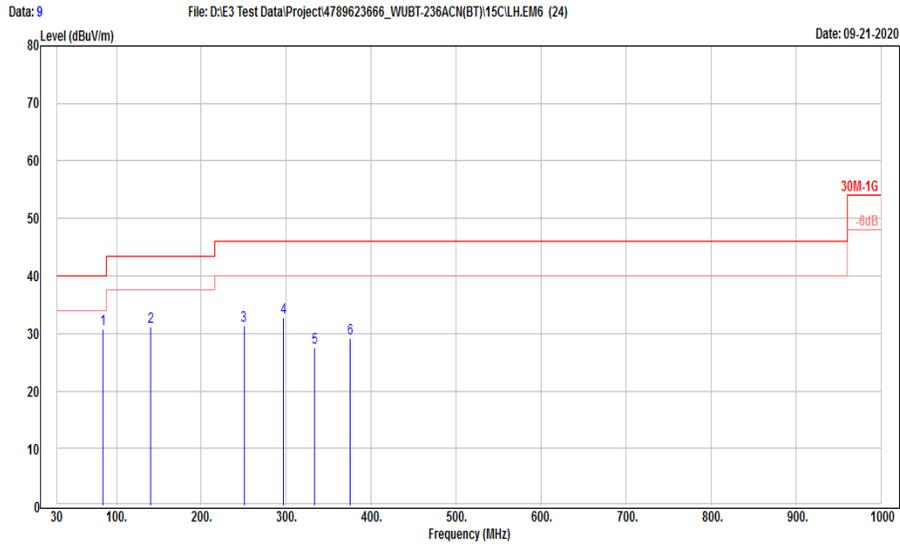


Co-Location Mode

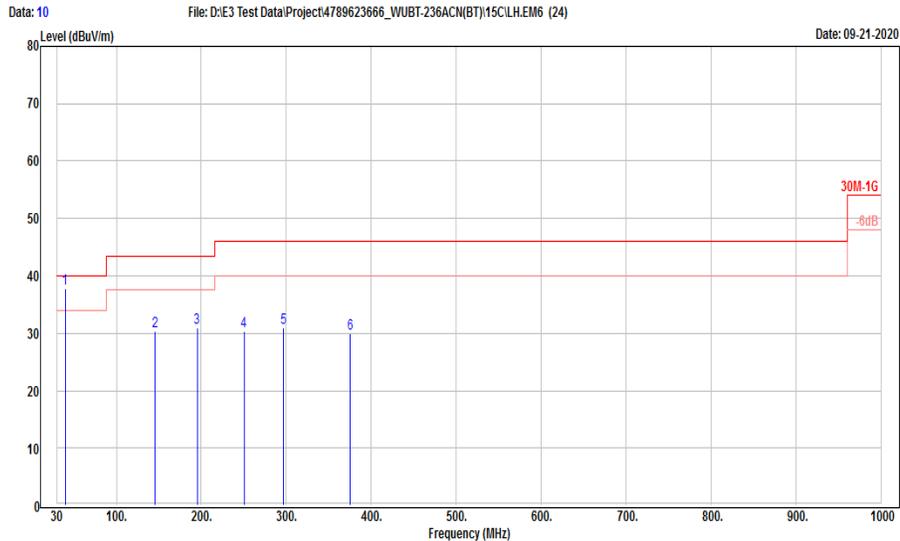
802.11b + BT

EUT Test Condition		Measurement Detail	
Channel	Channel 11 + Channel 0	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)	
-	84.32	48.08	-17.25	30.83	40	-9.17	Peak
-	140.58	43.1	-12.02	31.08	43.5	-12.42	Peak
-	250.19	43.22	-11.84	31.38	46	-14.62	Peak
-	296.75	43.03	-10.17	32.86	46	-13.14	Peak
-	333.61	36.5	-9.03	27.47	46	-18.53	Peak
-	375.32	36.79	-7.69	29.1	46	-16.9	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)	
-	39.7	49.73	-11.91	37.82	40	-2.18	Peak
-	145.43	42.16	-11.88	30.28	43.5	-13.22	Peak
-	194.9	44.19	-13.25	30.94	43.5	-12.56	Peak
-	250.19	42.16	-11.84	30.32	46	-15.68	Peak
-	296.75	41.05	-10.17	30.88	46	-15.12	Peak
-	375.32	37.57	-7.69	29.88	46	-16.12	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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Doc No: 17-EM-F0876 / 5.0



9.6. AC Power Line Conducted Emission

Requirements

Frequency (MHz)	Conducted limit (dB μ 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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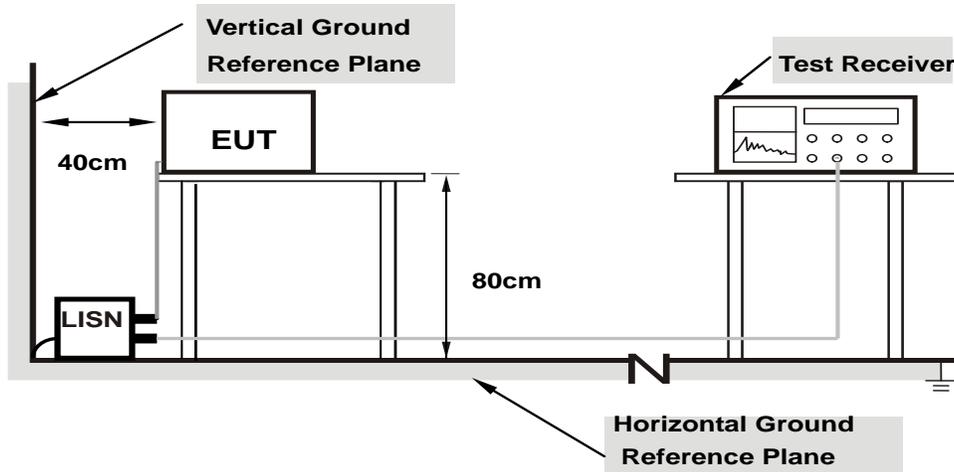
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Test Setup



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

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

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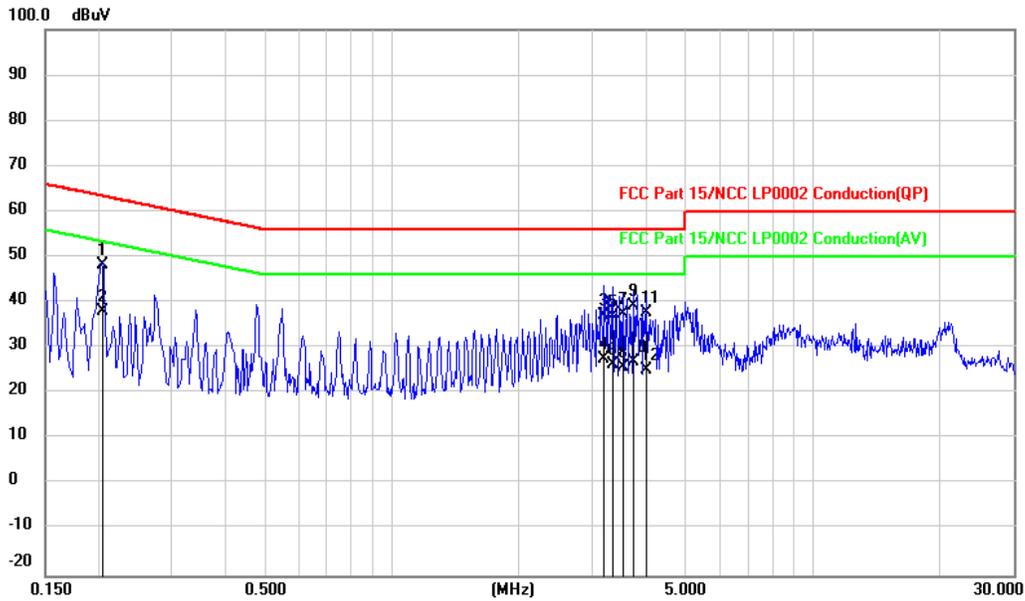


Test Data

802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 11	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	0.2060	28.86	19.47	48.33	63.37	-15.04	QP
2	0.2060	18.66	19.47	38.13	53.37	-15.24	AVG
3	3.2060	17.51	19.55	37.06	56.00	-18.94	QP
4	3.2060	8.12	19.55	27.67	46.00	-18.33	AVG
5	3.3460	17.19	19.56	36.75	56.00	-19.25	QP
6	3.3460	6.77	19.56	26.33	46.00	-19.67	AVG
7	3.5460	17.86	19.57	37.43	56.00	-18.57	QP
8	3.5460	6.18	19.57	25.75	46.00	-20.25	AVG
9	3.7540	19.72	19.57	39.29	56.00	-16.71	QP
10	3.7540	7.28	19.57	26.85	46.00	-19.15	AVG
11	4.0260	18.09	19.58	37.67	56.00	-18.33	QP
12	4.0260	5.68	19.58	25.26	46.00	-20.74	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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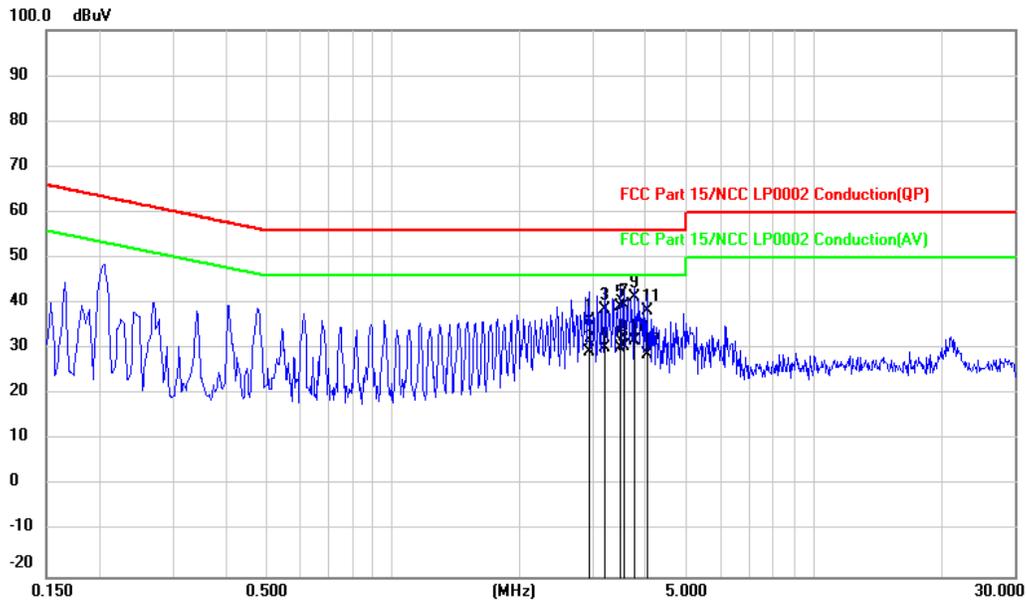
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Phase of Power : Neutral (N)



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No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2.9380	16.67	19.54	36.21	56.00	-19.79	QP
2	2.9380	9.74	19.54	29.28	46.00	-16.72	AVG
3	3.2060	19.18	19.54	38.72	56.00	-17.28	QP
4	3.2060	10.77	19.54	30.31	46.00	-15.69	AVG
5	3.4820	19.82	19.55	39.37	56.00	-16.63	QP
6	3.4820	10.83	19.55	30.38	46.00	-15.62	AVG
7	3.5500	20.03	19.57	39.60	56.00	-16.40	QP
8	3.5500	11.05	19.57	30.62	46.00	-15.38	AVG
9	3.7540	21.79	19.57	41.36	56.00	-14.64	QP
10	3.7540	12.29	19.57	31.86	46.00	-14.14	AVG
11	4.0260	18.82	19.58	38.40	56.00	-17.60	QP
12	4.0260	9.15	19.58	28.73	46.00	-17.27	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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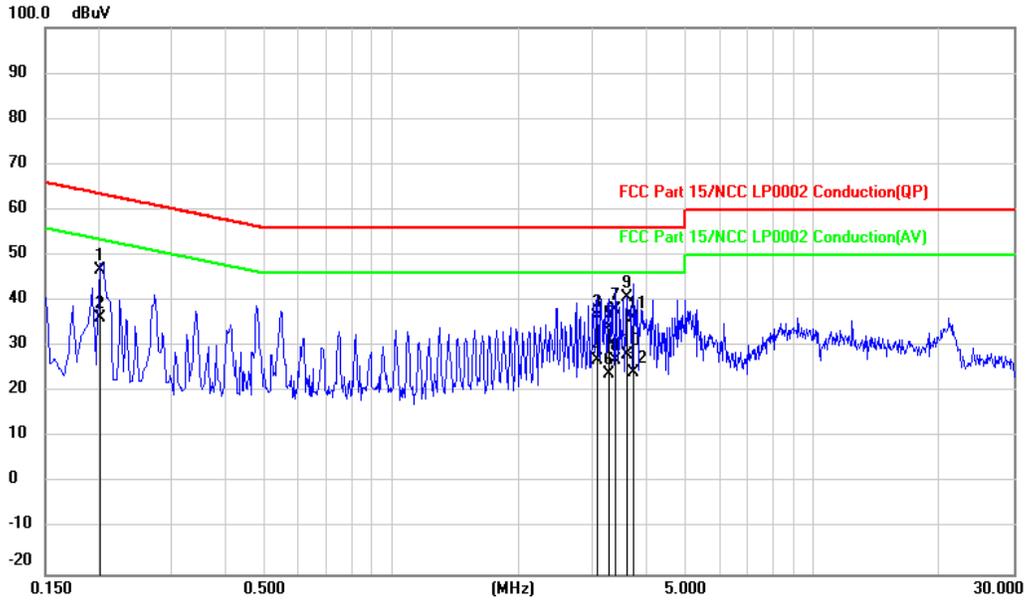


Co-Location Mode

802.11b + BT

EUT Test Condition		Measurement Detail	
Channel	Channel 11 + Channel 0	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	0.2020	27.13	19.47	46.60	63.53	-16.93	QP
2	0.2020	16.88	19.47	36.35	53.53	-17.18	AVG
3	3.0740	16.97	19.55	36.52	56.00	-19.48	QP
4	3.0740	7.45	19.55	27.00	46.00	-19.00	AVG
5	3.2820	14.49	19.55	34.04	56.00	-21.96	QP
6	3.2820	4.32	19.55	23.87	46.00	-22.13	AVG
7	3.4140	18.40	19.56	37.96	56.00	-18.04	QP
8	3.4140	7.51	19.56	27.07	46.00	-18.93	AVG
9	3.6180	21.20	19.57	40.77	56.00	-15.23	QP
10	3.6180	8.60	19.57	28.17	46.00	-17.83	AVG
11	3.7500	16.81	19.57	36.38	56.00	-19.62	QP
12	3.7500	4.67	19.57	24.24	46.00	-21.76	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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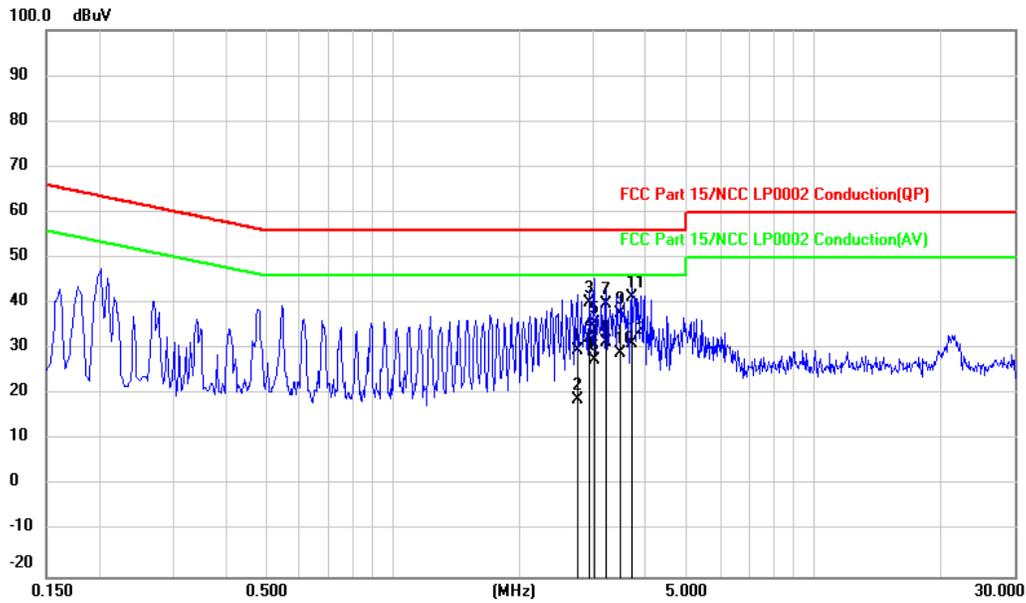
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Phase of Power : Neutral (N)



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No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	2.7460	10.15	19.54	29.69	56.00	-26.31	QP
2	2.7460	-0.79	19.54	18.75	46.00	-27.25	AVG
3	2.9380	20.75	19.54	40.29	56.00	-15.71	QP
4	2.9380	12.80	19.54	32.34	46.00	-13.66	AVG
5	3.0100	16.13	19.54	35.67	56.00	-20.33	QP
6	3.0100	8.05	19.54	27.59	46.00	-18.41	AVG
7	3.2100	20.43	19.54	39.97	56.00	-16.03	QP
8	3.2100	11.77	19.54	31.31	46.00	-14.69	AVG
9	3.4860	18.11	19.55	37.66	56.00	-18.34	QP
10	3.4860	9.42	19.55	28.97	46.00	-17.03	AVG
11	3.6860	21.90	19.57	41.47	56.00	-14.53	QP
12	3.6860	11.72	19.57	31.29	46.00	-14.71	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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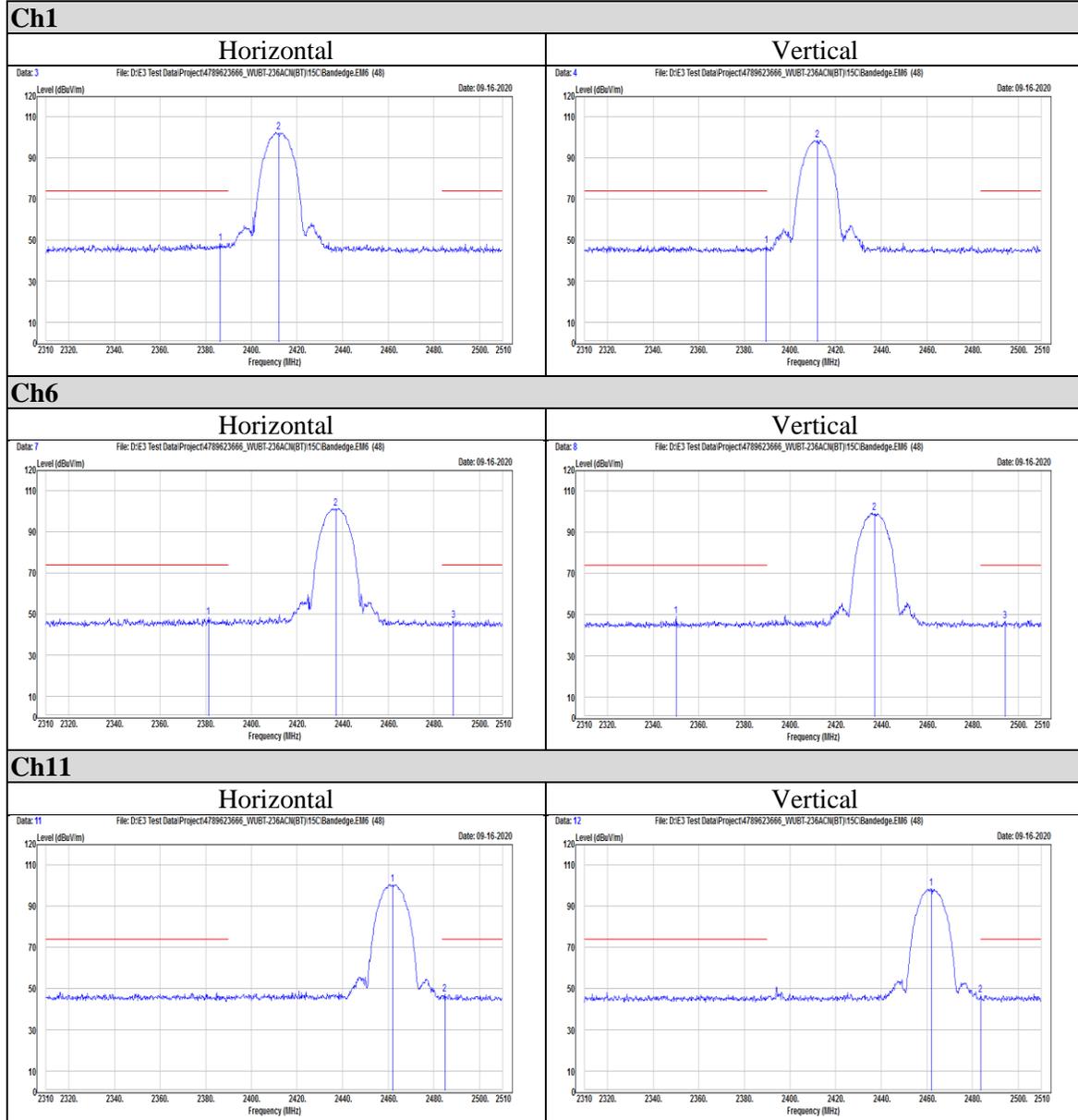
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Appendix I Radiated Band Edge Measurement

802.11b

Peak



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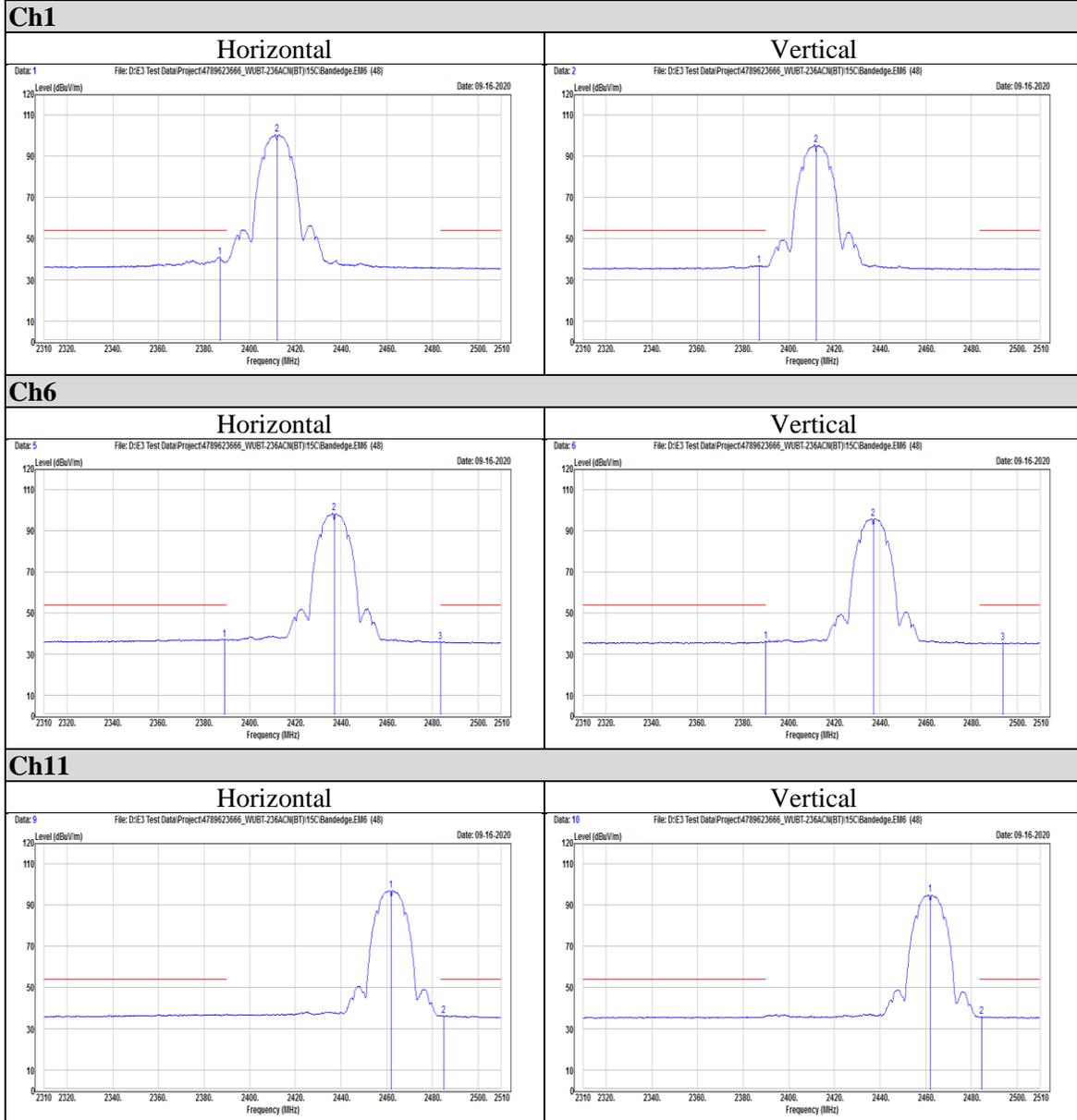
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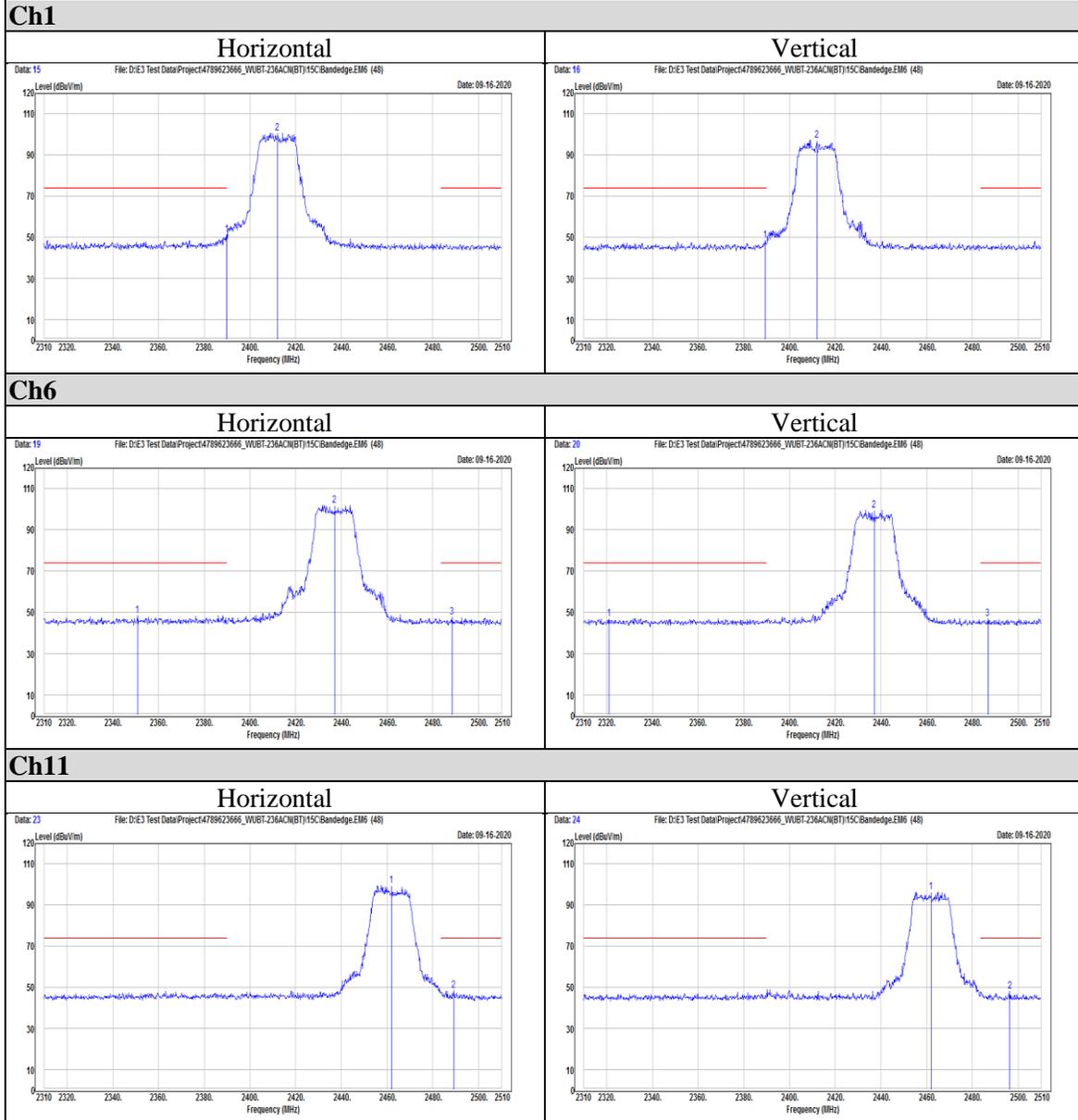
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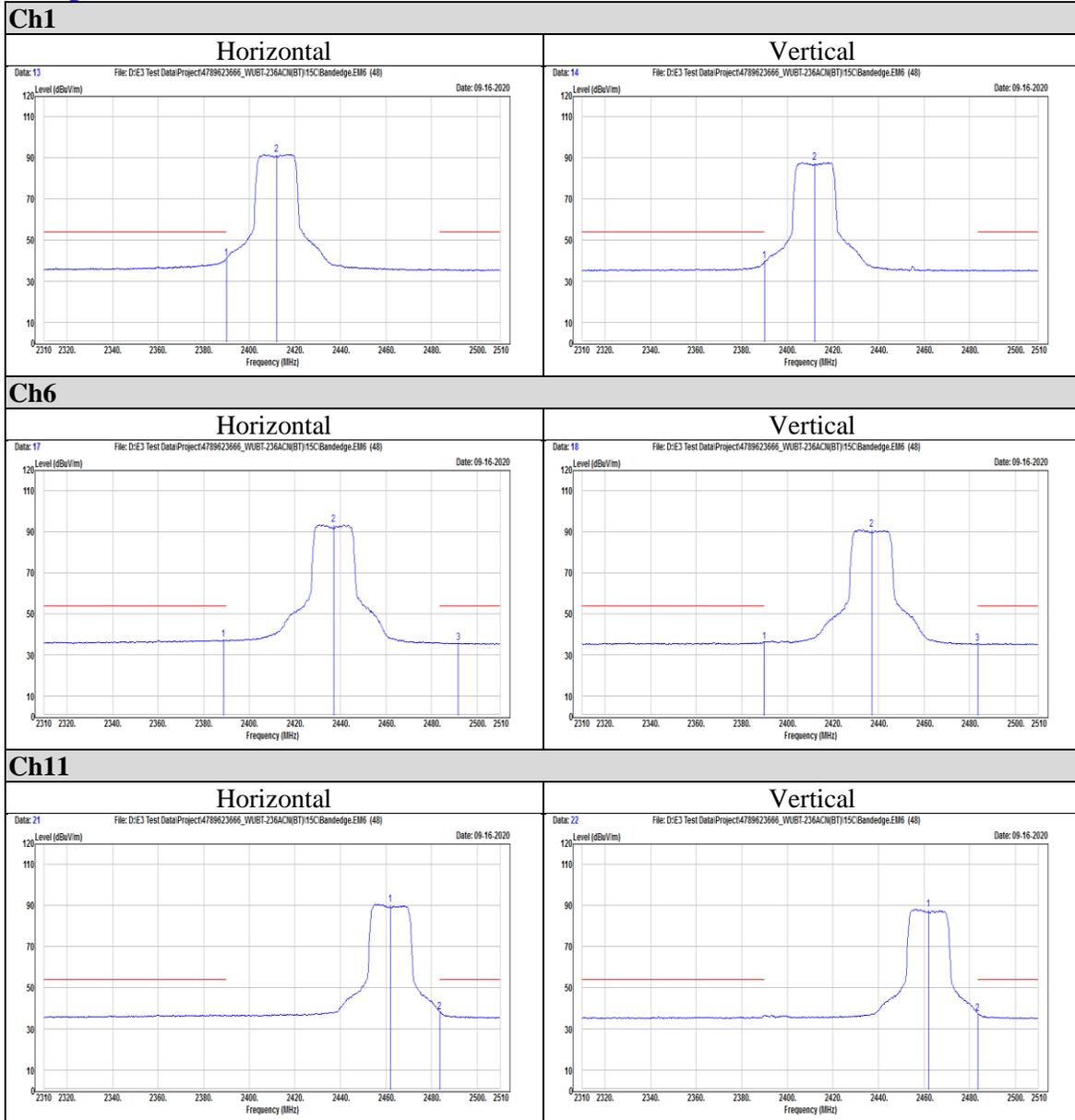
802.11g

Peak





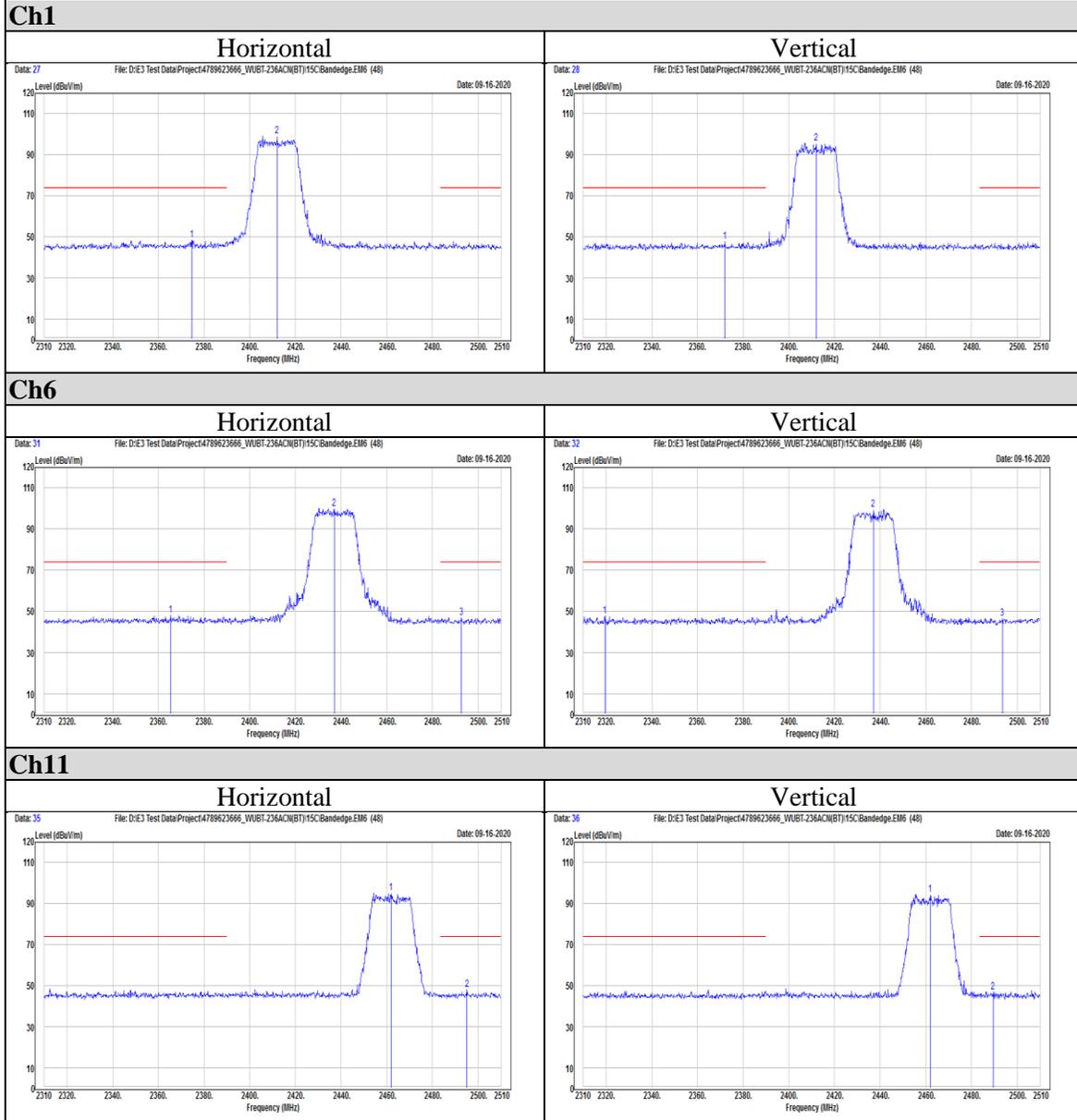
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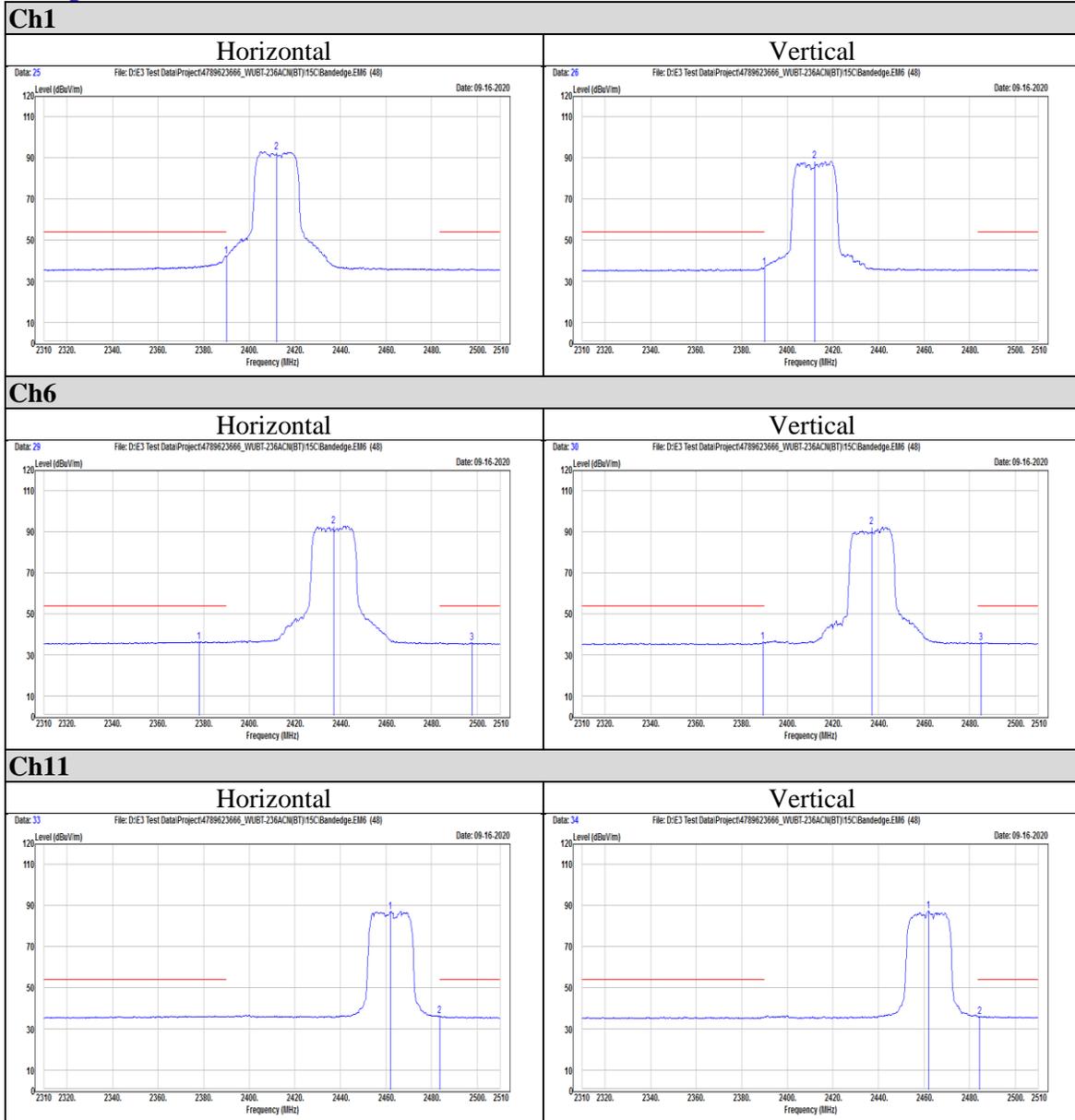
802.11n (HT20)

Peak





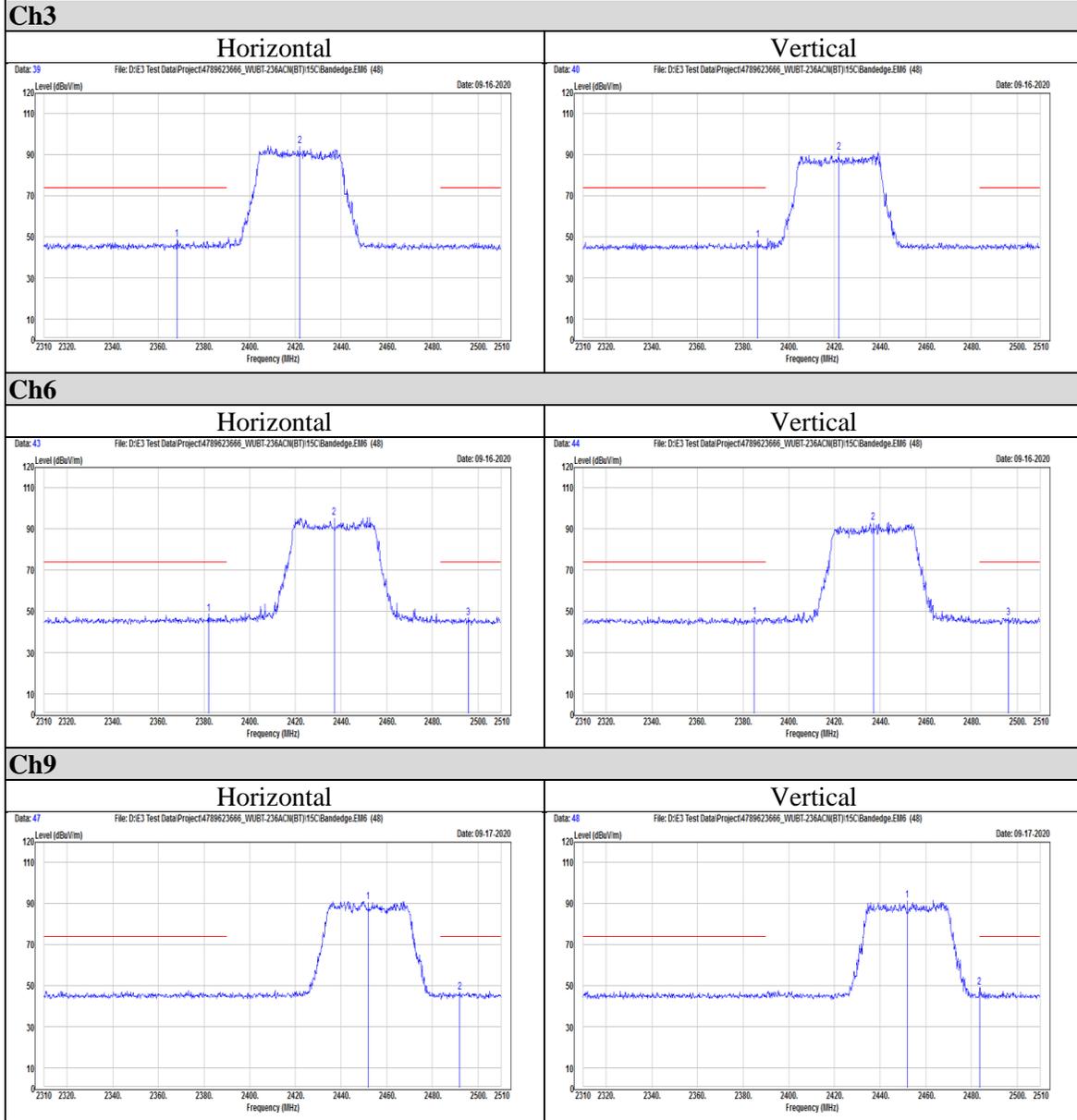
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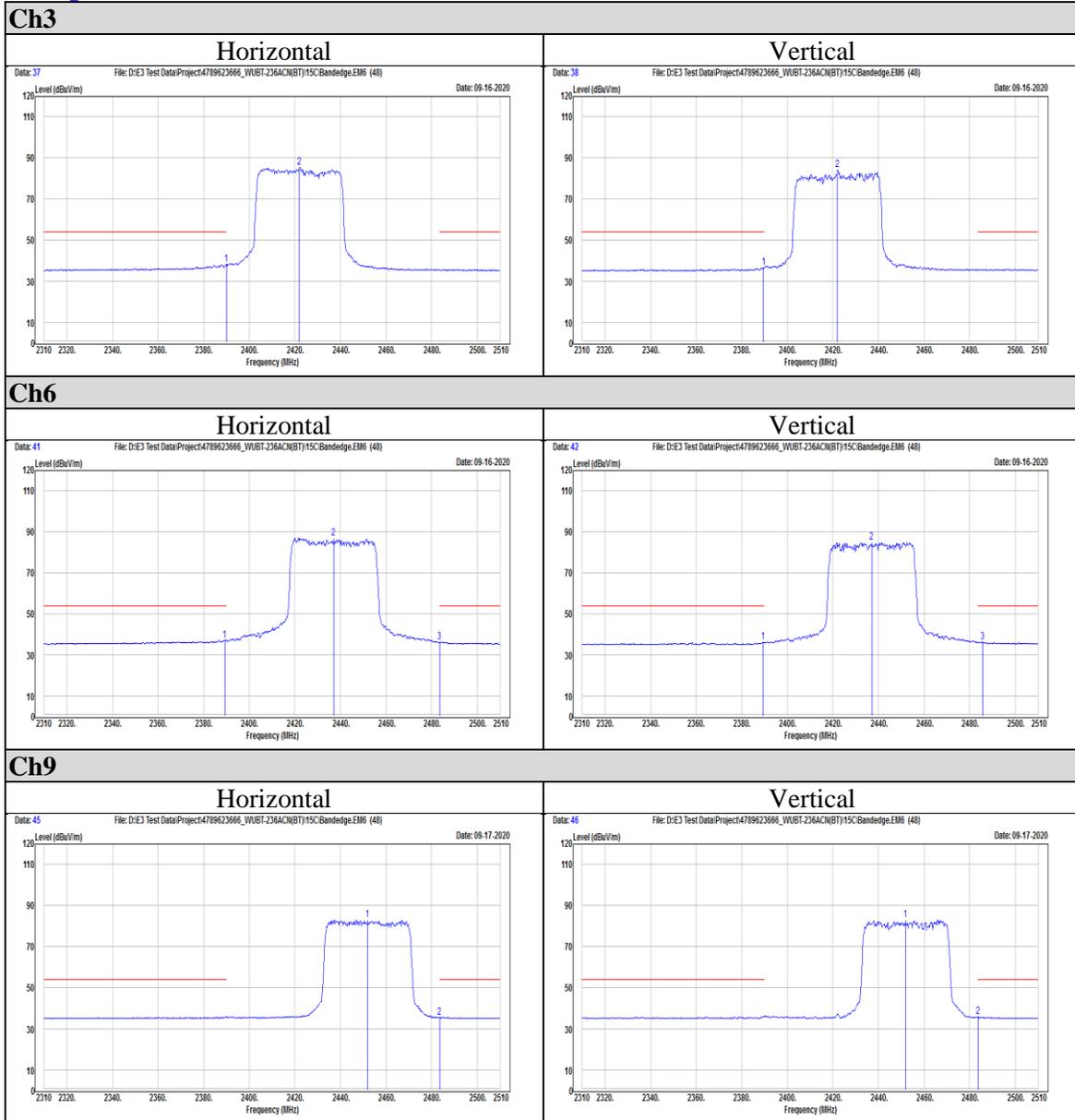
802.11n (HT40)

Peak





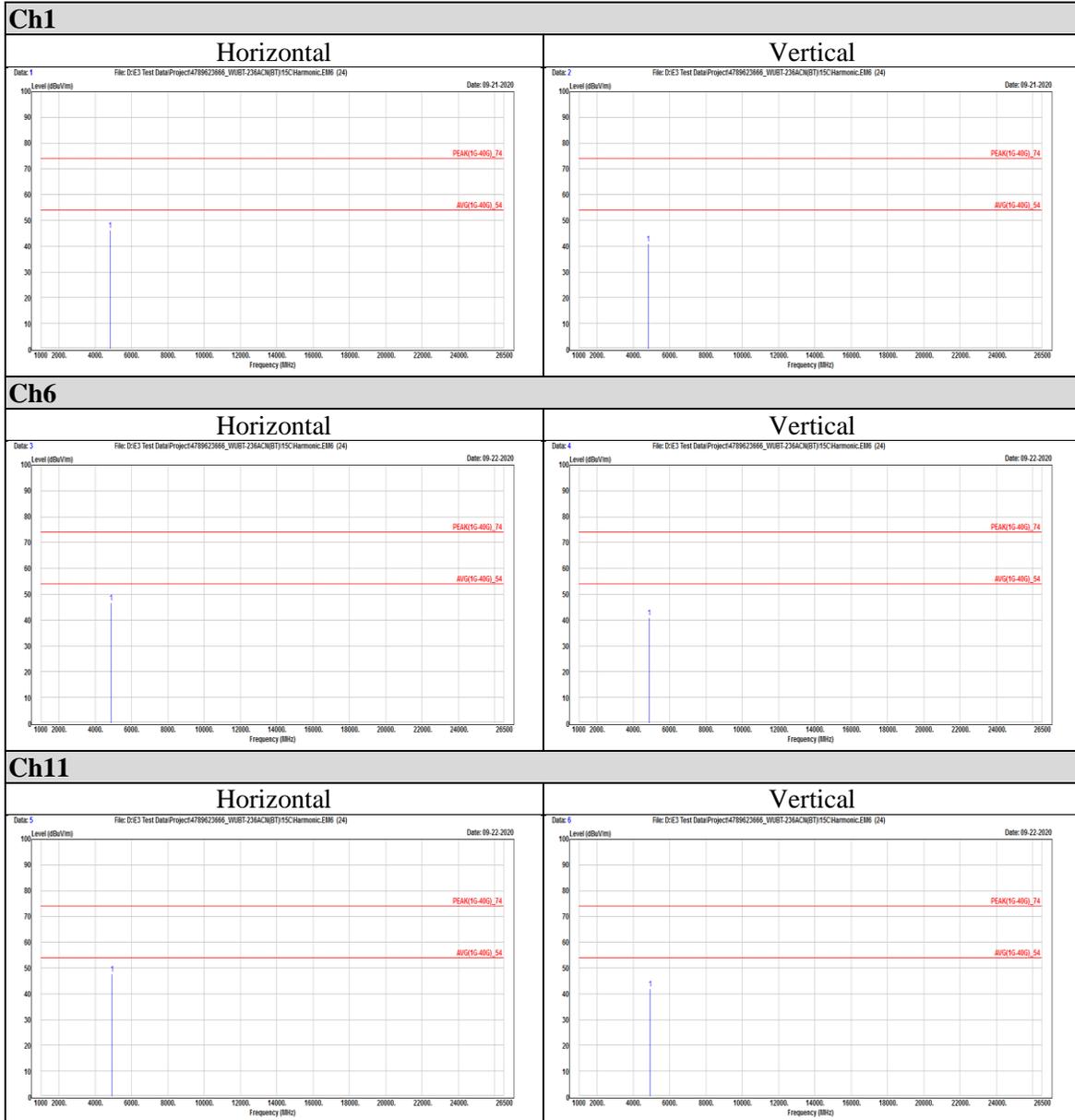
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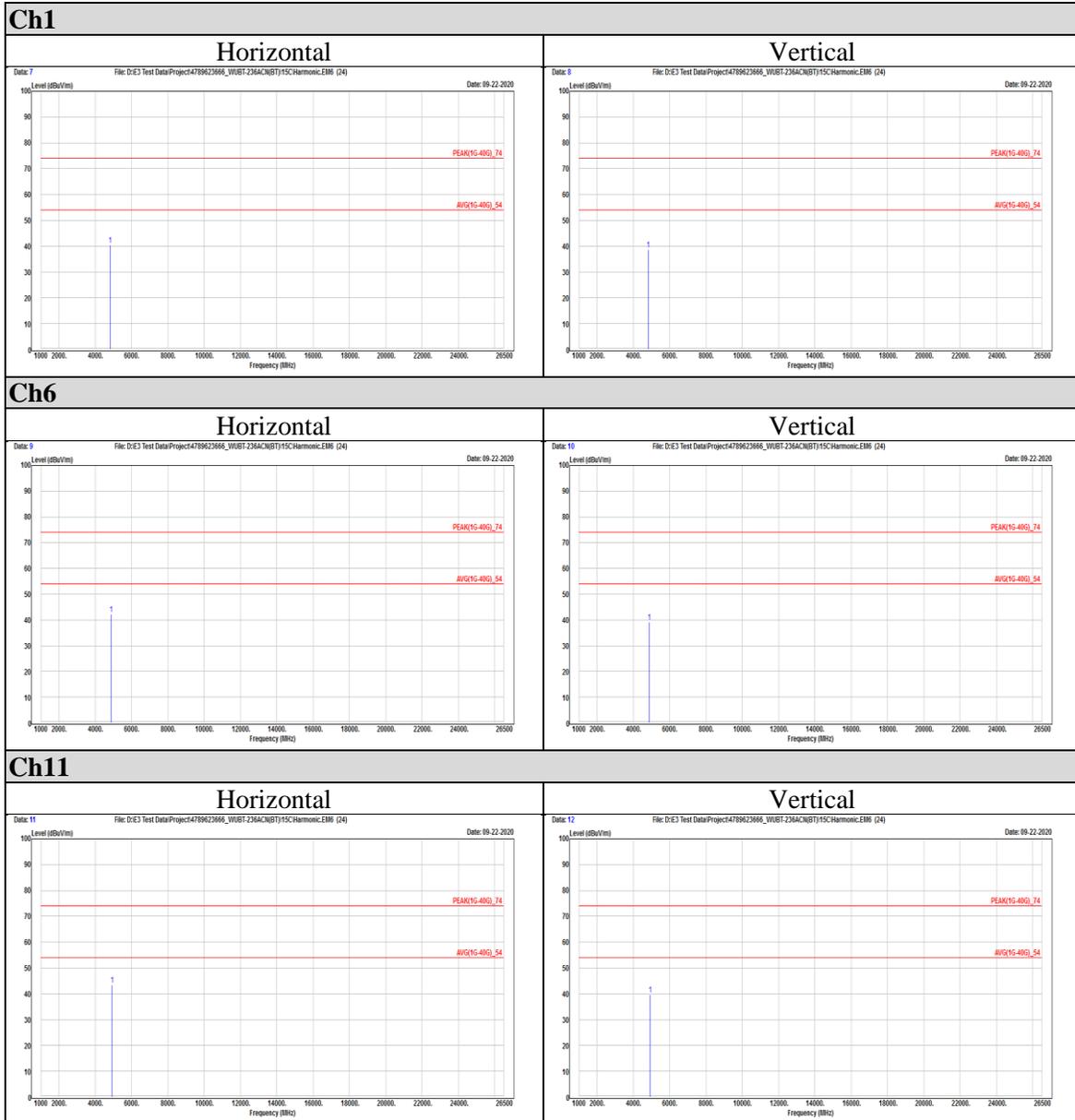
Appendix II Radiated Spurious Emission Measurement

802.11b



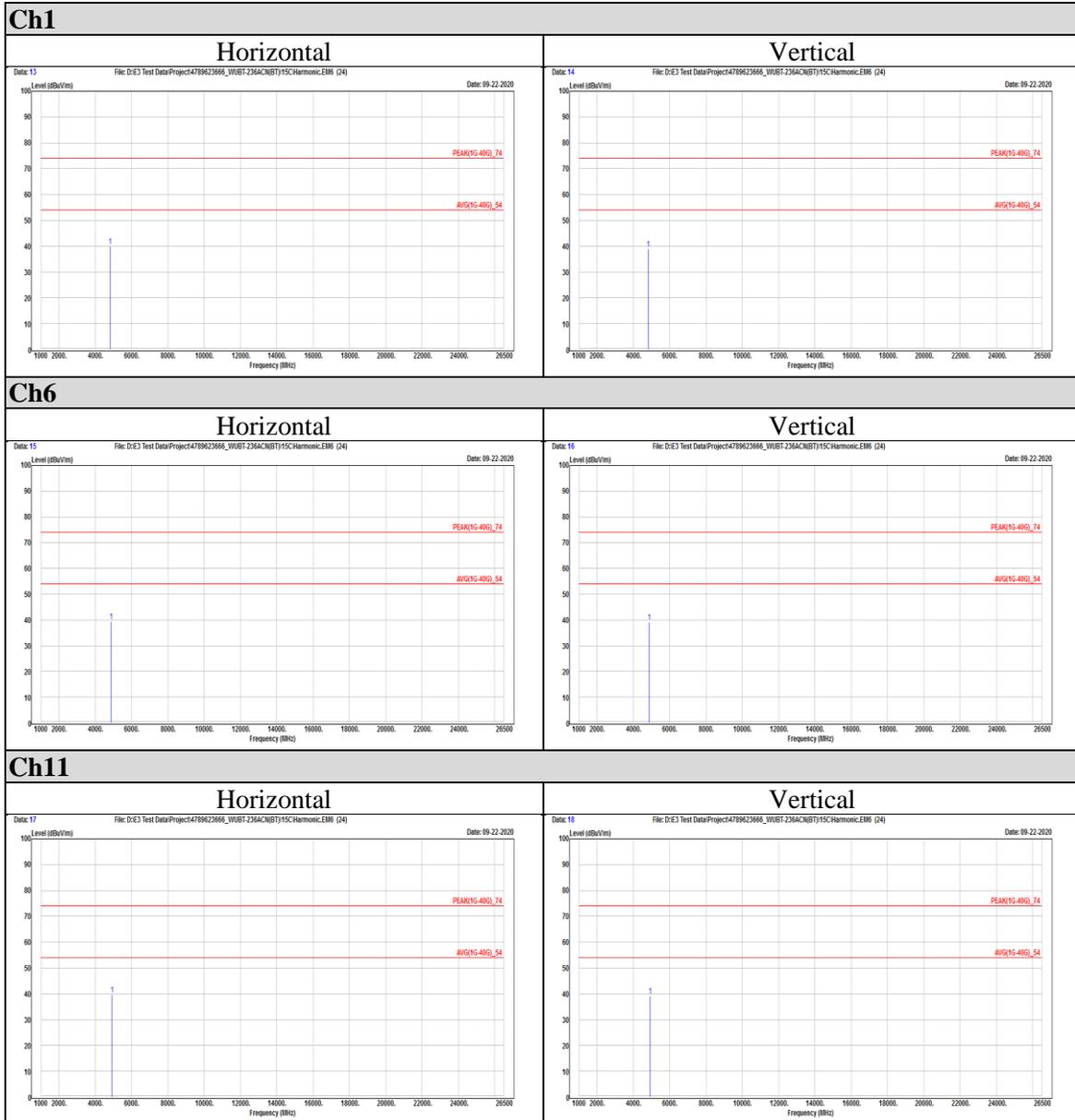


802.11g





802.11n (HT20)



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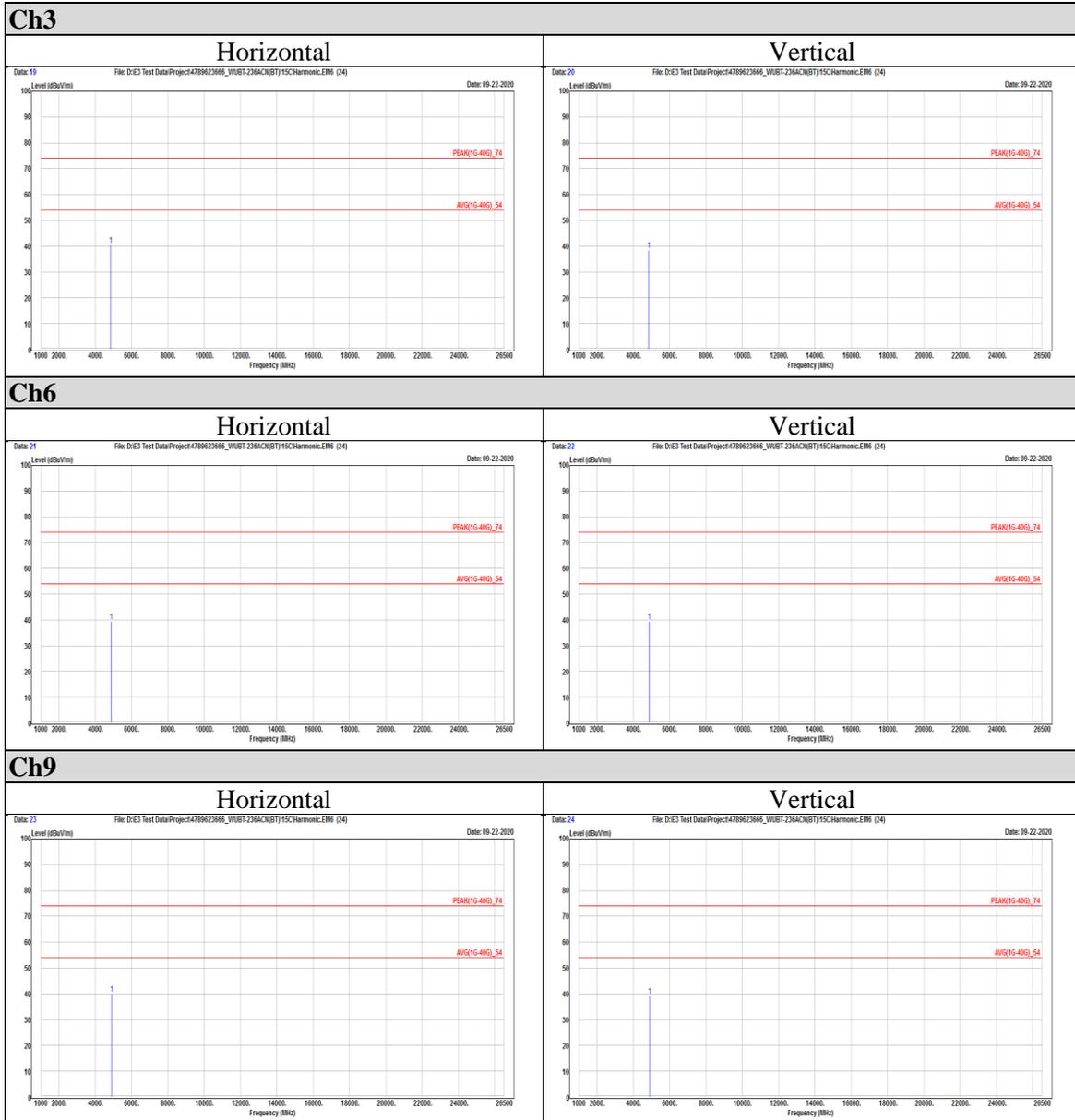
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802.11n (HT40)



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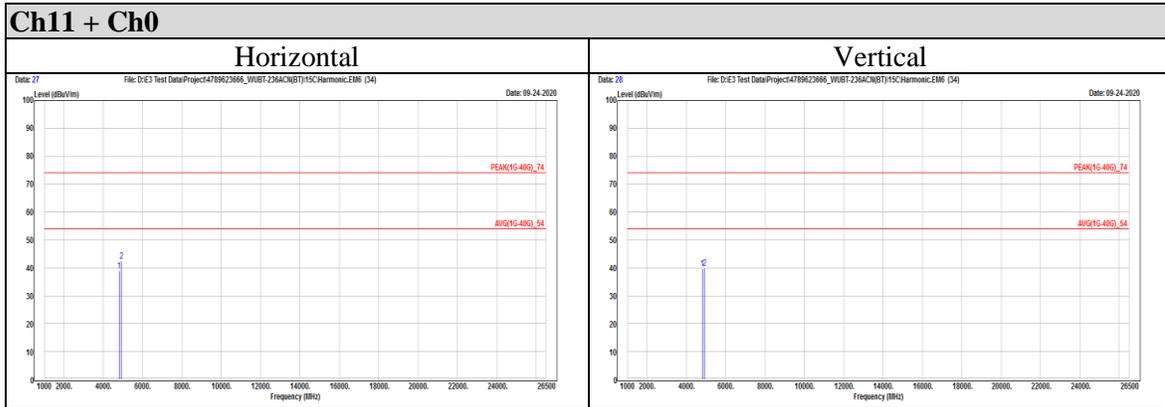
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Co-Location Mode

802.11b + BT



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