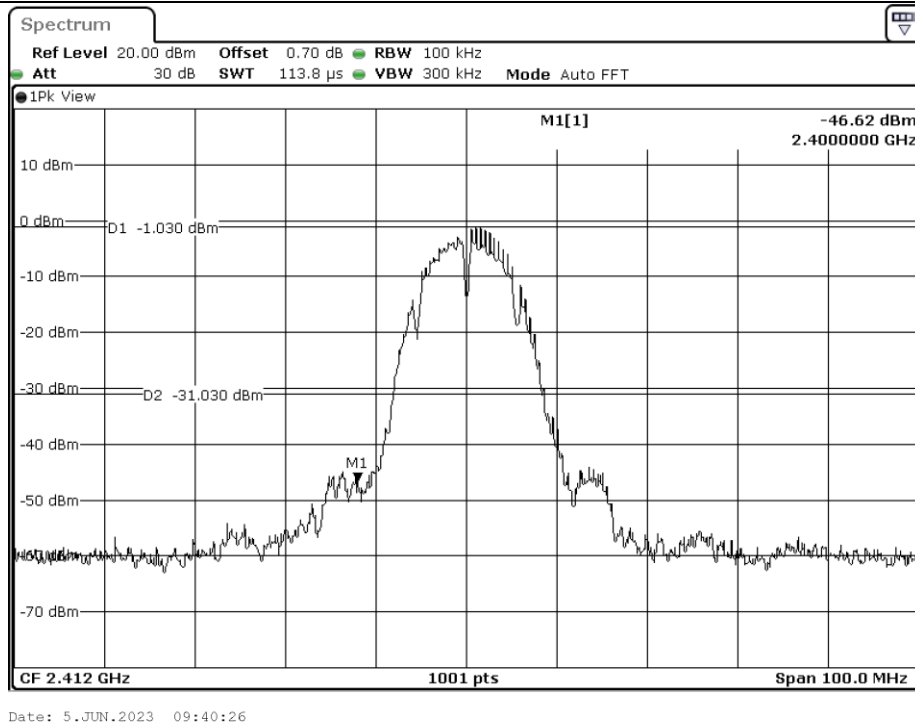
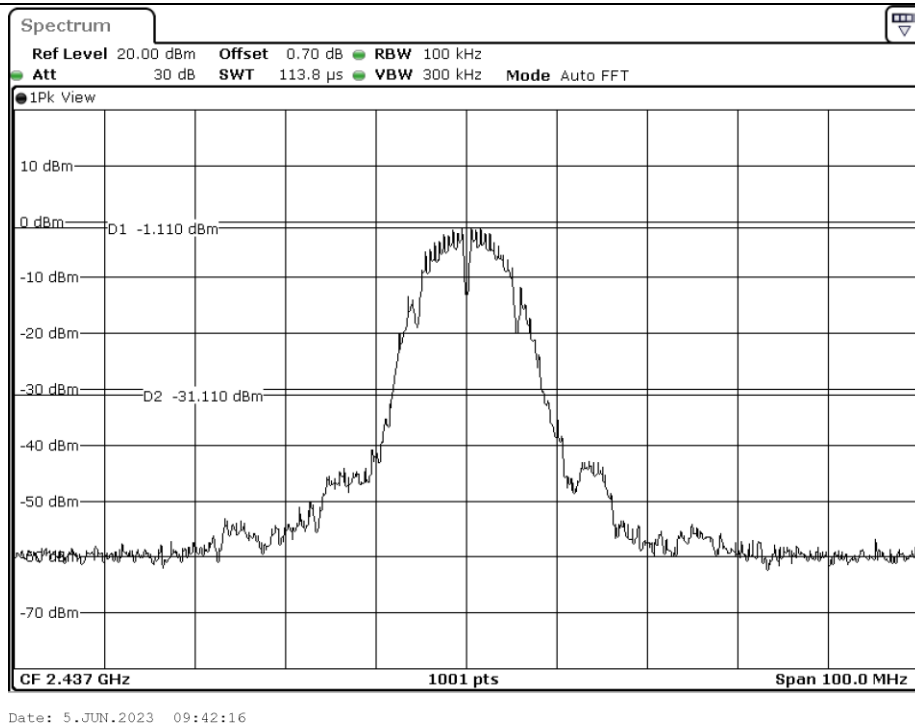


9.5.2 Test data for DC 24 V

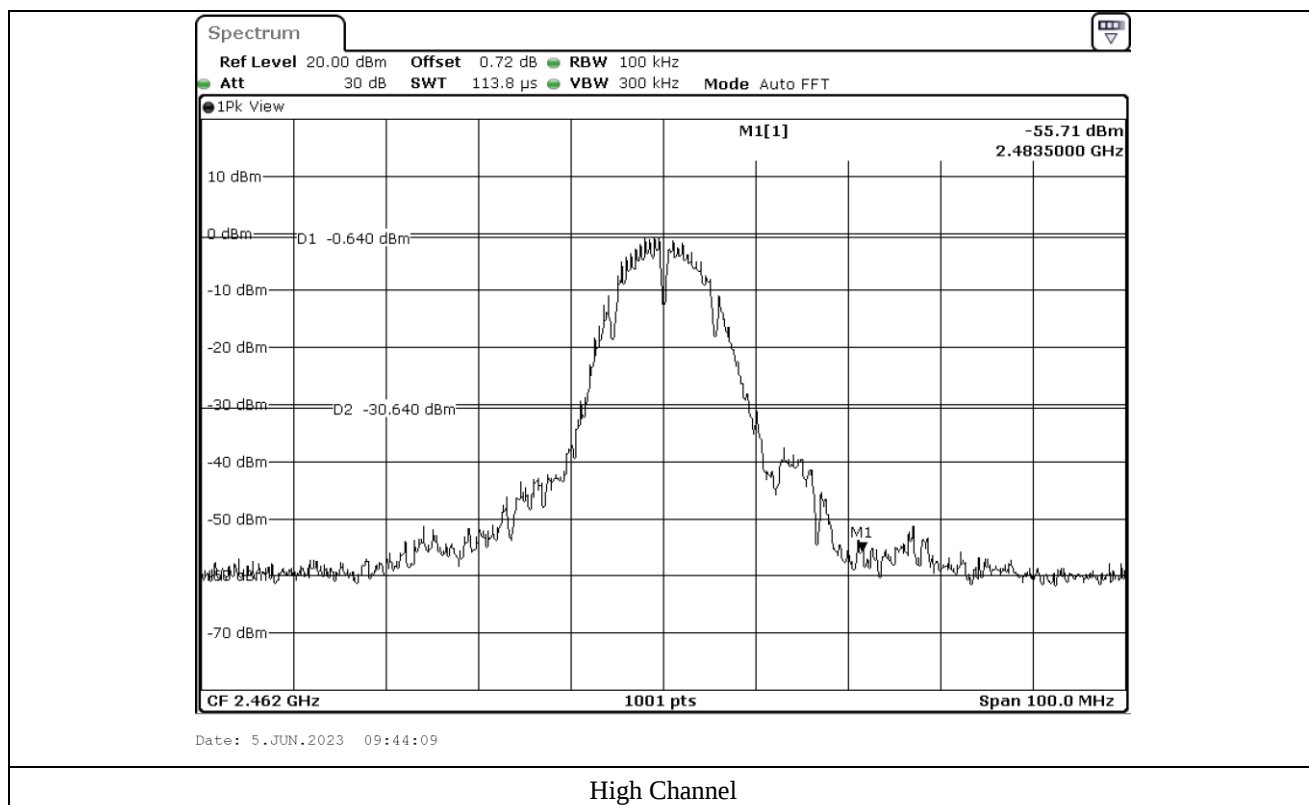
9.5.2.1 Test data for 802.11b WLAN Mode

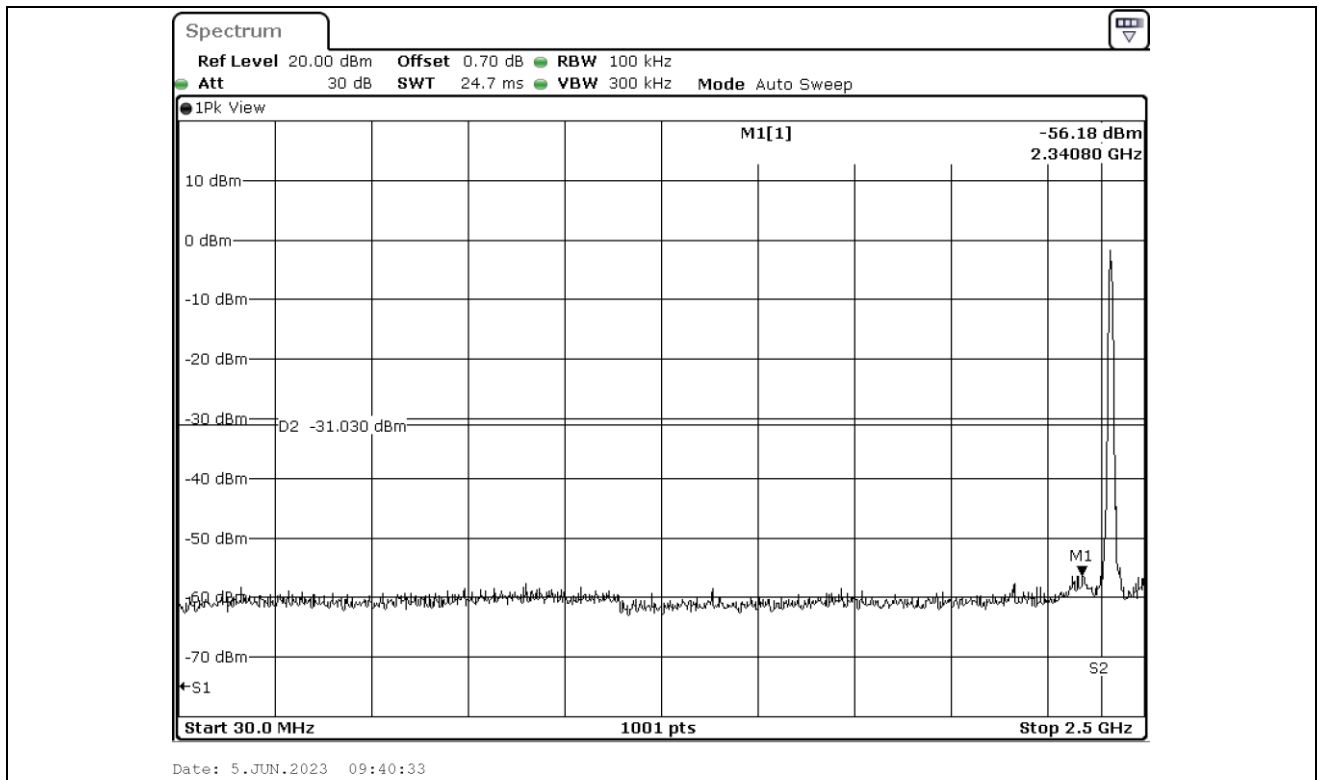


Low Channel

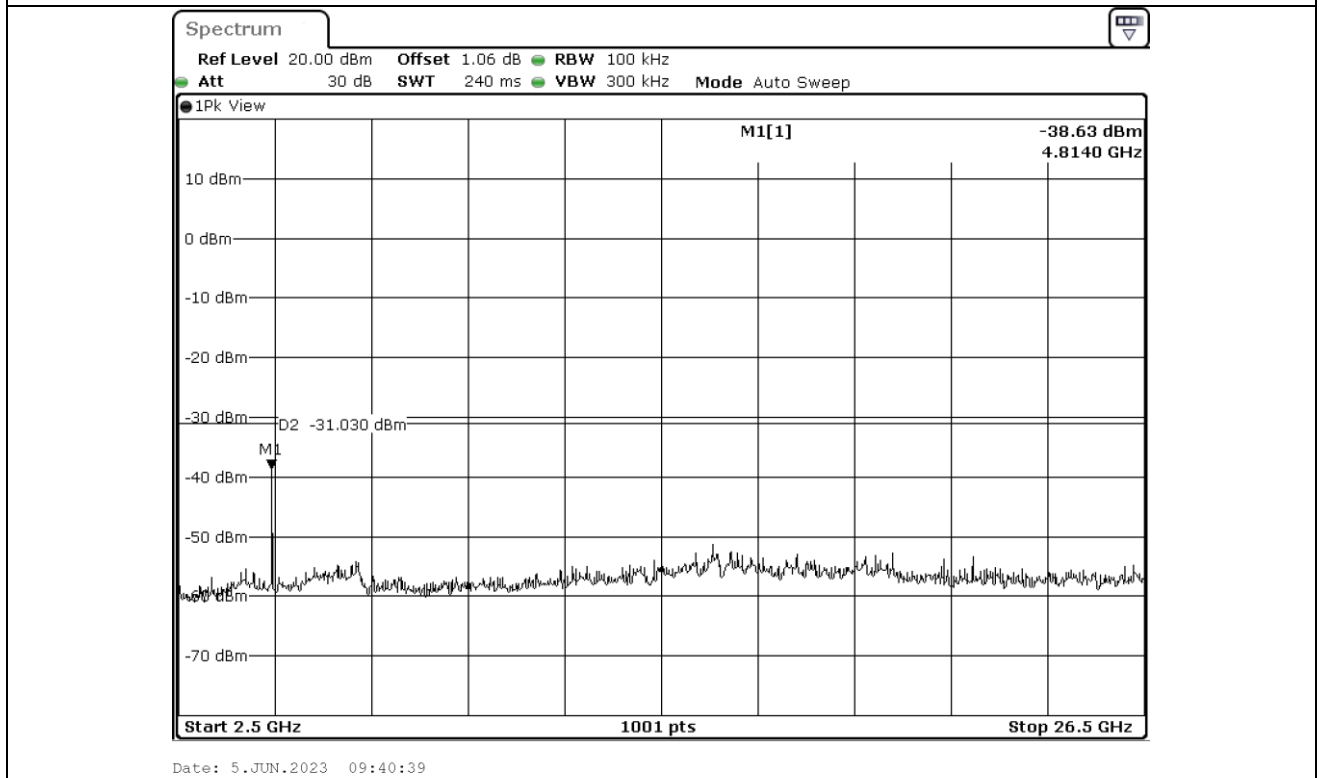


Middle Channel

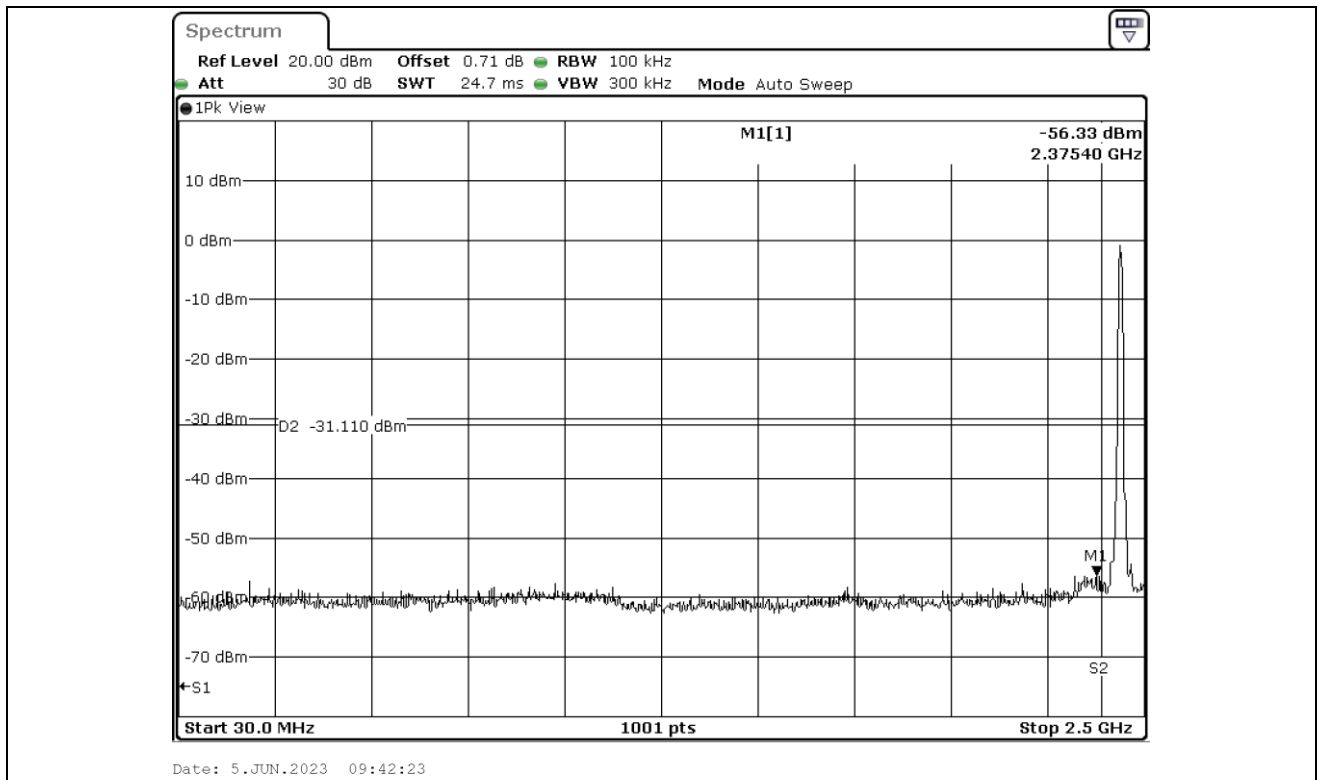




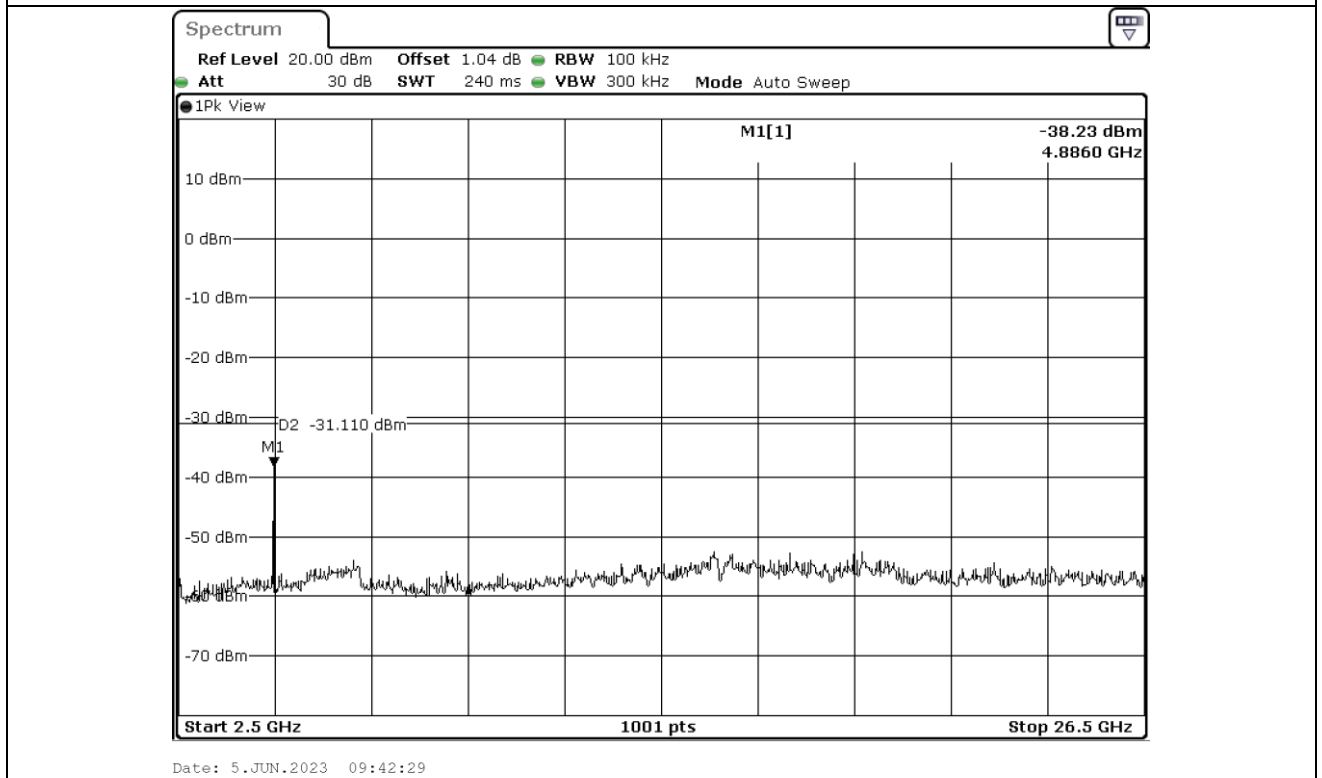
Low Channel



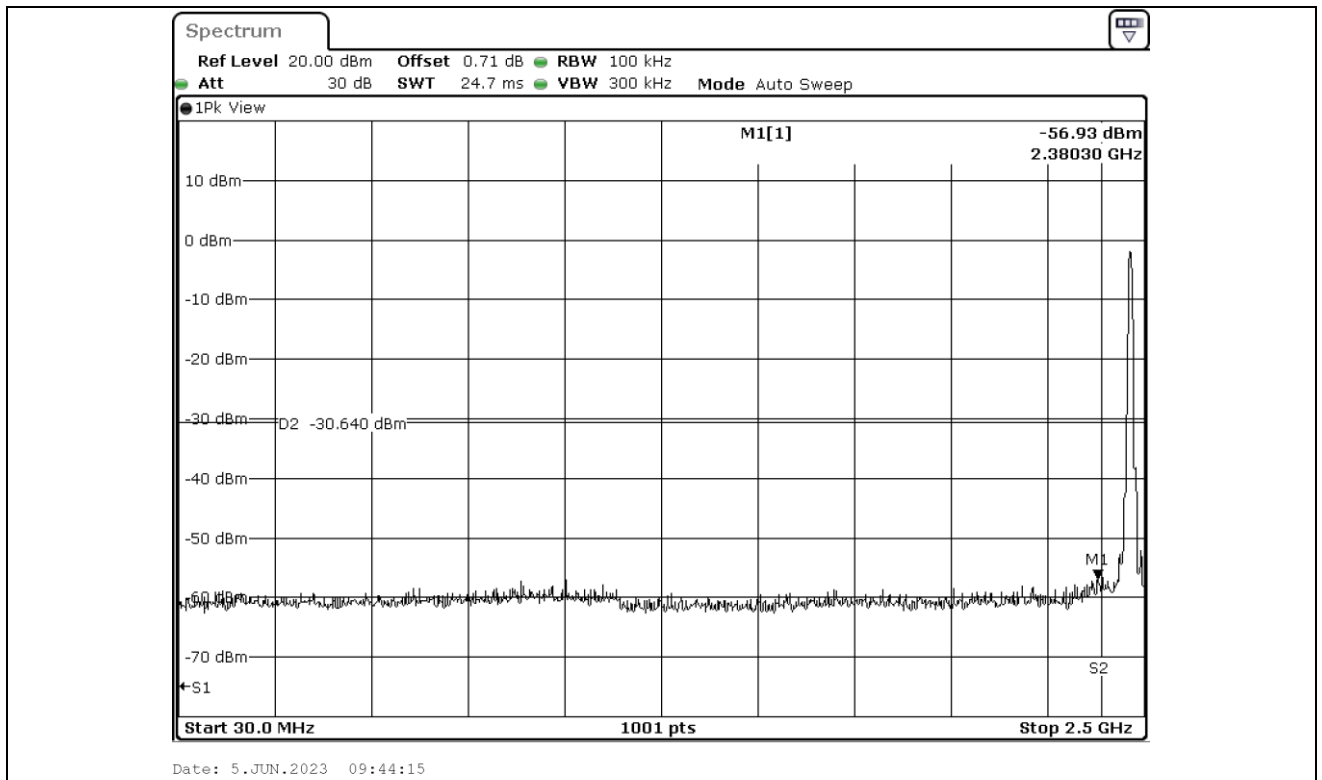
Low Channel



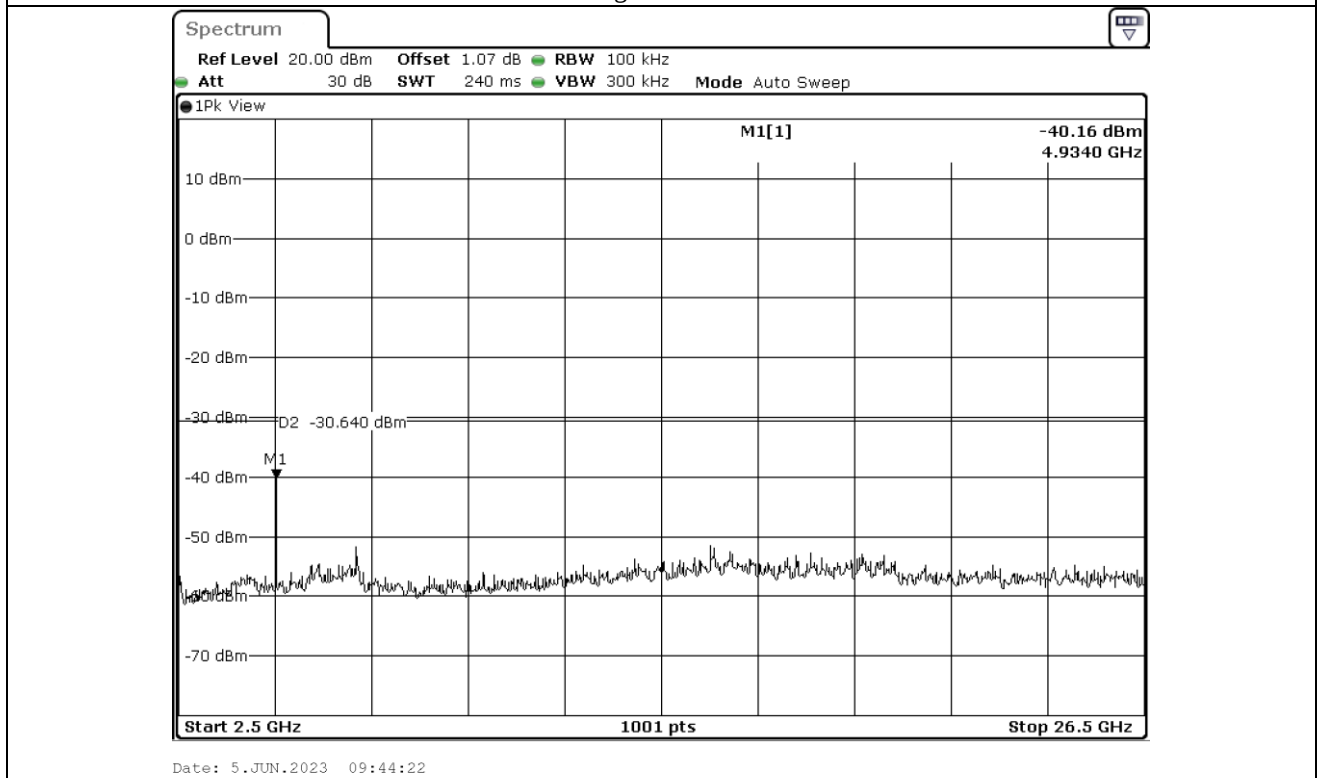
Middle Channel



Middle Channel

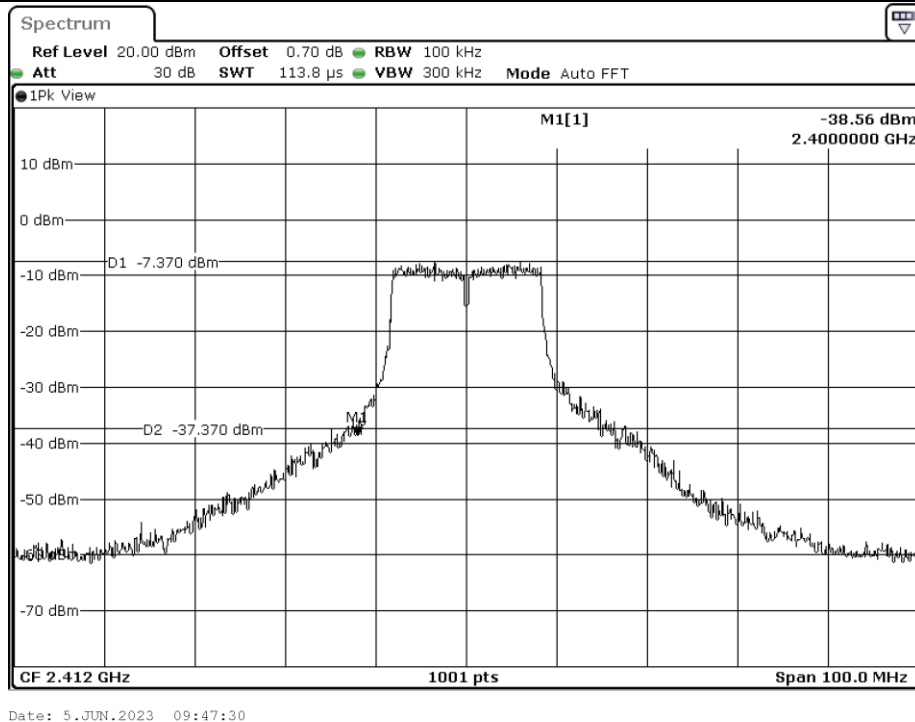


High Channel

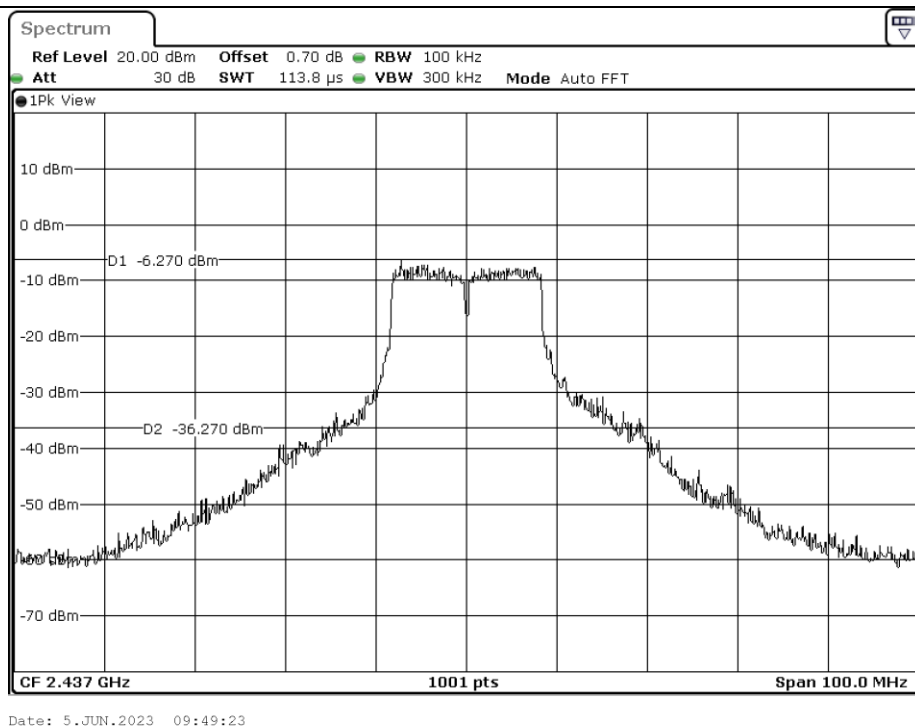


High Channel

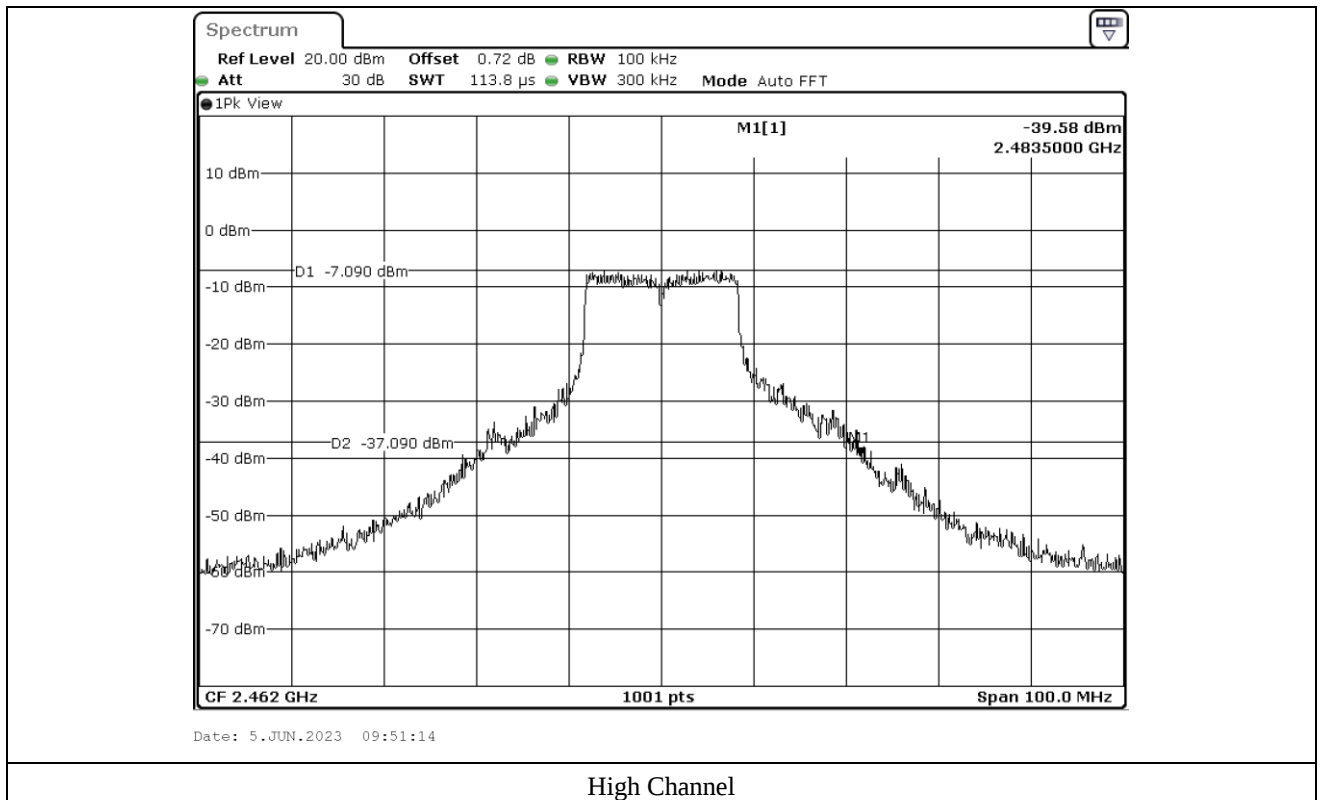
9.5.2.2 Test data for 802.11g WLAN Mode

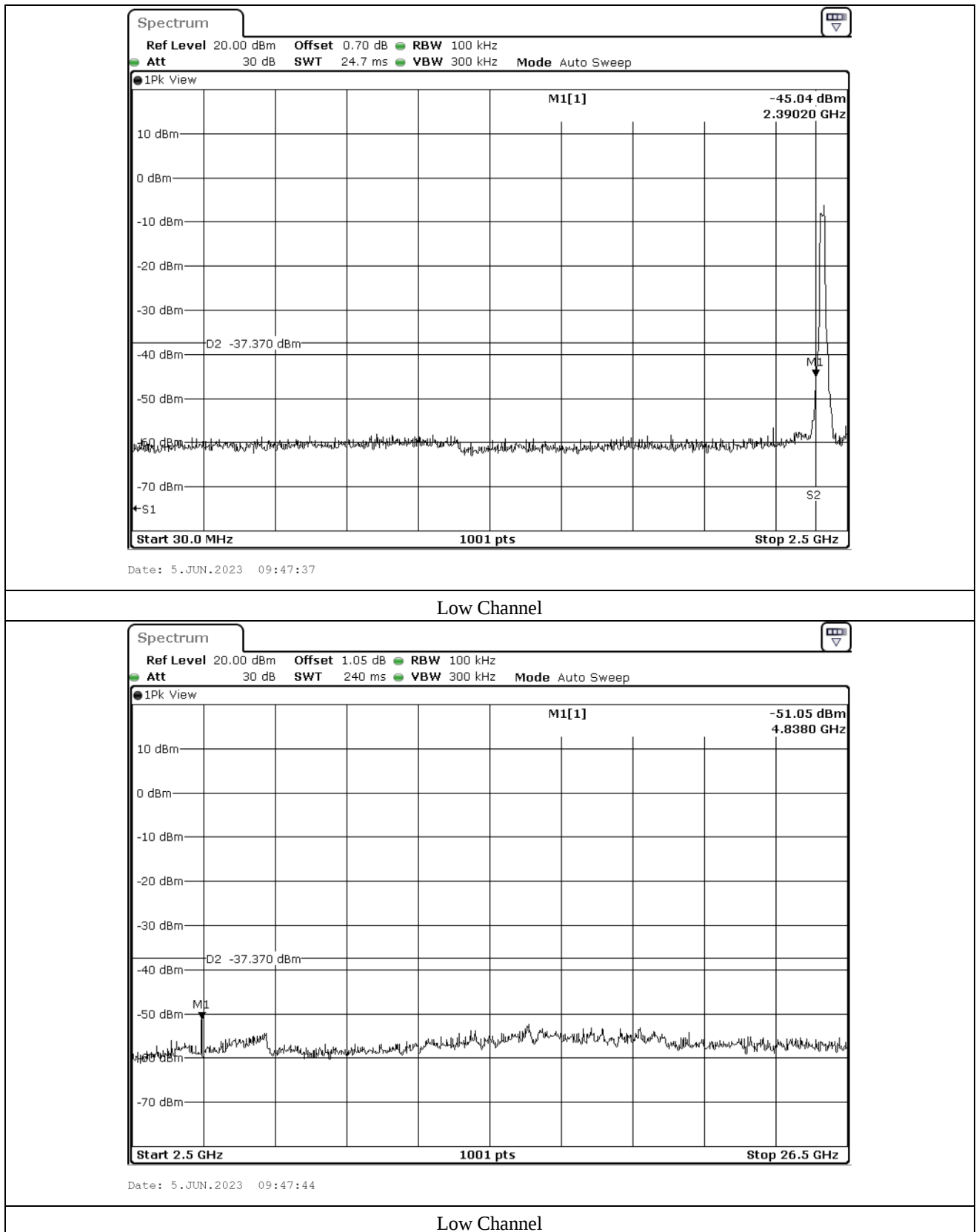


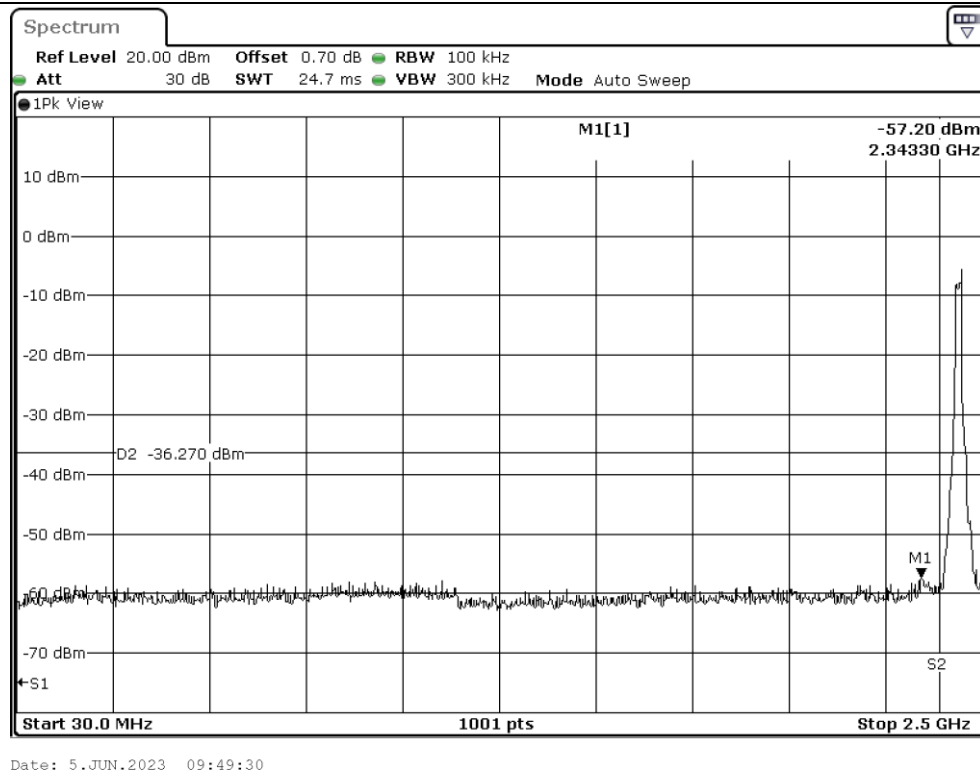
Low Channel



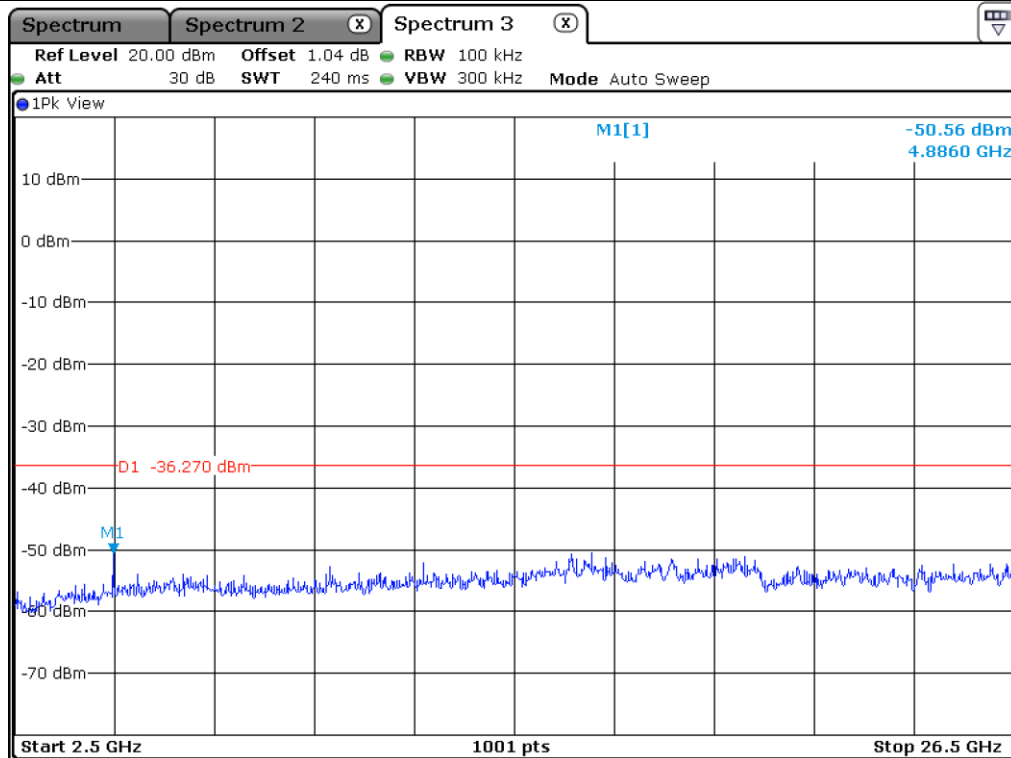
Middle Channel



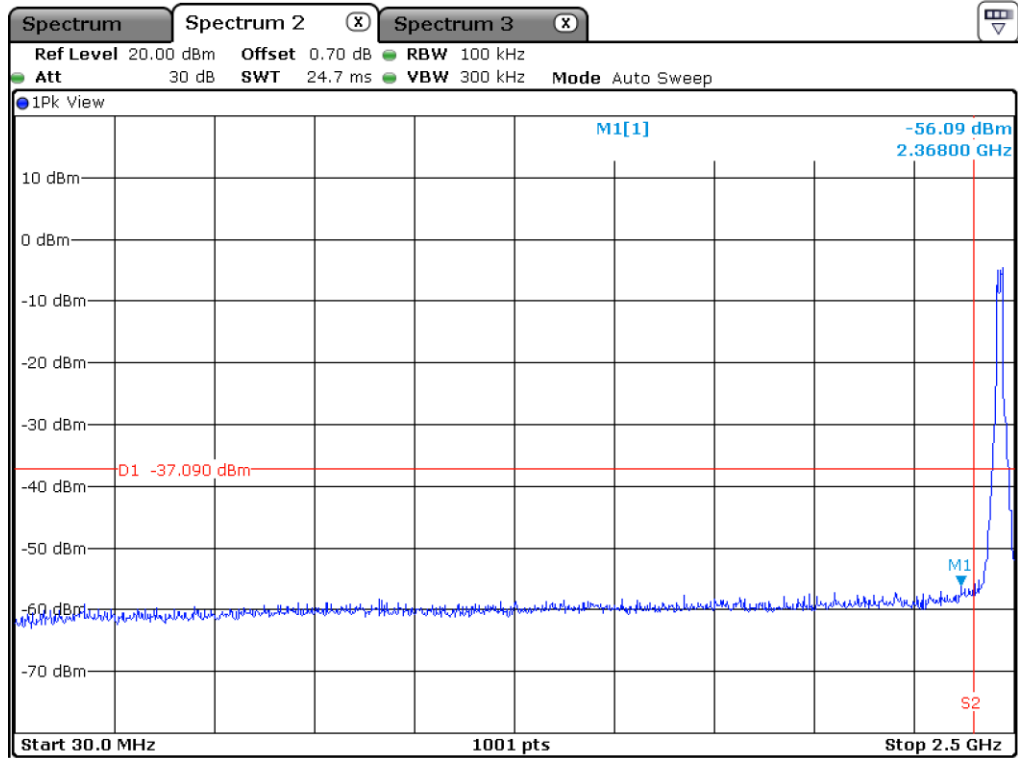




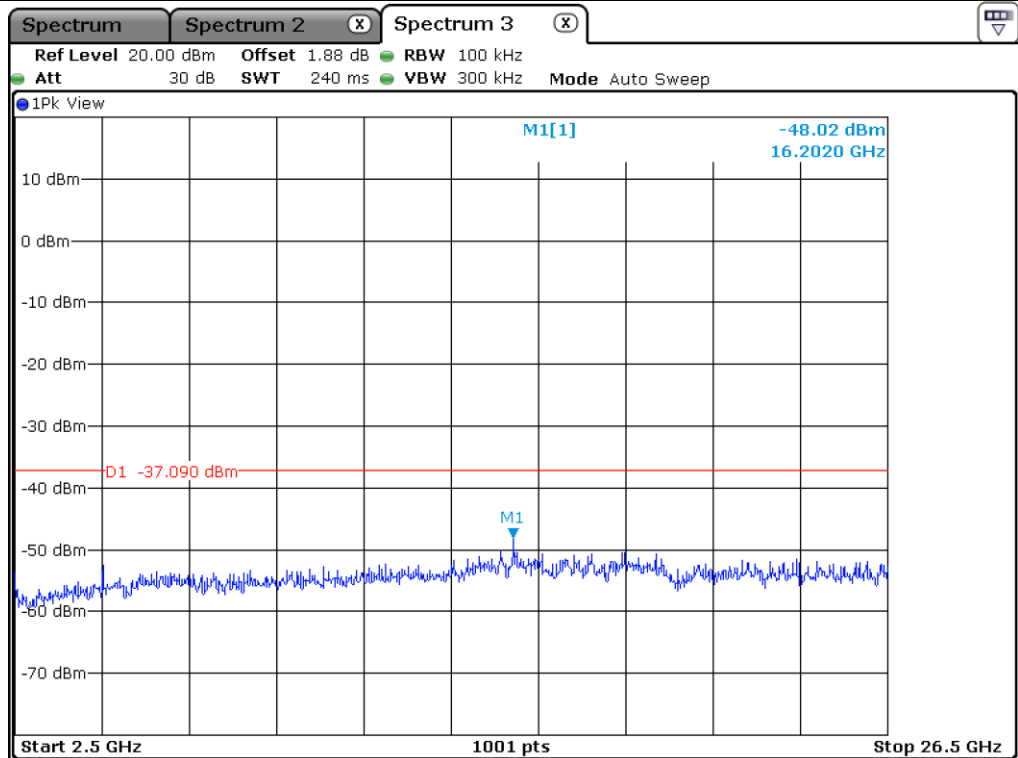
Middle Channel



Middle Channel

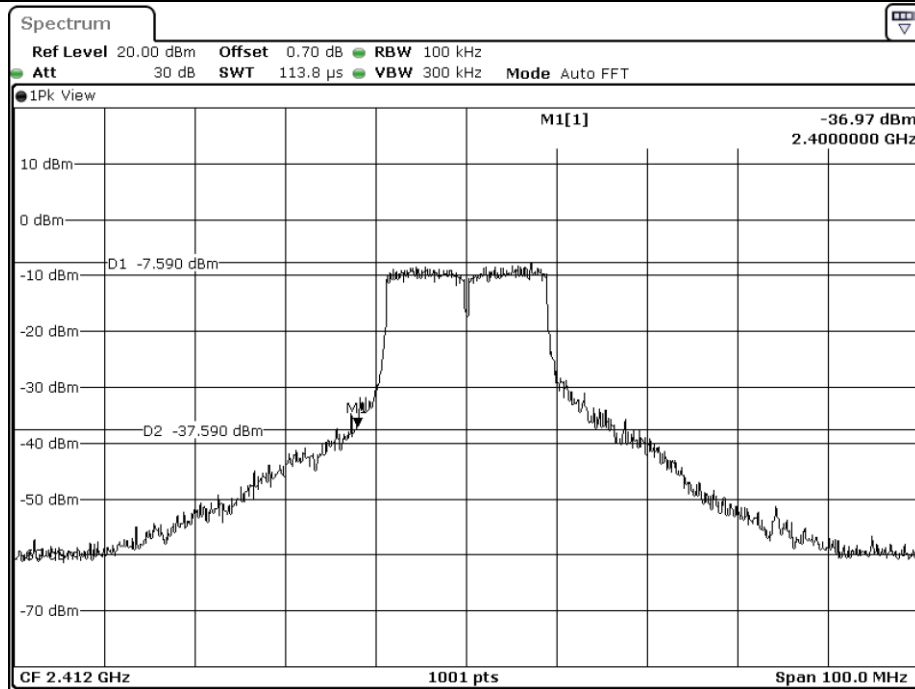


High Channel



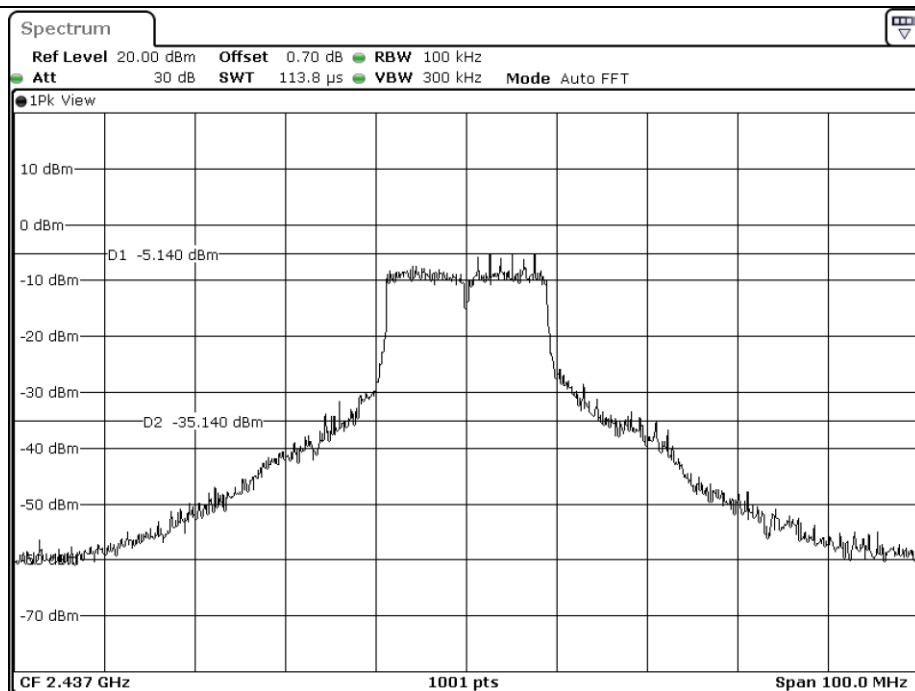
High Channel

9.5.2.3 Test data for 802.11n_HT20 WLAN Mode



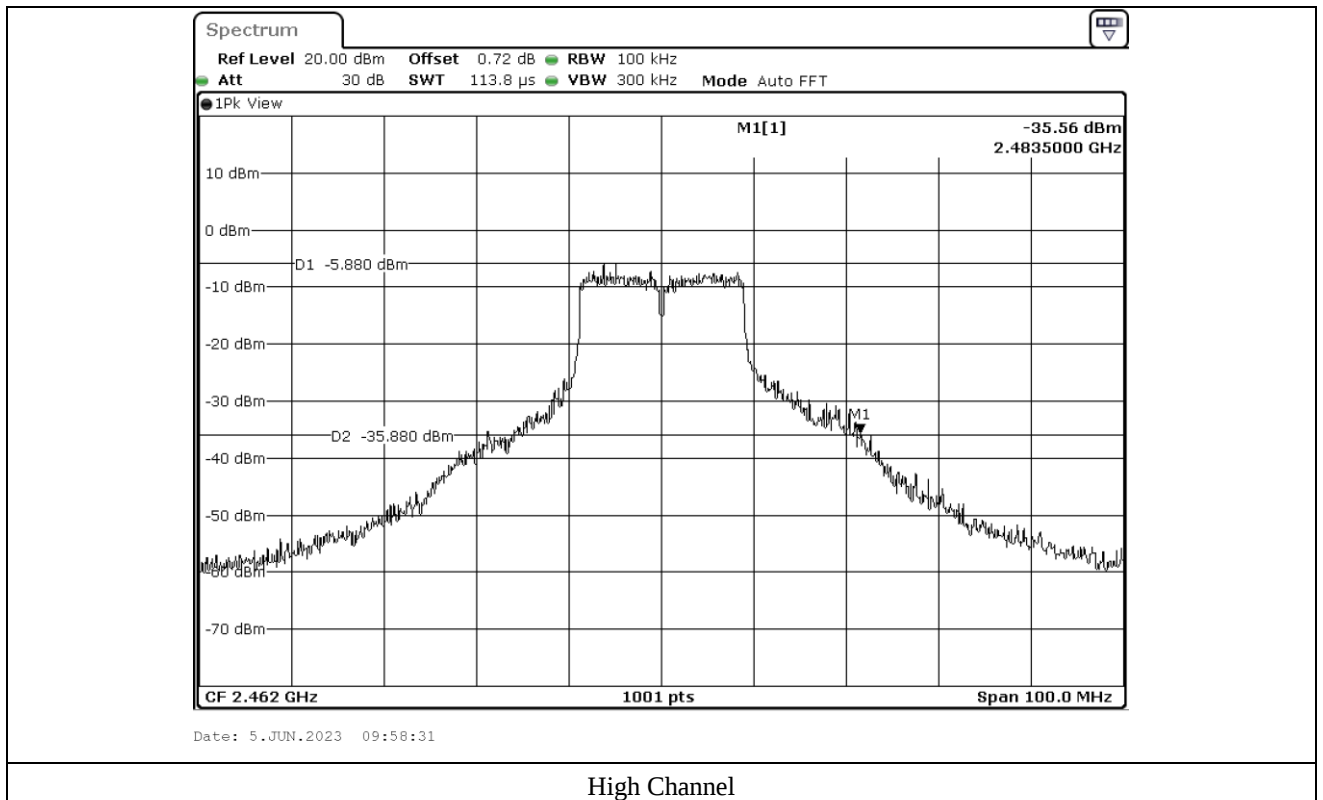
Date: 5.JUN.2023 09:54:41

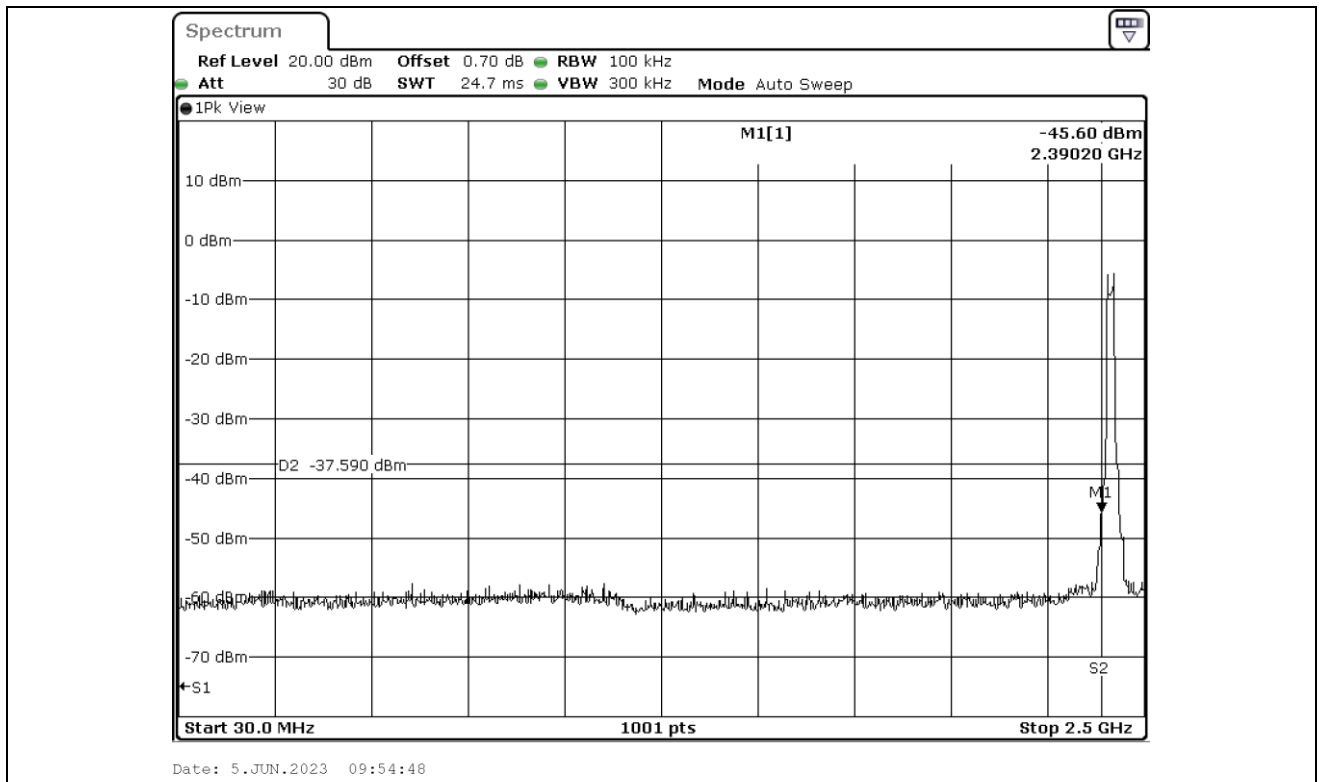
Low Channel



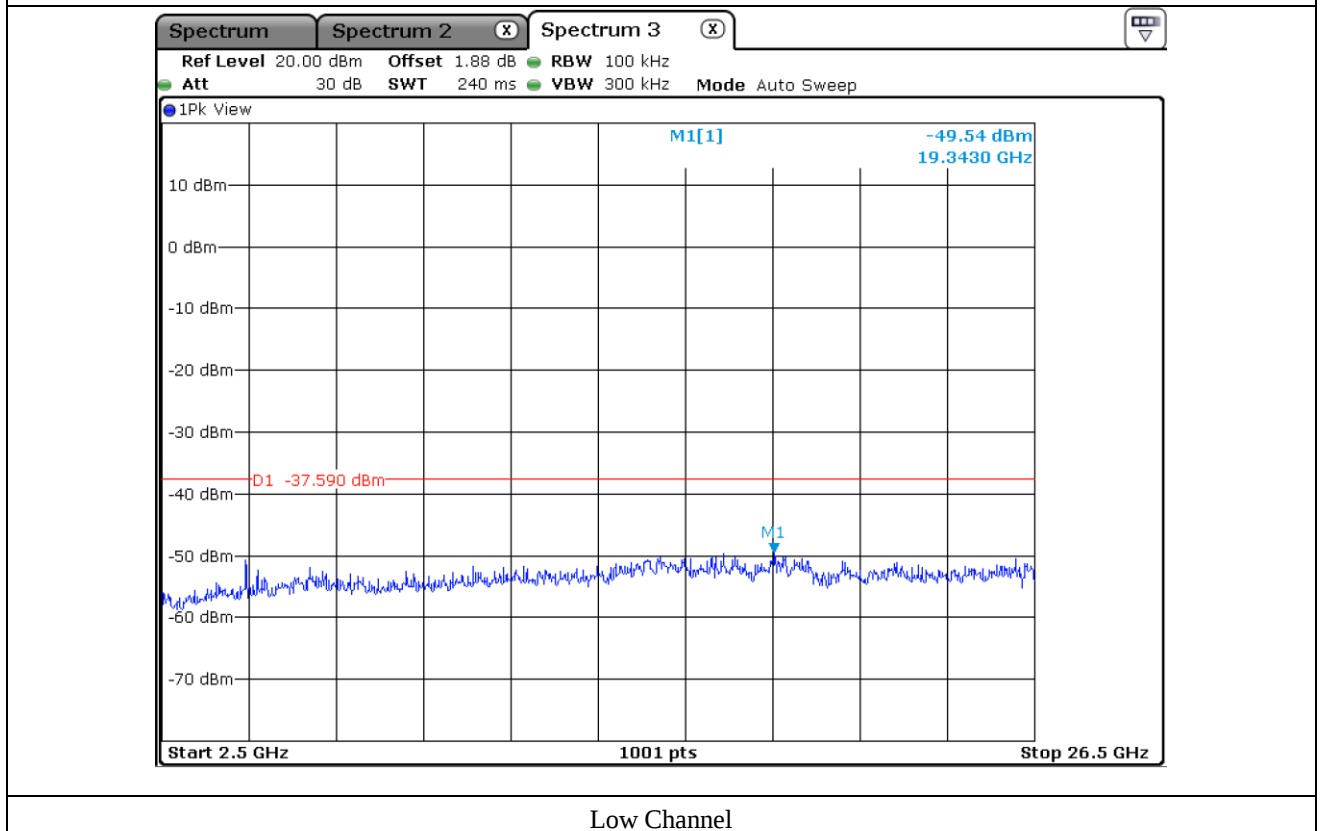
Date: 5.JUN.2023 09:56:41

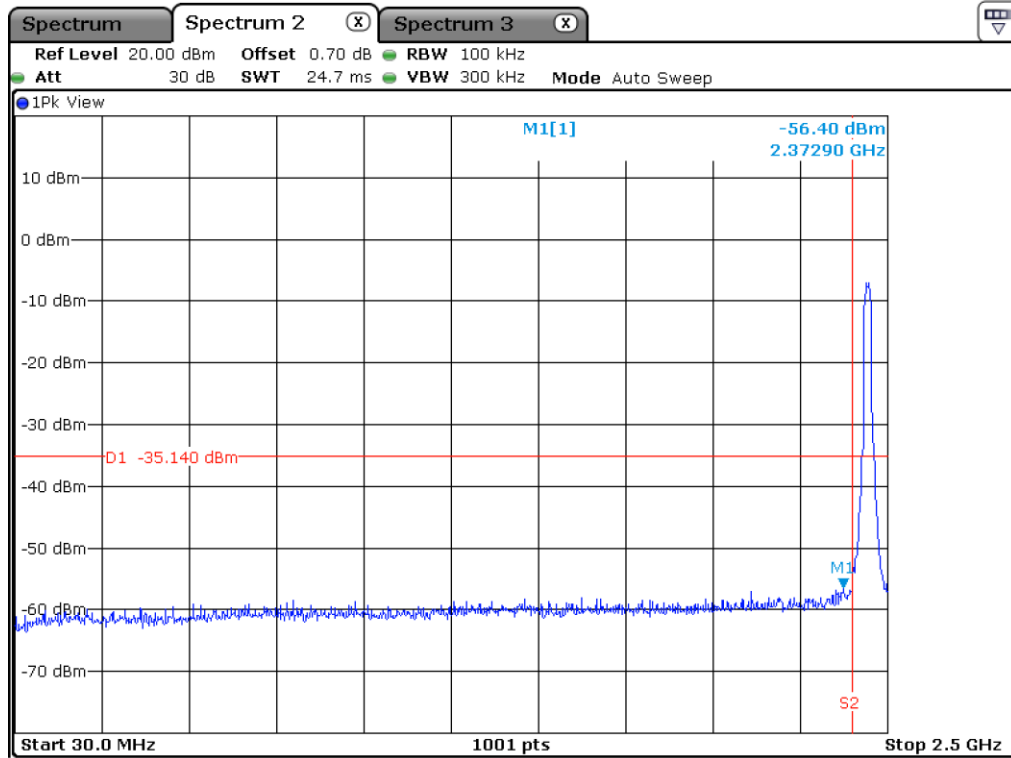
Middle Channel



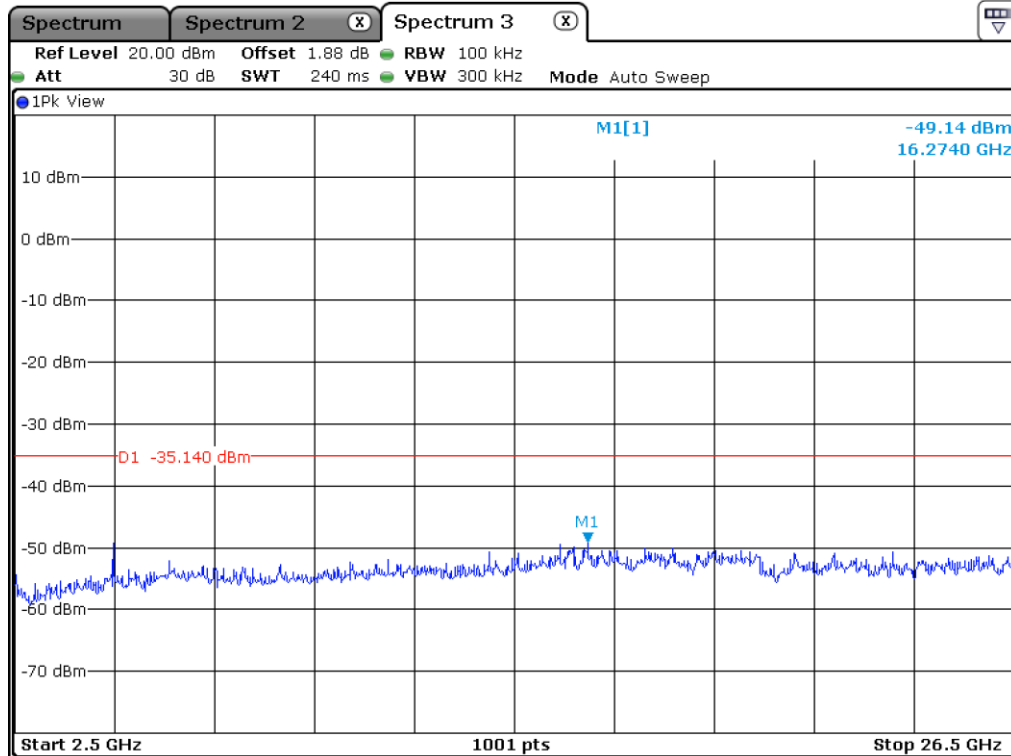


Low Channel

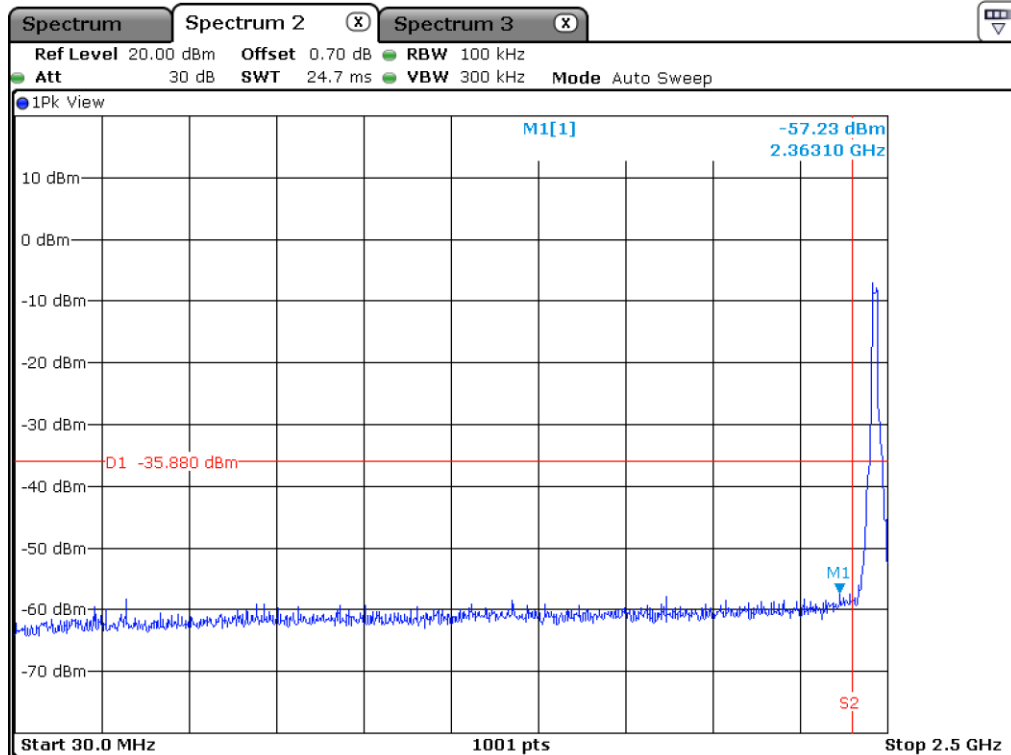




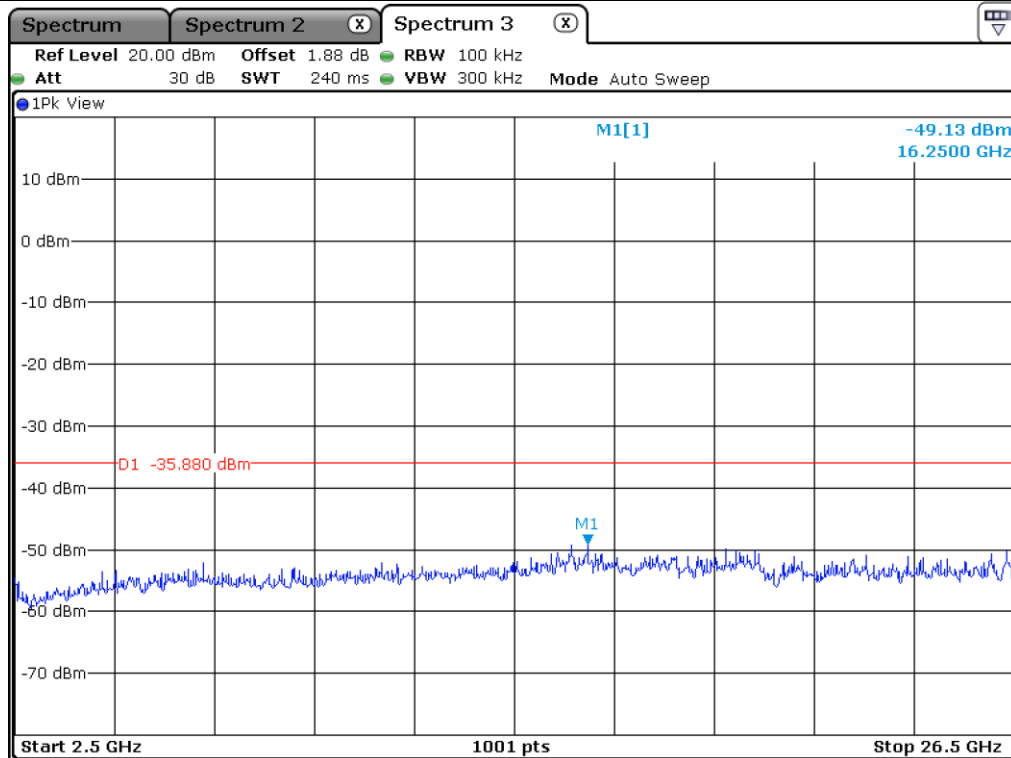
Middle Channel



Middle Channel



High Channel



High Channel

9.6 Test data for radiated emission

9.6.1 Test data for DC 12 V

9.6.1.1 Radiated Emission which fall in the Restricted Band

9.6.1.1.1 Test data for 802.11b WLAN Mode

- 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 : 99.40 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel											
2 332.47	54.99	Peak	H	27.55	6.59	44.97	6.04	-	50.20	74.00	23.80
2 314.02	43.55	Average	H	27.80	6.60	44.97	6.04	0.03	39.05	54.00	14.95
2 333.79	56.75	Peak	V	27.53	6.59	44.97	6.04	-	51.94	74.00	22.06
2 341.84	43.21	Average	V	27.41	6.72	44.96	6.04	0.03	38.45	54.00	15.55
Test Data for High Channel											
2 487.83	55.16	Peak	H	27.55	6.97	44.90	6.04	-	50.82	74.00	23.18
2 487.95	43.44	Average	H	27.55	6.97	44.90	6.04	0.03	39.13	54.00	14.87
2 484.00	55.26	Peak	V	27.56	6.94	44.91	6.04	-	50.89	74.00	23.11
2 486.77	43.37	Average	V	27.55	6.97	44.91	6.04	0.03	39.05	54.00	14.95

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

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

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amp Gain} + \text{ATT} + \text{Duty Factor}$$

9.6.1.1.2 Test data for 802.11g WLAN Mode

- 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 : 91.38 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel											
2 389.63	55.68	Peak	H	27.54	6.92	44.94	6.04	-	51.24	74.00	22.76
2 390.04	44.83	Average	H	27.54	6.92	44.94	6.04	0.39	40.78	54.00	13.22
2 321.06	55.66	Peak	V	27.71	6.57	44.97	6.04	-	51.01	74.00	22.99
2 390.04	43.52	Average	V	27.54	6.92	44.94	6.04	0.39	39.47	54.00	14.53
Test Data for High Channel											
2 483.51	58.84	Peak	H	27.57	6.94	44.91	6.04	-	54.48	74.00	19.52
2 484.07	44.81	Average	H	27.56	6.94	44.91	6.04	0.39	40.83	54.00	13.17
2 484.23	58.39	Peak	V	27.56	6.94	44.91	6.04	-	54.02	74.00	19.98
2 484.15	44.21	Average	V	27.56	6.94	44.91	6.04	0.39	40.23	54.00	13.77

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

9.6.1.1.3 Test data for 802.11n_HT20 WLAN Mode

- 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 : 94.81 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel											
2 390.04	55.30	Peak	H	27.54	6.92	44.94	6.04	-	50.86	74.00	23.14
2 390.04	43.55	Average	H	27.54	6.92	44.94	6.04	0.24	39.35	54.00	14.65
2 385.35	55.42	Peak	V	27.51	6.92	44.95	6.04	-	50.94	74.00	23.06
2 389.94	43.80	Average	V	27.54	6.92	44.94	6.04	0.24	39.60	54.00	14.40
Test Data for High Channel											
2 483.70	59.02	Peak	H	27.57	6.94	44.91	6.04	-	54.66	74.00	19.34
2 483.51	47.28	Average	H	27.57	6.94	44.91	6.04	0.24	43.16	54.00	10.84
2 483.77	56.96	Peak	V	27.56	6.94	44.91	6.04	-	52.59	74.00	21.41
2 484.00	44.20	Average	V	27.56	6.94	44.91	6.04	0.24	40.07	54.00	13.93

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

9.6.1.2 Spurious & Harmonic Radiated Emission

9.6.1.2.1 Test data for 802.11b WLAN Mode

- 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 : 99.40 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 833.14	50.15	Peak	H	31.30	11.27	44.67	-	48.05	74.00	25.95
4 824.15	38.70	Average	H	31.30	11.15	44.66	0.03	36.52	54.00	17.48
4 824.05	51.45	Peak	V	31.30	11.15	44.66	-	49.24	74.00	24.76
4 824.00	43.30	Average	V	31.30	11.15	44.66	0.03	41.12	54.00	12.88
Test Data for Middle Channel										
4 874.15	49.56	Peak	H	31.30	11.27	44.67	-	47.46	74.00	26.54
4 874.05	37.94	Average	H	31.30	11.27	44.67	0.03	35.87	54.00	18.13
4 874.10	51.01	Peak	V	31.30	11.27	44.67	-	48.91	74.00	25.09
4 874.25	43.24	Average	V	31.30	11.27	44.67	0.03	41.17	54.00	12.83
Test Data for High Channel										
4 923.05	49.43	Peak	H	31.30	11.15	44.68	-	47.20	74.00	26.80
4 924.05	37.27	Average	H	31.30	11.15	44.68	0.03	35.07	54.00	18.93
4 924.15	50.68	Peak	V	31.30	11.15	44.68	-	48.45	74.00	25.55
4 924.10	42.38	Average	V	31.30	11.15	44.68	0.03	40.18	54.00	13.82

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

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

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amp Gain} + \text{Duty Factor}$$

9.6.1.2.2 Test data for 802.11g WLAN Mode

- 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 : 91.38 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 832.89	49.61	Peak	H	31.30	11.27	44.67	-	47.51	74.00	26.49
4 821.40	37.76	Average	H	31.30	11.15	44.66	0.39	35.94	54.00	18.06
4 824.50	49.63	Peak	V	31.30	11.15	44.66	-	47.42	74.00	26.58
4 830.59	37.88	Average	V	31.30	11.27	44.67	0.39	36.17	54.00	17.83
Test Data for Middle Channel										
4 881.49	49.46	Peak	H	31.30	11.15	44.68	-	47.23	74.00	26.77
4 877.00	37.51	Average	H	31.30	11.15	44.68	0.39	35.67	54.00	18.33
4 877.50	50.00	Peak	V	31.30	11.15	44.68	-	47.77	74.00	26.23
4 874.45	37.56	Average	V	31.30	11.27	44.67	0.39	35.85	54.00	18.15
Test Data for High Channel										
4 915.06	49.57	Peak	H	31.30	11.15	44.68	-	47.34	74.00	26.66
4 946.38	37.44	Average	H	31.30	11.35	44.69	0.39	35.79	54.00	18.21
4 923.50	49.69	Peak	V	31.30	11.15	44.68	-	47.46	74.00	26.54
4 934.99	37.41	Average	V	31.30	11.35	44.69	0.39	35.76	54.00	18.24

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

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

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amp Gain} + \text{Duty Factor}$$

9.6.1.2.3 Test data for 802.11n_HT20 WLAN Mode

- 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 : 94.81 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 812.06	49.84	Peak	H	31.30	11.15	44.66	-	47.63	74.00	26.37
4 835.59	37.69	Average	H	31.30	11.27	44.67	0.24	35.83	54.00	18.17
4 824.80	49.65	Peak	V	31.30	11.15	44.66	-	47.44	74.00	26.56
4 824.70	38.00	Average	V	31.30	11.15	44.66	0.24	36.03	54.00	17.97
Test Data for Middle Channel										
4 872.40	49.98	Peak	H	31.30	11.27	44.67	-	47.88	74.00	26.12
4 867.91	37.47	Average	H	31.30	11.27	44.67	0.24	35.61	54.00	18.39
4 880.94	49.49	Peak	V	31.30	11.15	44.68	-	47.26	74.00	26.74
4 872.75	37.53	Average	V	31.30	11.27	44.67	0.24	35.67	54.00	18.33
Test Data for High Channel										
4 929.40	49.18	Peak	H	31.30	11.35	44.69	-	47.14	74.00	26.86
4 906.92	37.28	Average	H	31.30	11.15	44.68	0.24	35.29	54.00	18.71
4 905.72	50.06	Peak	V	31.30	11.15	44.68	-	47.83	74.00	26.17
4 917.66	37.62	Average	V	31.30	11.15	44.68	0.24	35.63	54.00	18.37

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

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

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amp Gain} + \text{Duty Factor}$$

9.6.2 Test data for DC 24 V

9.6.2.1 Radiated Emission which fall in the Restricted Band

9.6.2.1.1 Test data for 802.11b WLAN Mode

- 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 : 99.40 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel											
2 374.65	53.10	Peak	H	27.45	6.77	44.95	6.04	-	48.41	74.00	25.59
2 318.61	41.38	Average	H	27.74	6.57	44.97	6.04	0.03	36.79	54.00	17.21
2 331.55	52.39	Peak	V	27.56	6.59	44.97	6.04	-	47.61	74.00	26.39
2 336.14	40.91	Average	V	27.49	6.72	44.97	6.04	0.03	36.22	54.00	17.78
Test Data for High Channel											
2 485.18	52.43	Peak	H	27.56	6.94	44.91	6.04	-	48.06	74.00	25.94
2 485.14	40.96	Average	H	27.56	6.94	44.91	6.04	0.03	36.62	54.00	17.38
2 499.49	52.65	Peak	V	27.50	6.91	44.90	6.04	-	48.20	74.00	25.80
2 488.82	41.05	Average	V	27.54	6.97	44.90	6.04	0.03	36.73	54.00	17.27

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

9.6.2.1.2 Test data for 802.11g WLAN Mode

- 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 : 91.37 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel											
2 350.71	52.29	Peak	H	27.30	6.66	44.96	6.04	-	47.33	74.00	26.67
2 388.82	41.16	Average	H	27.53	6.92	44.94	6.04	0.39	37.10	54.00	16.90
2 389.53	55.39	Peak	V	27.54	6.92	44.94	6.04	-	50.95	74.00	23.05
2 389.84	42.62	Average	V	27.54	6.92	44.94	6.04	0.39	38.57	54.00	15.43
Test Data for High Channel											
2 483.51	54.90	Peak	H	27.57	6.94	44.91	6.04	-	50.54	74.00	23.46
2 483.66	41.68	Average	H	27.57	6.94	44.91	6.04	0.39	37.71	54.00	16.29
2 483.66	55.99	Peak	V	27.57	6.94	44.91	6.04	-	51.63	74.00	22.37
2 483.51	42.84	Average	V	27.57	6.94	44.91	6.04	0.39	38.87	54.00	15.13

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

9.6.2.1.3 Test data for 802.11n_HT20 WLAN Mode

- 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 : 94.81 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	ATT (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel											
2 389.94	53.60	Peak	H	27.54	6.92	44.94	6.04	-	49.16	74.00	24.84
2 389.84	41.17	Average	H	27.54	6.92	44.94	6.04	0.24	36.97	54.00	17.03
2 389.63	53.80	Peak	V	27.54	6.92	44.94	6.04	-	49.36	74.00	24.64
2 389.94	42.95	Average	V	27.54	6.92	44.94	6.04	0.24	38.75	54.00	15.25
Test Data for High Channel											
2 485.21	54.28	Peak	H	27.56	6.94	44.91	6.04	-	49.91	74.00	24.09
2 483.54	42.99	Average	H	27.57	6.94	44.91	6.04	0.24	38.87	54.00	15.13
2 484.11	58.23	Peak	V	27.56	6.94	44.91	6.04	-	53.86	74.00	20.14
2 483.62	42.15	Average	V	27.57	6.94	44.91	6.04	0.24	38.03	54.00	15.97

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

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

Total Level = Reading + Antenna Factor + Cable Loss - Amp Gain + ATT + Duty Factor

9.6.2.2 Spurious & Harmonic Radiated Emission

9.6.2.2.1 Test data for 802.11b WLAN Mode

- 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 : 99.40 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 824.09	51.33	Peak	H	31.30	11.15	44.66	-	49.12	74.00	24.88
4 824.14	43.56	Average	H	31.30	11.15	44.66	0.03	41.38	54.00	12.62
4 834.52	49.17	Peak	V	31.30	11.27	44.67	-	47.07	74.00	26.93
4 823.87	37.24	Average	V	31.30	11.15	44.66	0.03	35.06	54.00	18.94
Test Data for Middle Channel										
4 874.09	51.49	Peak	H	31.30	11.27	44.67	-	49.39	74.00	24.61
4 874.09	42.71	Average	H	31.30	11.27	44.67	0.03	40.64	54.00	13.36
4 856.78	48.63	Peak	V	31.30	11.27	44.67	-	46.53	74.00	27.47
4 853.55	37.17	Average	V	31.30	11.27	44.67	0.03	35.10	54.00	18.90
Test Data for High Channel										
4 924.05	51.53	Peak	H	31.30	11.15	44.68	-	49.30	74.00	24.70
4 924.27	44.49	Average	H	31.30	11.15	44.68	0.03	42.29	54.00	11.71
4 915.82	49.37	Peak	V	31.30	11.15	44.68	-	47.14	74.00	26.86
4 923.96	38.52	Average	V	31.30	11.15	44.68	0.03	36.32	54.00	17.68

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

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

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amp Gain} + \text{Duty Factor}$$

9.6.2.2.2 Test data for 802.11g WLAN Mode

- 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 : 91.37 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 813.84	49.09	Peak	H	31.30	11.15	44.66	-	46.88	74.00	27.12
4 825.62	37.50	Average	H	31.30	11.27	44.67	0.39	35.79	54.00	18.21
4 804.53	48.84	Peak	V	31.30	11.15	44.66	-	46.63	74.00	27.37
4 802.51	36.99	Average	V	31.30	11.15	44.66	0.39	35.17	54.00	18.83
Test Data for Middle Channel										
4 852.78	48.84	Peak	H	31.30	11.27	44.67	-	46.74	74.00	27.26
4 875.44	37.36	Average	H	31.30	11.15	44.68	0.39	35.52	54.00	18.48
4 882.41	49.06	Peak	V	31.30	11.15	44.68	-	46.83	74.00	27.17
4 865.77	36.93	Average	V	31.30	11.27	44.67	0.39	35.22	54.00	18.78
Test Data for High Channel										
4 929.26	49.12	Peak	H	31.30	11.35	44.69	-	47.08	74.00	26.92
4 928.27	37.30	Average	H	31.30	11.35	44.69	0.39	35.65	54.00	18.35
4 928.59	48.58	Peak	V	31.30	11.35	44.69	-	46.54	74.00	27.46
4 916.27	37.01	Average	V	31.30	11.15	44.68	0.39	35.17	54.00	18.83

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

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

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amp Gain} + \text{Duty Factor}$$

9.6.2.2.3 Test data for 802.11n_HT20 WLAN Mode

- 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 : 94.81 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 827.82	48.81	Peak	H	31.30	11.27	44.67	-	46.71	74.00	27.29
4 823.87	37.40	Average	H	31.30	11.15	44.66	0.24	35.43	54.00	18.57
4 827.51	49.02	Peak	V	31.30	11.27	44.67	-	46.92	74.00	27.08
4 811.68	36.93	Average	V	31.30	11.15	44.66	0.24	34.96	54.00	19.04
Test Data for Middle Channel										
4 877.60	48.90	Peak	H	31.30	11.15	44.68	-	46.67	74.00	27.33
4 875.12	37.06	Average	H	31.30	11.15	44.68	0.24	35.07	54.00	18.93
4 859.21	48.62	Peak	V	31.30	11.27	44.67	-	46.52	74.00	27.48
4 853.19	36.92	Average	V	31.30	11.27	44.67	0.24	35.06	54.00	18.94
Test Data for High Channel										
4 926.79	49.36	Peak	H	31.30	11.35	44.69	-	47.32	74.00	26.68
4 924.36	37.68	Average	H	31.30	11.15	44.68	0.24	35.69	54.00	18.31
4 904.53	48.65	Peak	V	31.30	11.15	44.68	-	46.42	74.00	27.58
4 940.18	37.12	Average	V	31.30	11.35	44.69	0.24	35.32	54.00	18.68

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

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

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amp Gain} + \text{Duty Factor}$$

10. PEAK POWER SPECTRAL DENSITY

10.1 Operating environment

Temperature : 23 °C

Relative humidity : 47 % 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 Date

May 24, 2023 ~ June 05, 2023

10.4 Test data for DC 12 V

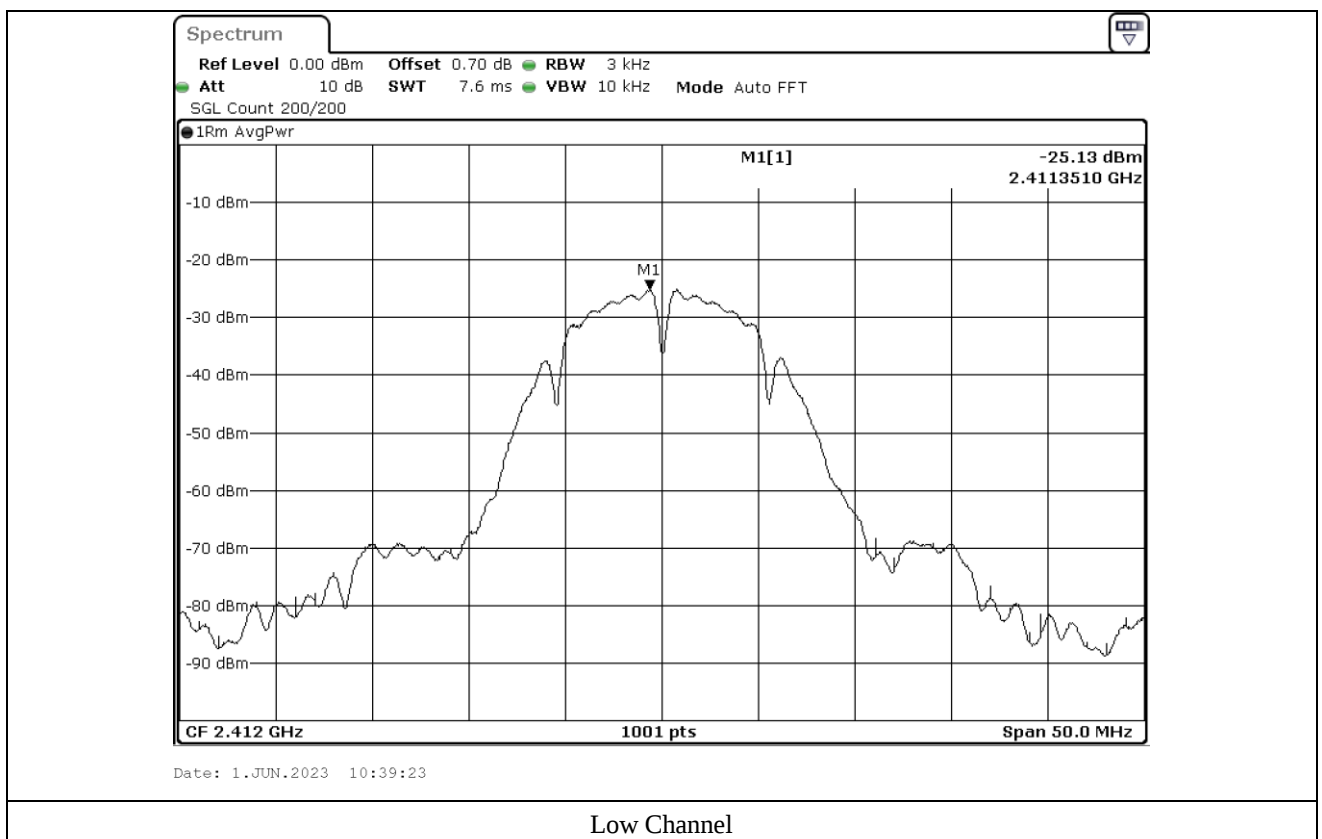
10.4.1 Test data for 802.11b WLAN Mode

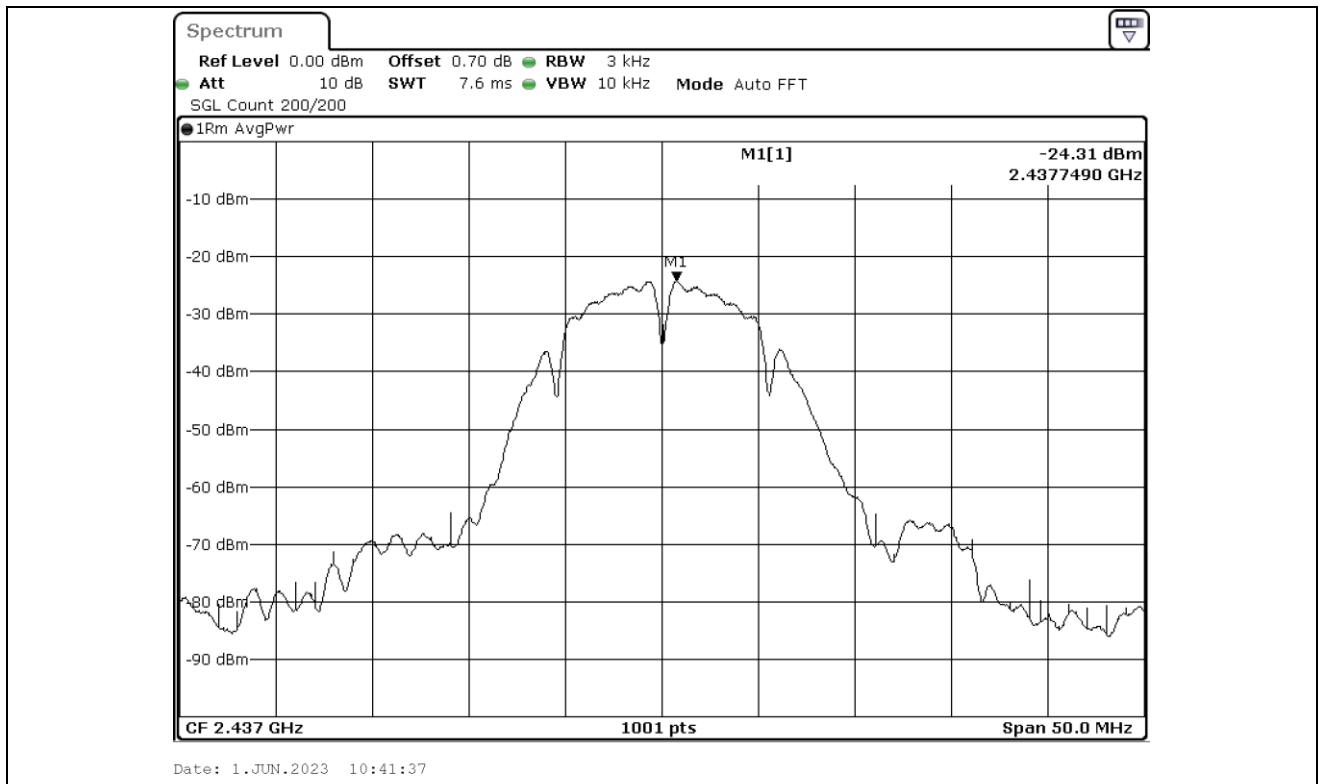
-. Test Result : Pass

-. Duty Cycle : 99.40 %

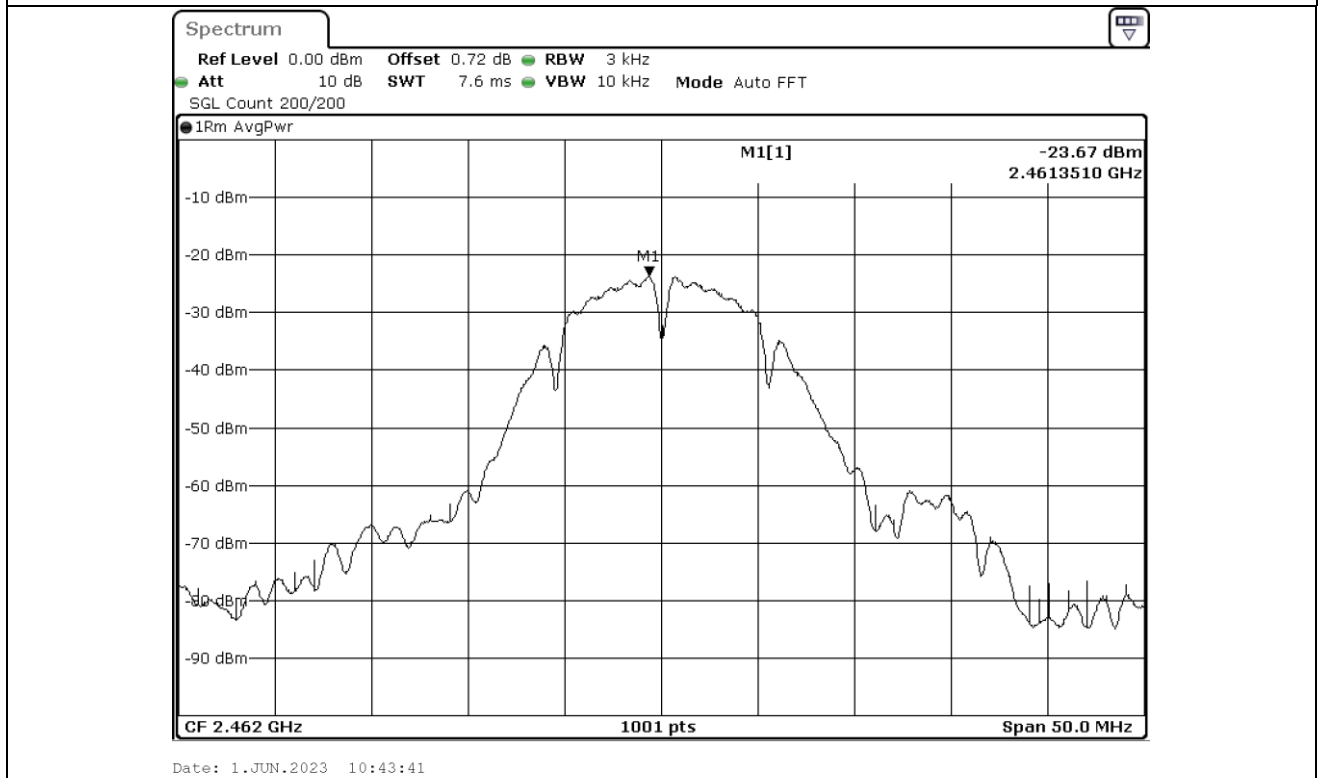
CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Duty Factor (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412.00	-25.13	0.03	-25.10	8	33.10
MIDDLE	2 437.00	-24.31	0.03	-24.28	8	32.28
HIGH	2 462.00	-23.67	0.03	-23.64	8	31.64

Remark. Margin = Limit – Result (=Measured Value + Duty Factor)





Middle Channel



High Channel

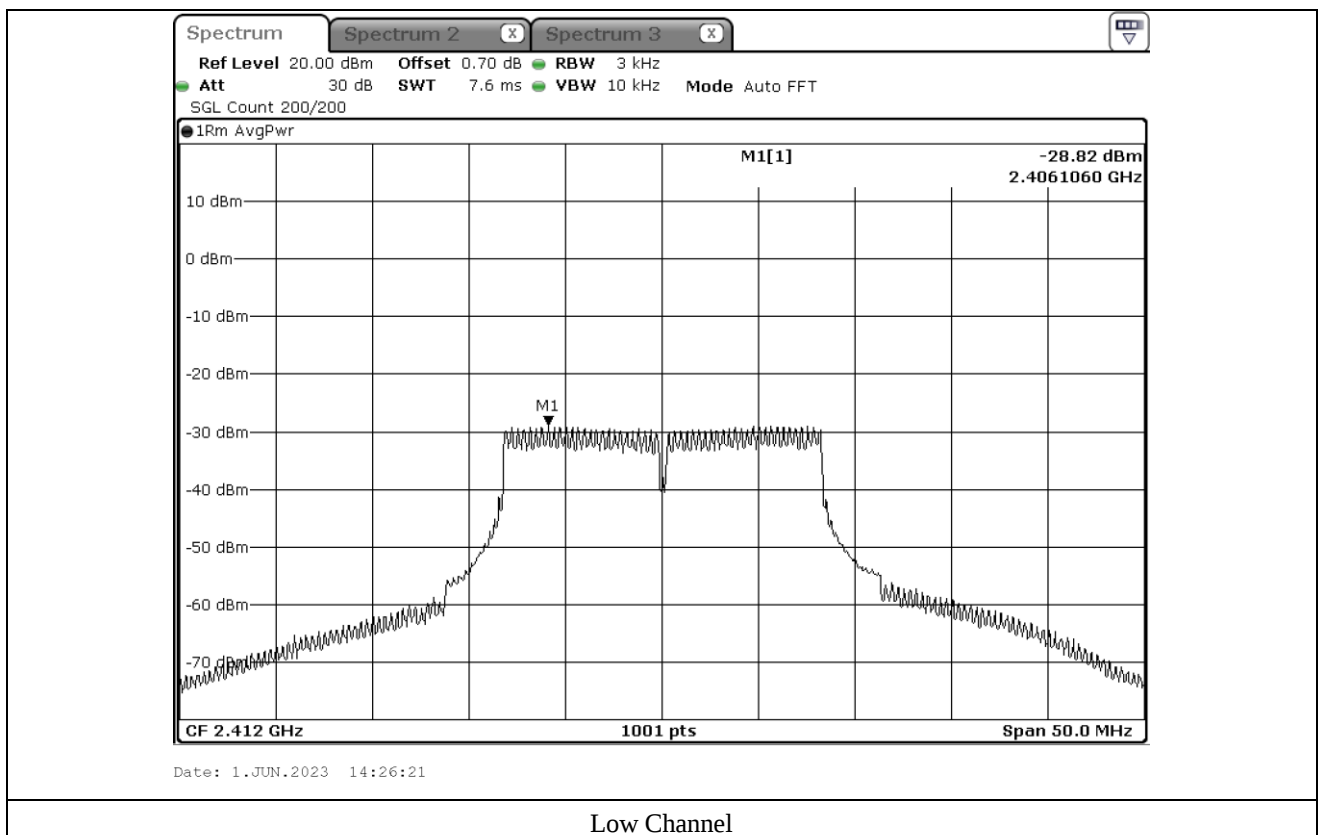
10.4.2 Test data for 802.11g WLAN Mode

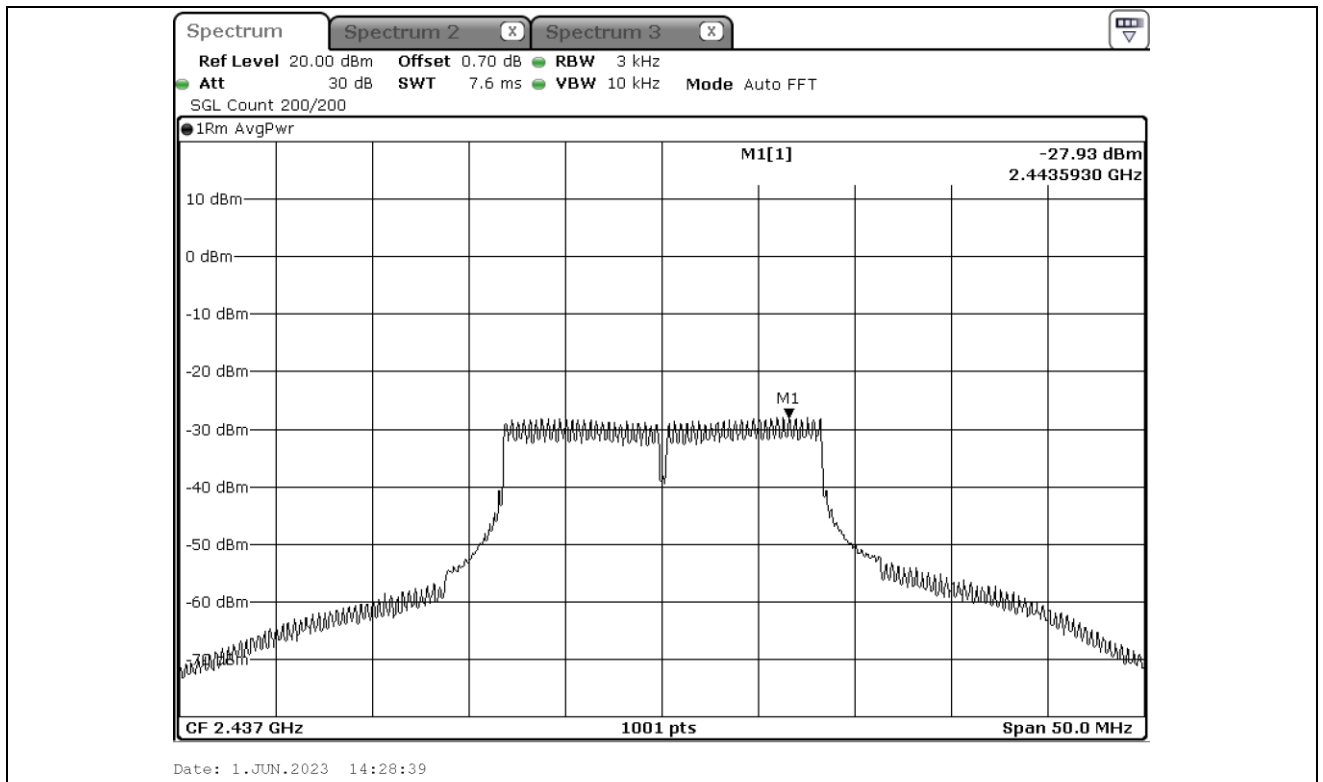
-. Test Result : Pass

-. Duty Cycle : 91.38 %

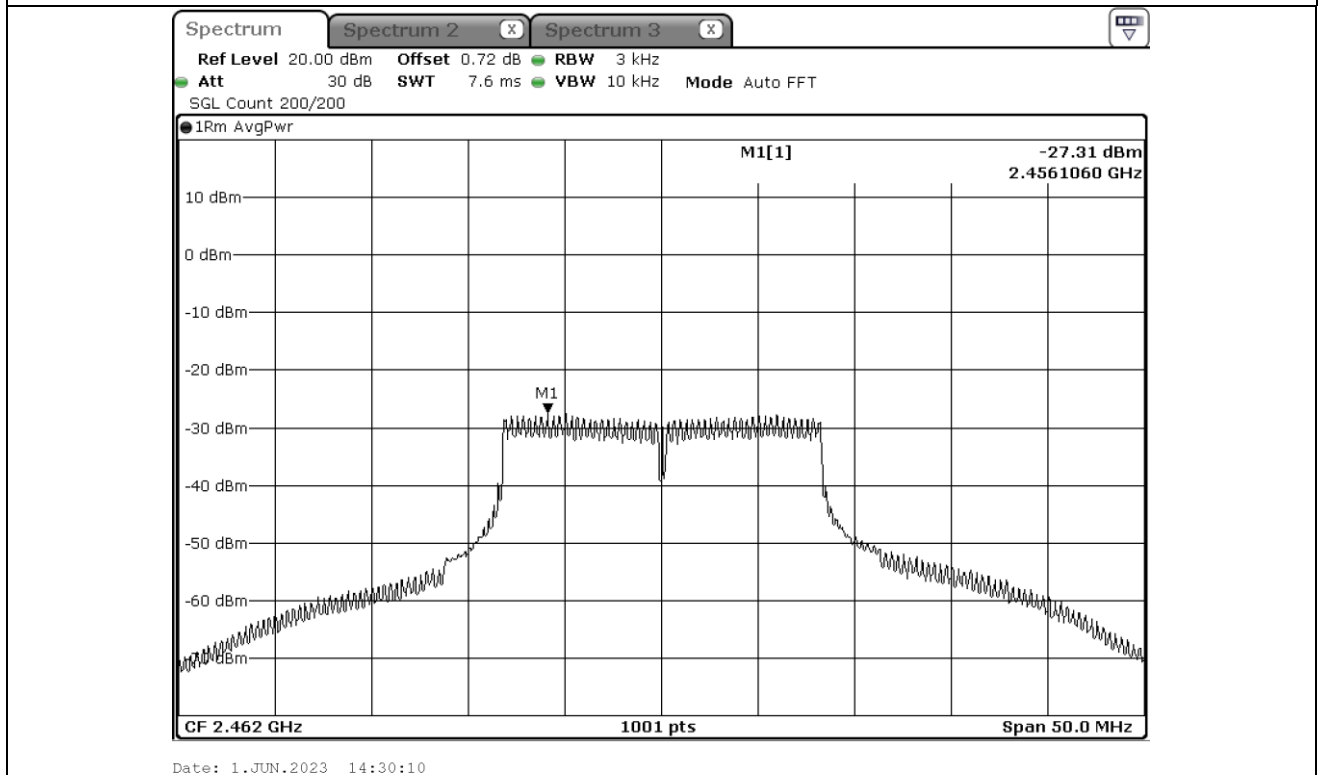
CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Duty Factor (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412.00	-28.82	0.39	-28.43	8	36.43
MIDDLE	2 437.00	-27.93	0.39	-27.54	8	35.54
HIGH	2 462.00	-27.31	0.39	-26.92	8	34.92

Remark. Margin = Limit – Result (=Measured Value + Duty Factor)





Middle Channel



High Channel

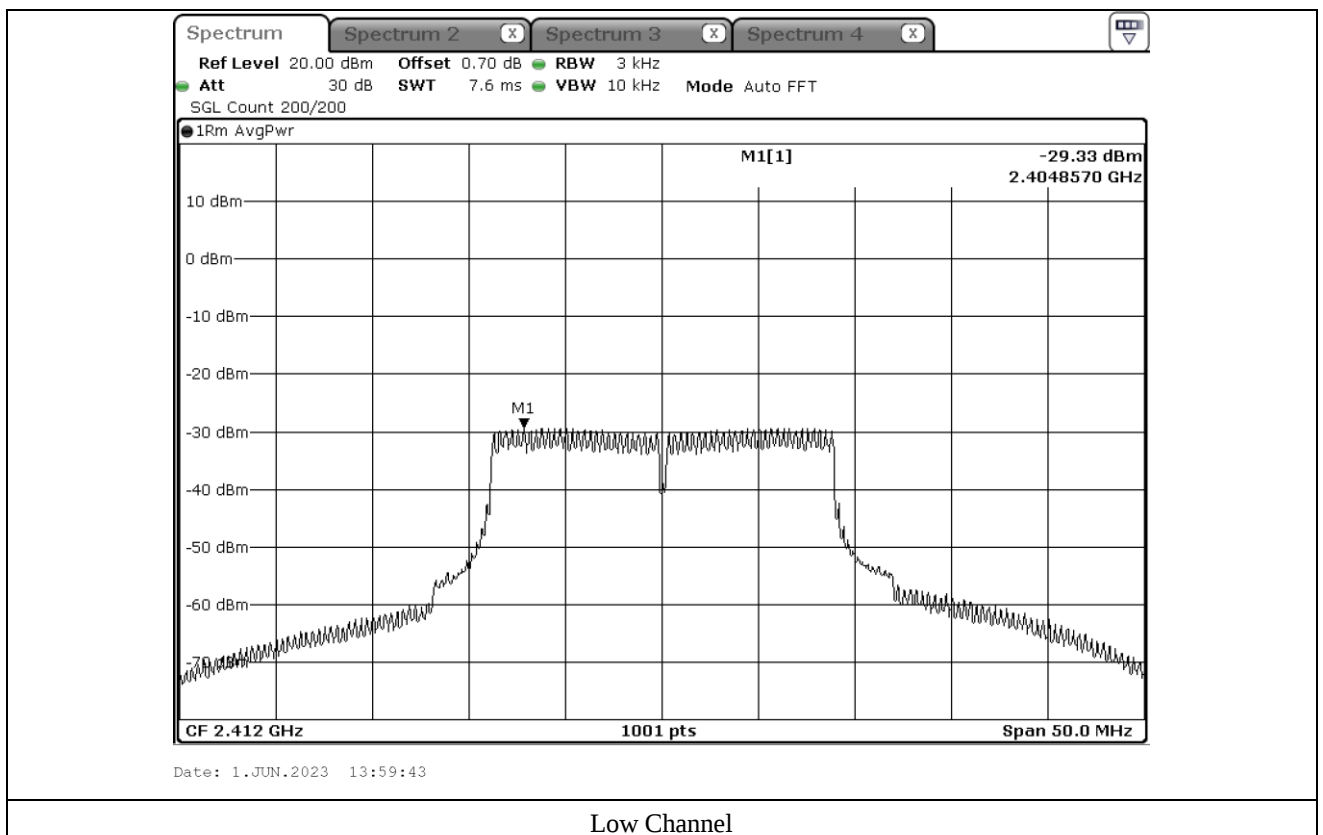
10.4.3 Test data for 802.11n_HT20 WLAN Mode

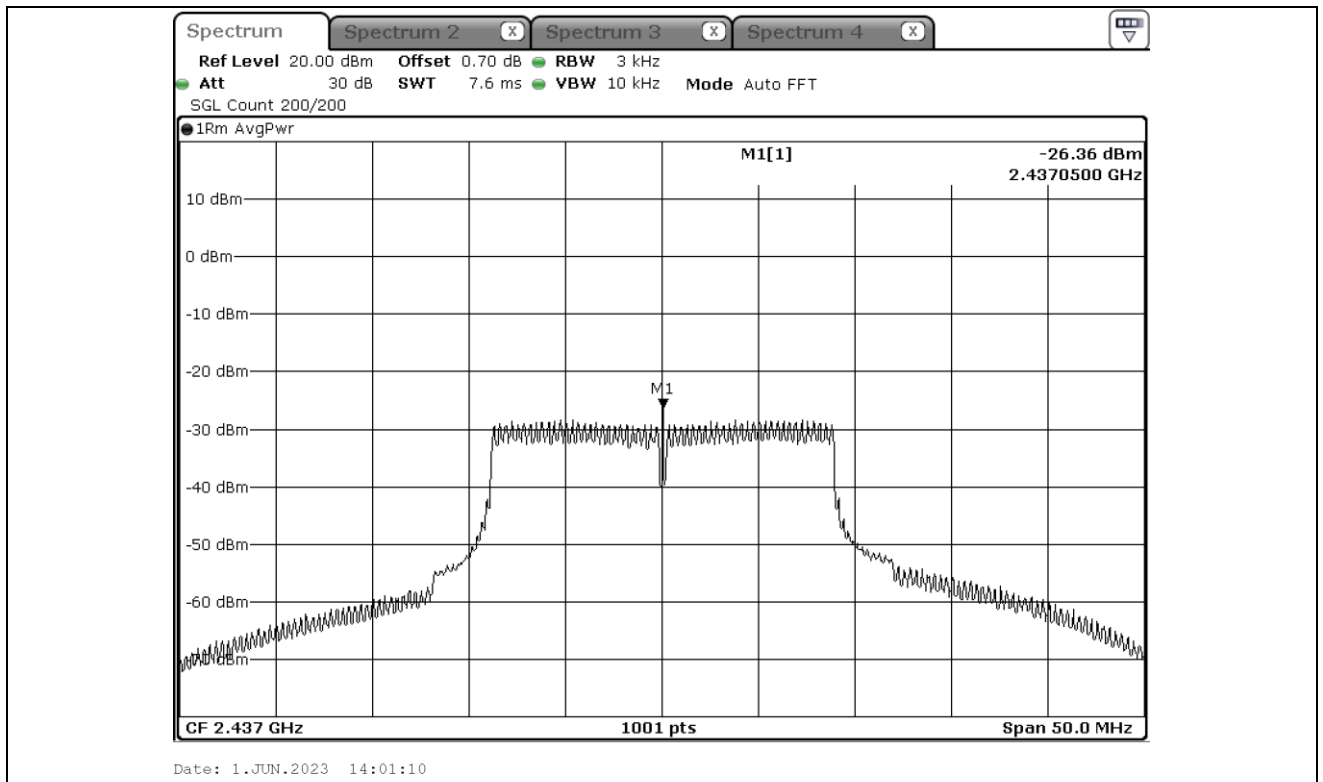
-. Test Result : Pass

-. Duty Cycle : 94.81 %

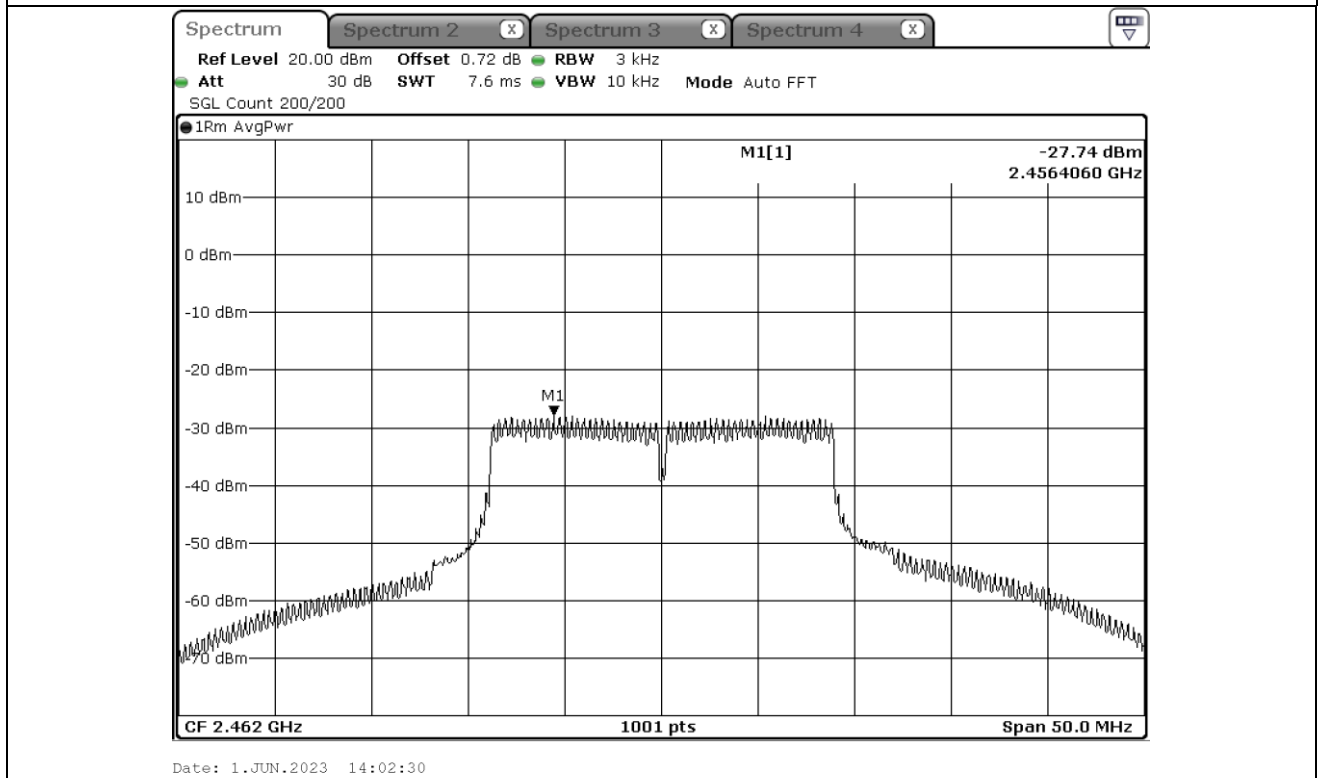
CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Duty Factor (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412.00	-29.33	0.24	-29.09	8	37.09
MIDDLE	2 437.00	-26.36	0.24	-26.12	8	34.12
HIGH	2 462.00	-27.74	0.24	-27.50	8	35.50

Remark. Margin = Limit – Result (=Measured Value + Duty Factor)





Middle Channel



High Channel

10.5 Test data for DC 24 V

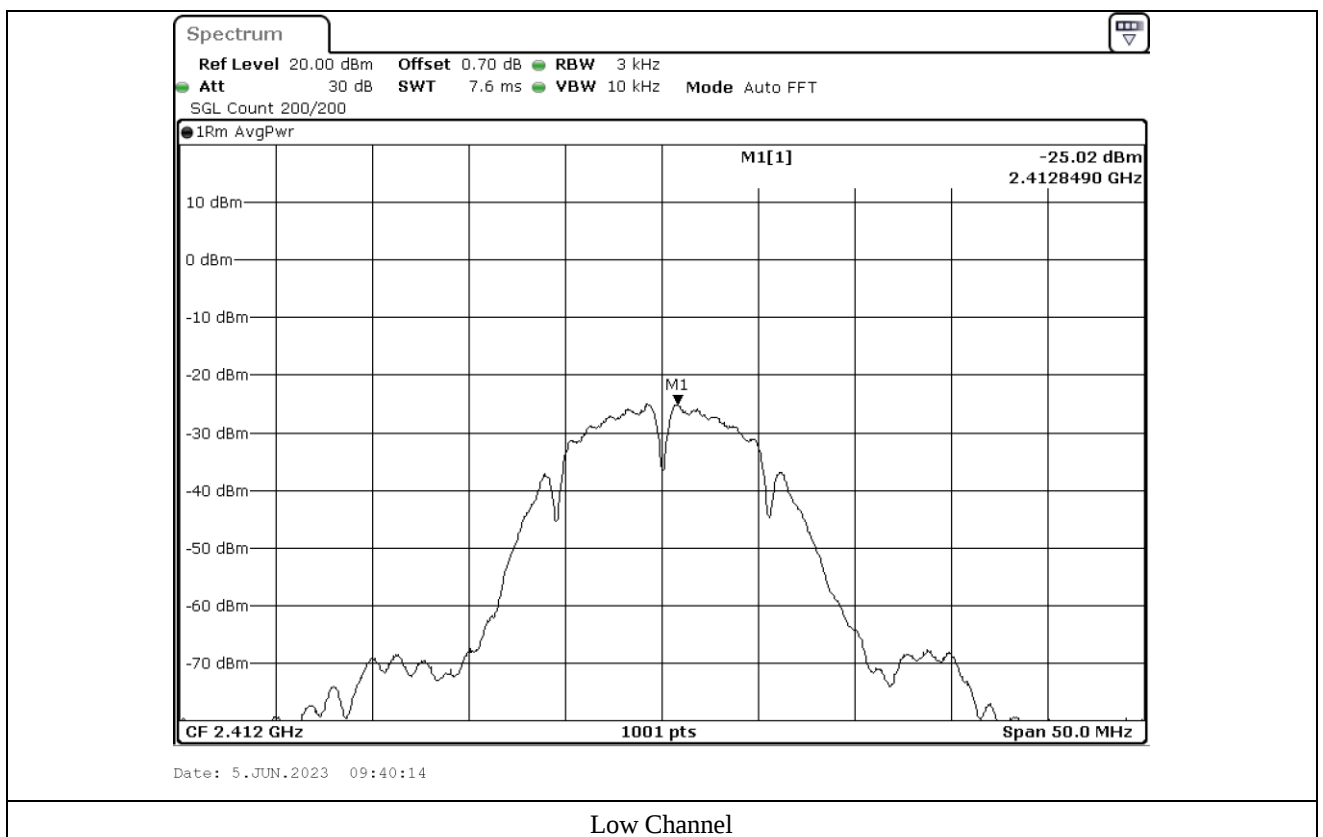
10.5.1 Test data for 802.11b WLAN Mode

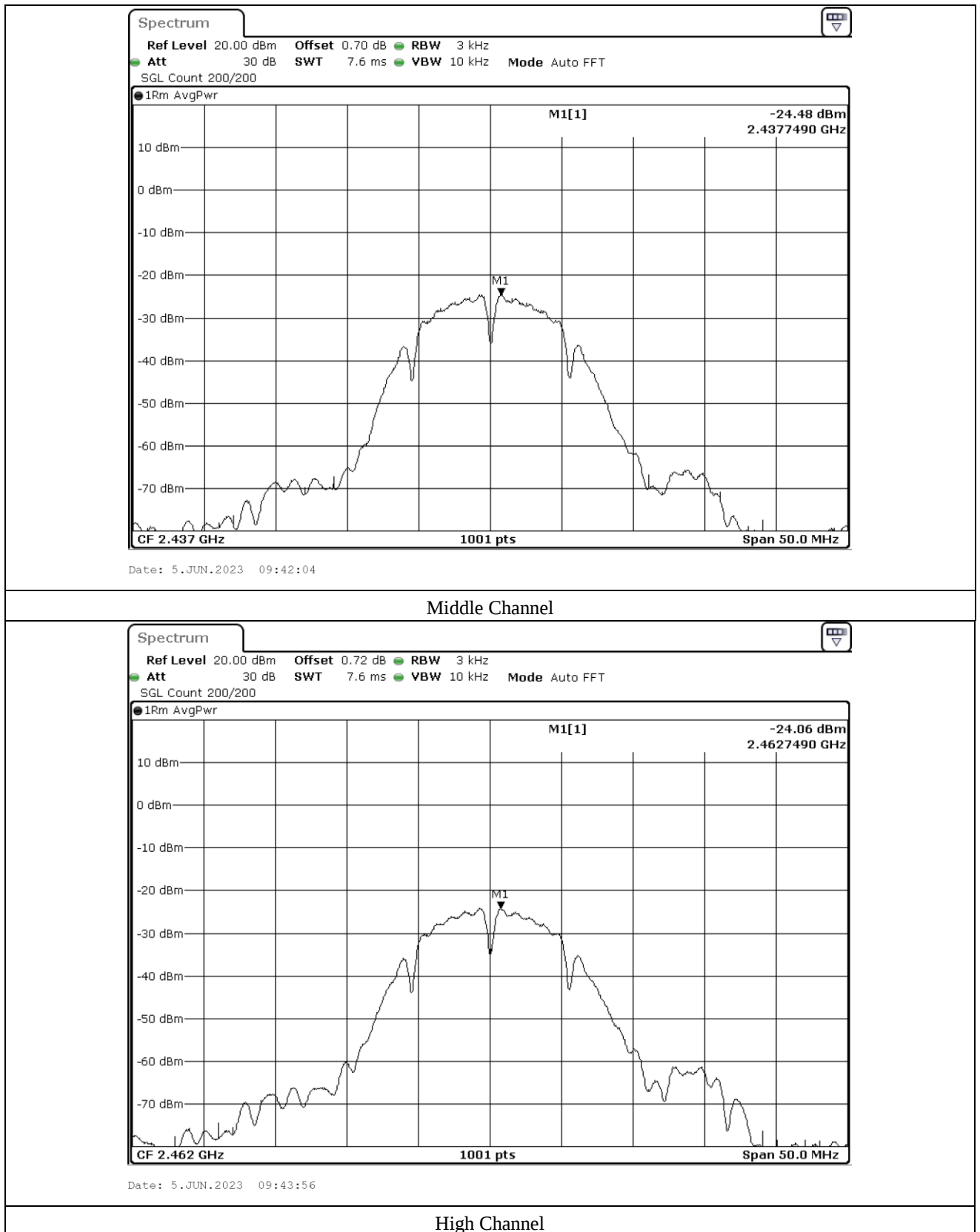
-. Test Result : Pass

-. Duty Cycle : 99.40 %

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Duty Factor (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412.00	-25.02	0.03	-24.98	8	32.98
MIDDLE	2 437.00	-24.48	0.03	-24.45	8	32.45
HIGH	2 462.00	-24.06	0.03	-24.03	8	32.03

Remark. Margin = Limit – Result (=Measured Value + Duty Factor)





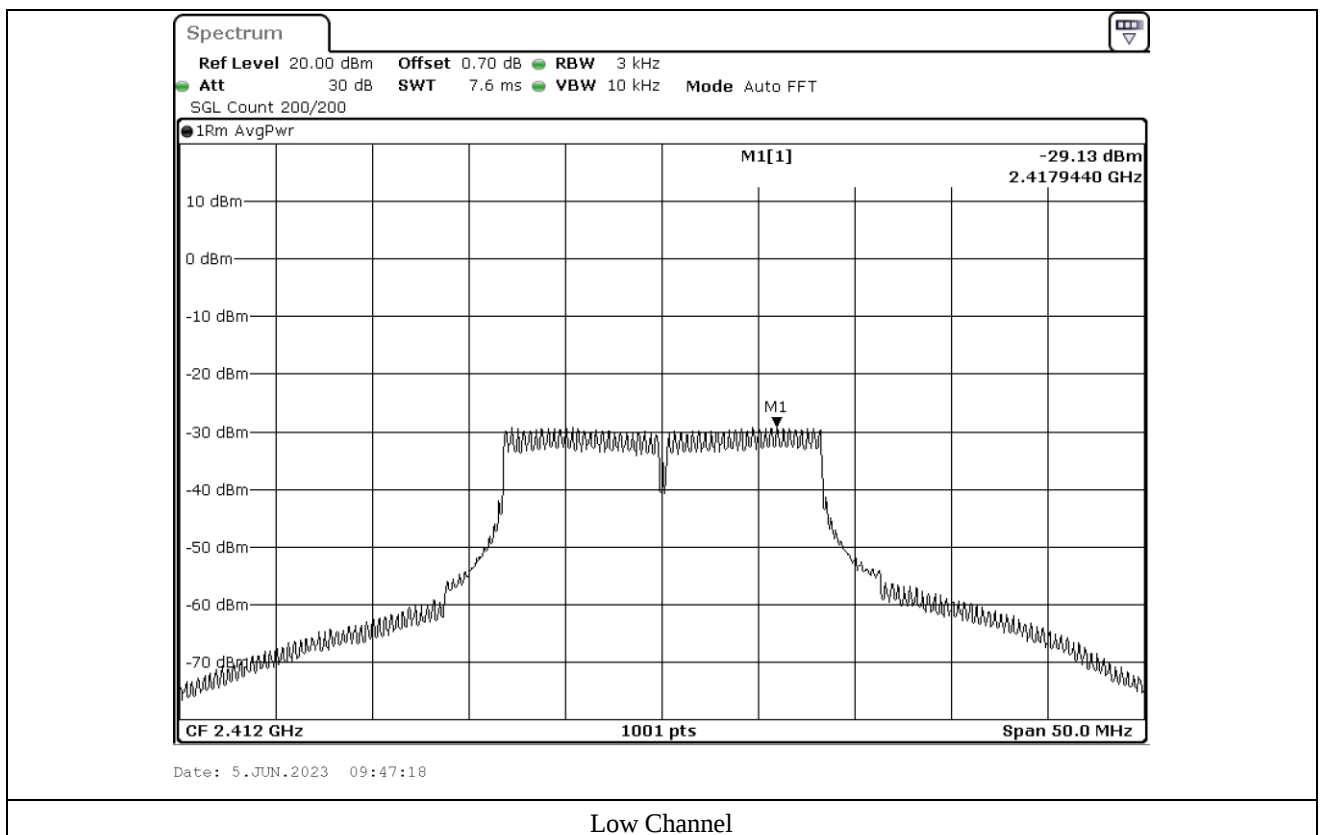
10.5.2 Test data for 802.11g WLAN Mode

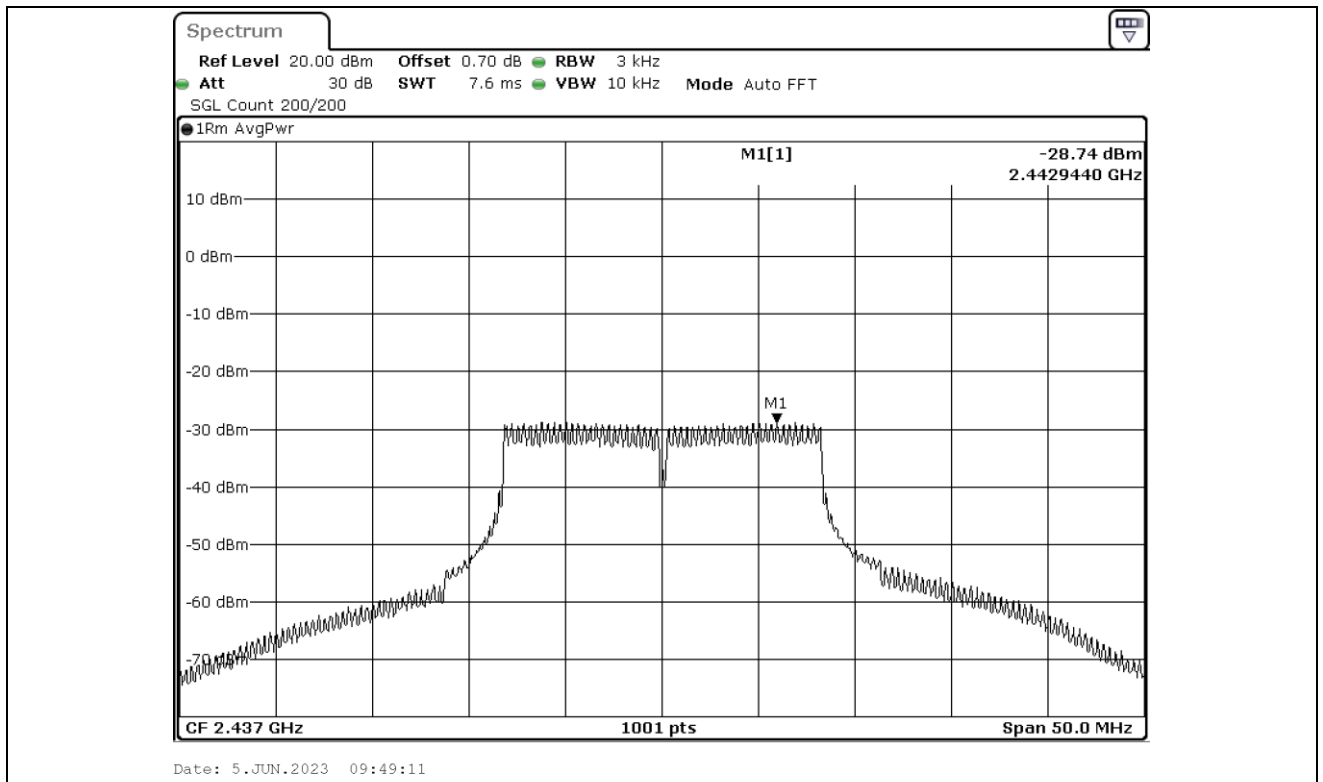
-. Test Result : Pass

-. Duty Cycle : 91.37 %

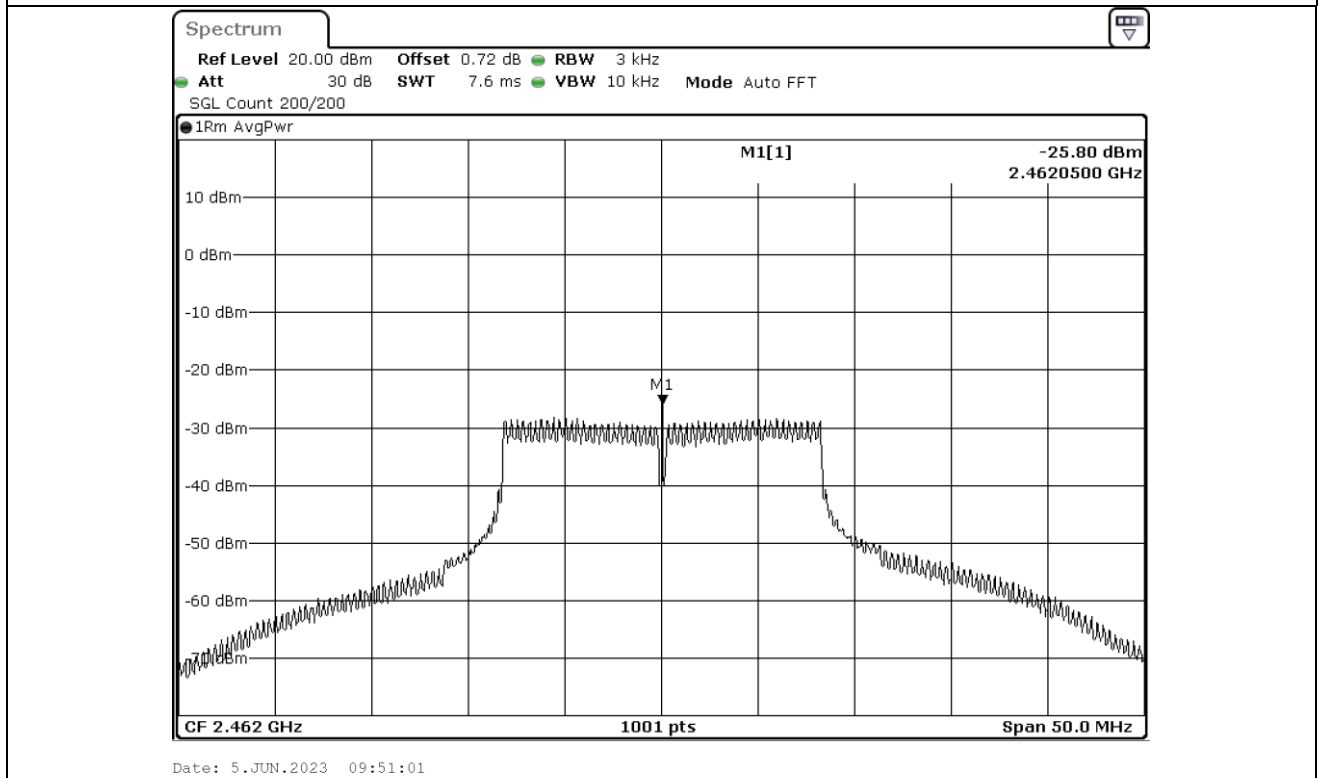
CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Duty Factor (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412.00	-29.13	0.39	-28.74	8	36.74
MIDDLE	2 437.00	-28.74	0.39	-28.35	8	36.35
HIGH	2 462.00	-25.80	0.39	-25.41	8	33.41

Remark. Margin = Limit – Result (=Measured Value + Duty Factor)





Middle Channel



High Channel

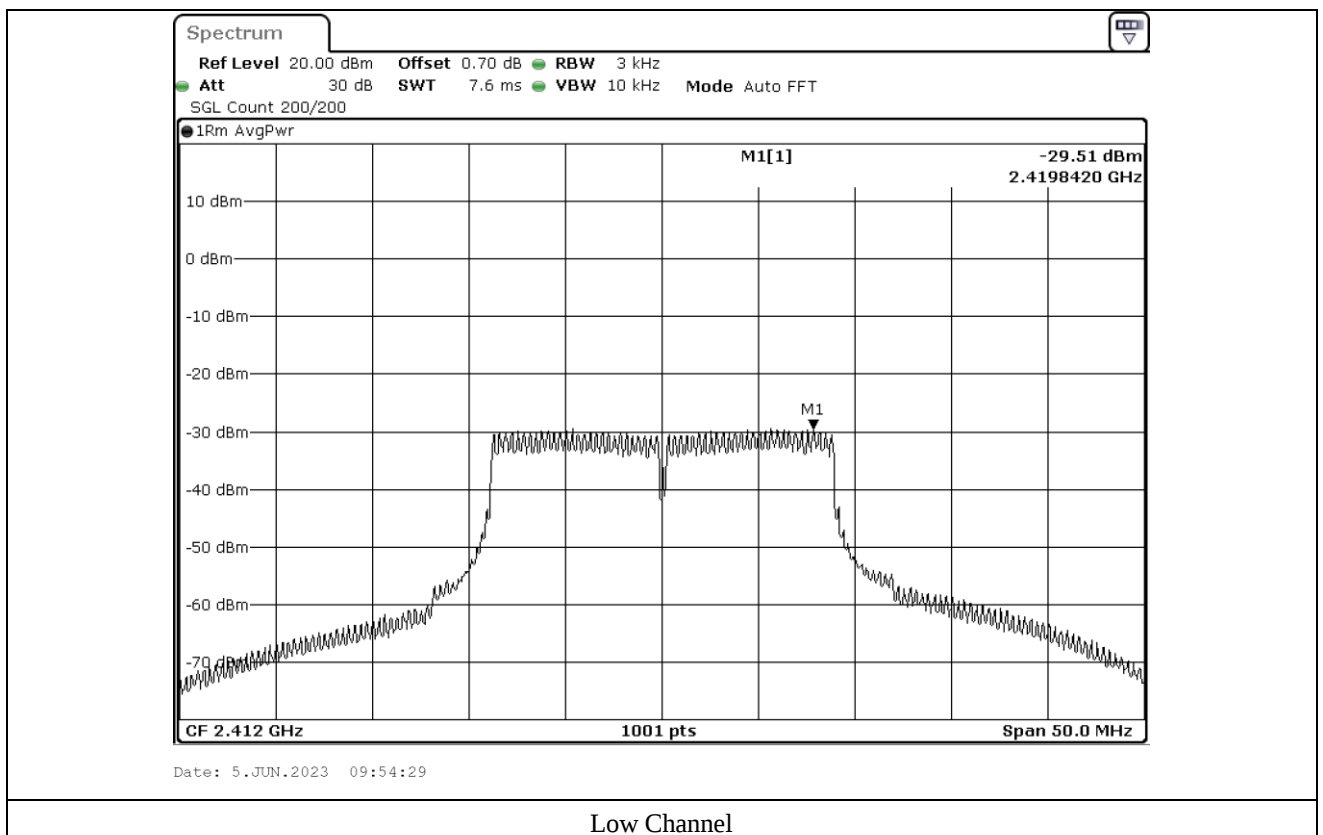
10.5.3 Test data for 802.11n_HT20 WLAN Mode

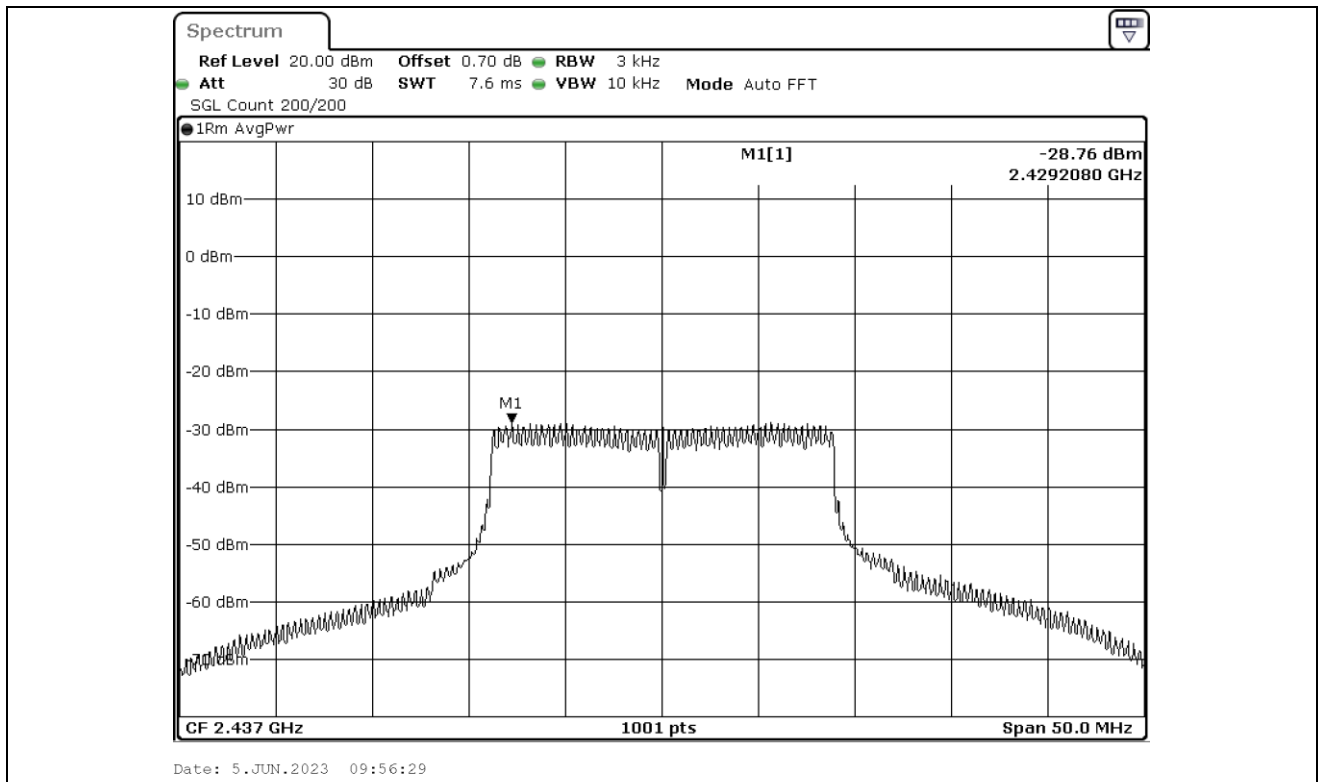
-. Test Result : Pass

-. Duty Cycle : 94.81 %

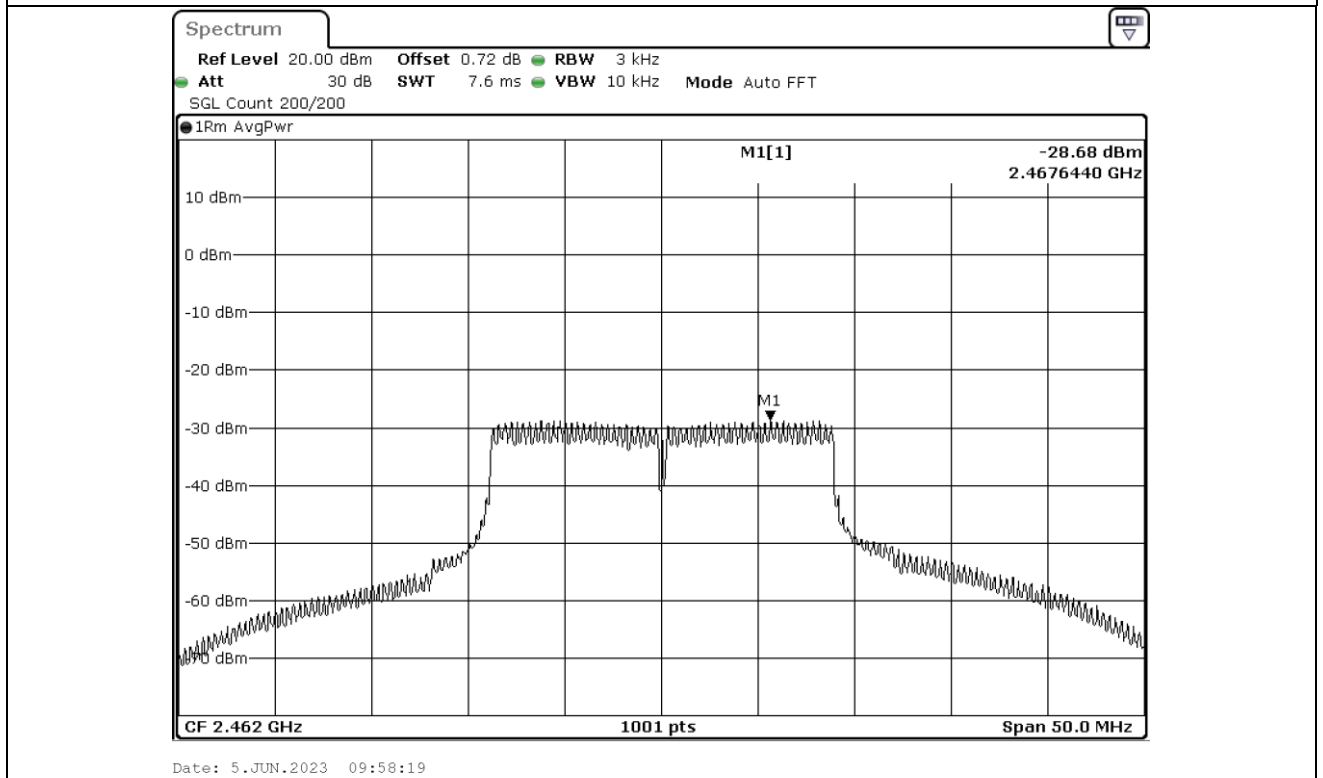
CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	Duty Factor (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 412.00	-29.51	0.24	-29.27	8	37.27
MIDDLE	2 437.00	-28.76	0.24	-28.52	8	36.52
HIGH	2 462.00	-28.68	0.24	-28.44	8	36.44

Remark. Margin = Limit – Result (=Measured Value + Duty Factor)





Middle Channel



High Channel

11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 23 °C

Relative humidity : 47 % R.H.

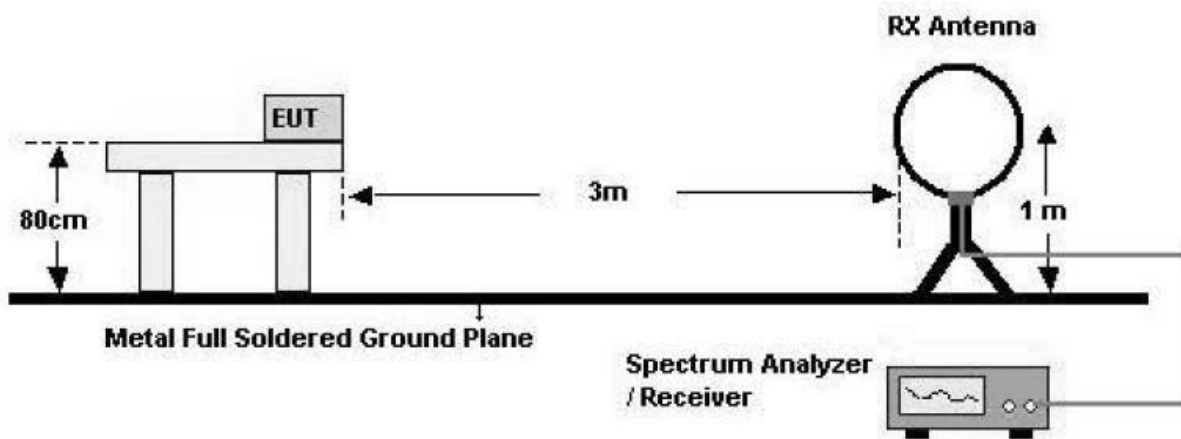
11.2 Test set-up

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on a non-conductive 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.

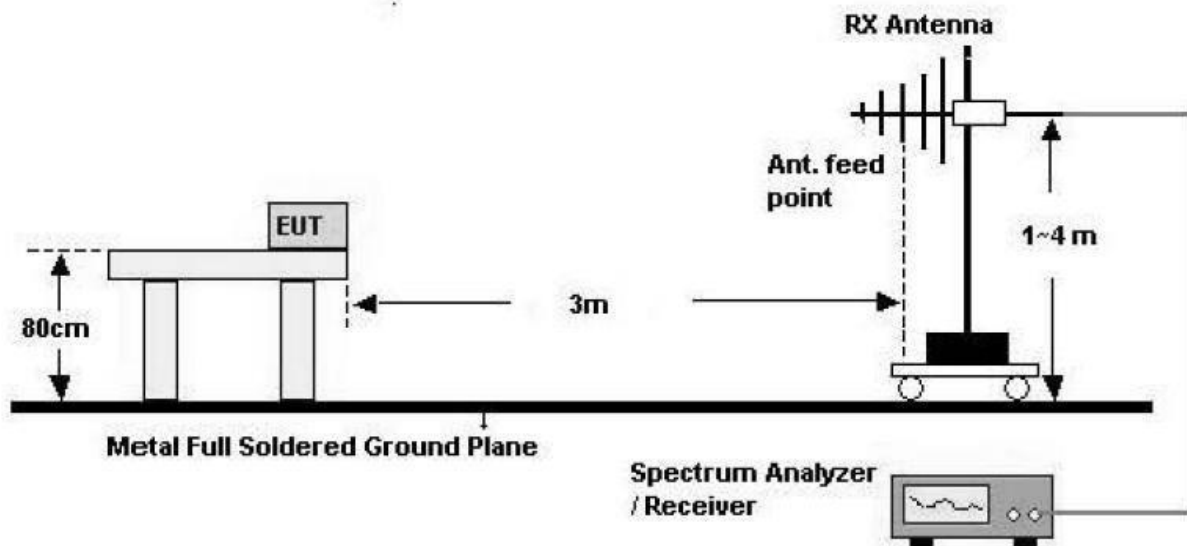
The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal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

- Test Configuration

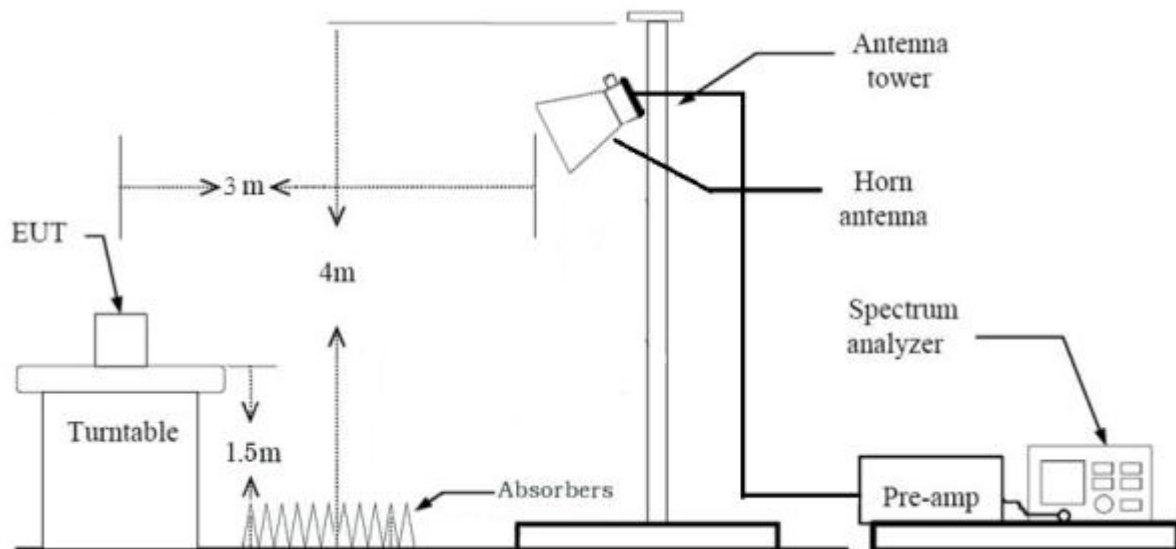
1. Below 30 MHz



2. 30 MHz - 1 GHz



3. Above 1 GHz



11.3 Test Date

May 24, 2023 ~ June 05, 2023

11.4 Test data for DC 12 V

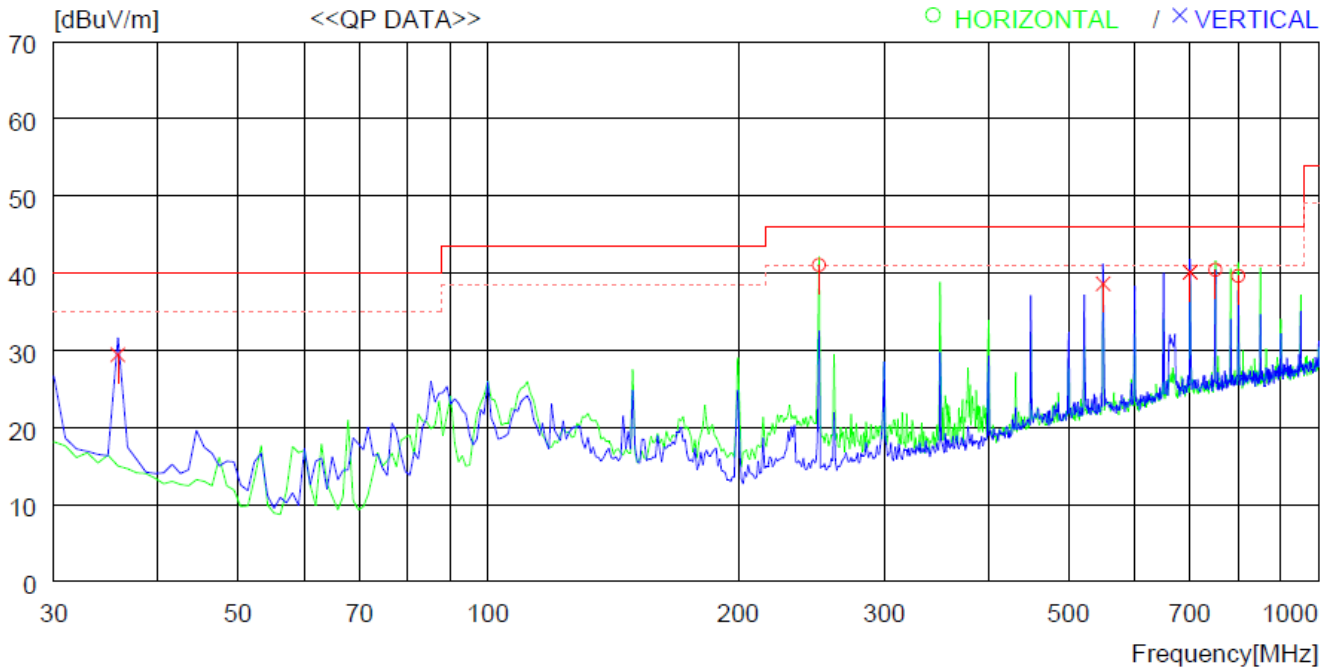
11.4.1 Test data for 30 MHz ~ 1 000 MHz

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

Result : PASSED

EUT : 3CH Dashcam

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



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	250.190	52.9	17.5	3.9	33.3	41.0	46.0	5.0	100	359
2	750.703	40.8	26.0	6.9	33.3	40.4	46.0	5.6	100	18
3	800.172	38.9	26.9	7.1	33.3	39.6	46.0	6.4	100	208
----- Vertical -----										
4	35.820	42.2	18.8	1.5	33.1	29.4	40.0	10.6	200	359
5	549.919	42.1	23.8	5.9	33.2	38.6	46.0	7.4	100	0
6	700.265	41.1	25.6	6.7	33.3	40.1	46.0	5.9	100	0

11.4.2 Test data for Below 30 MHz

- . 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 (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

11.4.3 Test data for above 1 GHz

- . 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
- . Frequency range : 1 GHz ~ 26.5 GHz
- . Measurement distance : 3 m
- . Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

11.5 Test data for DC 24 V

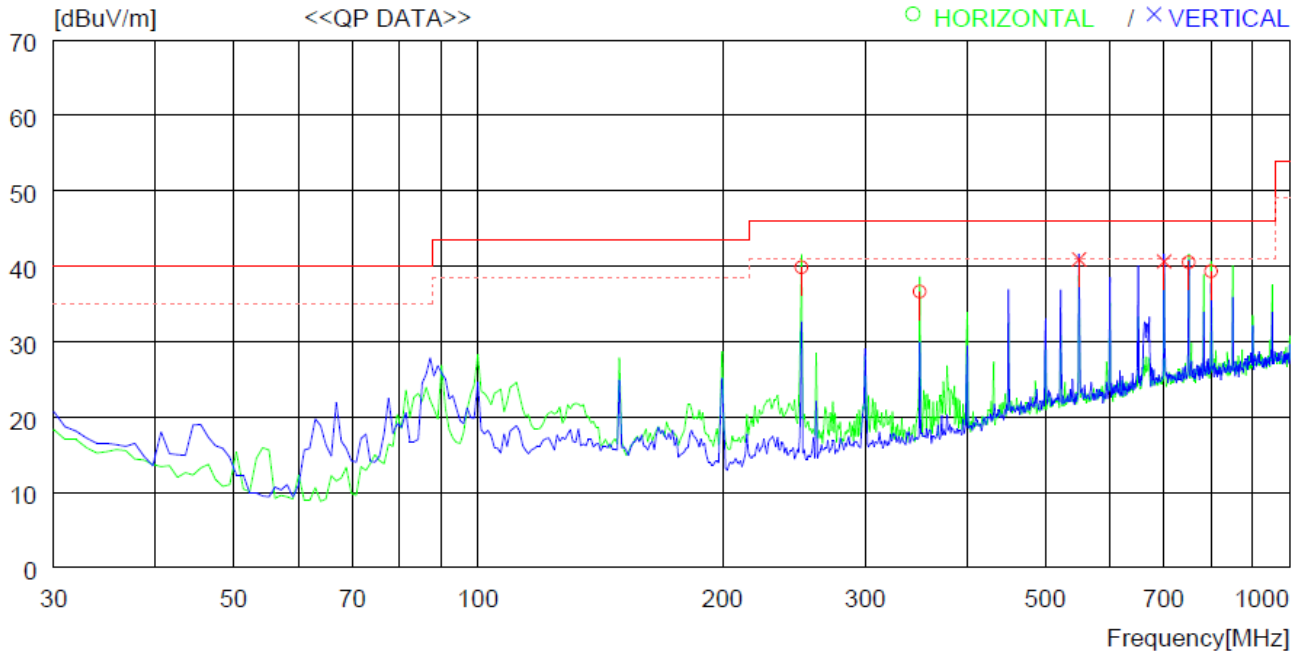
11.5.1 Test data for 30 MHz ~ 1 000 MHz

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

Result : PASSED

EUT : 3CH Dashcam

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



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	250.190	51.7	17.5	3.9	33.3	39.8	46.0	6.2	100	219
2	350.100	45.3	19.8	4.6	33.1	36.6	46.0	9.4	100	201
3	750.703	40.9	26.0	6.9	33.3	40.5	46.0	5.5	100	26
4	800.172	38.6	26.9	7.1	33.3	39.3	46.0	6.7	100	359
----- Vertical -----										
5	549.919	44.4	23.8	5.9	33.2	40.9	46.0	5.1	100	0
6	700.265	41.6	25.6	6.7	33.3	40.6	46.0	5.4	100	0

11.5.2 Test data for Below 30 MHz

- . 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)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

11.5.3 Test data for above 1 GHz

- . 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
- . 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)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

12. CONDUCTED EMISSION TEST

12.1 Operating environment

Temperature : 23 °C

Relative humidity : 47 % R.H.

12.2 Test set-up

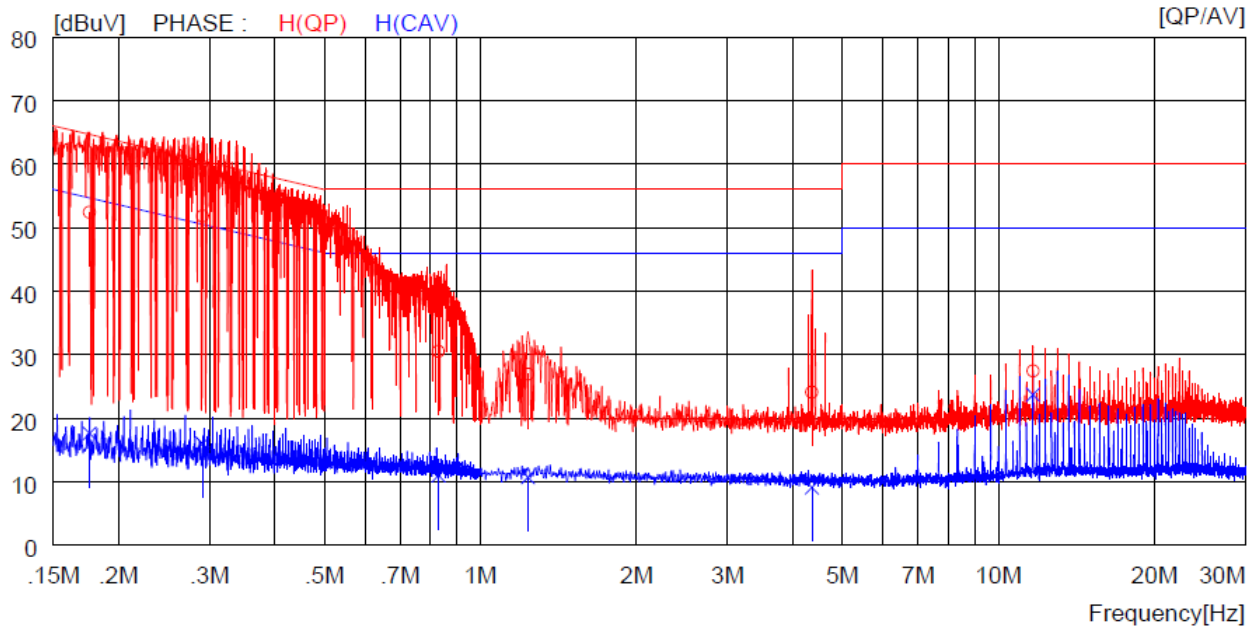
The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μ H + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

12.3 Test Date

May 24, 2023 ~ June 05, 2023

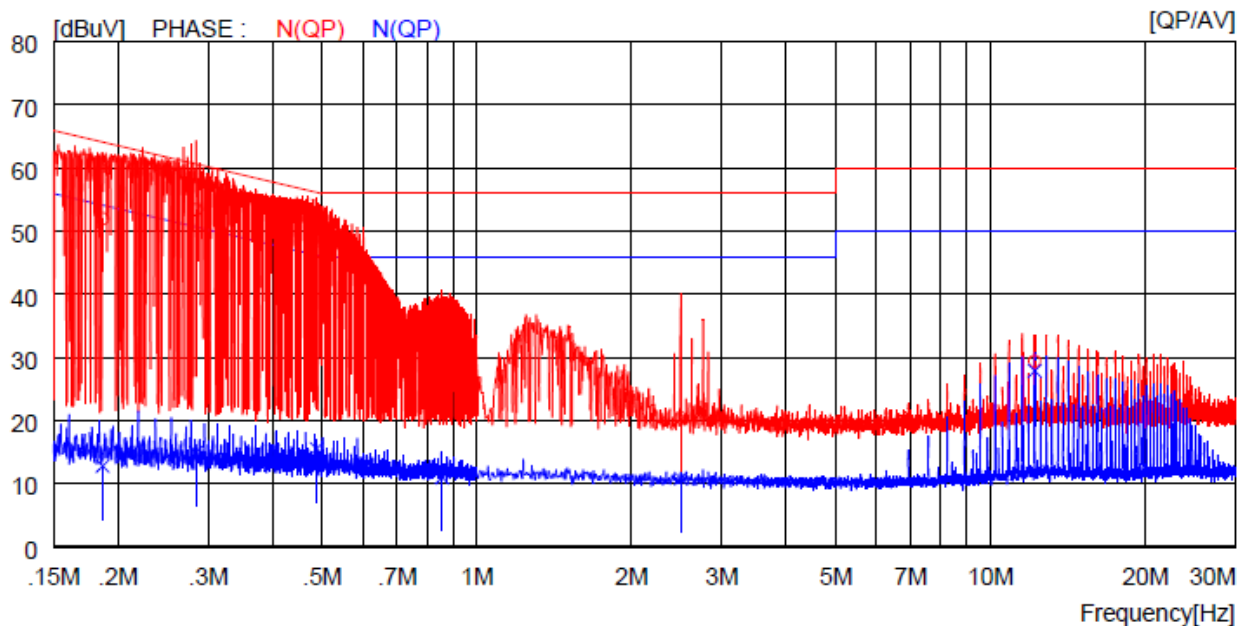
12.4 Test data for DC 12 V

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : HOT 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	0.17600	52.3	----	0.1	52.4	----	64.7	----	12.3	----	H (QP)
2	0.29100	51.8	----	0.0	51.8	----	60.5	----	8.7	----	H (QP)
3	0.83000	30.4	----	0.1	30.5	----	56.0	----	25.5	----	H (QP)
4	1.23600	26.7	----	0.2	26.9	----	56.0	----	29.1	----	H (QP)
5	4.36400	23.9	----	0.2	24.1	----	56.0	----	31.9	----	H (QP)
6	11.67000	26.9	----	0.5	27.4	----	60.0	----	32.6	----	H (QP)
7	0.17600	----	17.5	0.1	----	17.6	----	54.7	----	37.1	H (CAV)
8	0.29100	----	16.0	0.0	----	16.0	----	50.5	----	34.5	H (CAV)
9	0.83000	----	10.9	0.1	----	11.0	----	46.0	----	35.0	H (CAV)
10	1.23600	----	10.5	0.2	----	10.7	----	46.0	----	35.3	H (CAV)
11	4.36400	----	8.9	0.2	----	9.1	----	46.0	----	36.9	H (CAV)
12	11.67000	----	23.2	0.5	----	23.7	----	50.0	----	26.3	H (CAV)

-. Tested Line : NEUTRAL LINE



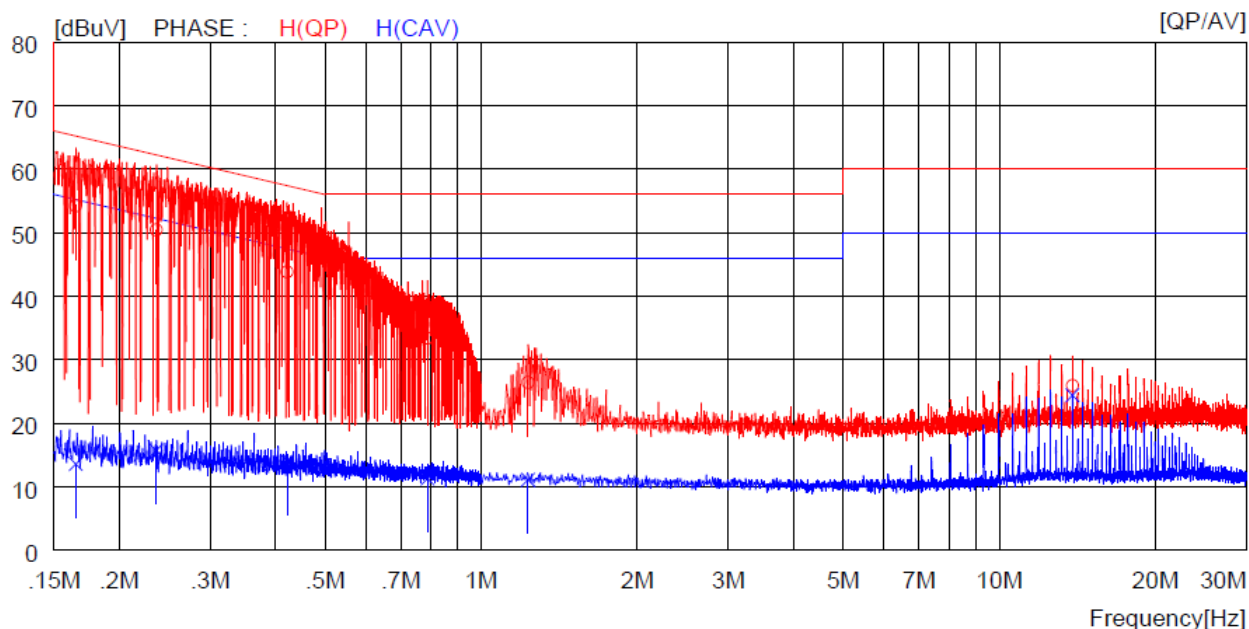
NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.18700	51.9	----	0.1	52.0	----	64.2	----	12.2	----	N (QP)
2	0.28400	53.4	----	0.0	53.4	----	60.7	----	7.3	----	N (QP)
3	0.48800	46.8	----	0.0	46.8	----	56.2	----	9.4	----	N (QP)
4	0.85600	28.5	----	0.1	28.6	----	56.0	----	27.4	----	N (QP)
5	2.49600	20.2	----	0.2	20.4	----	56.0	----	35.6	----	N (QP)
6	12.20000	28.9	----	0.5	29.4	----	60.0	----	30.6	----	N (QP)
7	0.18700	----	12.7	0.1	----	12.8	----	54.2	----	41.4	N (CAV)
8	0.28400	----	14.9	0.0	----	14.9	----	50.7	----	35.8	N (CAV)
9	0.48800	----	15.5	0.0	----	15.5	----	46.2	----	30.7	N (CAV)
10	0.85600	----	10.9	0.1	----	11.0	----	46.0	----	35.0	N (CAV)
11	2.49600	----	10.6	0.2	----	10.8	----	46.0	----	35.2	N (CAV)
12	12.20000	----	27.4	0.5	----	27.9	----	50.0	----	22.1	N (CAV)

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.

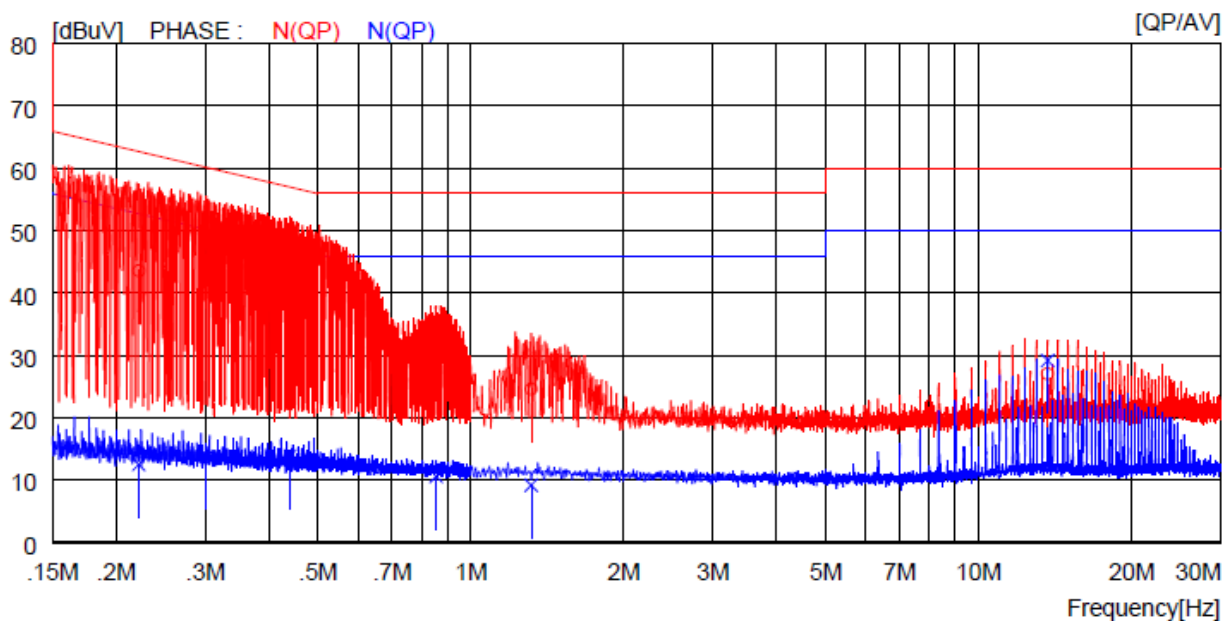
12.5 Test data for DC 24 V

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : HOT 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	0.16500	54.1	----	0.1	54.2	----	65.2	----	11.0	----	H (QP)
2	0.23600	50.3	----	0.1	50.4	----	62.2	----	11.8	----	H (QP)
3	0.42200	43.8	----	0.0	43.8	----	57.4	----	13.6	----	H (QP)
4	0.78800	33.3	----	0.1	33.4	----	56.0	----	22.6	----	H (QP)
5	1.23200	26.2	----	0.2	26.4	----	56.0	----	29.6	----	H (QP)
6	13.85000	25.4	----	0.5	25.9	----	60.0	----	34.1	----	H (QP)
7	0.16500	----	13.5	0.1	----	13.6	----	55.2	----	41.6	H (CAV)
8	0.23600	----	15.6	0.1	----	15.7	----	52.2	----	36.5	H (CAV)
9	0.42200	----	14.1	0.0	----	14.1	----	47.4	----	33.3	H (CAV)
10	0.78800	----	11.2	0.1	----	11.3	----	46.0	----	34.7	H (CAV)
11	1.23200	----	10.9	0.2	----	11.1	----	46.0	----	34.9	H (CAV)
12	13.85000	----	23.9	0.5	----	24.4	----	50.0	----	25.6	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	0.22200	43.5	----	0.1	43.6	----	62.7	----	19.1	----	N (QP)
2	0.30200	46.1	----	0.0	46.1	----	60.2	----	14.1	----	N (QP)
3	0.44100	43.8	----	0.0	43.8	----	57.0	----	13.2	----	N (QP)
4	0.85500	31.0	----	0.1	31.1	----	56.0	----	24.9	----	N (QP)
5	1.31600	24.4	----	0.2	24.6	----	56.0	----	31.4	----	N (QP)
6	13.68000	26.6	----	0.5	27.1	----	60.0	----	32.9	----	N (QP)
7	0.22200	----	12.4	0.1	----	12.5	----	52.7	----	40.2	N (CAV)
8	0.30200	----	13.8	0.0	----	13.8	----	50.2	----	36.4	N (CAV)
9	0.44100	----	13.9	0.0	----	13.9	----	47.0	----	33.1	N (CAV)
10	0.85500	----	10.5	0.1	----	10.6	----	46.0	----	35.4	N (CAV)
11	1.31600	----	9.0	0.2	----	9.2	----	46.0	----	36.8	N (CAV)
12	13.68000	----	28.7	0.5	----	29.2	----	50.0	----	20.8	N (CAV)

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.

13. LIST OF TEST EQUIPMENT

Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
FSV40-N	Rohde & Schwarz	Signal Analyzer	102196	Mar. 03, 2023 (1Y)
FSV30	Rohde & Schwarz	Signal Analyzer	101372	Jul. 14, 2022 (1Y)
ESR	Rohde & Schwarz	EMI Test Receiver	101470	Oct. 18, 2022 (1Y)
310N	Sonoma Instrument	Pre-Amplifier	312544	Mar. 14, 2023 (1Y)
SCU18	Rohde & Schwarz	Signal Conditioning unit	102266	Jul. 12, 2022 (1Y)
SCU40A	Rohde & Schwarz	Signal Conditioning unit	100436	Jan. 18, 2023 (1Y)
HPF 3GHz	Rohde & Schwarz	High Pass Filter (1-3 GHz)	N/A	Jan. 17, 2023 (1Y)
FMZB 1513	Schwarzbeck	Loop Antenna	1513-235	Mar. 24, 2022 (2Y)
HLP-2008	TDK	Hybrid Antenna	131314	Mar. 07, 2023 (2Y)
BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1349	Jul. 08, 2022 (1Y)
BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 25, 2023 (1Y)
ESCI	Rohde & Schwarz	EMI Test Receiver	101012	Oct. 12, 2022 (1Y)
ESH3-Z2	Rohde & Schwarz	Pulse Limiter	100655	Mar. 13, 2023 (1Y)
NSLK8128	Schwarzbeck	LISN	8128216	Mar. 14, 2023 (1Y)
DT3000	Innco System	Turn Table	DT3000/093	N/A
MA4000-EP	Innco System	Antenna Master	MA4000/332	N/A
CO3000	Innco System	Controller	CO3000/904	N/A