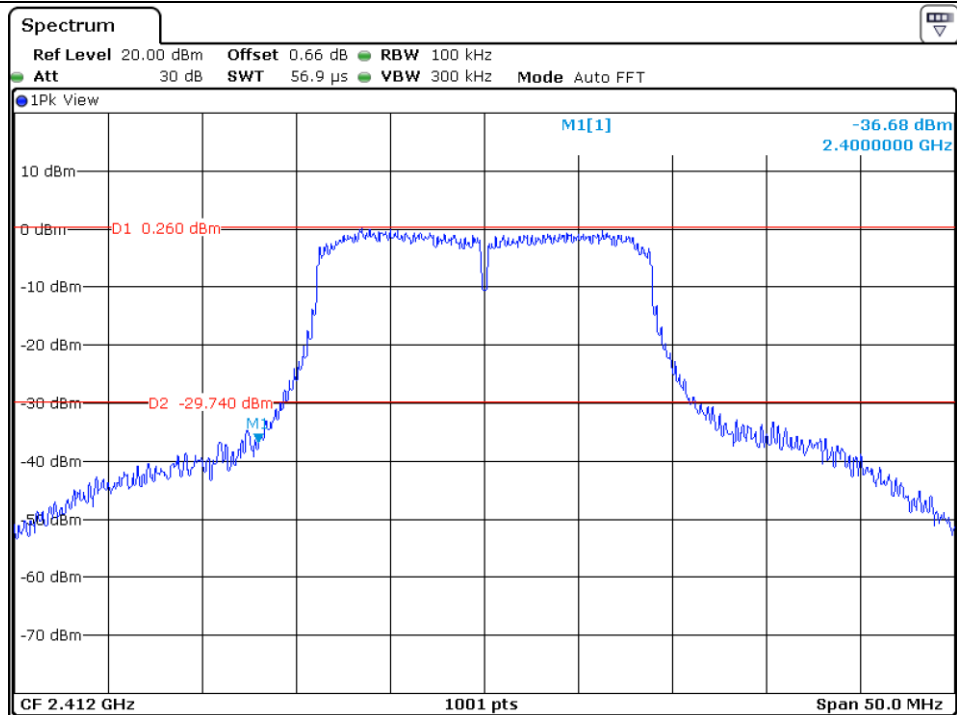
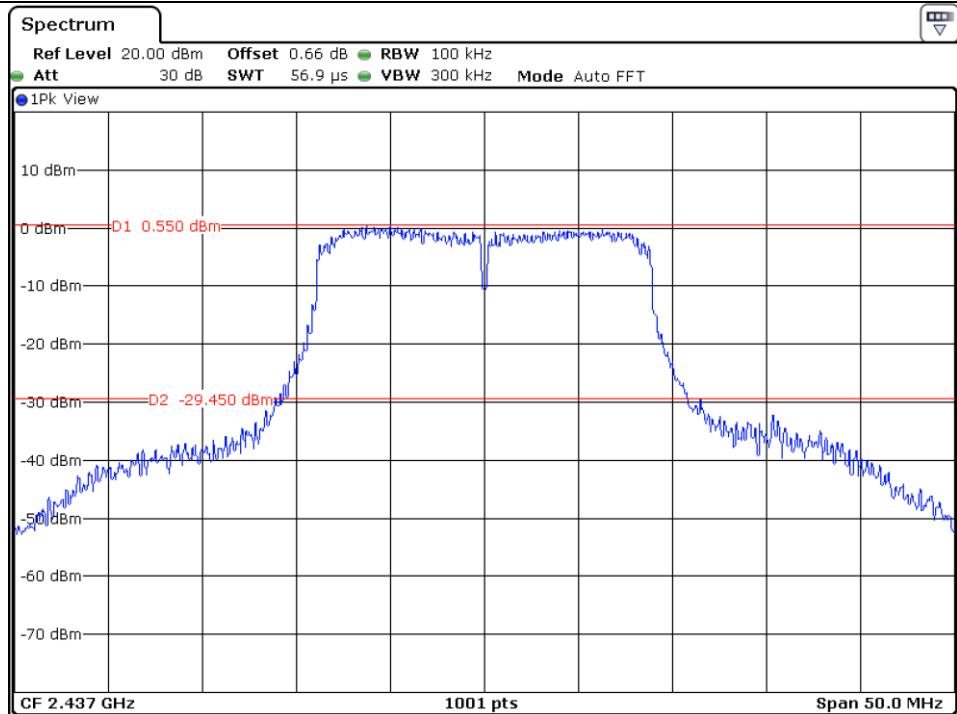


9.5.3 Test data for 802.11n_HT20 WLAN Mode

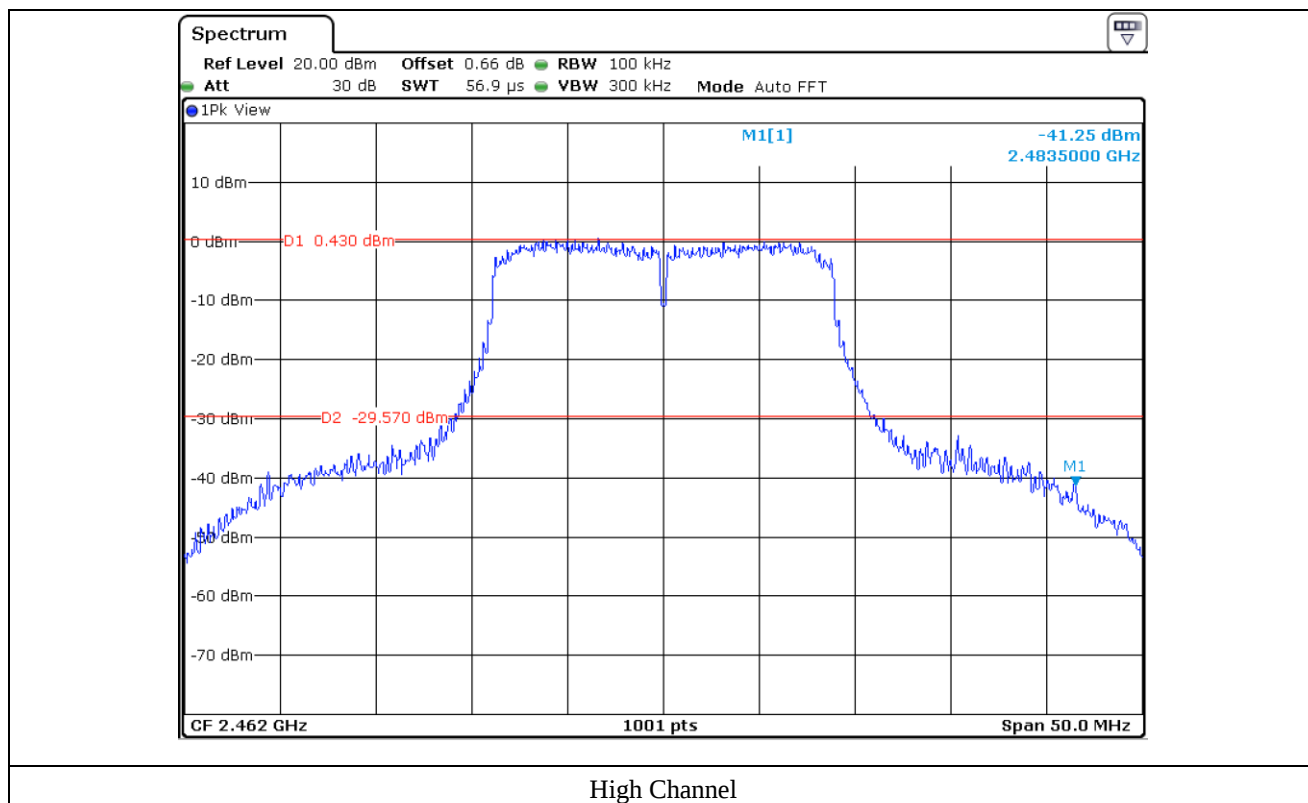
9.5.3.1 Test data for Antenna 0

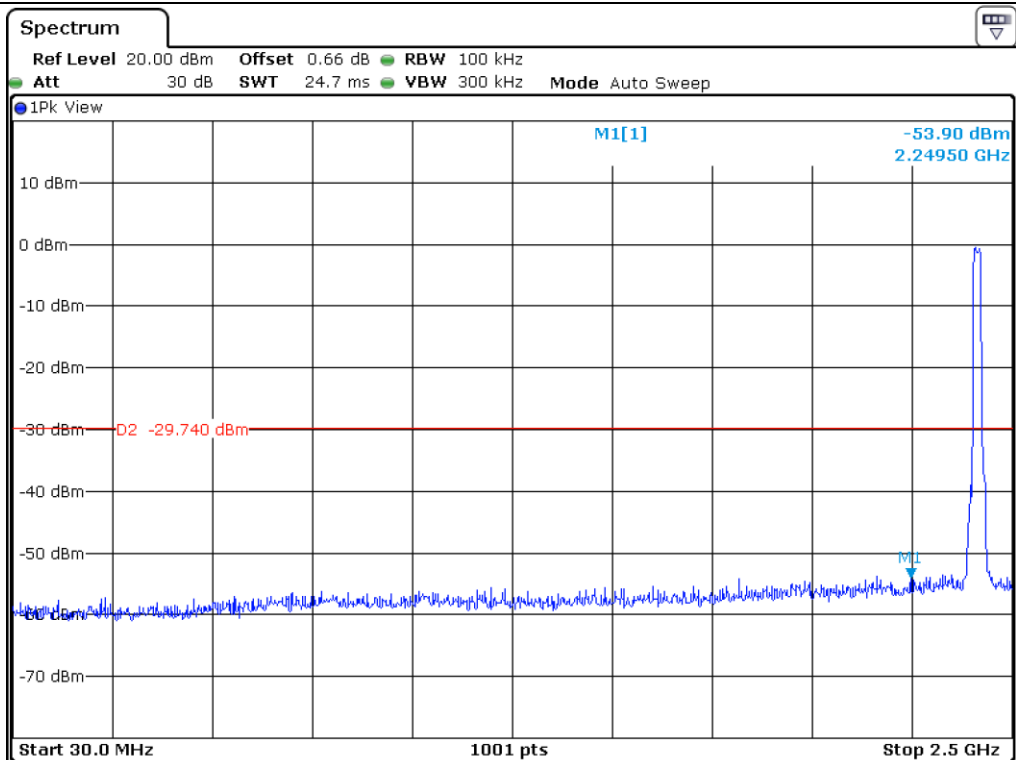


Low Channel

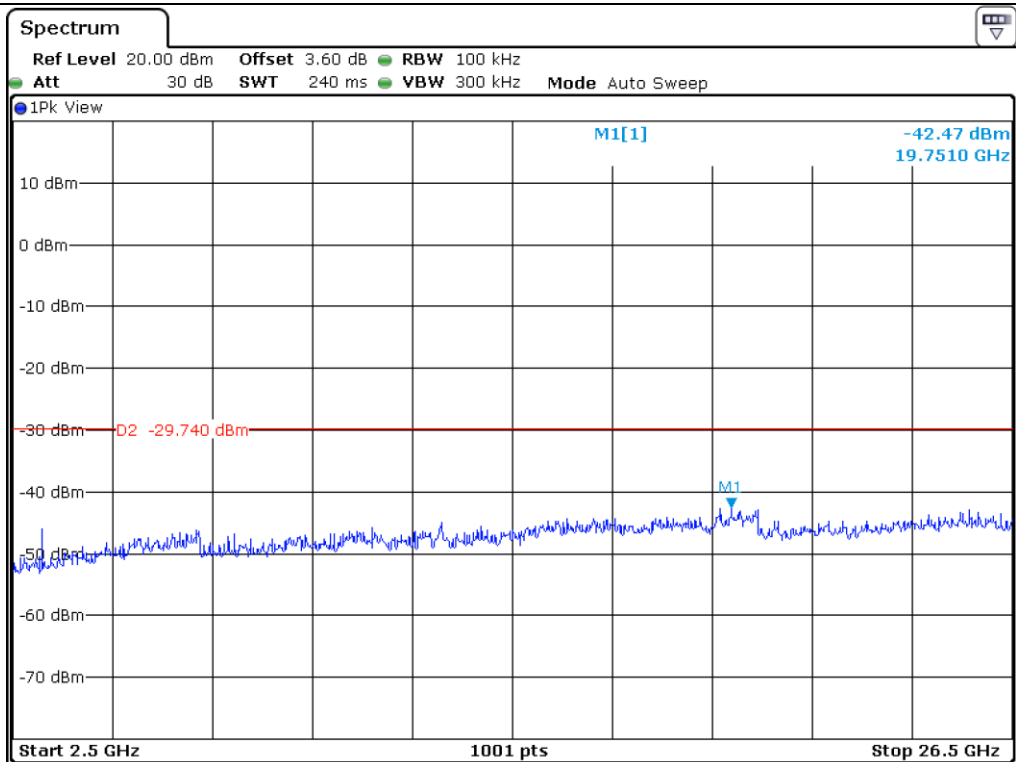


Middle Channel

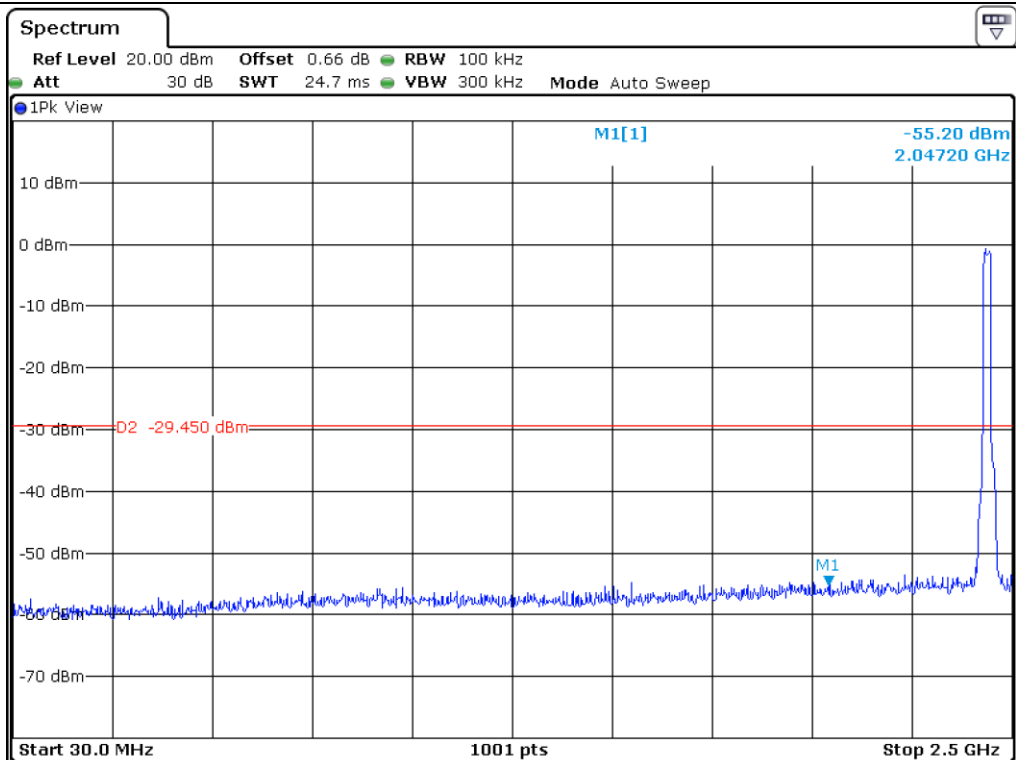




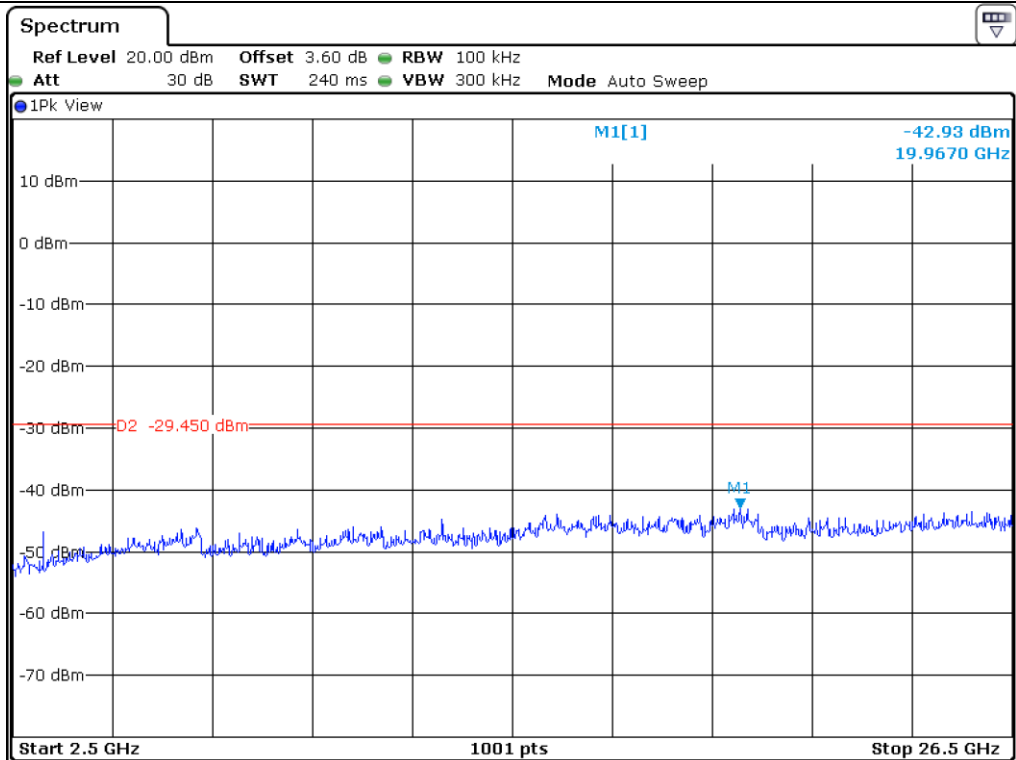
Low Channel



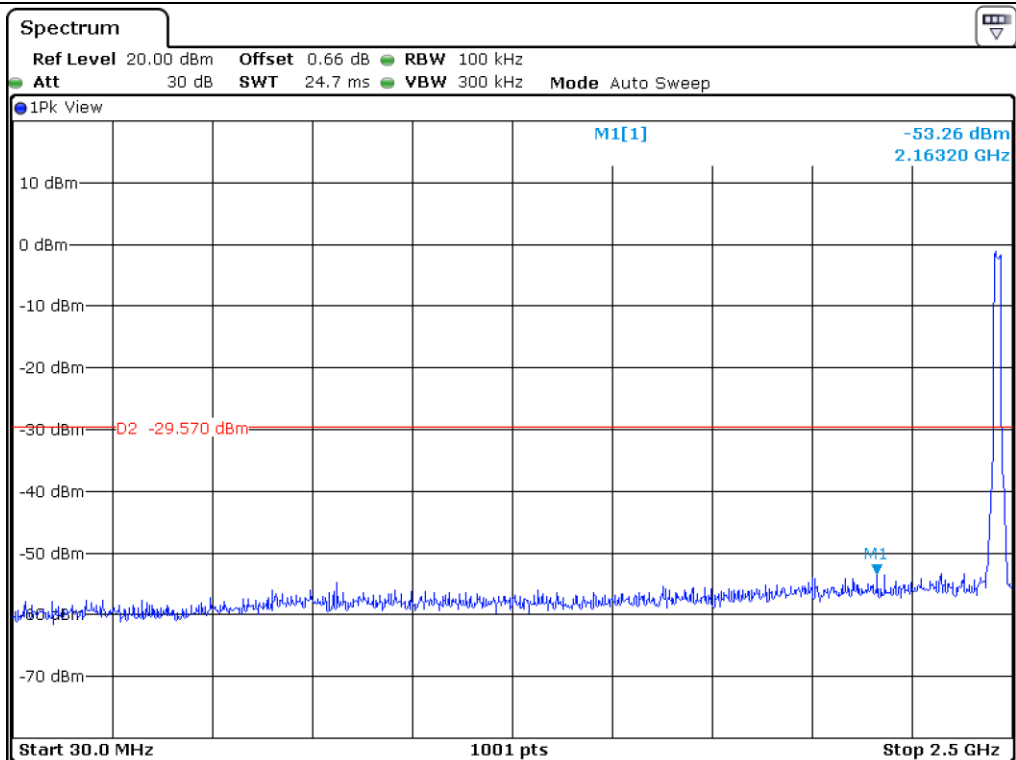
Low Channel



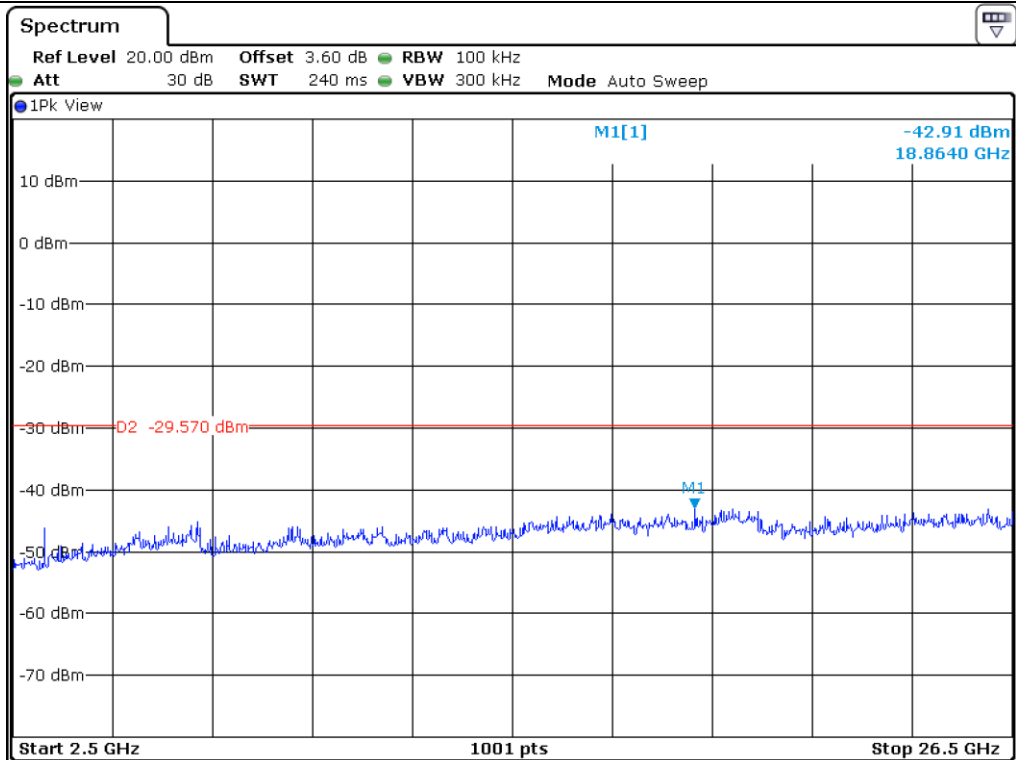
Middle Channel



Middle Channel

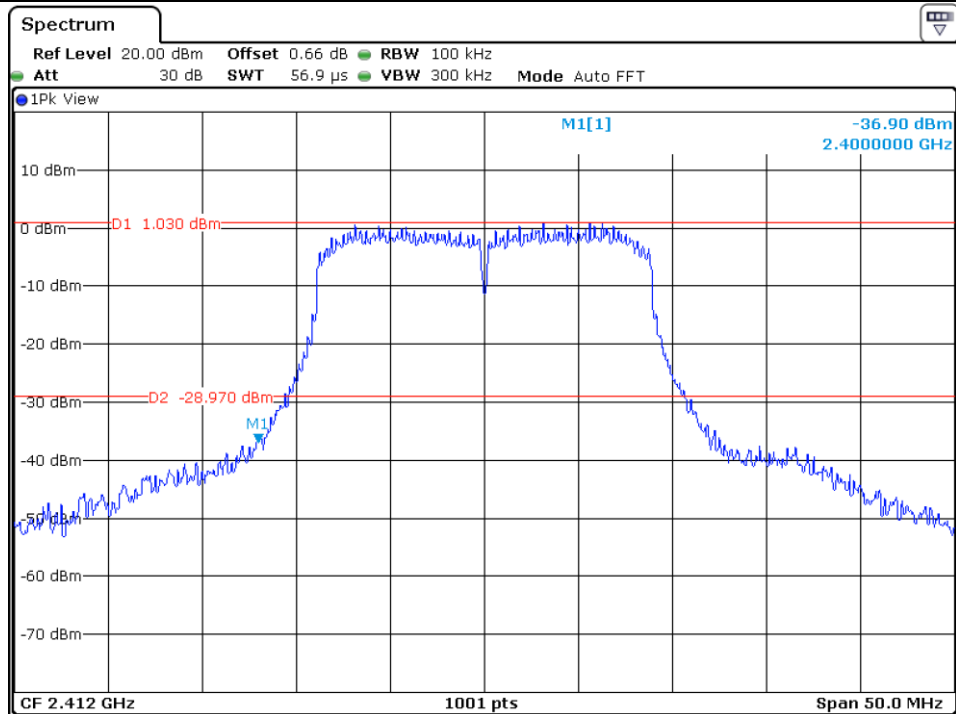


High Channel

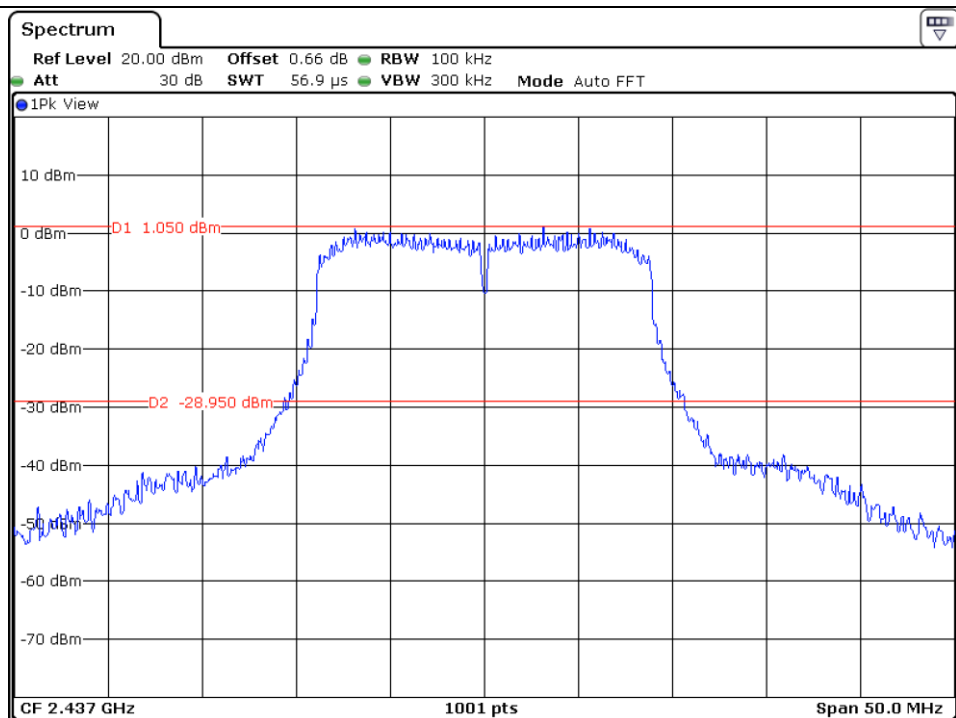


High Channel

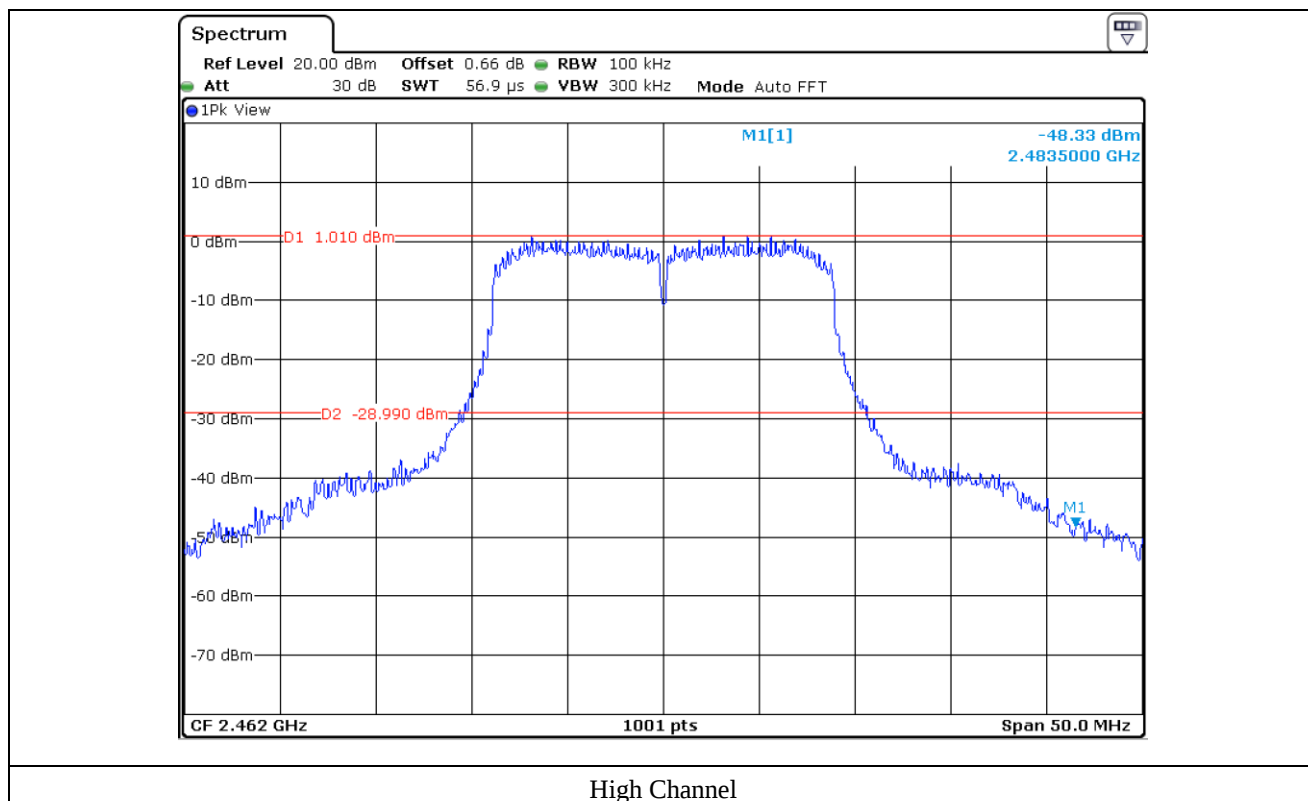
9.5.3.2 Test data for Antenna 1

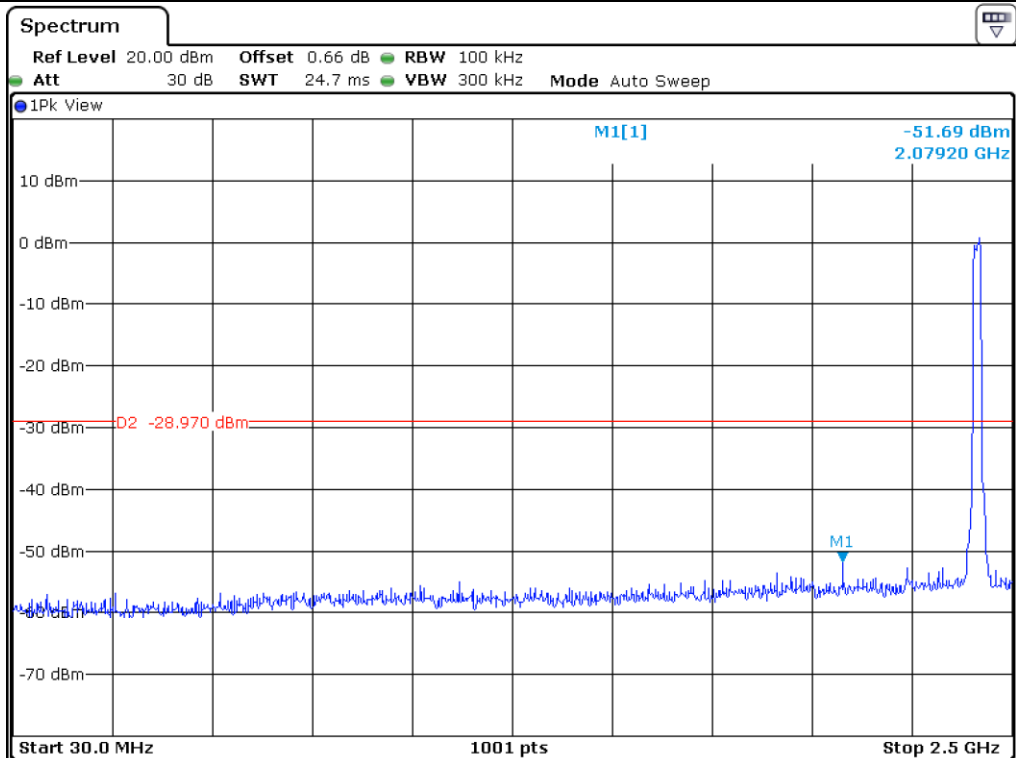


Low Channel

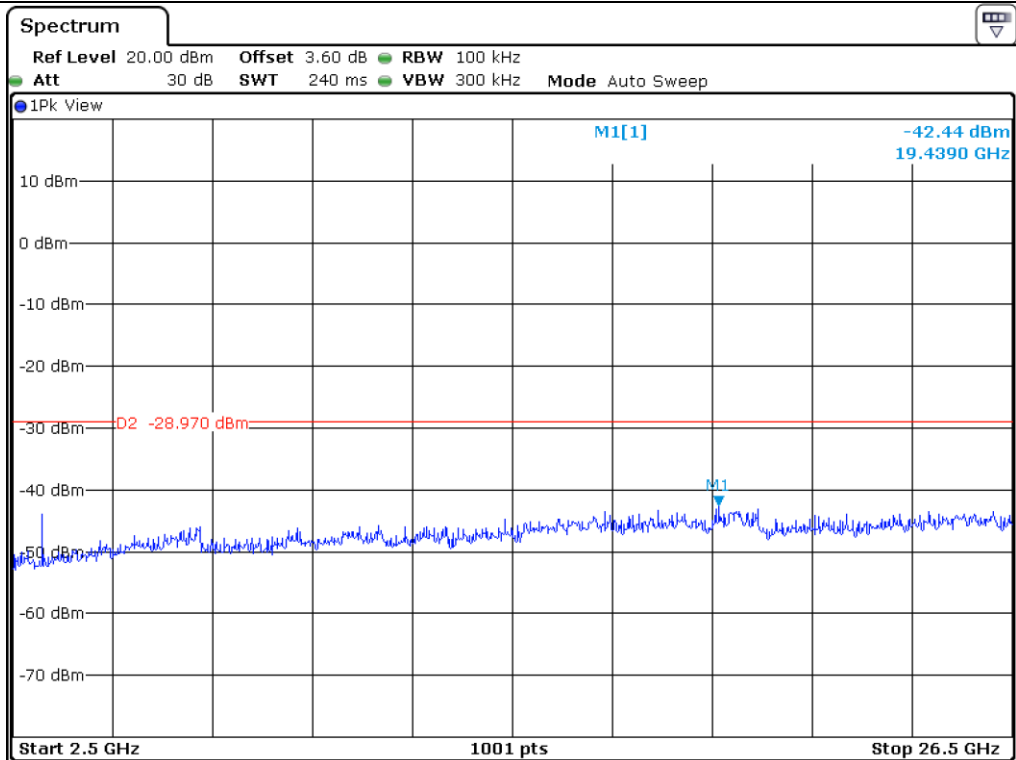


Middle Channel

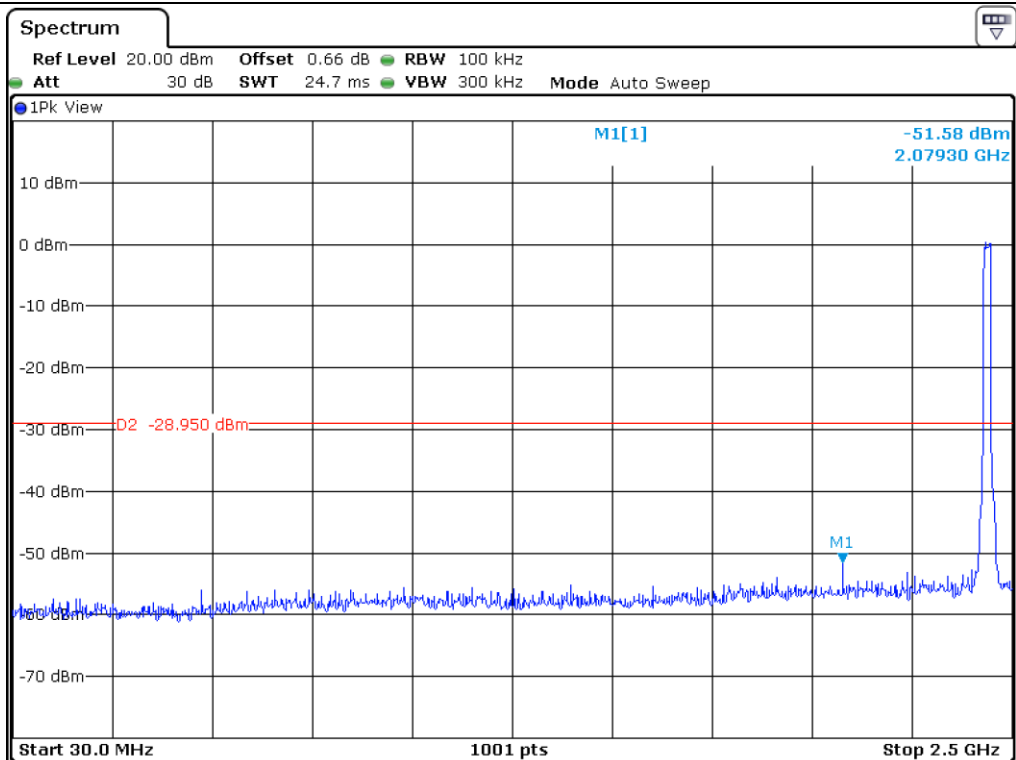




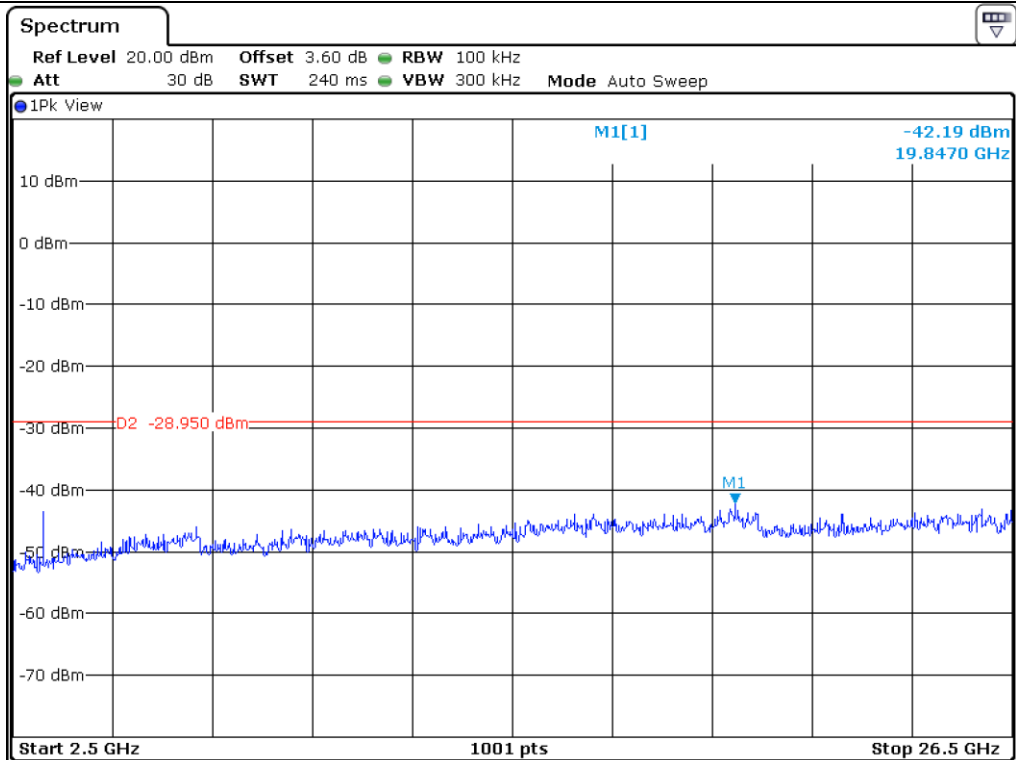
Low Channel



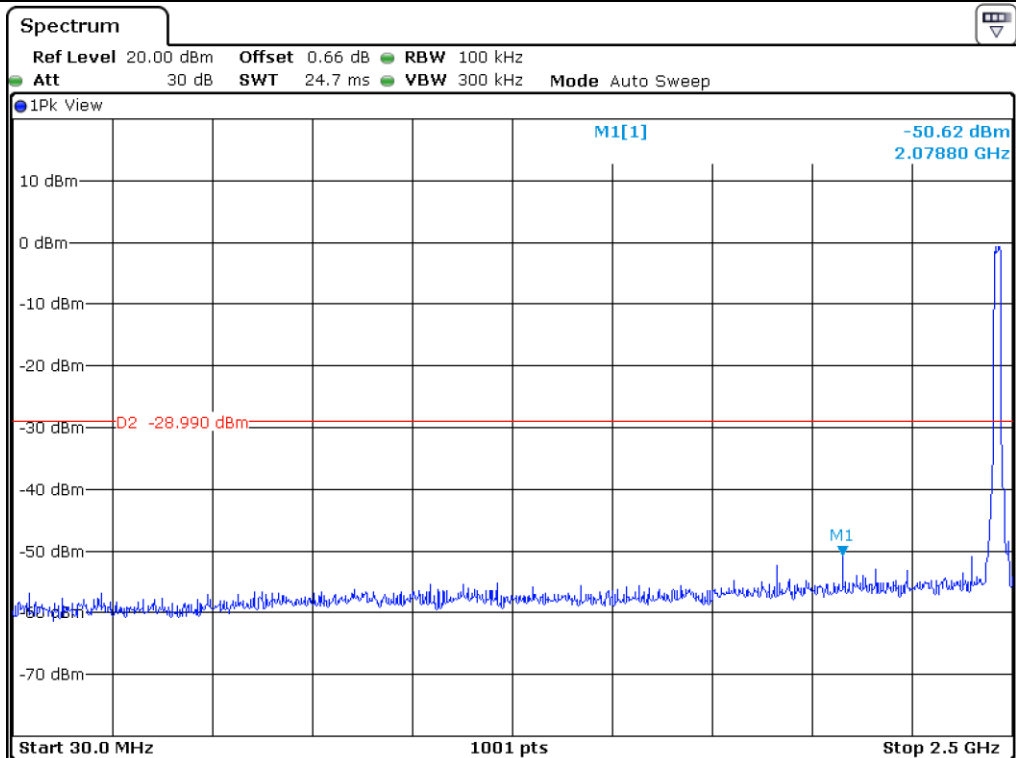
Low Channel



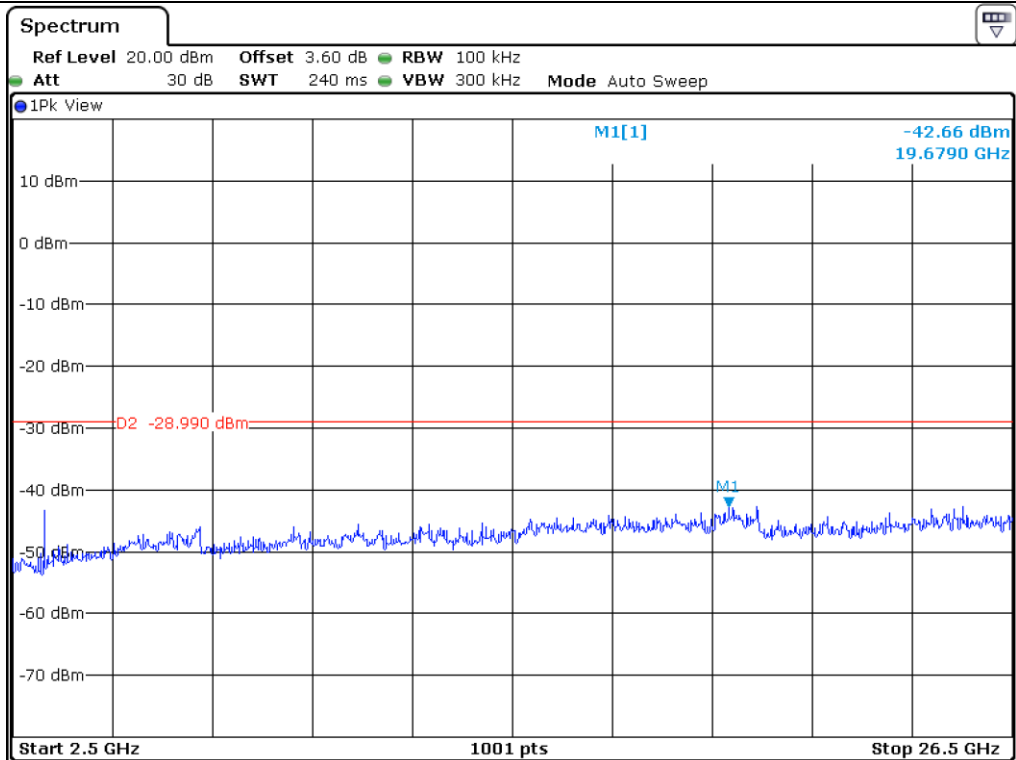
Middle Channel



Middle Channel



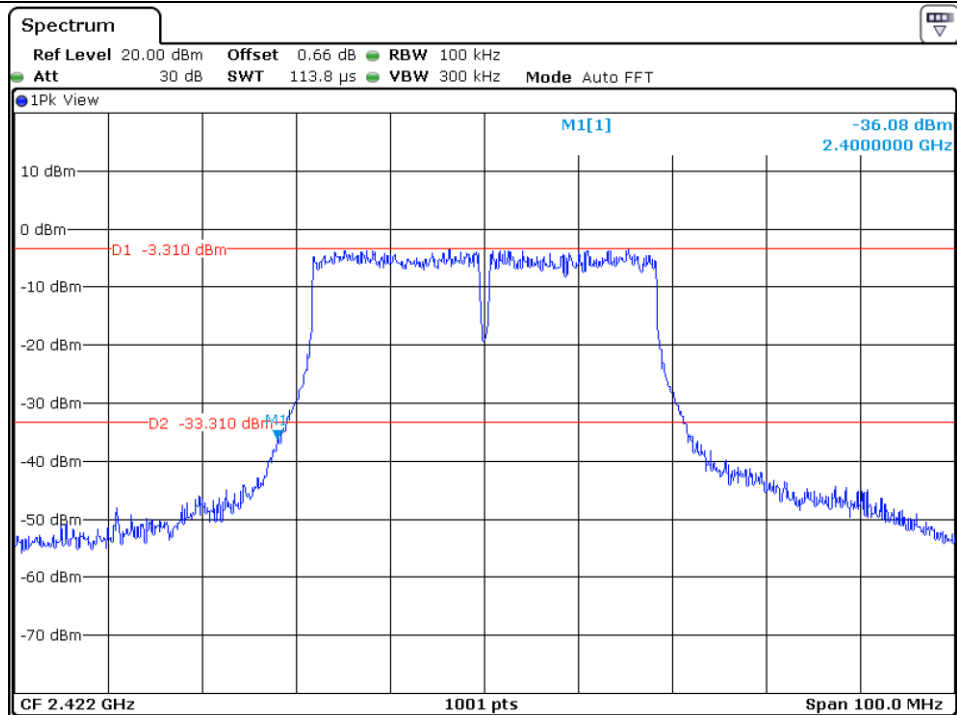
High Channel



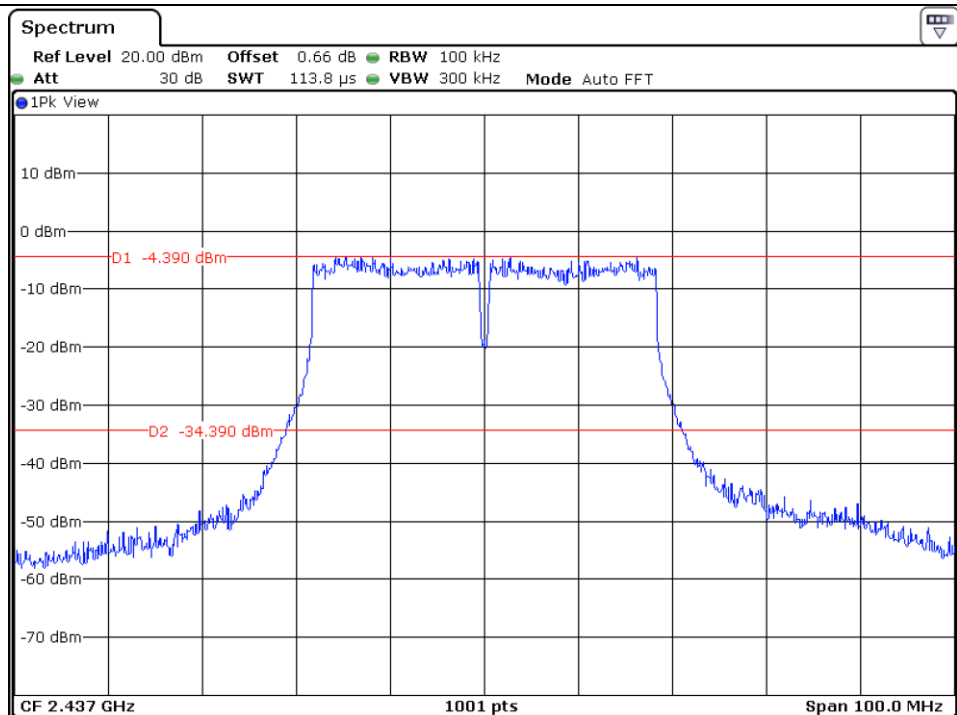
High Channel

9.5.4 Test data for 802.11n_HT40 WLAN Mode

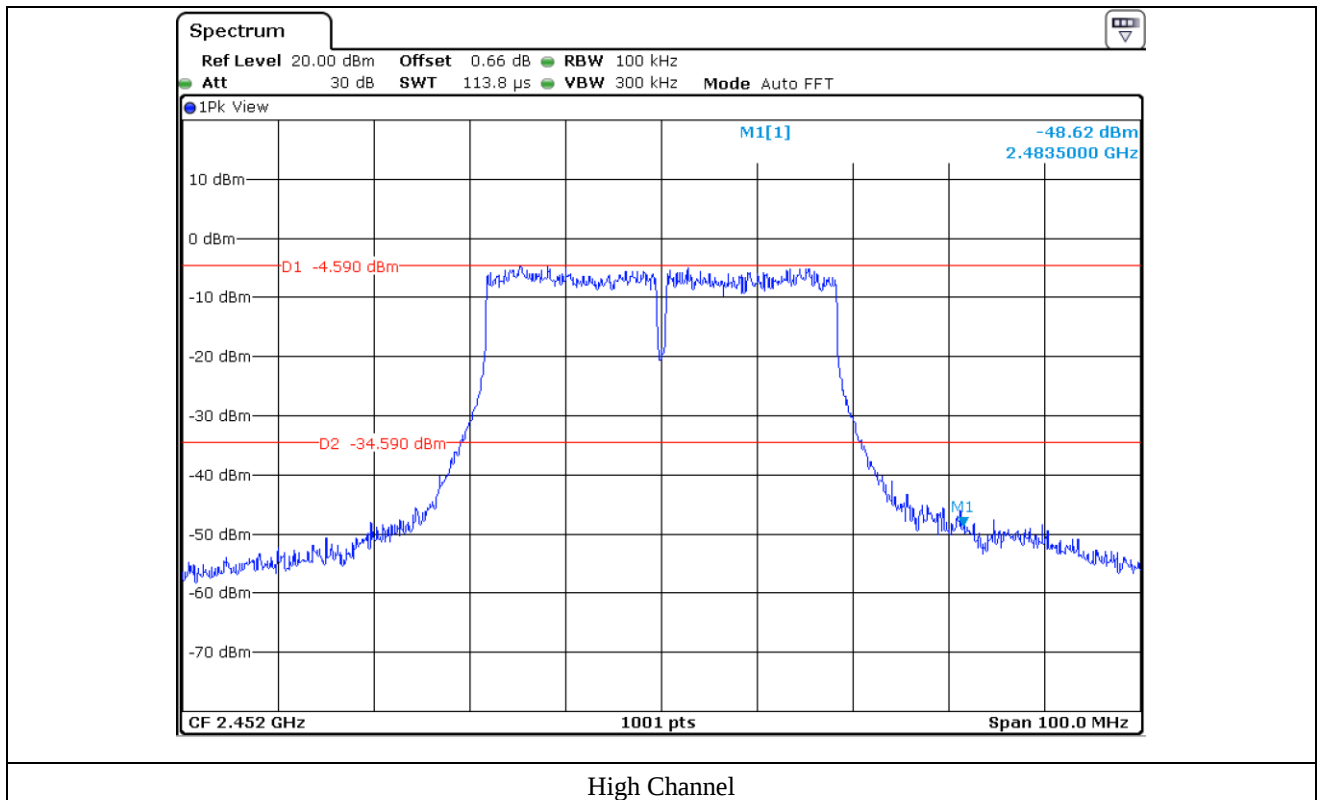
9.5.4.1 Test data for Antenna 0

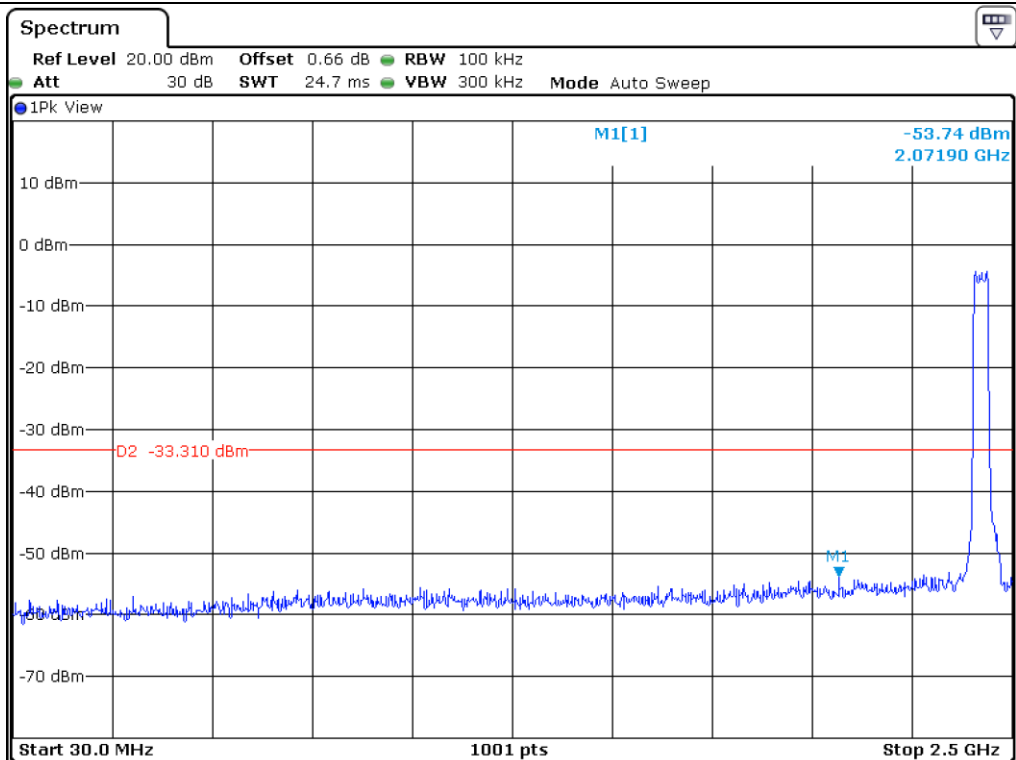


Low Channel

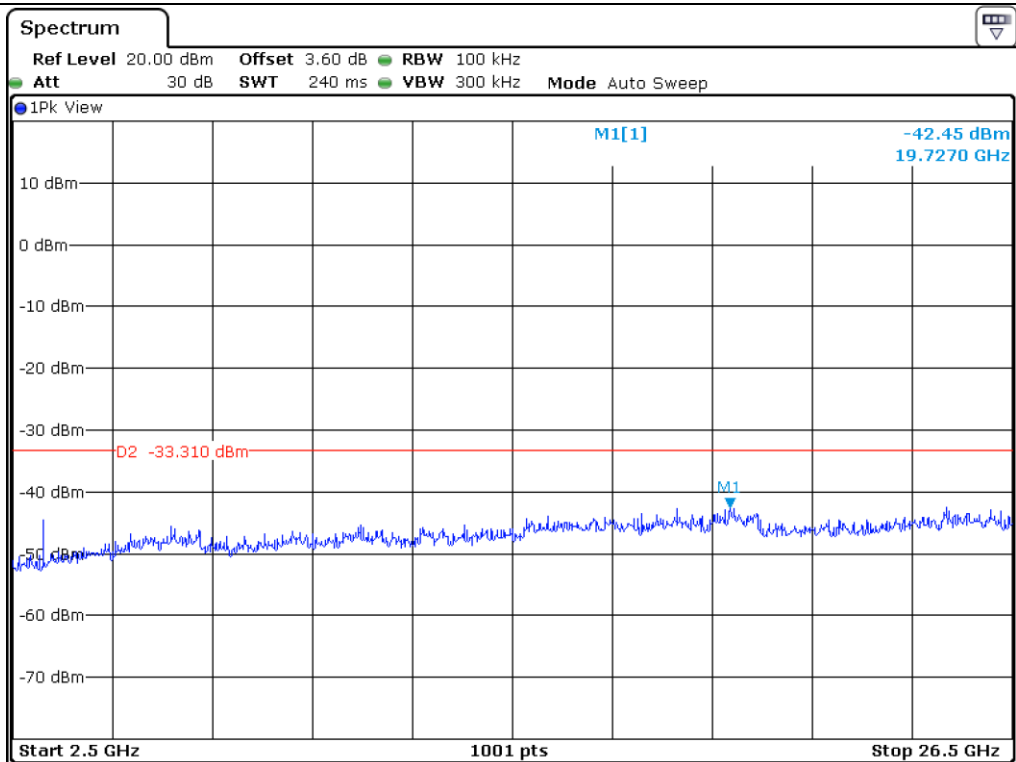


Middle Channel

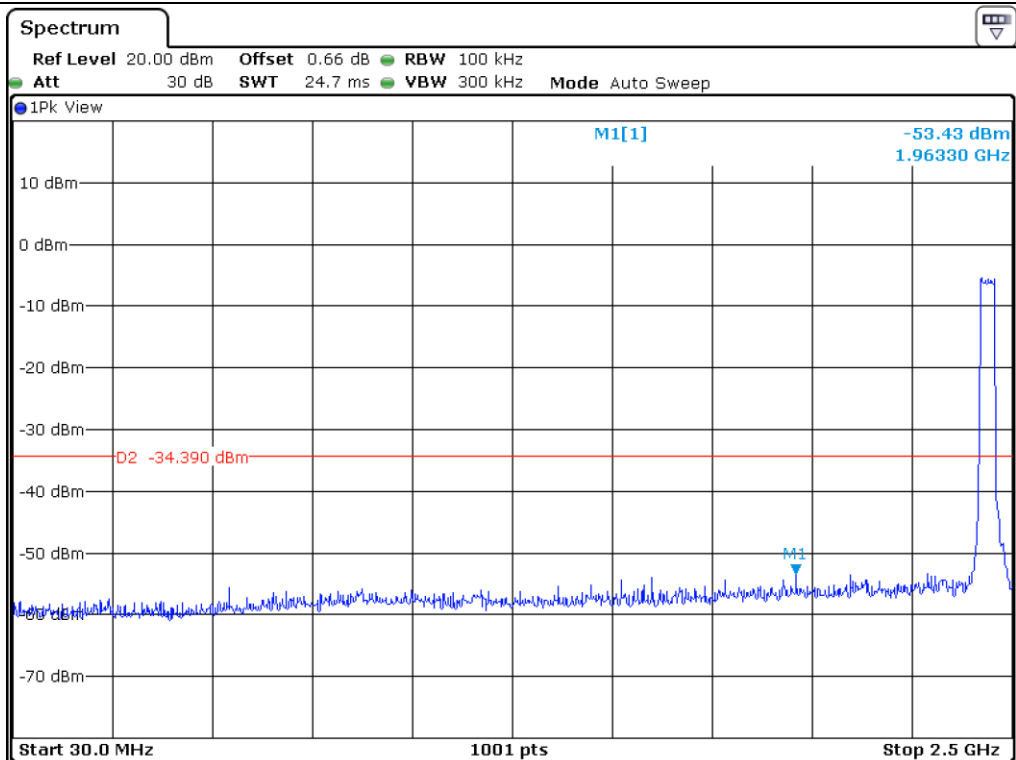




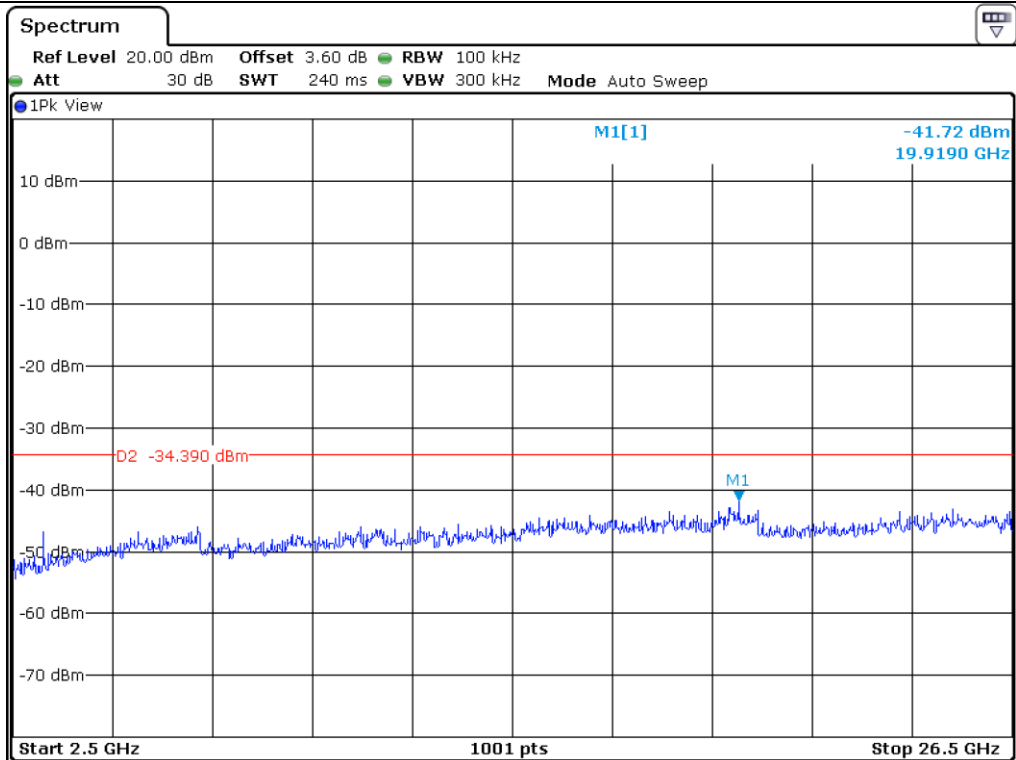
Low Channel



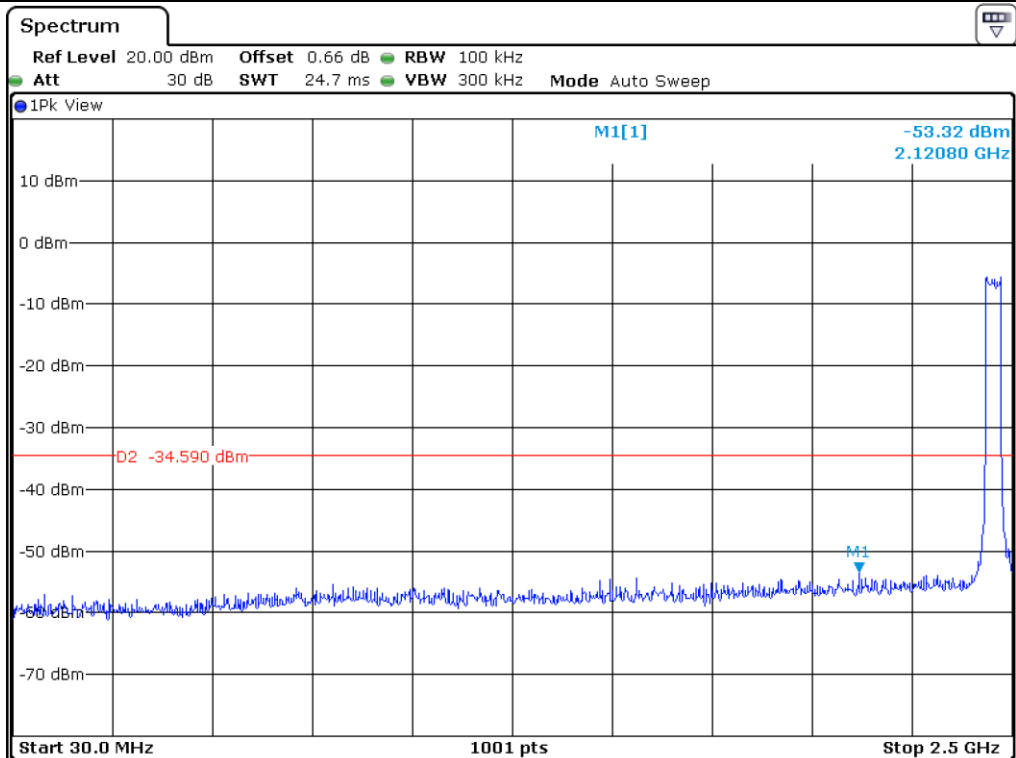
Low Channel



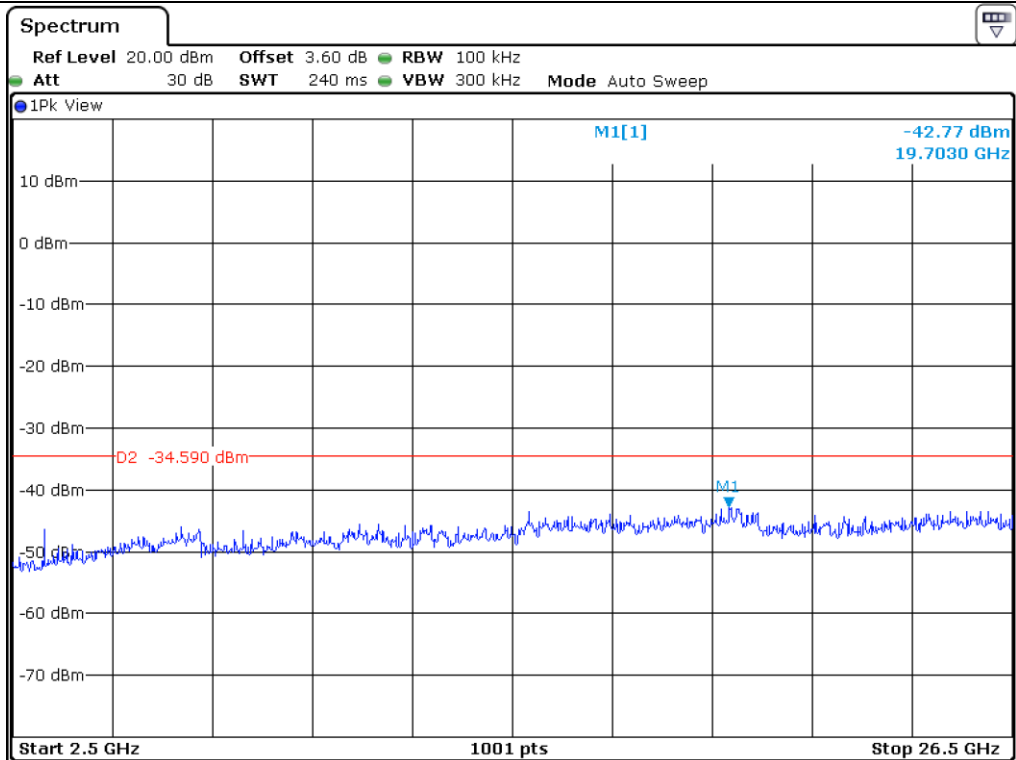
Middle Channel



Middle Channel

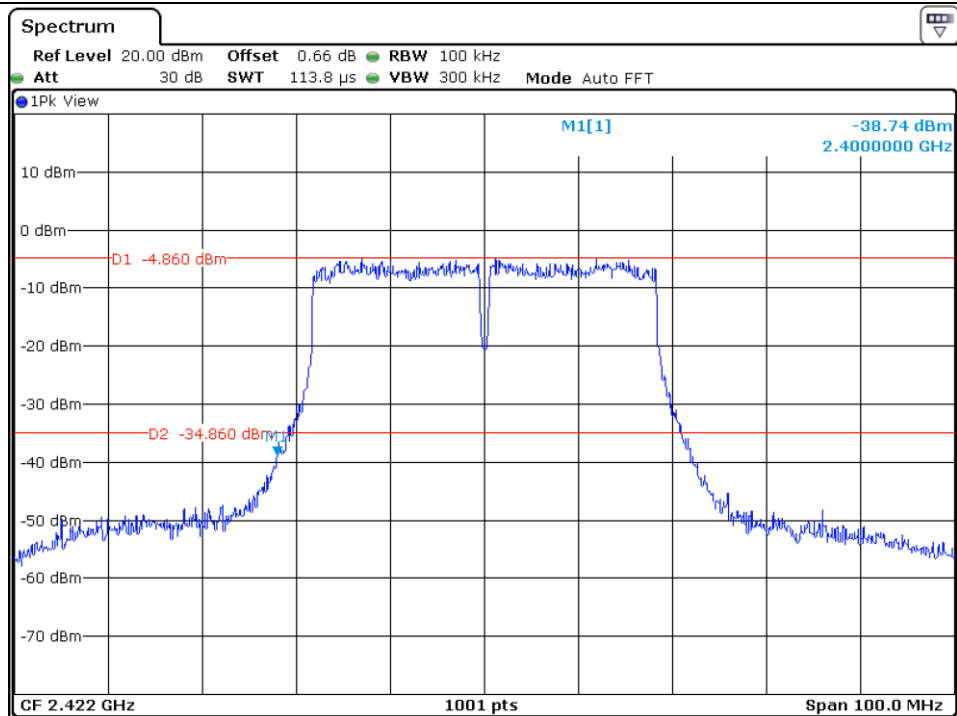


High Channel

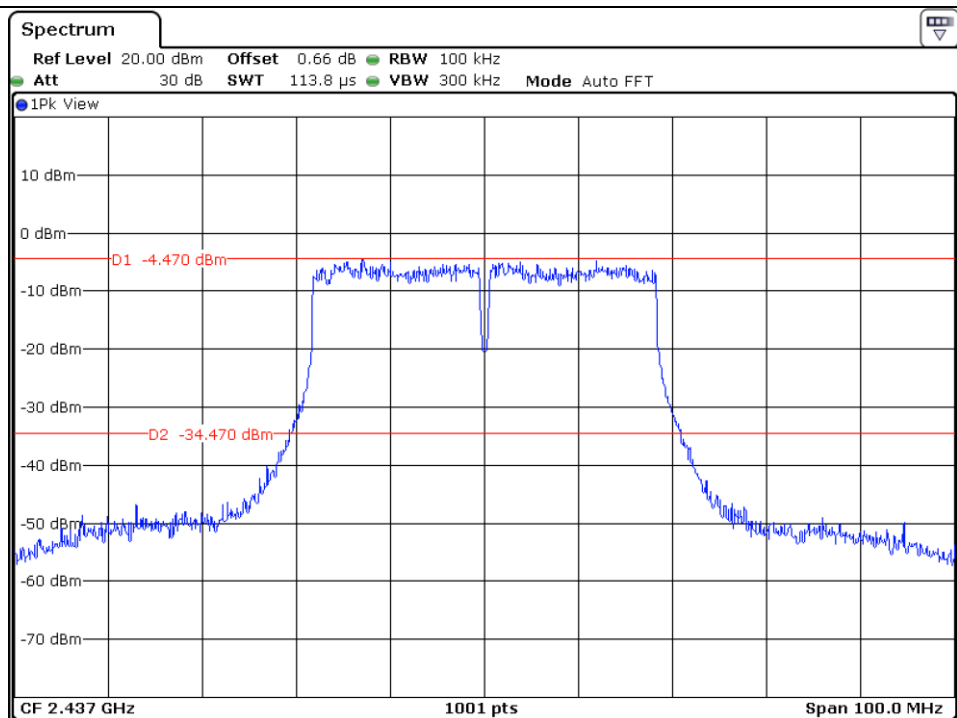


High Channel

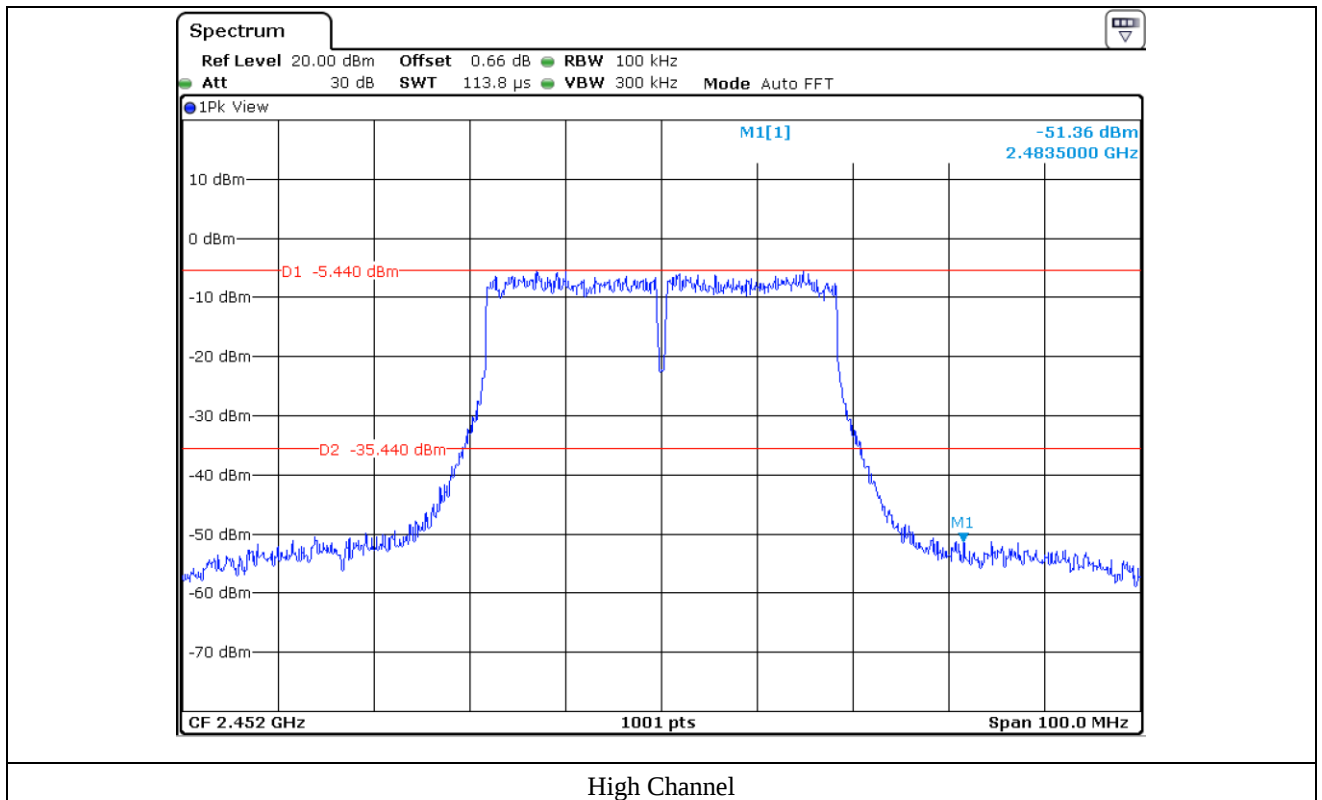
9.5.4.2 Test data for Antenna 1

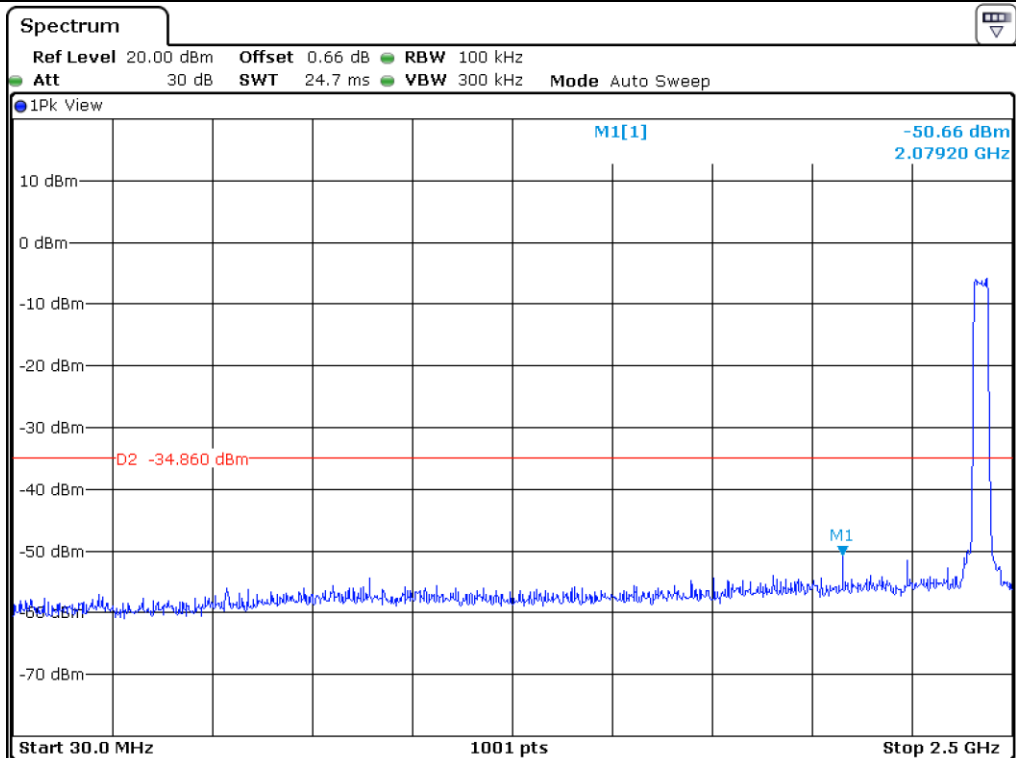


Low Channel

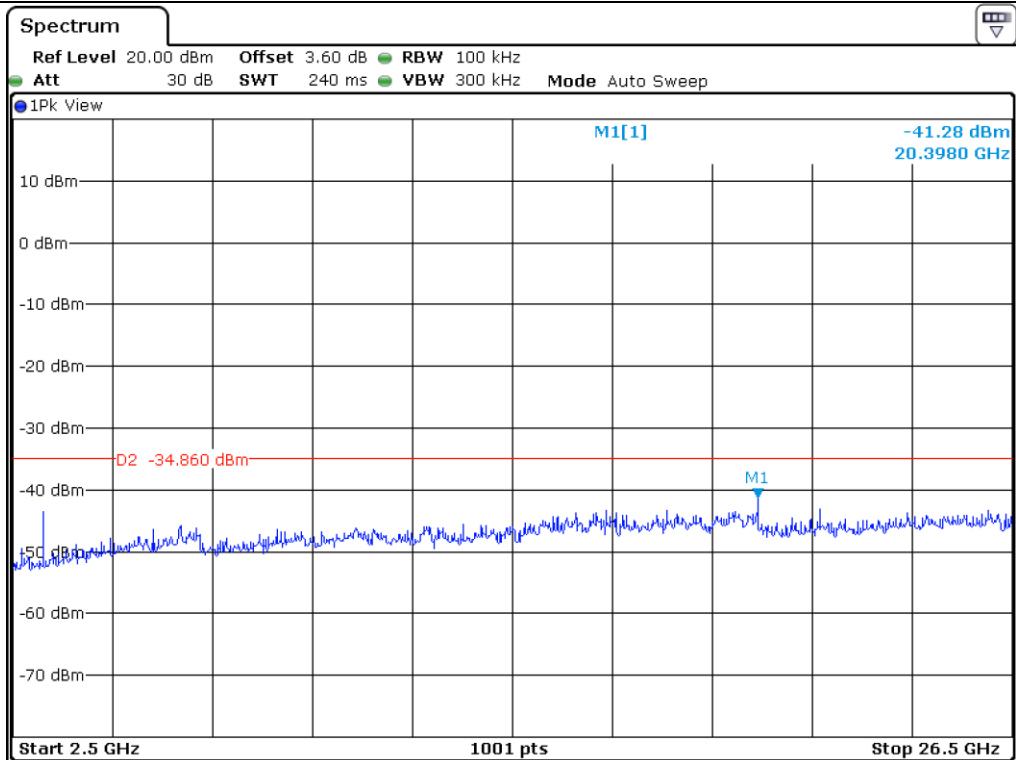


Middle Channel

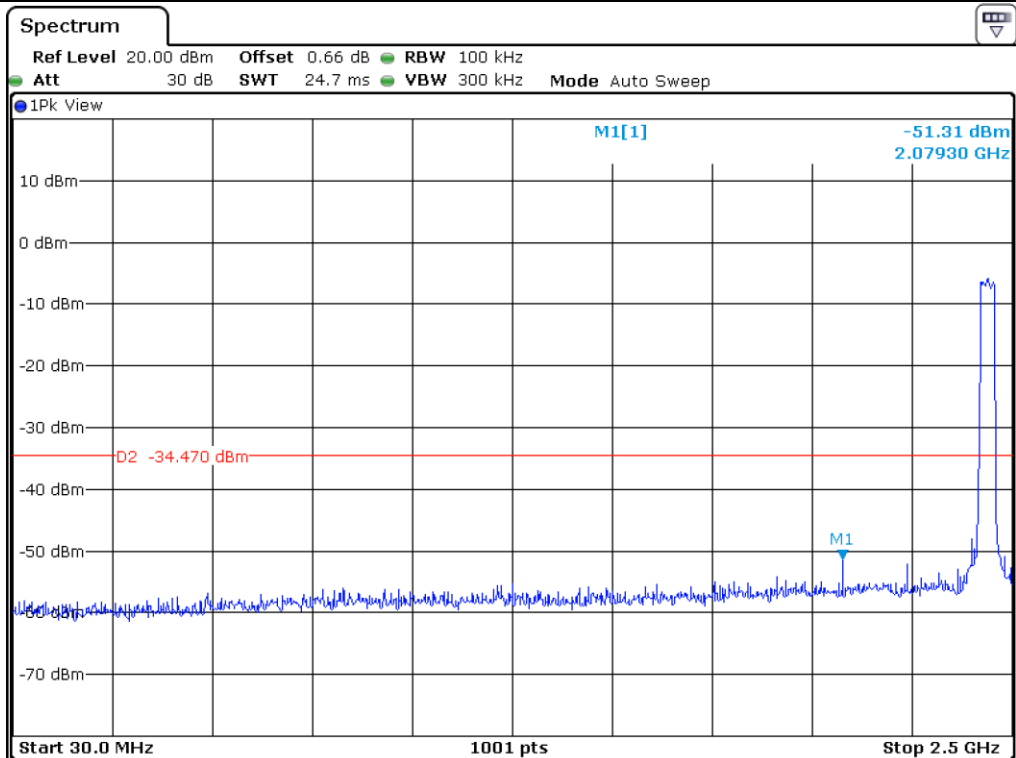




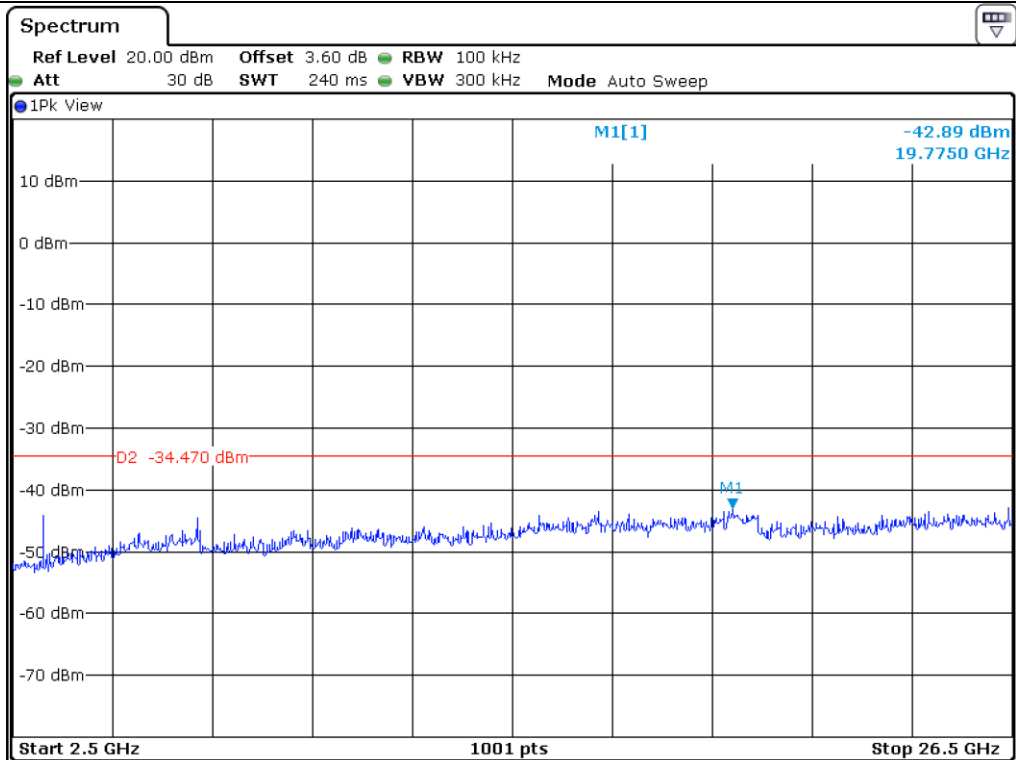
Low Channel



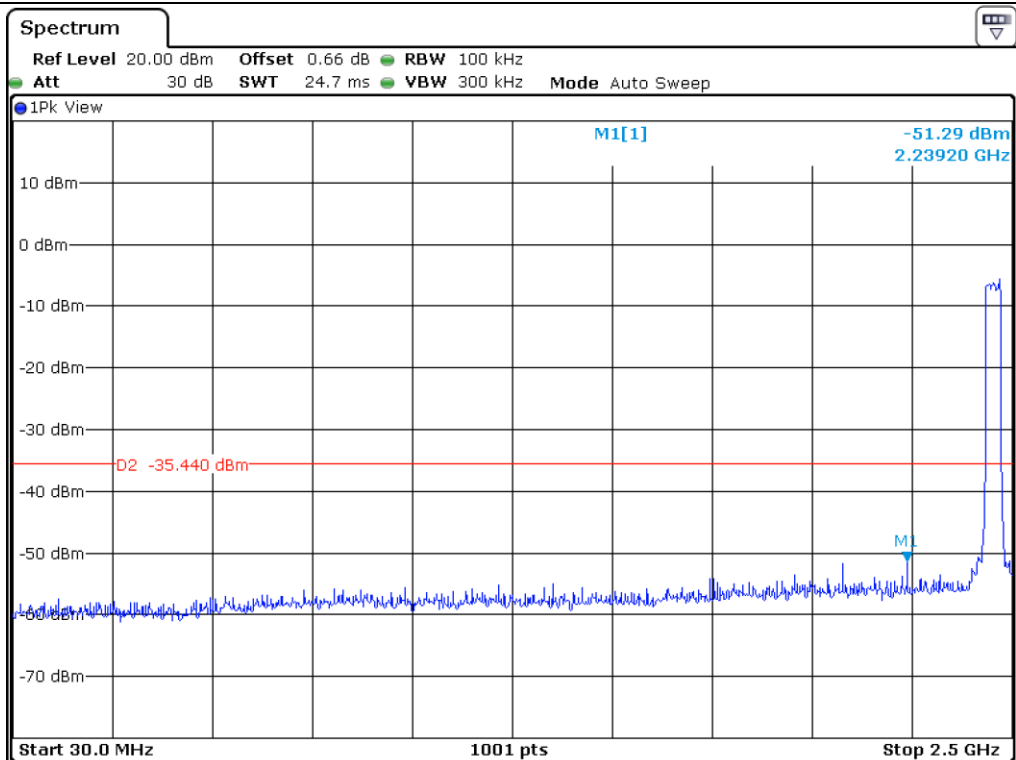
Low Channel



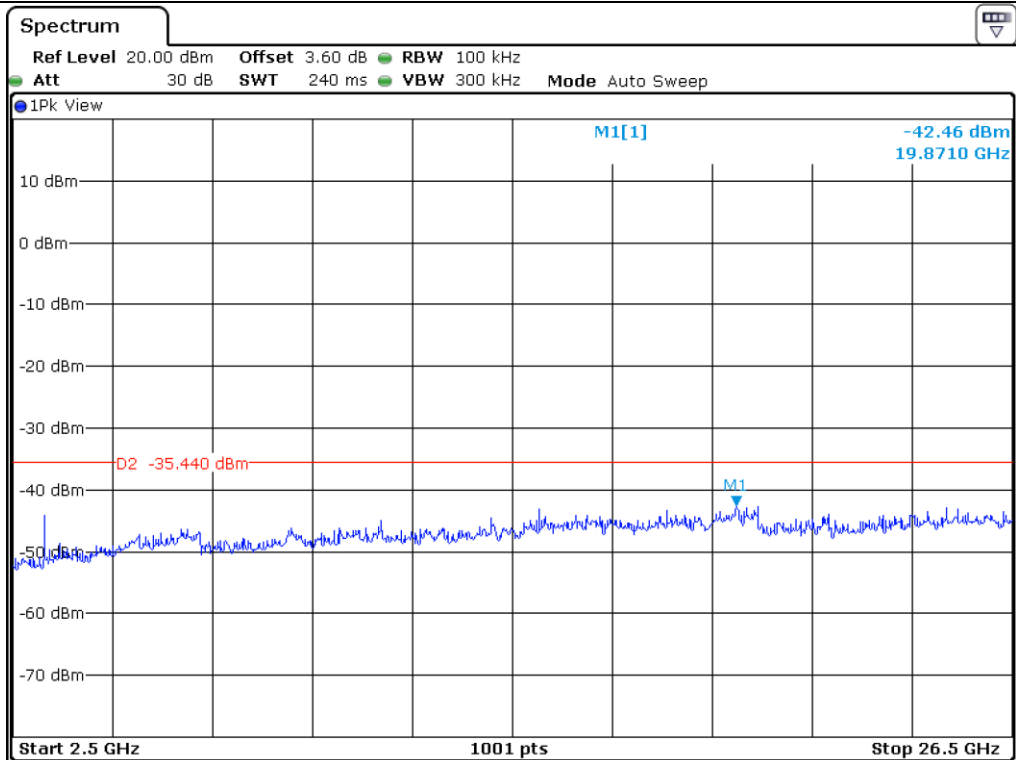
Middle Channel



Middle Channel



High Channel



High Channel

9.6 Test data for radiated emission

9.6.1 Radiated Emission which fall in the Restricted Band

9.6.1.1 Test data for 802.11b WLAN Mode

9.6.1.1.1 Test data for Antenna 0

- . Test Date : June 07, 2019 ~ June 13, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 100.00 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
2 384.605	18.96	Peak	H	26.94	4.75	50.65	74.00	23.35
2 386.523	11.16	Average	H	26.94	4.75	42.85	54.00	11.15
2 310.040	17.94	Peak	V	26.94	4.75	49.63	74.00	24.37
2 386.444	8.41	Average	V	26.94	4.75	40.10	54.00	13.90
Test Data for High Channel								
2 487.629	18.75	Peak	H	27.47	4.39	50.61	74.00	23.39
2 483.508	8.33	Average	H	27.47	4.39	40.19	54.00	13.81
2 488.074	17.98	Peak	V	27.47	4.39	49.84	74.00	24.16
2 483.508	7.24	Average	V	27.47	4.39	39.10	54.00	14.90

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss



Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.1.1.2 Test data for Antenna 1

- . Test Date : June 07, 2019 ~ June 13, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 100.00 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
2 386.204	23.09	Peak	H	26.94	4.75	54.78	74.00	19.22
2 386.364	17.63	Average	H	26.94	4.75	49.32	54.00	4.68
2 386.763	20.51	Peak	V	26.94	4.75	52.20	74.00	21.80
2 386.444	14.06	Average	V	26.94	4.75	45.75	54.00	8.25
Test Data for High Channel								
2 487.992	20.77	Peak	H	27.47	4.39	52.63	74.00	21.37
2 483.508	13.48	Average	H	27.47	4.39	45.34	54.00	8.66
2 486.624	19.45	Peak	V	27.47	4.39	51.31	74.00	22.69
2 483.508	10.61	Average	V	27.47	4.39	42.47	54.00	11.53

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss



Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.1.2 Test data for 802.11g WLAN Mode

9.6.1.2.1 Test data for Antenna 0

- . Test Date : June 07, 2019 ~ June 13, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 100.00 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
2 389.960	29.52	Peak	H	26.94	4.75	61.21	74.00	12.79
2 389.960	15.61	Average	H	26.94	4.75	47.30	54.00	6.70
2 389.960	25.90	Peak	V	26.94	4.75	57.59	74.00	16.41
2 389.960	11.81	Average	V	26.94	4.75	43.50	54.00	10.50
Test Data for High Channel								
2 483.607	29.05	Peak	H	27.47	4.39	60.91	74.00	13.09
2 483.508	15.17	Average	H	27.47	4.39	47.03	54.00	6.97
2 483.624	26.94	Peak	V	27.47	4.39	58.80	74.00	15.20
2 483.508	12.68	Average	V	27.47	4.39	44.54	54.00	9.46

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss



Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.1.2.2 Test data for Antenna 1

- . Test Date : June 07, 2019 ~ June 13, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 100.00 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
2 389.720	30.65	Peak	H	26.94	4.75	62.34	74.00	11.66
2 389.960	15.51	Average	H	26.94	4.75	47.20	54.00	6.80
2 389.640	25.56	Peak	V	26.94	4.75	57.25	74.00	16.75
2 389.960	10.79	Average	V	26.94	4.75	42.48	54.00	11.52
Test Data for High Channel								
2 483.541	27.74	Peak	H	27.47	4.39	59.60	74.00	14.40
2 483.508	14.69	Average	H	27.47	4.39	46.55	54.00	7.45
2 483.723	25.05	Peak	V	27.47	4.39	56.91	74.00	17.09
2 483.508	11.30	Average	V	27.47	4.39	43.16	54.00	10.84

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss



Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.1.3 Test data for 802.11n_HT20 WLAN Mode

9.6.1.3.1 Test data for Multiple Transmit

- . Test Date : June 07, 2019 ~ June 13, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 100.00 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
2 389.960	31.22	Peak	H	26.94	4.75	62.91	74.00	11.09
2 389.960	15.27	Average	H	26.94	4.75	46.96	54.00	7.04
2 389.960	28.33	Peak	V	26.94	4.75	60.02	74.00	13.98
2 389.960	12.09	Average	V	26.94	4.75	43.78	54.00	10.22
Test Data for High Channel								
2 483.508	33.21	Peak	H	27.47	4.39	65.07	74.00	8.93
2 483.508	16.67	Average	H	27.47	4.39	48.53	54.00	5.47
2 483.508	28.75	Peak	V	27.47	4.39	60.61	74.00	13.39
2 483.508	12.29	Average	V	27.47	4.39	44.15	54.00	9.85

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss



Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.1.4 Test data for 802.11n_HT40 WLAN Mode

9.6.1.4.1 Test data for Multiple Transmit

- Test Date : June 07, 2019 ~ June 13, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 100.00 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
2 384.605	27.13	Peak	H	26.94	4.75	58.82	74.00	15.18
2 387.562	13.25	Average	H	26.94	4.75	44.94	54.00	9.06
2 384.605	24.03	Peak	V	26.94	4.75	55.72	74.00	18.28
2 384.685	8.94	Average	V	26.94	4.75	40.63	54.00	13.37
Test Data for High Channel								
2 483.508	25.52	Peak	H	27.47	4.39	57.38	74.00	16.62
2 483.508	13.98	Average	H	27.47	4.39	45.84	54.00	8.16
2 484.530	22.08	Peak	V	27.47	4.39	53.94	74.00	20.06
2 483.508	10.02	Average	V	27.47	4.39	41.88	54.00	12.12

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss



Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.2 Spurious & Harmonic Radiated Emission

9.6.2.1 Test data for 802.11b WLAN Mode

9.6.2.1.1 Test data for Antenna 0

- Test Date : June 07, 2019 ~ June 13, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Duty Cycle : 100.00 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
4 824.00	20.66	Peak	H	30.84	7.28	58.78	74.00	15.22
4 824.00	9.60	Average	H	30.84	7.28	47.72	54.00	6.28
4 824.00	19.13	Peak	V	30.84	7.28	57.25	74.00	16.75
4 824.00	8.43	Average	V	30.84	7.28	46.55	54.00	7.45
Test Data for Middle Channel								
4 874.00	20.67	Peak	H	30.01	7.42	58.10	74.00	15.90
4 874.00	7.78	Average	H	30.01	7.42	45.21	54.00	8.79
4 874.00	19.69	Peak	V	30.01	7.42	57.12	74.00	16.88
4 874.00	9.05	Average	V	30.01	7.42	46.48	54.00	7.52
Test Data for High Channel								
4 924.00	20.36	Peak	H	31.15	7.40	58.91	74.00	15.09
4 924.00	9.59	Average	H	31.15	7.40	48.14	54.00	5.86
4 924.00	21.13	Peak	V	31.15	7.40	59.68	74.00	14.32
4 924.00	8.98	Average	V	31.15	7.40	47.53	54.00	6.47

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss


Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.2.1.2 Test data for Antenna 1

- . Test Date : June 07, 2019 ~ June 13, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Frequency range : 1 GHz ~ 26.5 GHz
- . Measurement distance : 3 m
- . Duty Cycle : 100.00 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
4 824.00	20.60	Peak	H	30.84	7.28	58.72	74.00	15.28
4 824.00	8.35	Average	H	30.84	7.28	46.47	54.00	7.53
4 824.00	19.08	Peak	V	30.84	7.28	57.20	74.00	16.80
4 824.00	7.85	Average	V	30.84	7.28	45.97	54.00	8.03
Test Data for Middle Channel								
4 874.00	20.96	Peak	H	30.01	7.42	58.39	74.00	15.61
4 874.00	8.40	Average	H	30.01	7.42	45.83	54.00	8.17
4 874.00	20.99	Peak	V	30.01	7.42	58.42	74.00	15.58
4 874.00	8.70	Average	V	30.01	7.42	46.13	54.00	7.87
Test Data for High Channel								
4 924.00	19.59	Peak	H	31.15	7.40	58.14	74.00	15.86
4 924.00	7.89	Average	H	31.15	7.40	46.44	54.00	7.56
4 924.00	19.97	Peak	V	31.15	7.40	58.52	74.00	15.48
4 924.00	8.34	Average	V	31.15	7.40	46.89	54.00	7.11

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss


Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.2.2 Test data for 802.11g WLAN Mode

9.6.2.2.1 Test data for Antenna 0

- Test Date : June 07, 2019 ~ June 13, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Duty Cycle : 100.00 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
4 824.00	21.36	Peak	H	30.84	7.28	59.48	74.00	14.52
4 824.00	8.88	Average	H	30.84	7.28	47.00	54.00	7.00
4 824.00	19.48	Peak	V	30.84	7.28	57.60	74.00	16.40
4 824.00	7.53	Average	V	30.84	7.28	45.65	54.00	8.35
Test Data for Middle Channel								
4 874.00	20.59	Peak	H	30.01	7.42	58.02	74.00	15.98
4 874.00	8.47	Average	H	30.01	7.42	45.90	54.00	8.10
4 874.00	20.85	Peak	V	30.01	7.42	58.28	74.00	15.72
4 874.00	7.88	Average	V	30.01	7.42	45.31	54.00	8.69
Test Data for High Channel								
4 924.00	20.62	Peak	H	31.15	7.40	59.17	74.00	14.83
4 924.00	8.62	Average	H	31.15	7.40	47.17	54.00	6.83
4 924.00	20.35	Peak	V	31.15	7.40	58.90	74.00	15.10
4 924.00	8.80	Average	V	31.15	7.40	47.35	54.00	6.65

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss}$$

Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.2.2.2 Test data for Antenna 1

- . Test Date : June 07, 2019 ~ June 13, 2019
- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Frequency range : 1 GHz ~ 26.5 GHz
- . Measurement distance : 3 m
- . Duty Cycle : 100.00 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
4 824.00	21.03	Peak	H	30.84	7.28	59.15	74.00	14.85
4 824.00	9.49	Average	H	30.84	7.28	47.61	54.00	6.39
4 824.00	18.50	Peak	V	30.84	7.28	56.62	74.00	17.38
4 824.00	7.72	Average	V	30.84	7.28	45.84	54.00	8.16
Test Data for Middle Channel								
4 874.00	19.64	Peak	H	30.01	7.42	57.07	74.00	16.93
4 874.00	7.77	Average	H	30.01	7.42	45.20	54.00	8.80
4 874.00	19.44	Peak	V	30.01	7.42	56.87	74.00	17.13
4 874.00	8.82	Average	V	30.01	7.42	46.25	54.00	7.75
Test Data for High Channel								
4 924.00	19.80	Peak	H	31.15	7.40	58.35	74.00	15.65
4 924.00	9.56	Average	H	31.15	7.40	48.11	54.00	5.89
4 924.00	20.57	Peak	V	31.15	7.40	59.12	74.00	14.88
4 924.00	7.52	Average	V	31.15	7.40	46.07	54.00	7.93

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss


Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.2.3 Test data for 802.11n_HT20 WLAN Mode

9.6.2.3.1 Test data for Multiple Transmit

- Test Date : June 07, 2019 ~ June 13, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Duty Cycle : 100.00 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
4 824.00	19.37	Peak	H	30.84	7.28	57.49	74.00	16.51
4 824.00	8.11	Average	H	30.84	7.28	46.23	54.00	7.77
4 824.00	19.05	Peak	V	30.84	7.28	57.17	74.00	16.83
4 824.00	6.76	Average	V	30.84	7.28	44.88	54.00	9.12
Test Data for Middle Channel								
4 874.00	19.52	Peak	H	30.01	7.42	56.95	74.00	17.05
4 874.00	8.11	Average	H	30.01	7.42	45.54	54.00	8.46
4 874.00	20.96	Peak	V	30.01	7.42	58.39	74.00	15.61
4 874.00	8.81	Average	V	30.01	7.42	46.24	54.00	7.76
Test Data for High Channel								
4 924.00	19.93	Peak	H	31.15	7.40	58.48	74.00	15.52
4 924.00	8.10	Average	H	31.15	7.40	46.65	54.00	7.35
4 924.00	20.17	Peak	V	31.15	7.40	58.72	74.00	15.28
4 924.00	8.12	Average	V	31.15	7.40	46.67	54.00	7.33

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss}$$


Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.2.4 Test data for 802.11n_HT40 WLAN Mode

9.6.2.4.1 Test data for Multiple Transmit

- Test Date : June 07, 2019 ~ June 13, 2019
- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Duty Cycle : 100.00 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
4 844.00	19.53	Peak	H	30.84	7.28	57.65	74.00	16.35
4 844.00	8.67	Average	H	30.84	7.28	46.79	54.00	7.21
4 844.00	19.25	Peak	V	30.84	7.28	57.37	74.00	16.63
4 844.00	6.94	Average	V	30.84	7.28	45.06	54.00	8.94
Test Data for Middle Channel								
4 874.00	20.62	Peak	H	30.01	7.42	58.05	74.00	15.95
4 874.00	7.76	Average	H	30.01	7.42	45.19	54.00	8.81
4 874.00	19.89	Peak	V	30.01	7.42	57.32	74.00	16.68
4 874.00	7.89	Average	V	30.01	7.42	45.32	54.00	8.68
Test Data for High Channel								
4 904.00	21.05	Peak	H	31.15	7.40	59.60	74.00	14.40
4 904.00	8.98	Average	H	31.15	7.40	47.53	54.00	6.47
4 904.00	20.69	Peak	V	31.15	7.40	59.24	74.00	14.76
4 904.00	9.39	Average	V	31.15	7.40	47.94	54.00	6.06

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss}$$


 Tested by: Hyung-Kwon, Oh / Assistant Manager

10. PEAK POWER SPECTRUL DENSITY

10.1 Operating environment

Temperature : 23 °C
Relative humidity : 41 % R.H.

10.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$, the video bandwidth is set to 3 times the resolution bandwidth.



10.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

10.4 Test data for 802.11b WLAN Mode

10.4.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Test Result : Pass

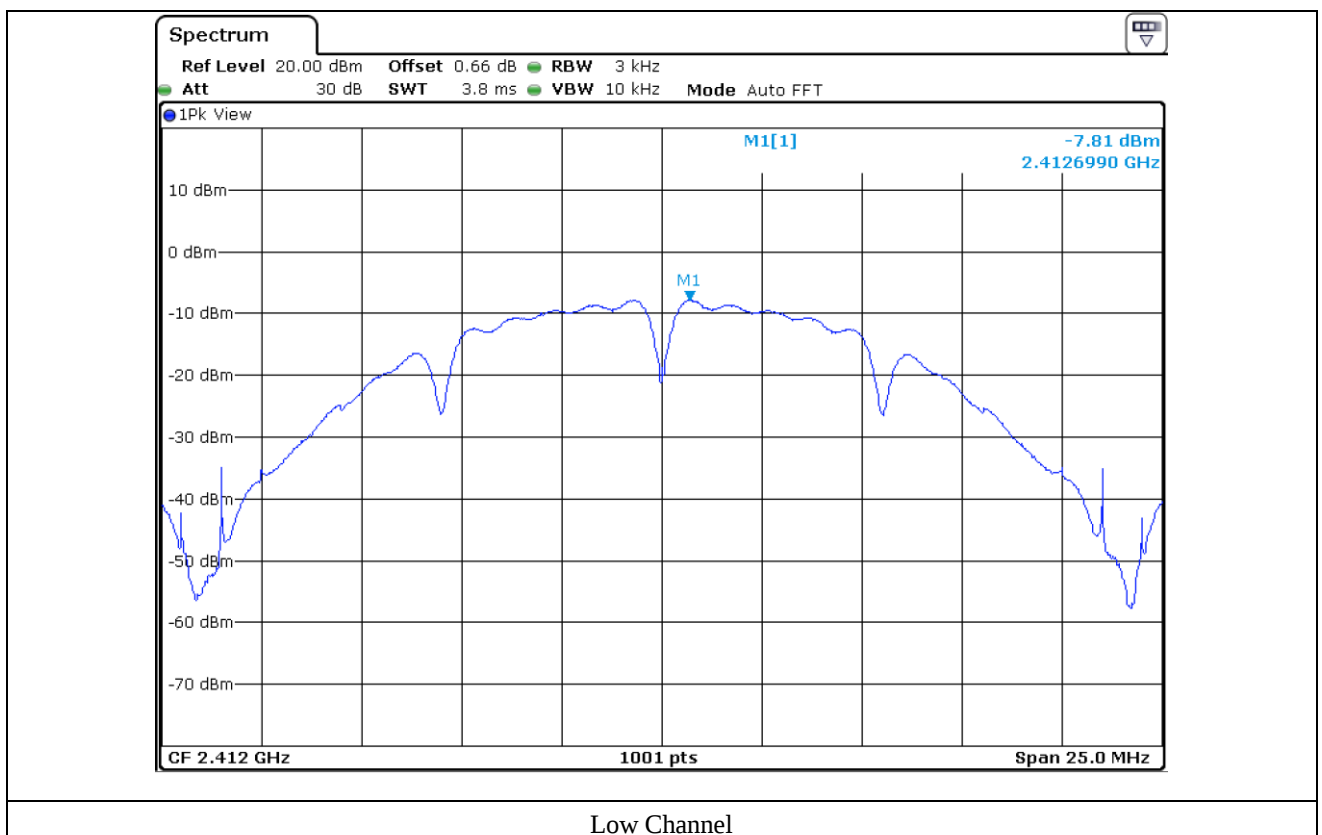
-. Operating Condition : Continuous transmitting mode

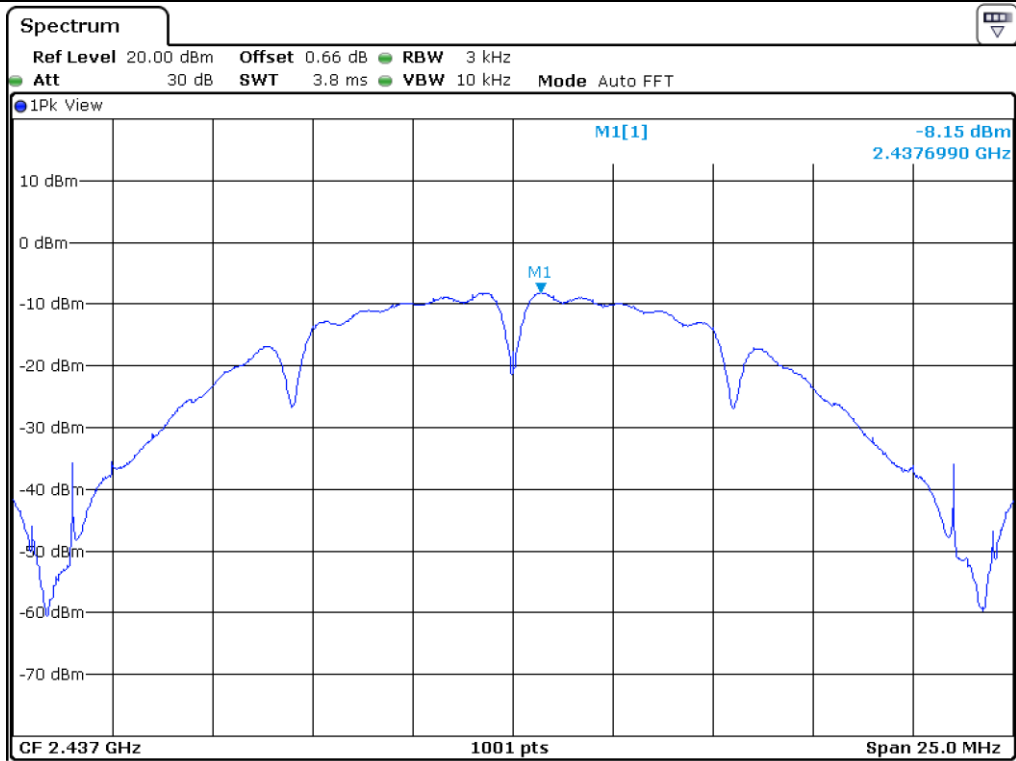
CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 412.00	-7.81	8.00	15.81
Middle	2 437.00	-8.15	8.00	16.15
High	2 462.00	-8.32	8.00	16.32

Remark. Margin = Limit – Measured value

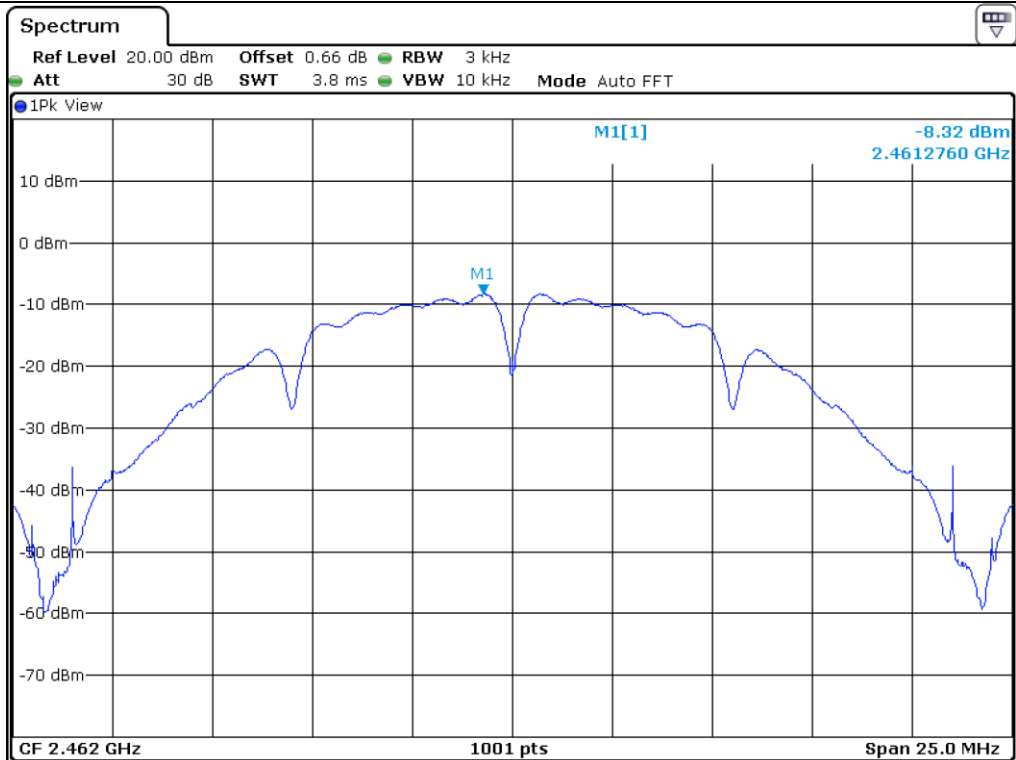


Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

10.4.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 2019

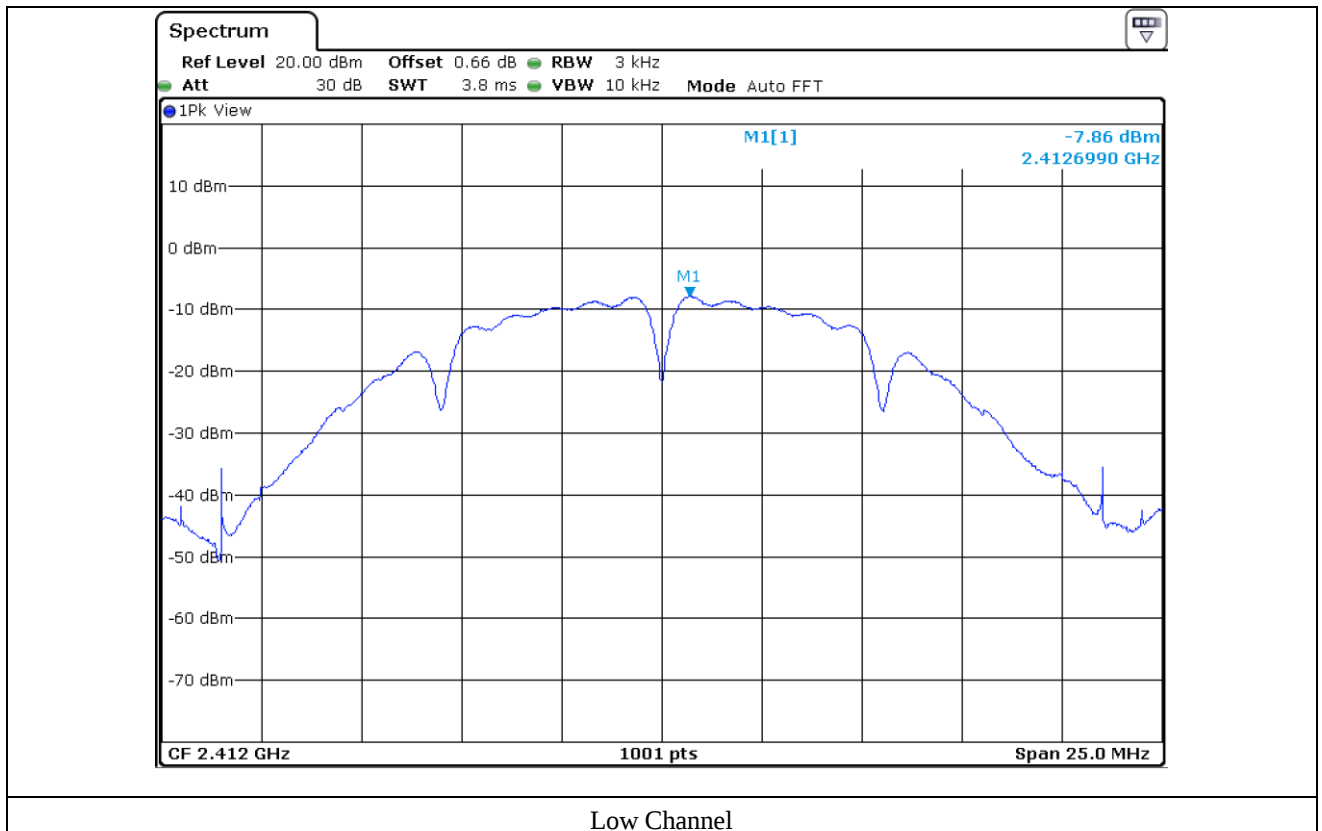
-. Test Result : Pass

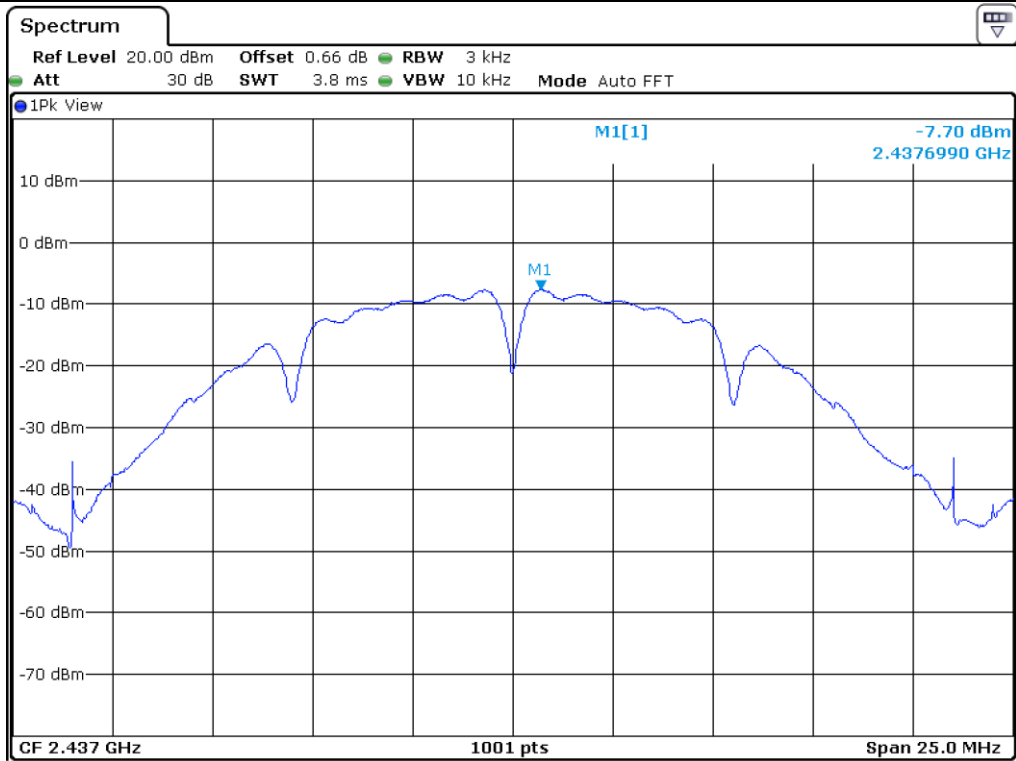
-. Operating Condition : Continuous transmitting mode

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 412.00	-7.86	8.00	15.86
Middle	2 437.00	-7.70	8.00	15.70
High	2 462.00	-7.91	8.00	15.91

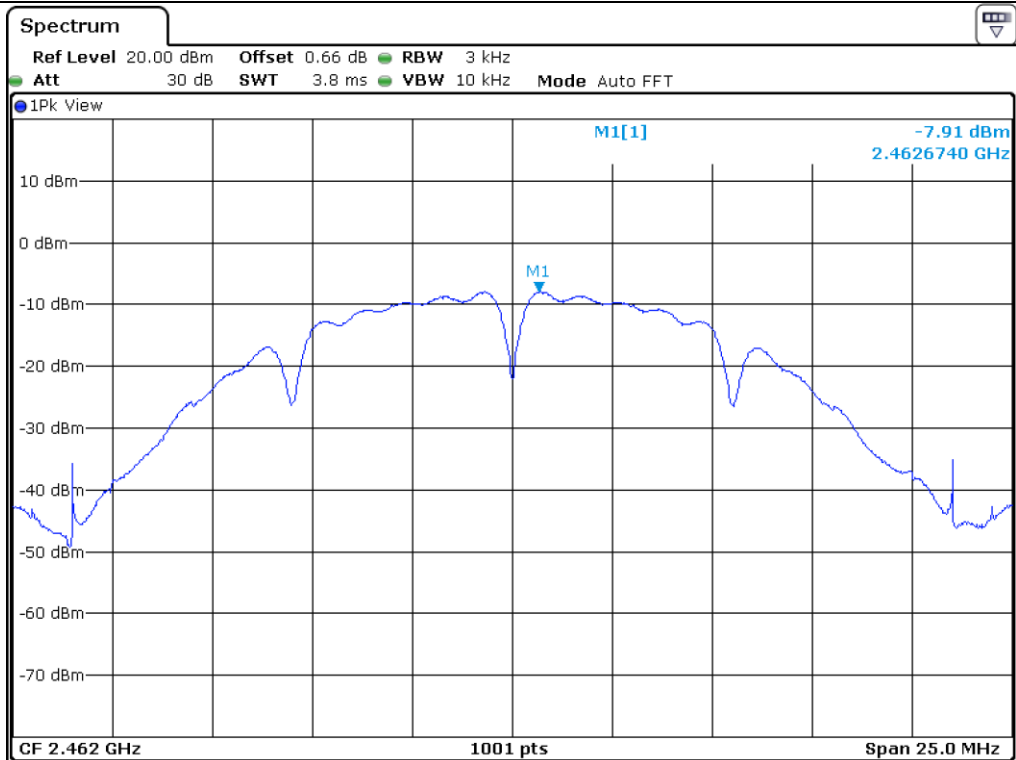
Remark. Margin = Limit – Measured value

Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

10.5 Test data for 802.11g WLAN Mode

10.5.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Test Result : Pass

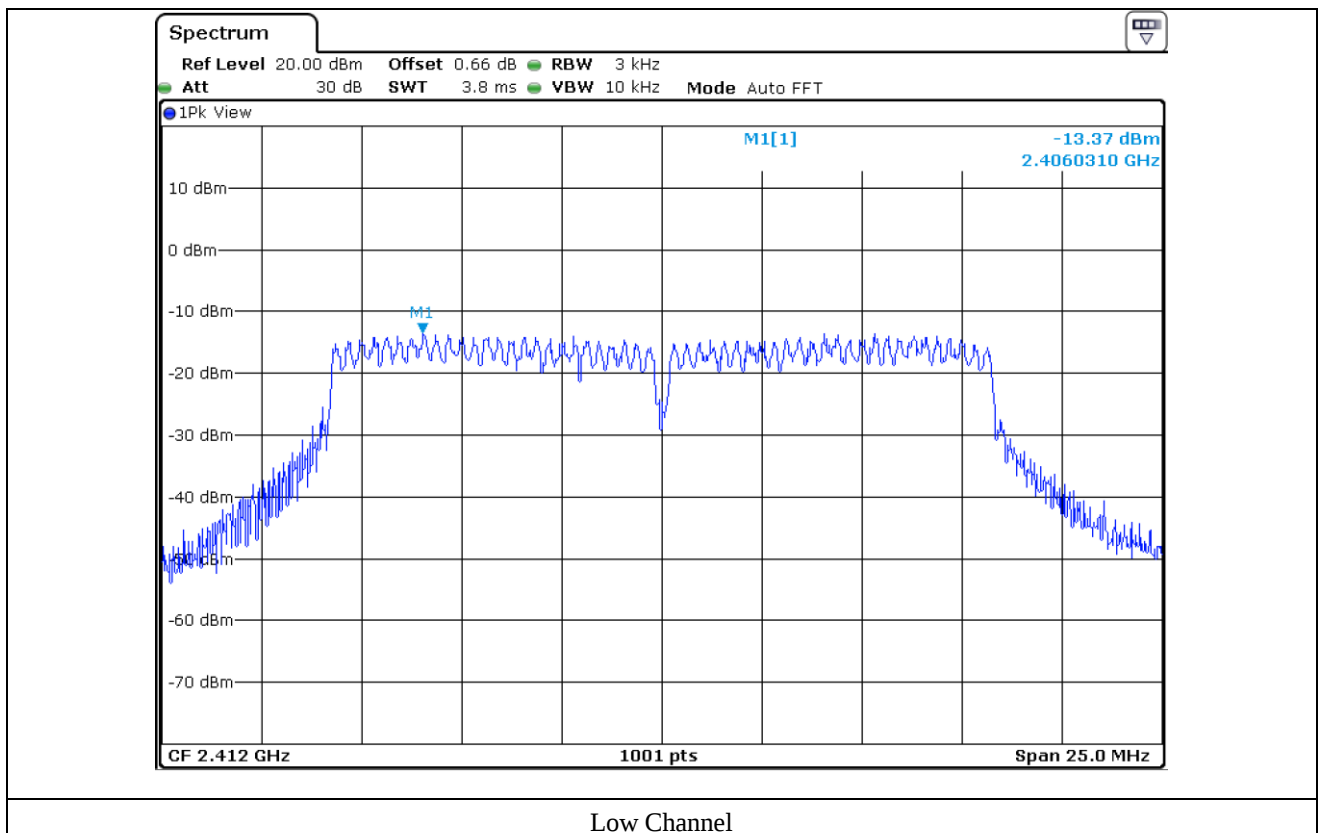
-. Operating Condition : Continuous transmitting mode

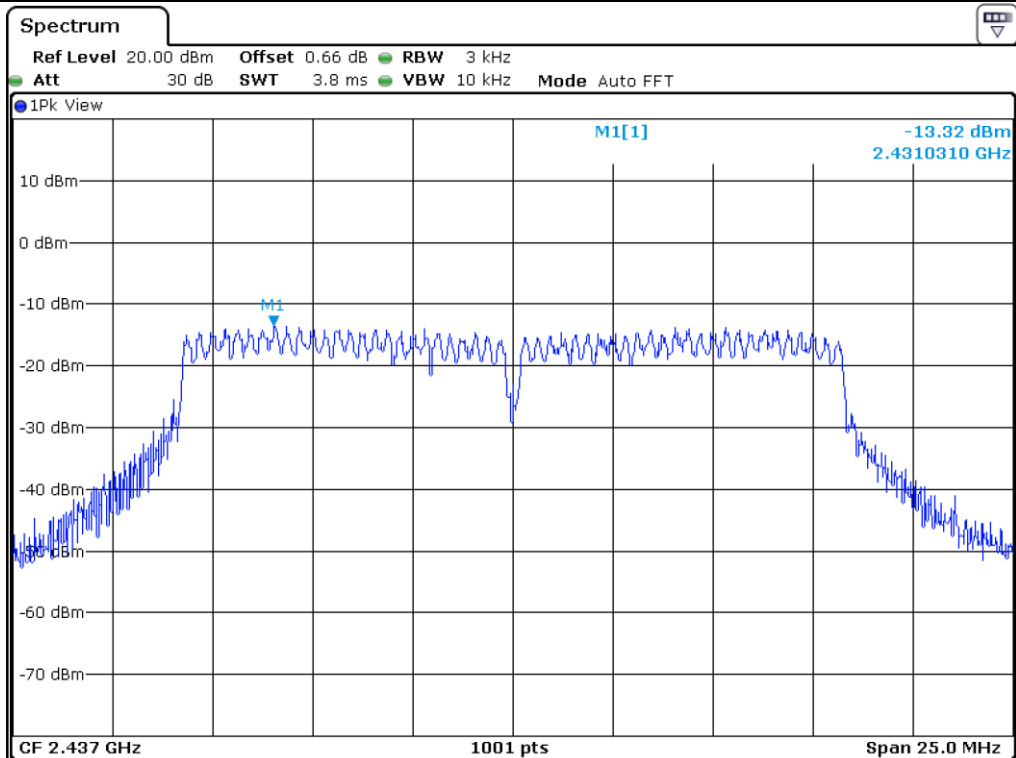
CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 412.00	-13.37	8.00	21.37
Middle	2 437.00	-13.32	8.00	21.32
High	2 462.00	-13.94	8.00	21.94

Remark. Margin = Limit – Measured value

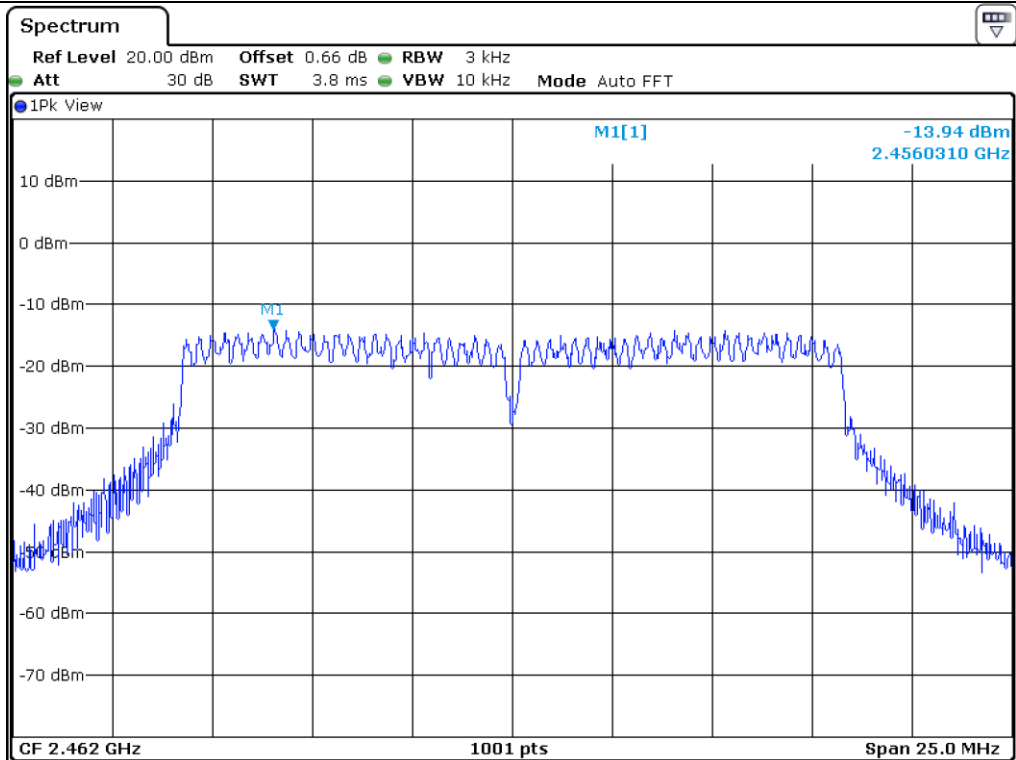


Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

10.5.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Test Result : Pass

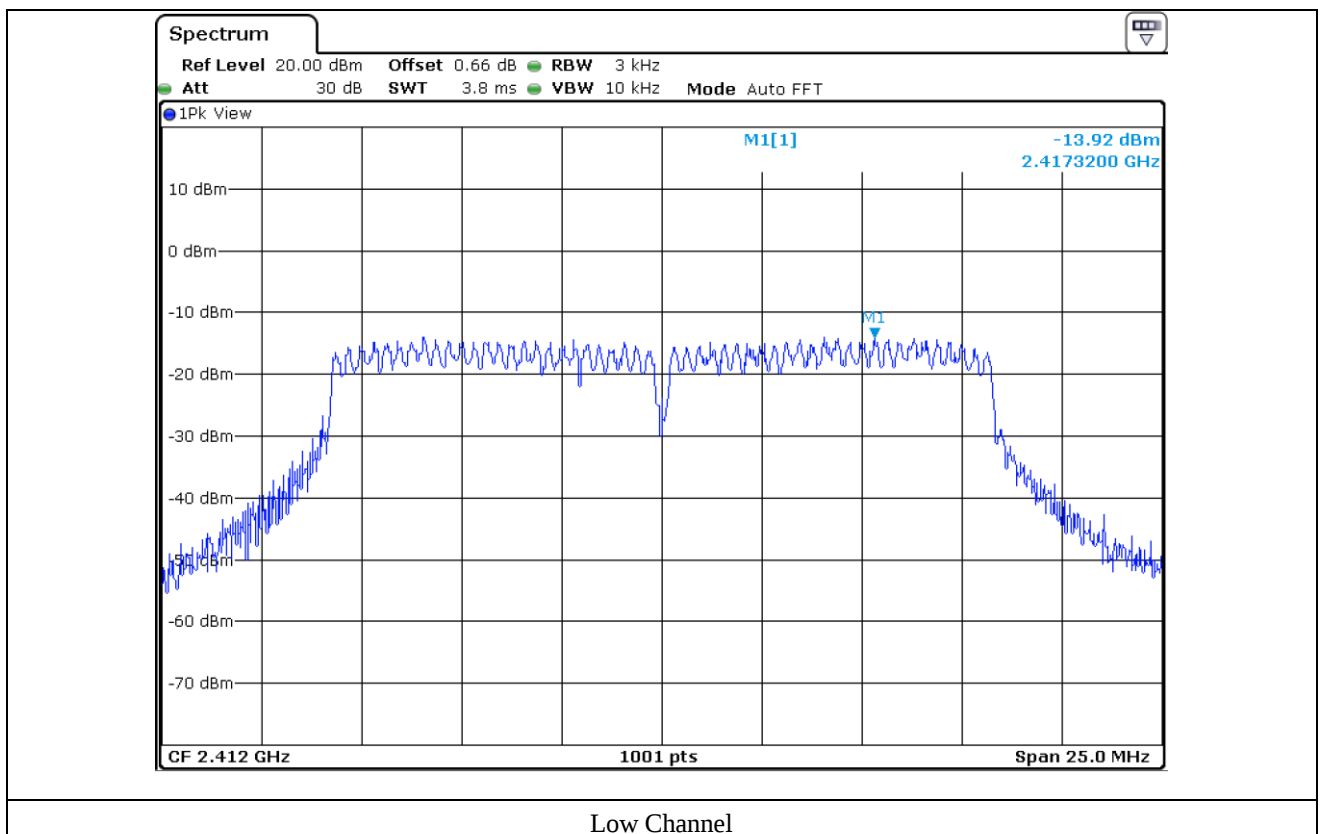
-. Operating Condition : Continuous transmitting mode

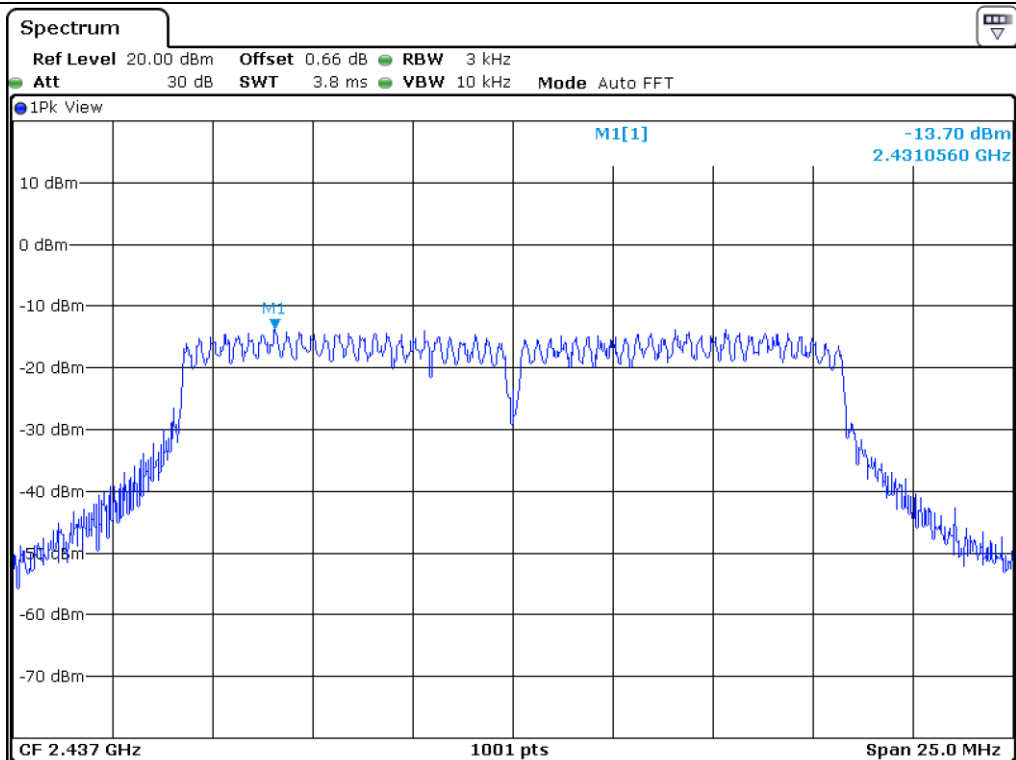
CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 412.00	-13.92	8.00	21.92
Middle	2 437.00	-13.70	8.00	21.70
High	2 462.00	-14.12	8.00	22.12

Remark. Margin = Limit – Measured value

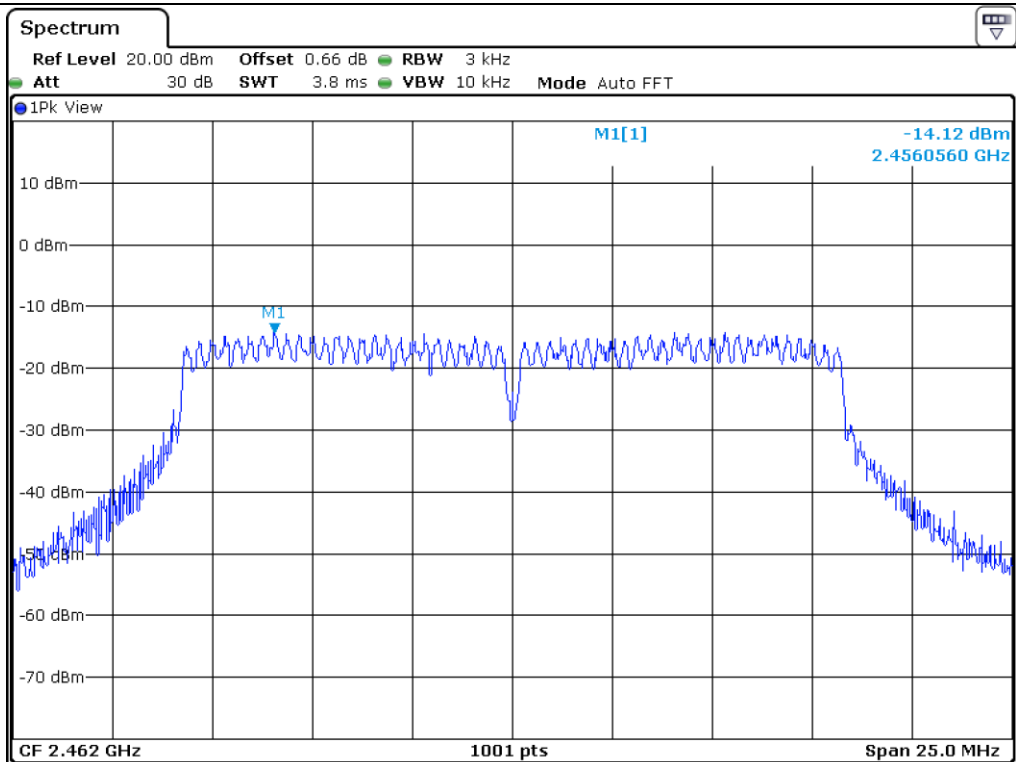


Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

10.6 Test data for 802.11n_HT20 WLAN Mode

10.6.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 2019

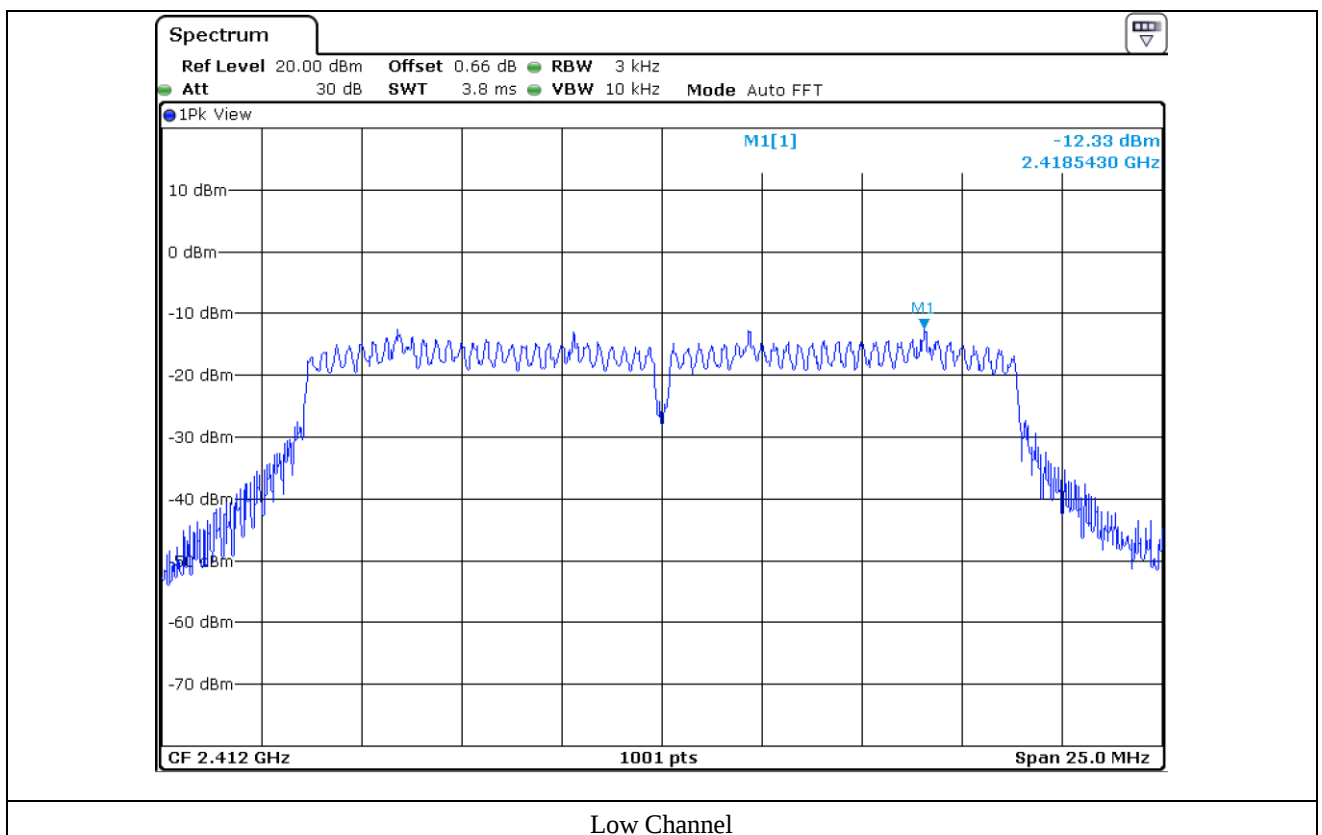
-. Test Result : Pass

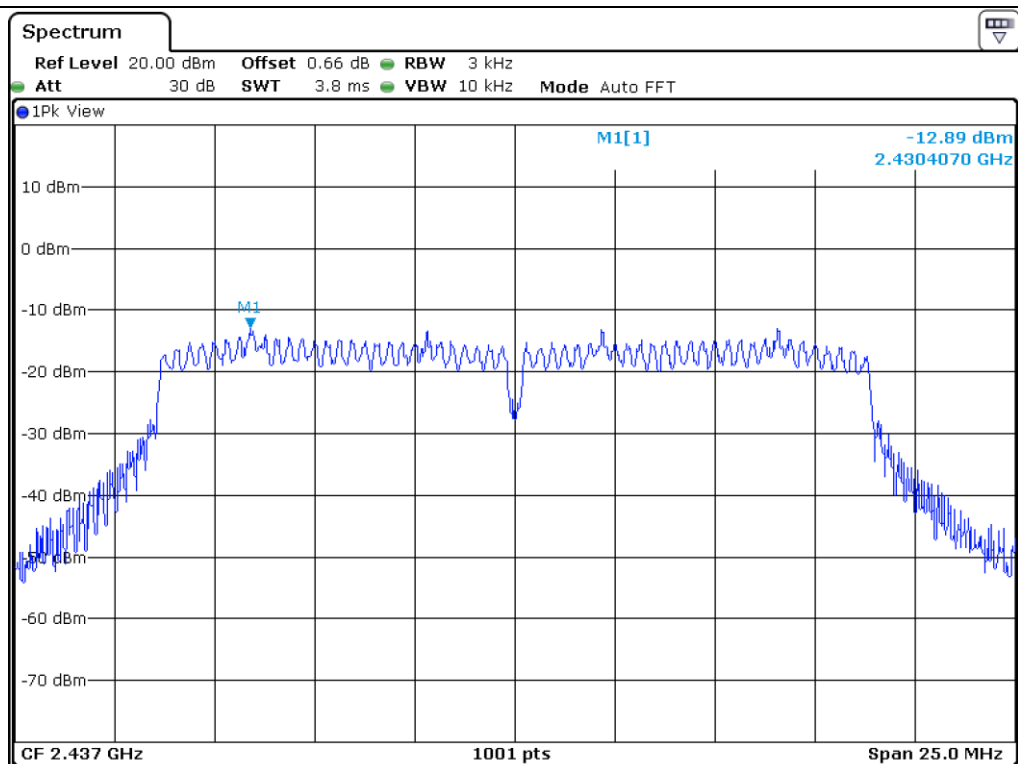
-. Operating Condition : Continuous transmitting mode

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 412.00	-12.33	8.00	20.33
Middle	2 437.00	-12.89	8.00	20.89
High	2 462.00	-13.39	8.00	21.39

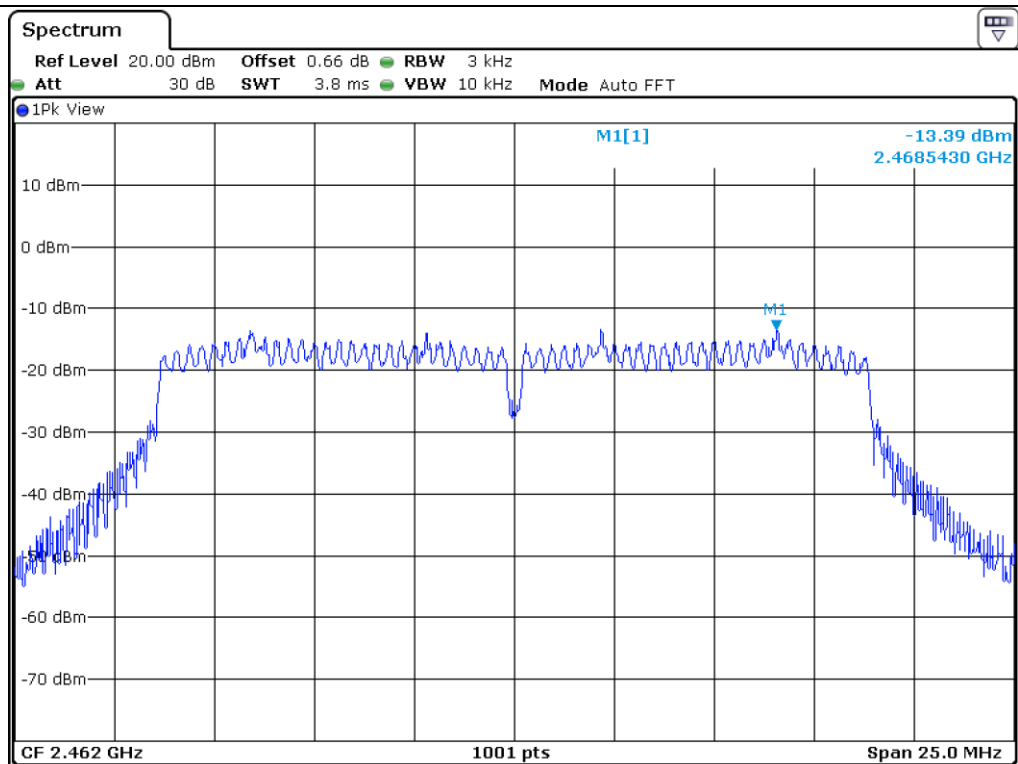
Remark. Margin = Limit – Measured value

Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

10.6.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Test Result : Pass

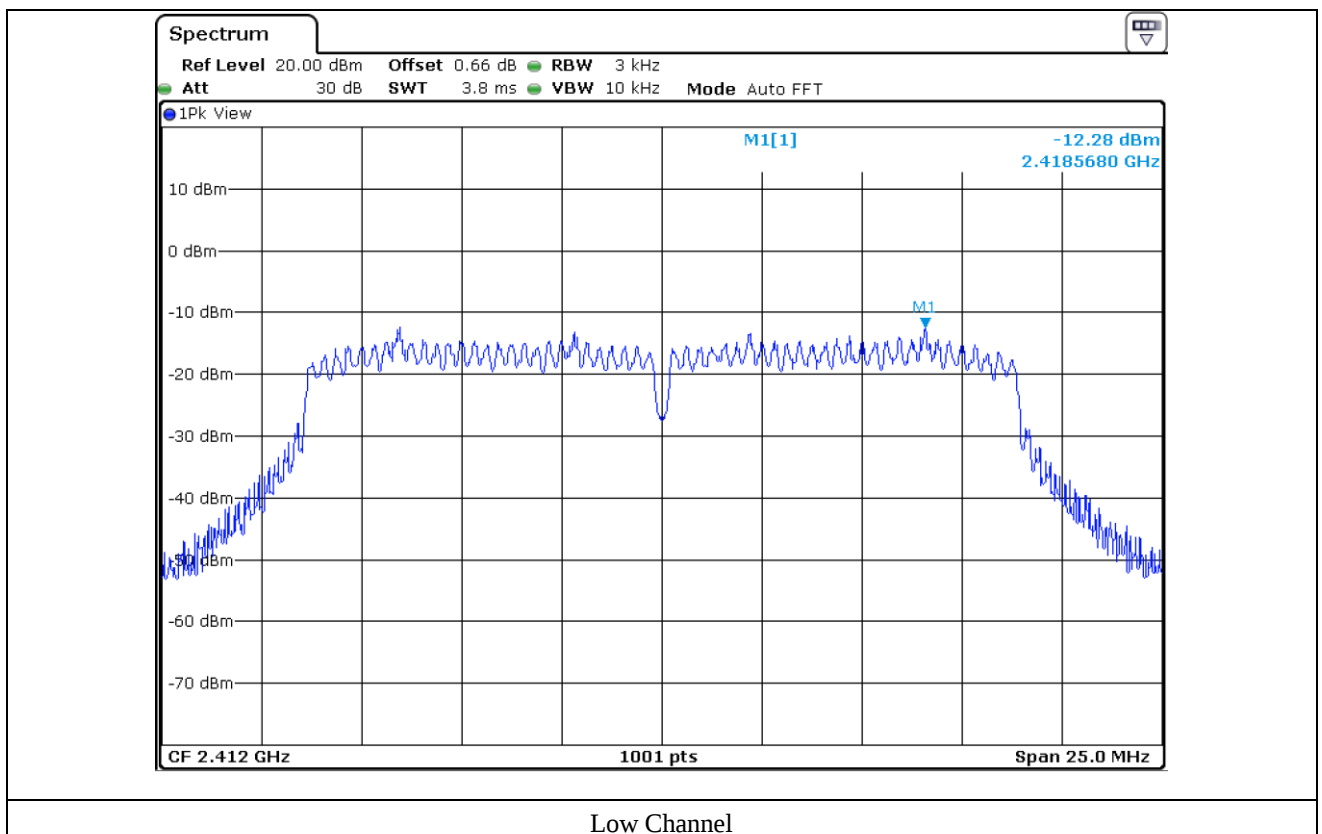
-. Operating Condition : Continuous transmitting mode

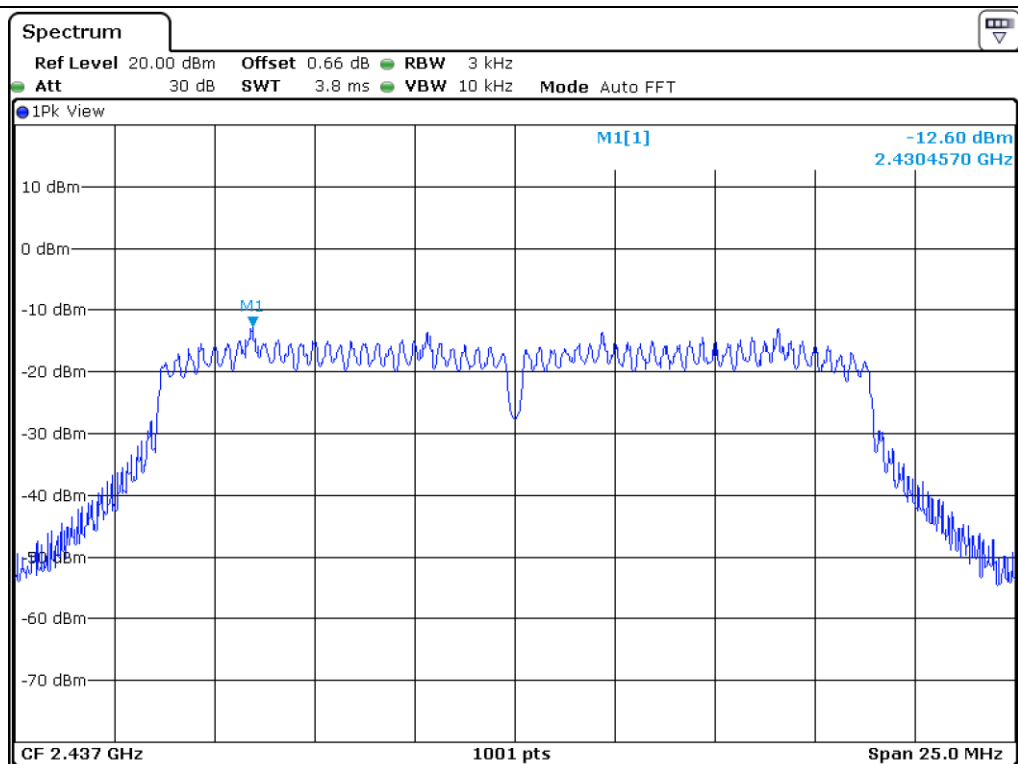
CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 412.00	-12.28	8.00	20.28
Middle	2 437.00	-12.60	8.00	20.60
High	2 462.00	-12.80	8.00	20.80

Remark. Margin = Limit – Measured value

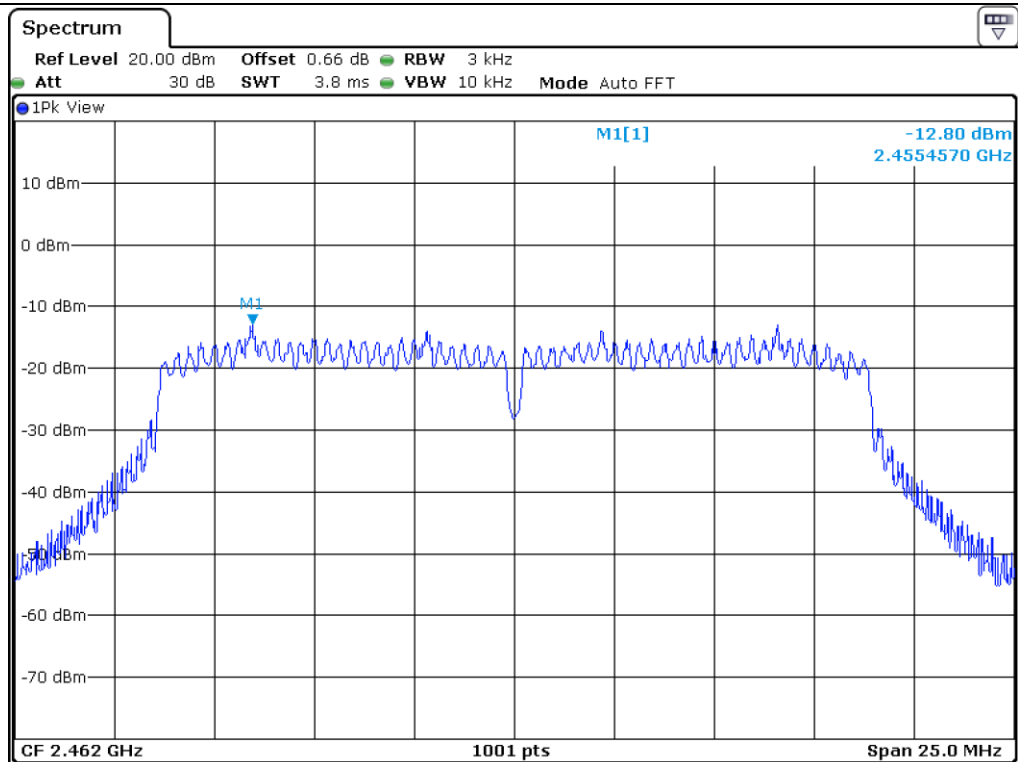


Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

10.6.3 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Test Result : Pass

-. Operating Condition : Continuous transmitting mode

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 412.00	-9.29	8.00	17.29
Middle	2 437.00	-9.73	8.00	17.73
High	2 462.00	-10.07	8.00	18.07

Remark 1 : Margin = Limit – Measured value

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna 0 Power Density}/10)} + 10^{(\text{Antenna 1 Power Density}/10)})$



Tested by: Hyung-Kwon, Oh / Assistant Manager

10.7 Test data for 802.11n_HT40 WLAN Mode

10.7.1 Test data for Antenna 0

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Test Result : Pass

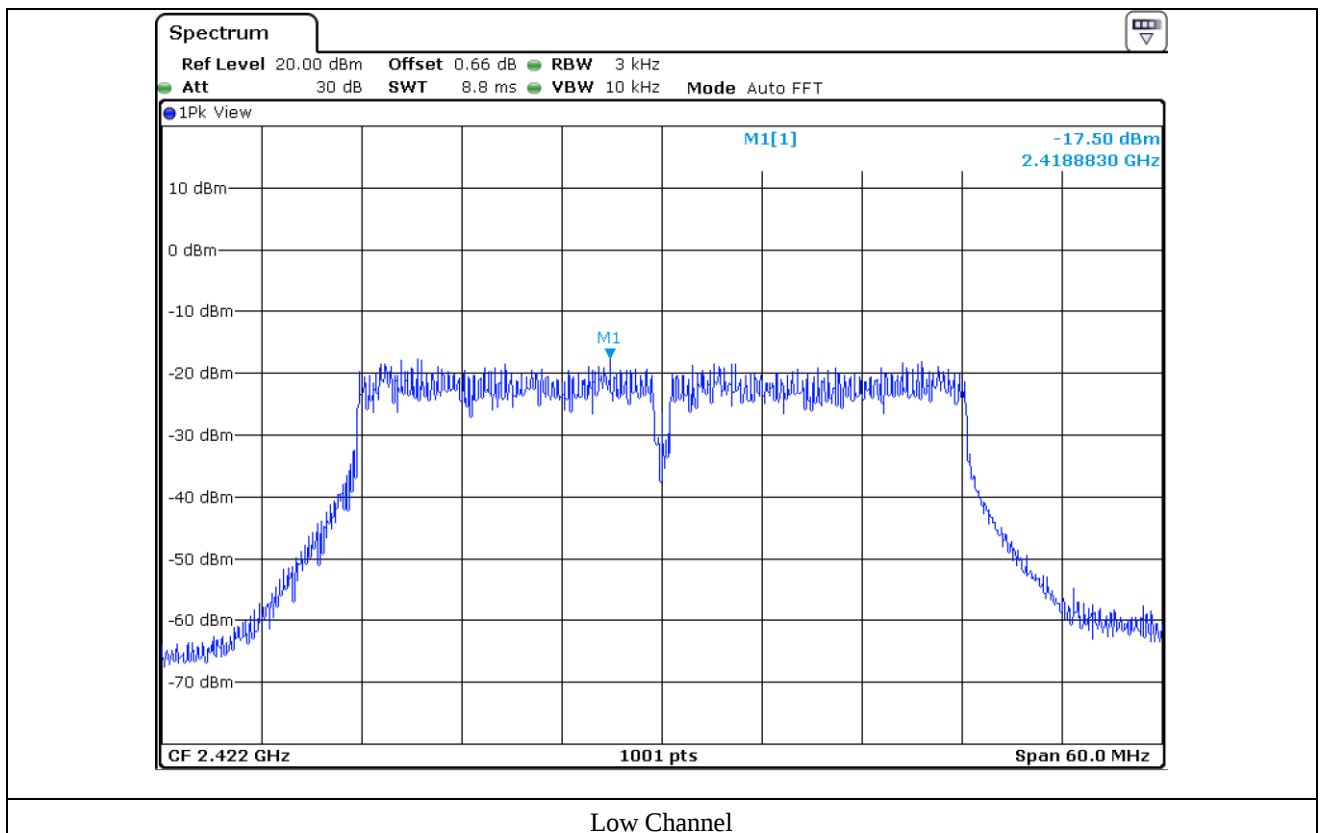
-. Operating Condition : Continuous transmitting mode

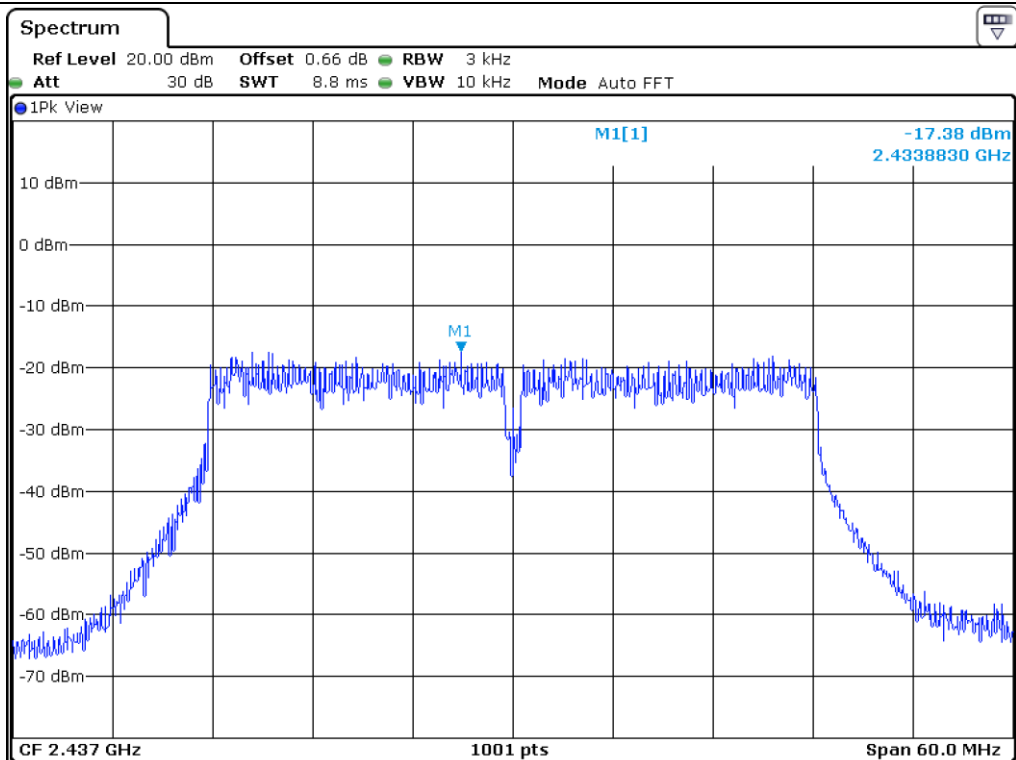
CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 422.00	-17.50	8.00	25.50
Middle	2 437.00	-17.38	8.00	25.38
High	2 452.00	-17.75	8.00	25.75

Remark. Margin = Limit – Measured value

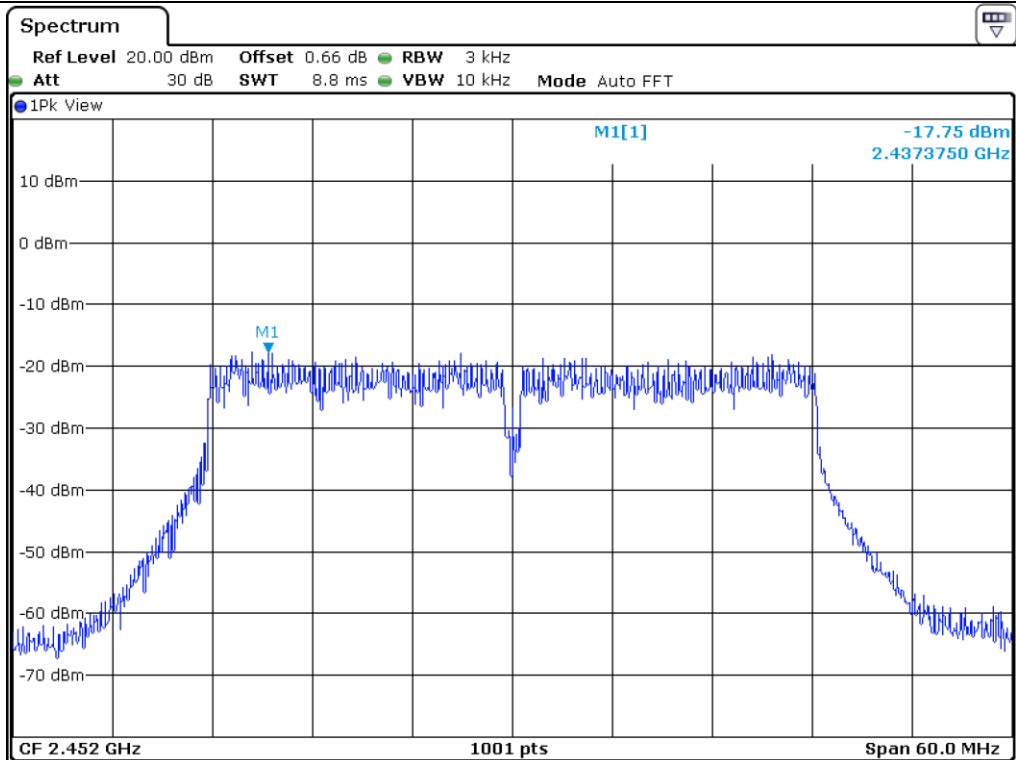


Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

10.7.2 Test data for Antenna 1

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Test Result : Pass

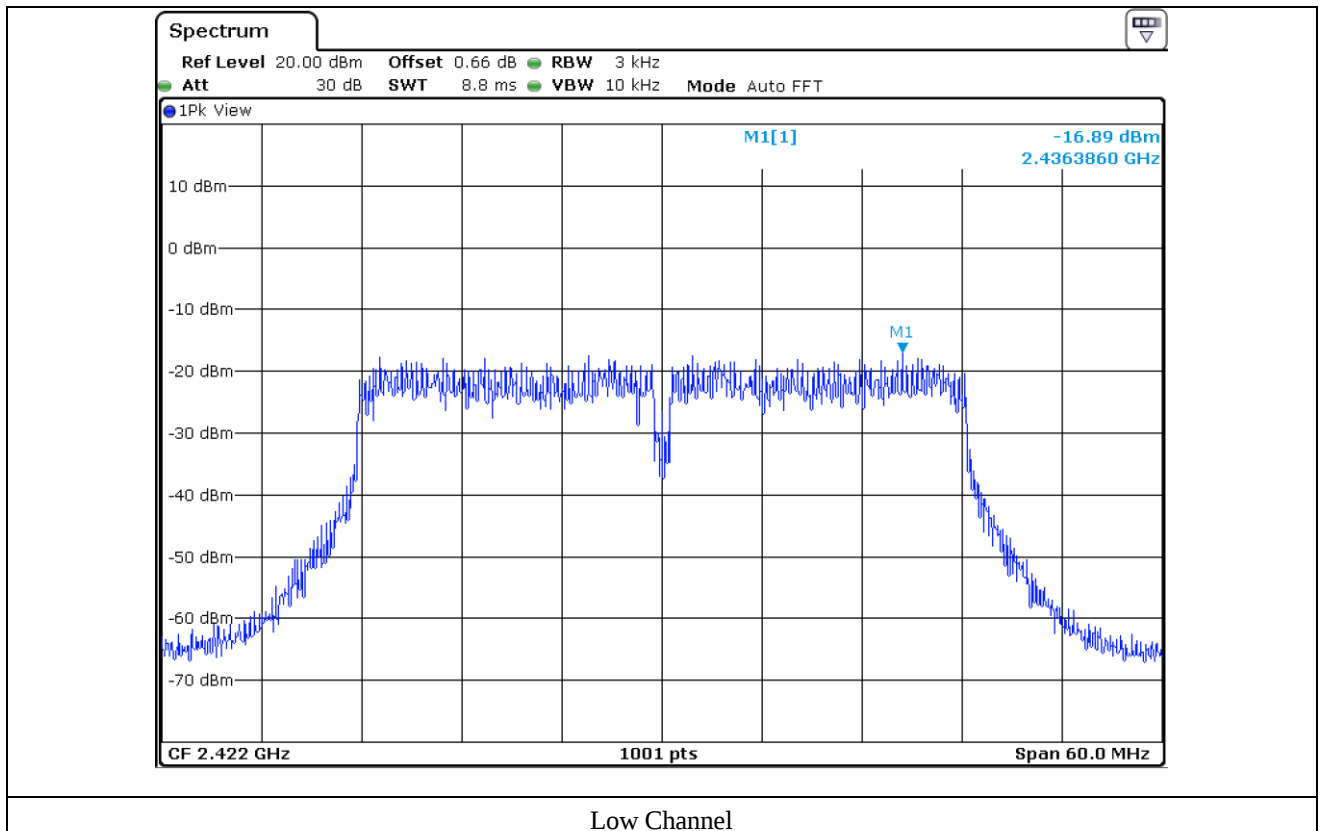
-. Operating Condition : Continuous transmitting mode

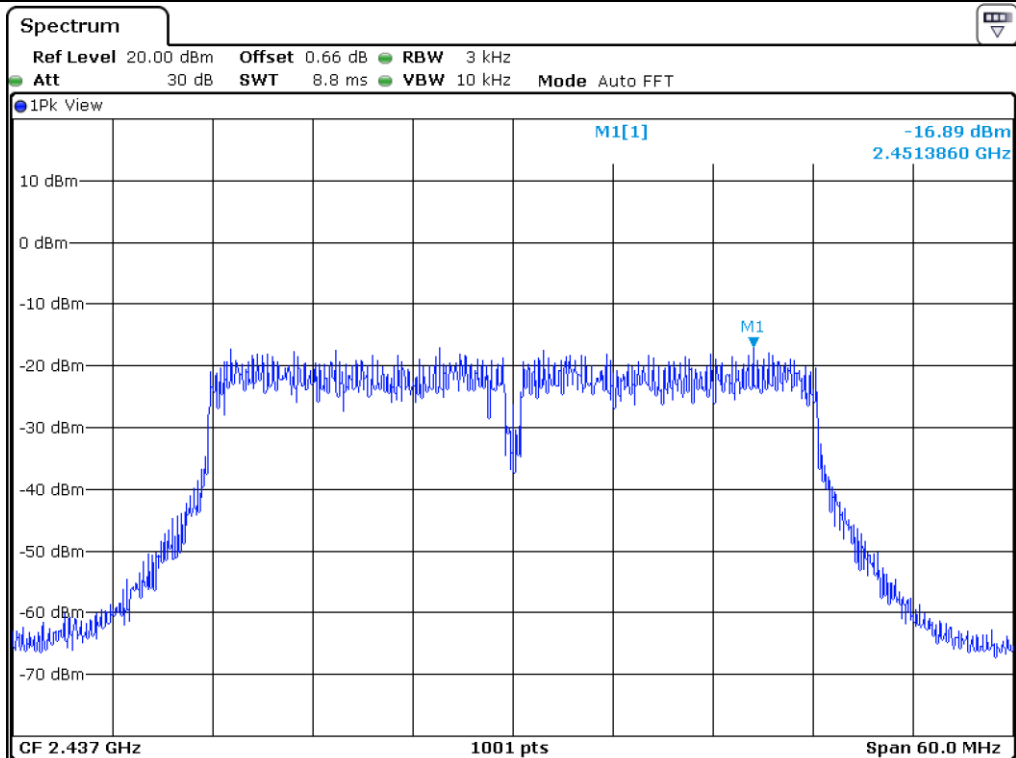
CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 422.00	-16.89	8.00	24.89
Middle	2 437.00	-16.89	8.00	24.89
High	2 452.00	-17.18	8.00	25.18

Remark. Margin = Limit – Measured value

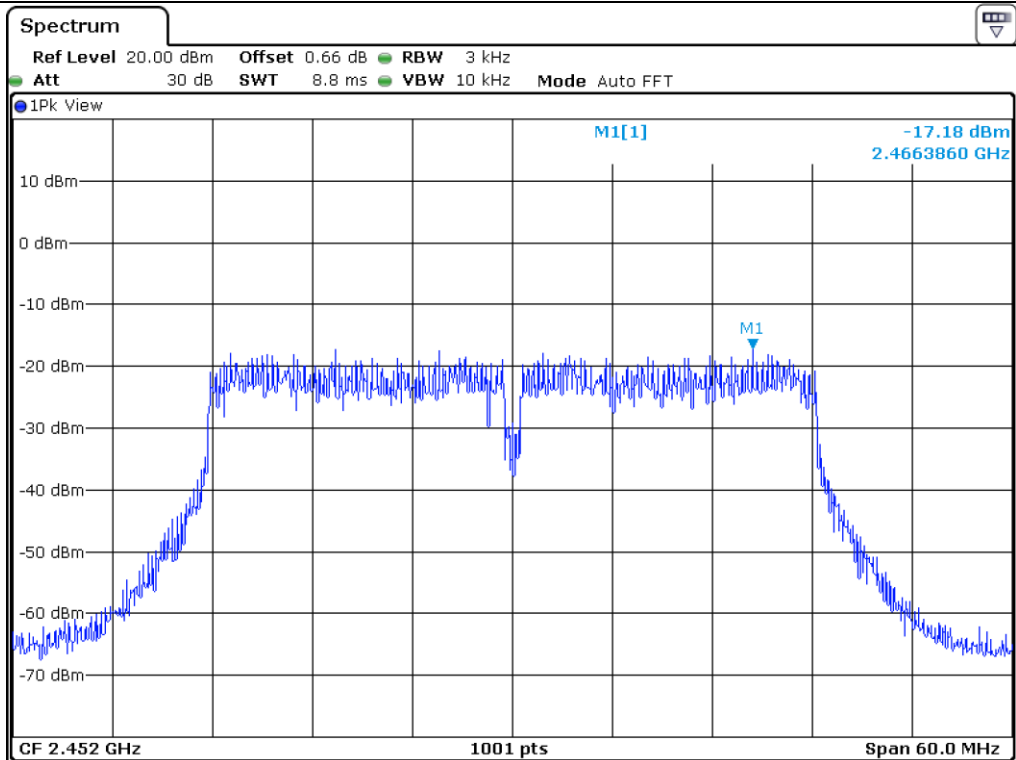


Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

10.7.3 Test data for Multiple Transmit

-. Test Date : June 07, 2019 ~ June 13, 2019

-. Test Result : Pass

-. Operating Condition : Continuous transmitting mode

CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 422.00	-14.17	8.00	22.17
Middle	2 437.00	-14.12	8.00	22.12
High	2 452.00	-14.45	8.00	22.45

Remark 1 : Margin = Limit – Measured value

Remark 2 : Calculated Power Density = $10\log(10^{(\text{Antenna 0 Power Density}/10)} + 10^{(\text{Antenna 1 Power Density}/10)})$



Tested by: Hyung-Kwon, Oh / Assistant Manager

11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 25 °C
Relative humidity : 44 % R.H.

11.2 Test set-up

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

11.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV40	Rohde & Schwarz	Signal Analyzer	101009	Mar. 11, 2019 (1Y)
■ -	ESR	Rohde & Schwarz	EMI Test Receiver	101470	Oct. 22, 2018 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312545	Mar. 18, 2019 (1Y)
■ -	BBV9718B	Schwarzbeck	Amplifier	310	Mar. 20, 2019 (1Y)
■	SCU40A	Rohde & Schwarz	Signal Conditioning unit	100436	Mar. 11, 2019 (1Y)
■ -	DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
■	HLA 6121	TESEQ GmbH	Loop Antenna	50841	Aug. 29, 2019 (1Y)
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-419	Aug. 09, 2018 (2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Aug. 16, 2017 (2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 16, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

11.4 Test data

11.4.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 44 % R.H.

Temperature: 25 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

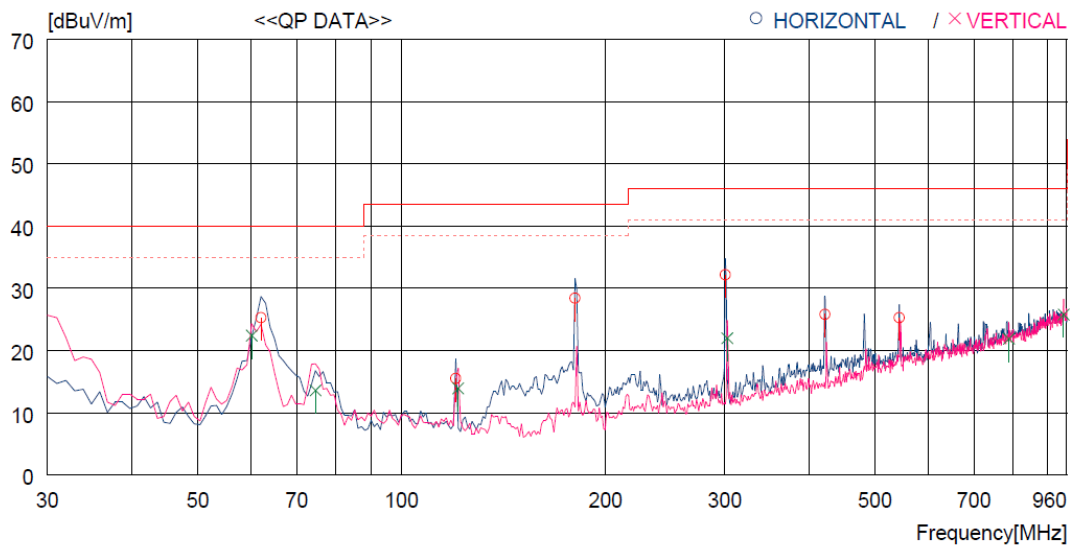
Result : PASSED

EUT EUT : 802.11 a/b/g/n/ac Wi-Fi Module

Date: June 07, 2019 ~ June 13, 2019

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-Antenna 0, Antenna 1 and Multiple transmit tested, but the worst data were recorded.



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	62.010	43.8	12.6	2.0	33.1	25.3	40.0	14.7	200	174
2	120.210	35.5	10.1	2.9	33.0	15.5	43.5	28.0	200	102
3	180.350	48.6	9.4	3.5	33.1	28.4	43.5	15.1	200	192
4	300.630	47.4	13.3	4.5	33.0	32.2	46.0	13.8	100	203
5	421.881	36.9	16.7	5.4	33.2	25.8	46.0	20.2	100	291
6	543.130	35.0	17.5	6.1	33.3	25.3	46.0	20.7	300	359
----- Vertical -----										
7	60.070	40.2	13.3	2.0	33.1	22.4	40.0	17.6	374	0
8	74.620	36.3	8.1	2.3	33.1	13.6	40.0	26.4	400	331
9	121.180	34.1	9.9	2.9	33.0	13.9	43.5	29.6	400	140
10	302.570	37.2	13.3	4.5	33.0	22.0	46.0	24.0	374	0
11	788.532	27.3	20.5	7.4	33.3	21.9	46.0	24.1	400	3
12	949.547	27.8	21.9	8.2	32.1	25.8	46.0	20.2	400	180

Tested by: Hyung-Kwon, Oh / Assistant Manager

11.4.2 Test data for Below 30 MHz

- . Test Date : June 07, 2019 ~ June 13, 2019
- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m
- . Operating mode : Transmitting mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									

11.4.3 Test data for above 1 GHz

- . Test Date : June 07, 2019 ~ June 13, 2019
- . Resolution bandwidth : 1 MHz for Peak and Average Mode
- . Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- . Frequency range : 1 GHz ~ 26.5 GHz
- . Measurement distance : 3 m
- . Operating mode : Transmitting mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									



 Tested by: Hyung-Kwon, Oh / Assistant Manager

12. CONDUCTED EMISSION TEST

12.1 Operating environment

Temperature : 25 °C
Relative humidity : 44 % R.H.

12.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μ H + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

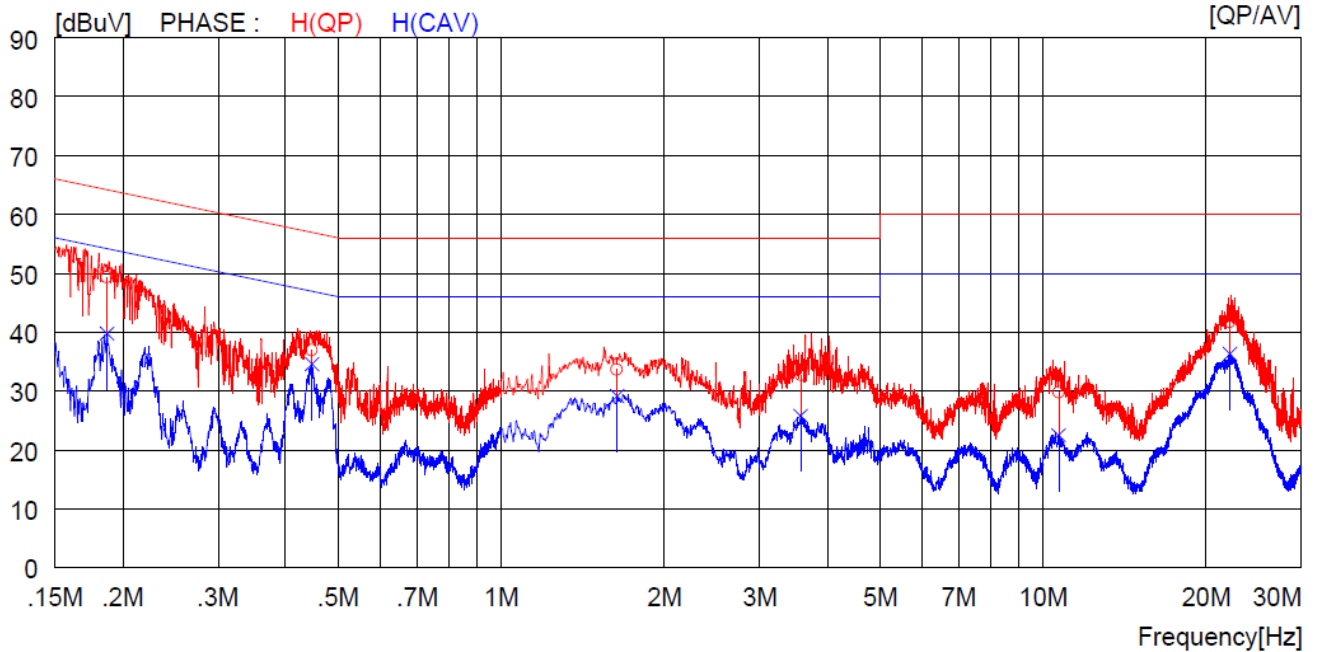
12.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Oct. 22, 2018 (1Y)
□ -	NSLK8128	Schwarzbeck	AMN	8128-216	Mar. 20, 2019 (1Y)
■ -	NSLK8126	Schwarzbeck	AMN	8126-404	Mar. 19, 2019 (1Y)
□ -	3825/2	EMCO	AMN	9109-1869	Mar. 19, 2019 (1Y)
■ -	3825/2	EMCO	AMN	9109-1867	Mar. 27, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

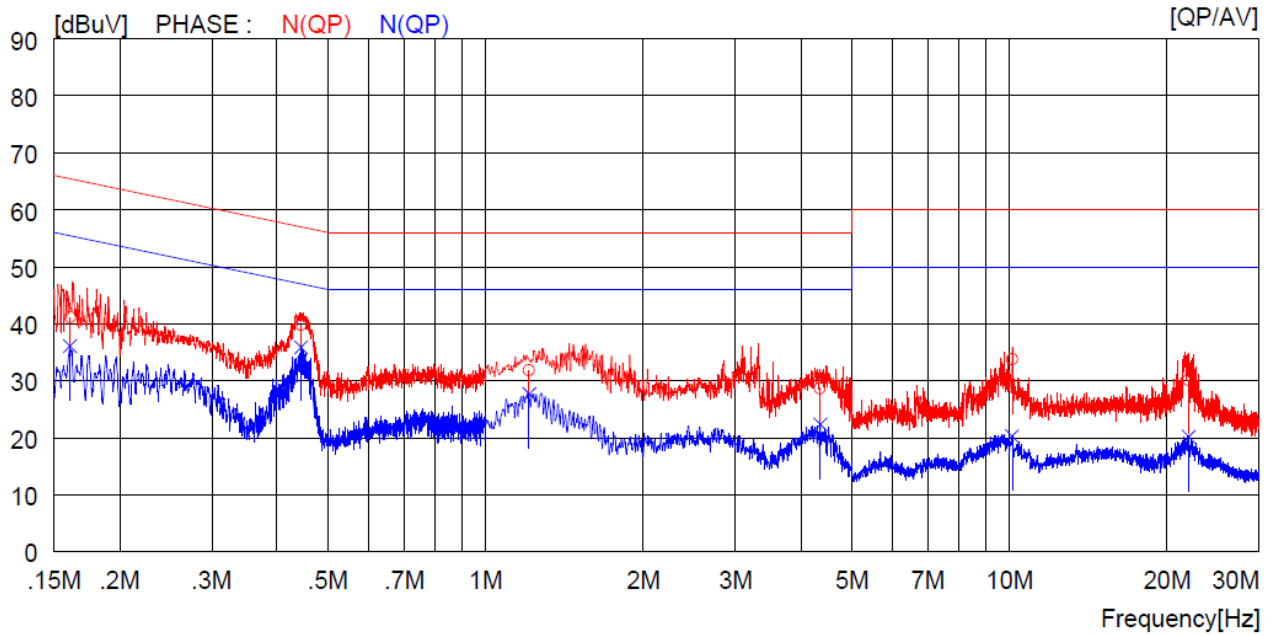
12.4 Test data

- Test Date : June 07, 2019 ~ June 13, 2019
- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : HOT LINE
- Antenna 0, Antenna 1 and Multiple transmit tested, but the worst data were recorded.



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.18700	39.2	----	10.1	49.3	----	64.2	----	14.9	----	H (QP)
2	0.44700	26.8	----	10.1	36.9	----	56.9	----	20.0	----	H (QP)
3	1.63600	23.5	----	10.1	33.6	----	56.0	----	22.4	----	H (QP)
4	3.56800	22.6	----	10.1	32.7	----	56.0	----	23.3	----	H (QP)
5	10.69000	19.5	----	10.3	29.8	----	60.0	----	30.2	----	H (QP)
6	22.11000	31.3	----	10.4	41.7	----	60.0	----	18.3	----	H (QP)
7	0.18700	----	29.7	10.1	----	39.8	----	54.2	----	14.4	H (CAV)
8	0.44700	----	24.5	10.1	----	34.6	----	46.9	----	12.3	H (CAV)
9	1.63600	----	19.0	10.1	----	29.1	----	46.0	----	16.9	H (CAV)
10	3.56800	----	15.7	10.1	----	25.8	----	46.0	----	20.2	H (CAV)
11	10.69000	----	12.2	10.3	----	22.5	----	50.0	----	27.5	H (CAV)
12	22.11000	----	25.9	10.4	----	36.3	----	50.0	----	13.7	H (CAV)

-. Tested Line : NEUTRAL LINE



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16100	31.0	----	10.1	41.1	----	65.4	----	24.3	----	N (QP)
2	0.44400	29.7	----	10.1	39.8	----	57.0	----	17.2	----	N (QP)
3	1.21200	21.7	----	10.1	31.8	----	56.0	----	24.2	----	N (QP)
4	4.35600	18.5	----	10.1	28.6	----	56.0	----	27.4	----	N (QP)
5	10.12000	23.5	----	10.3	33.8	----	60.0	----	26.2	----	N (QP)
6	21.99000	19.7	----	10.4	30.1	----	60.0	----	29.9	----	N (QP)
7	0.16100	----	26.0	10.1	----	36.1	----	55.4	----	19.3	NCAV)
8	0.44400	----	25.8	10.1	----	35.9	----	47.0	----	11.1	NCAV)
9	1.21200	----	17.6	10.1	----	27.7	----	46.0	----	18.3	NCAV)
10	4.35600	----	12.2	10.1	----	22.3	----	46.0	----	23.7	NCAV)
11	10.12000	----	10.0	10.3	----	20.3	----	50.0	----	29.7	NCAV)
12	21.99000	----	9.8	10.4	----	20.2	----	50.0	----	29.8	NCAV)

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

Tested by: Hyung-Kwon, Oh / Assistant Manager