

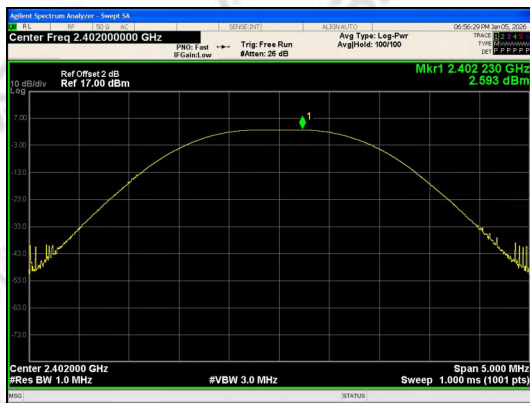
Appendix B of data

B1.Maximum Peak Conducted Output Power

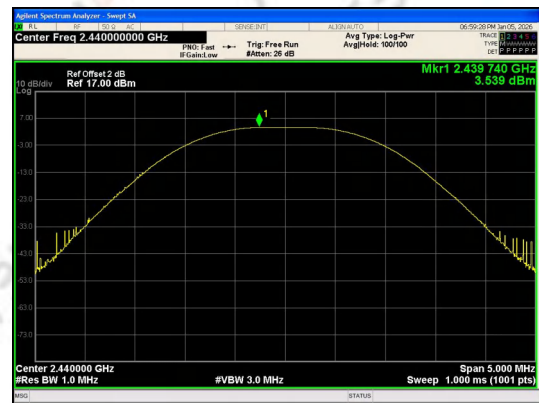
Test Result

Mode	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
BLE 1M	0	2.59	1.82	≤30	PASS
	19	3.54	2.26	≤30	PASS
	39	2.50	1.78	≤30	PASS
BLE 2M	0	2.67	1.85	≤30	PASS
	19	3.51	2.24	≤30	PASS
	39	2.99	1.99	≤30	PASS

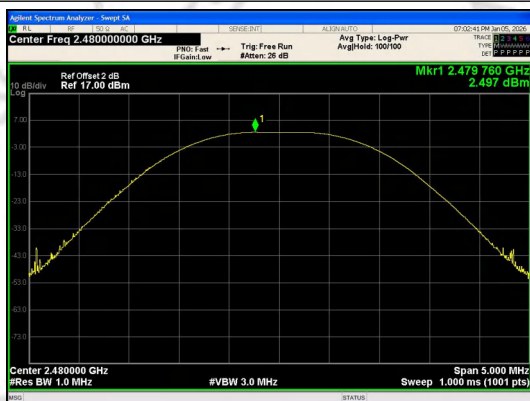
Test Graphs



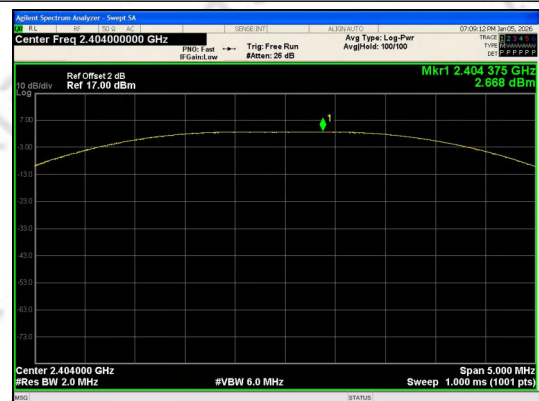
**Peak Output Power
BLE 1M_Channel 0**



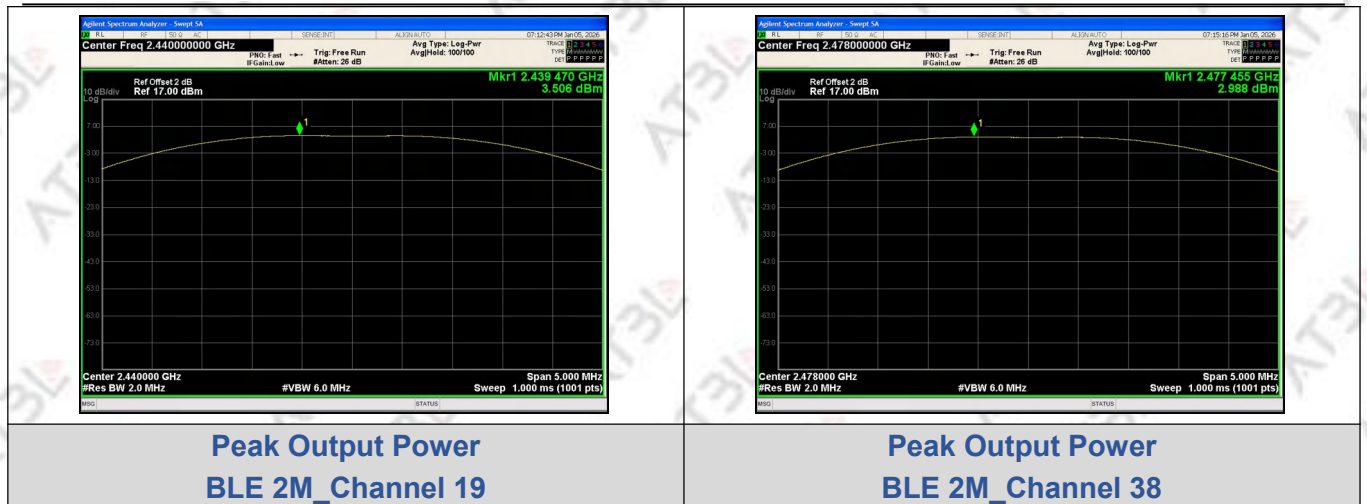
**Peak Output Power
BLE 1M_Channel 19**



**Peak Output Power
BLE 1M_Channel 39**



**Peak Output Power
BLE 2M_Channel 1**

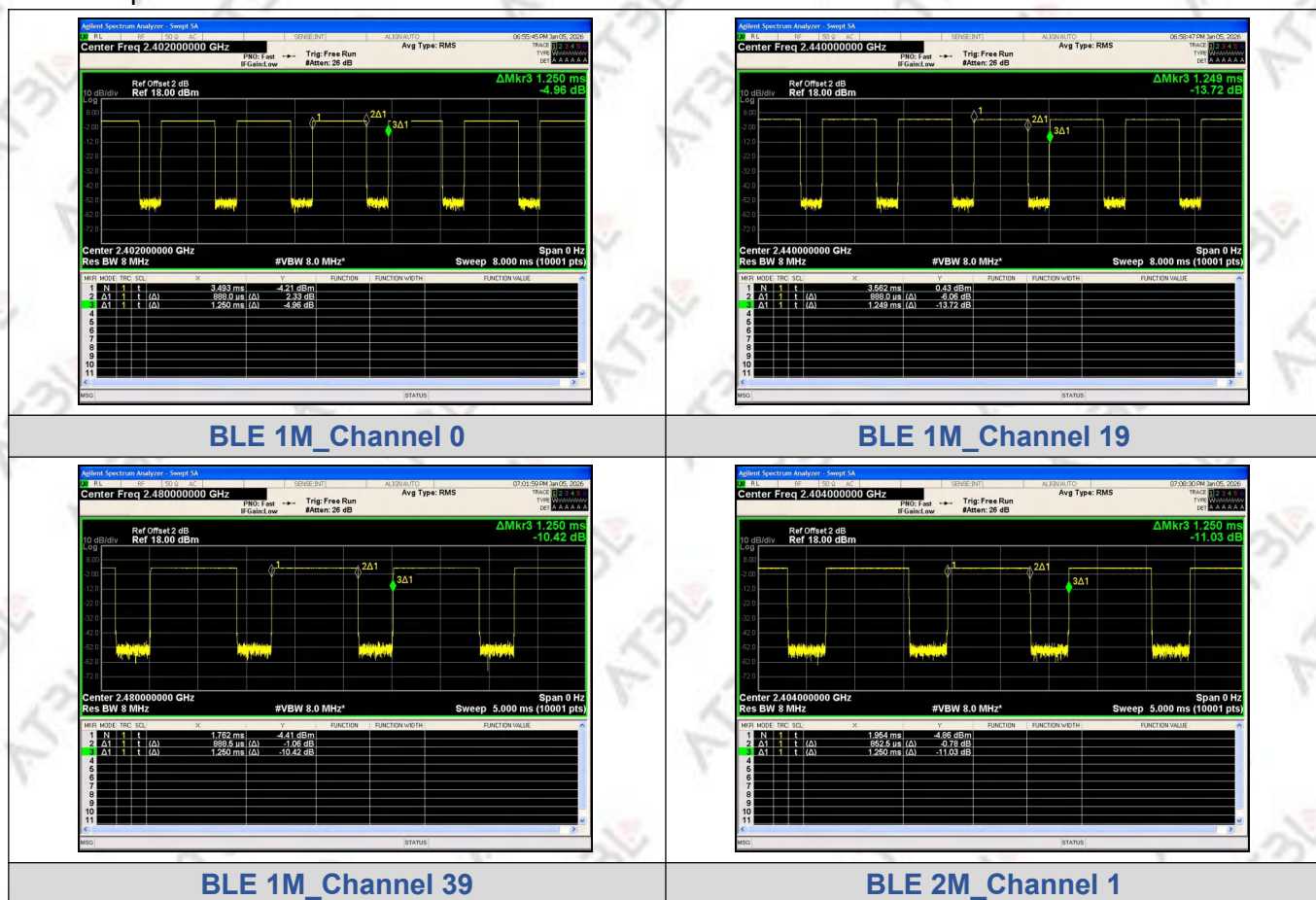


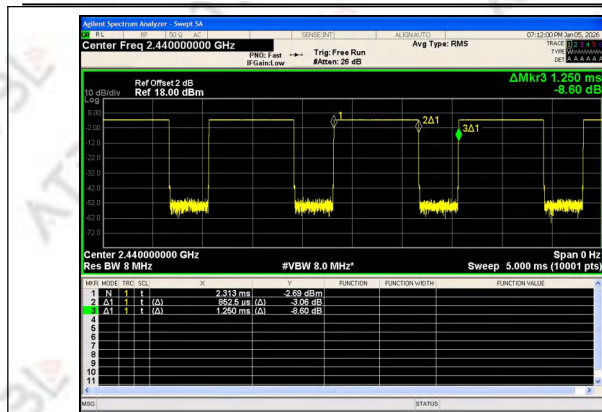
B2.Duty Cycle

Test Result

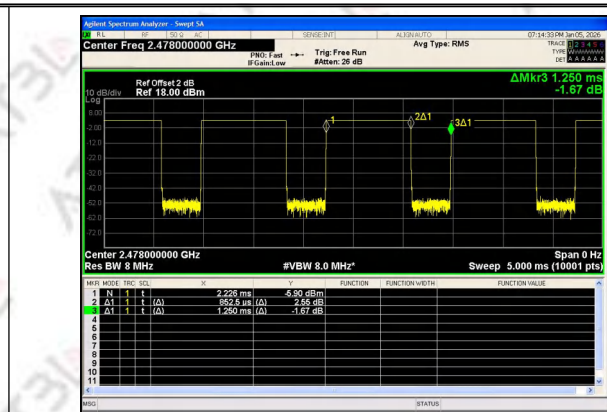
Mode	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)
BLE 1M	0	0.888	1.250	71.06	0.7106	1.4837
	19	0.888	1.249	71.11	0.7111	1.4807
	39	0.888	1.249	71.11	0.7111	1.4807
BLE 2M	0	0.853	1.250	68.23	0.6823	1.6602
	19	0.852	1.250	68.23	0.6823	1.6602
	39	0.852	1.250	68.20	0.6820	1.6622

Test Graphs





BLE 2M_Channel 19



BLE 2M_Channel 38

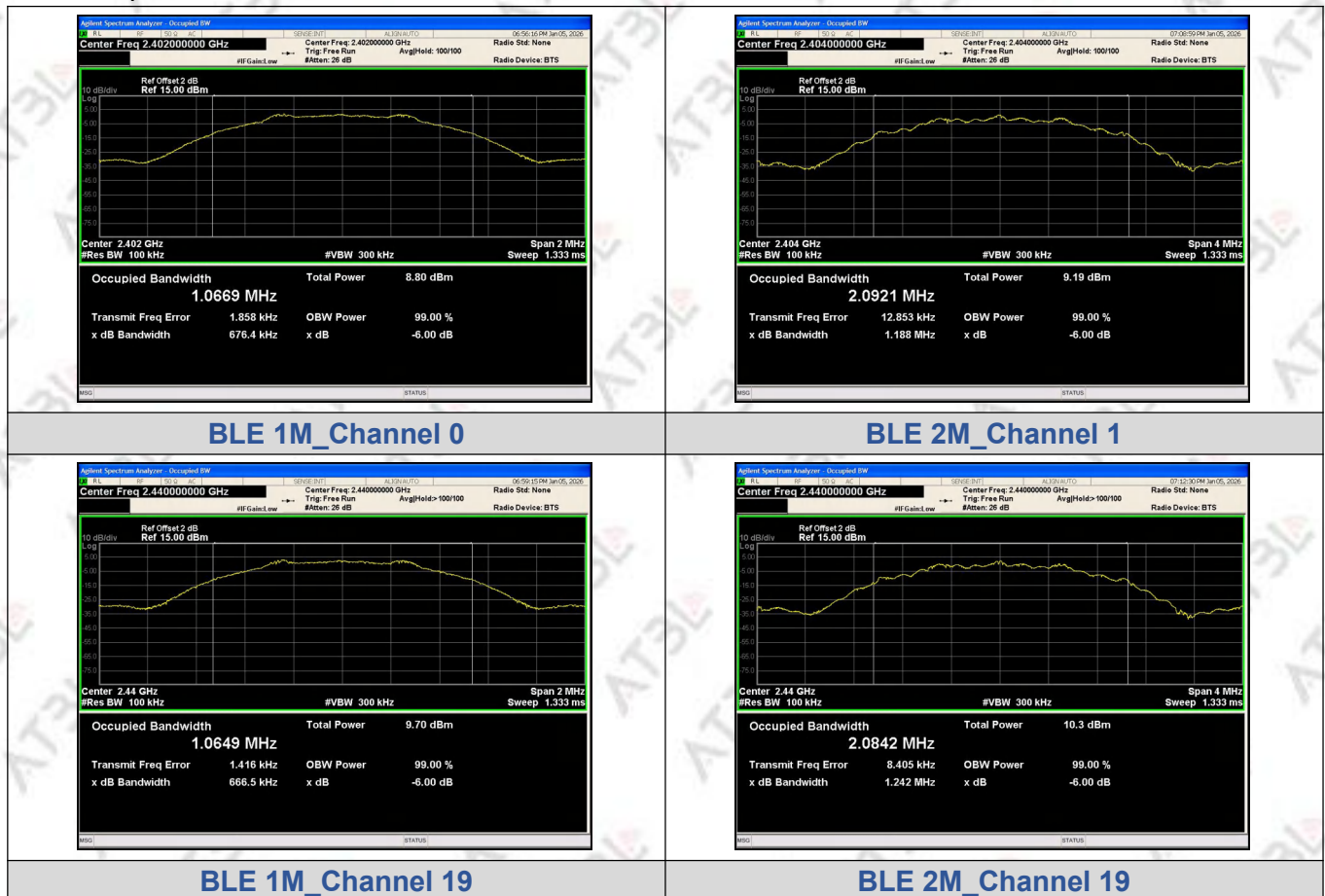
B3.6dB Bandwidth and 99% Bandwidth

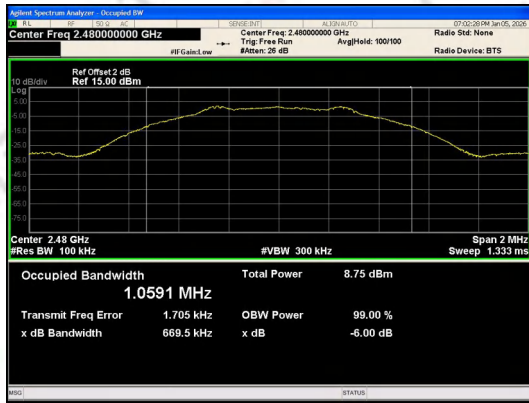
6dB Bandwidth

Test Result

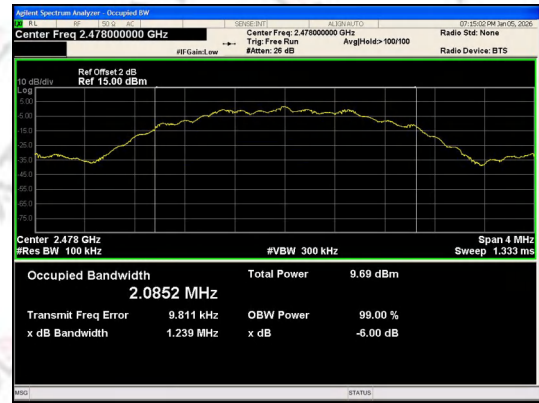
Mode	Channel	Center Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
BLE 1M	0	2402	0.67640	≥0.5	PASS
	19	2440	0.66650		PASS
	39	2480	0.66950		PASS
BLE 2M	0	2402	1.1880		PASS
	19	2440	1.2420		PASS
	39	2480	1.2390		PASS

Test Graphs





BLE 1M_Channel 39

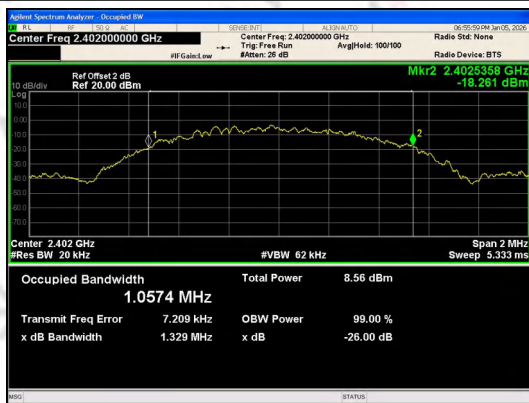


BLE 2M_Channel 38

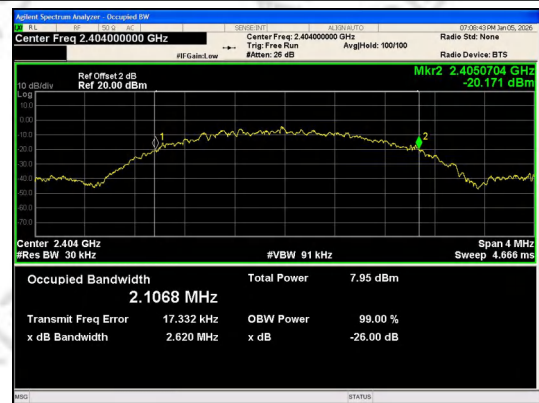
99dB Bandwidth Test Result

Mode	Channel	Center Frequency (MHz)	99% BW (MHz)
BLE 1M	0	2402	1.057400
	19	2440	1.056700
	39	2480	1.053900
BLE 2M	0	2402	2.106800
	19	2440	2.102700
	39	2480	2.089800

Test Graphs



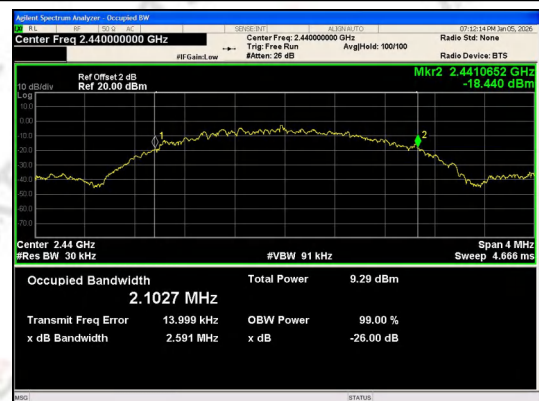
BLE 1M_Channel 0



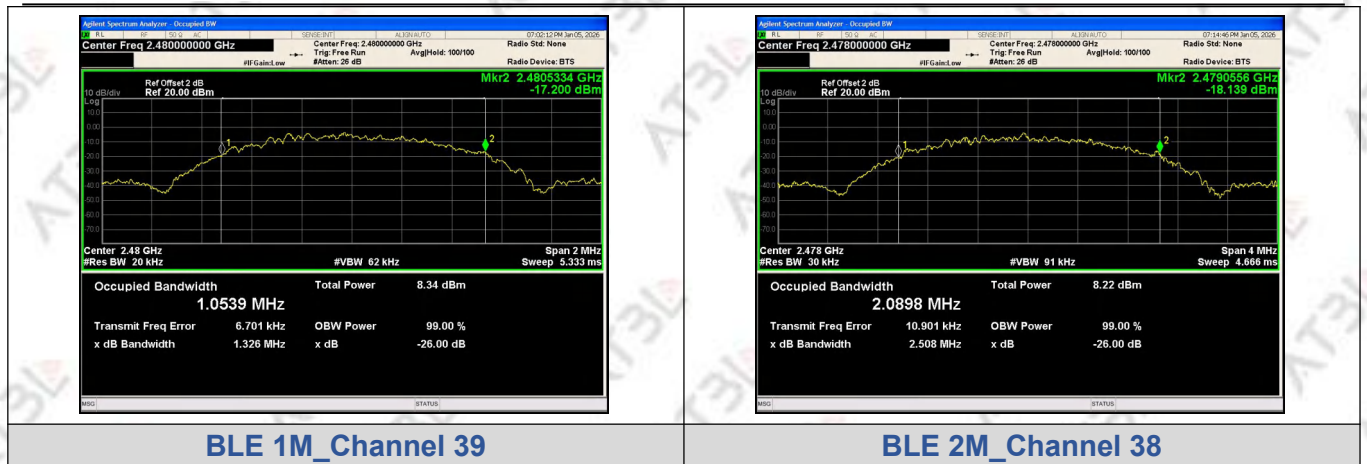
BLE 2M_Channel 1



BLE 1M_Channel 19



BLE 2M_Channel 19



B4. Power Spectral Density

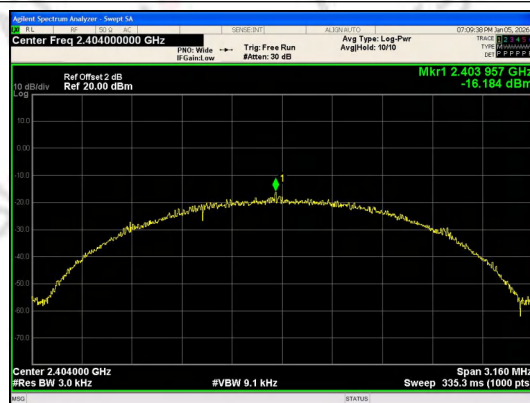
Test Result

Mode	Channel	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
BLE 1M	0	-14.020	≤8	PASS
	19	-12.510	≤8	PASS
	39	-13.540	≤8	PASS
BLE 2M	0	-16.180	≤8	PASS
	19	-15.210	≤8	PASS
	39	-15.620	≤8	PASS

Test Graphs



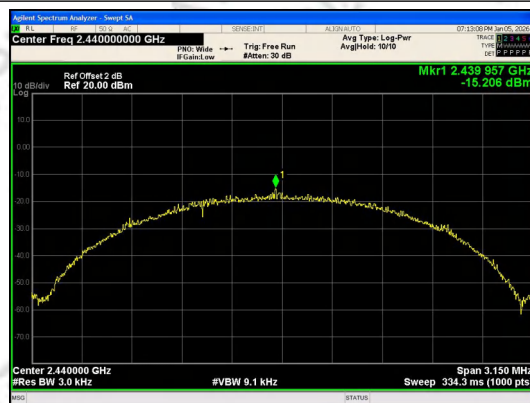
BLE 1M_Channel 0



BLE 2M_Channel 1



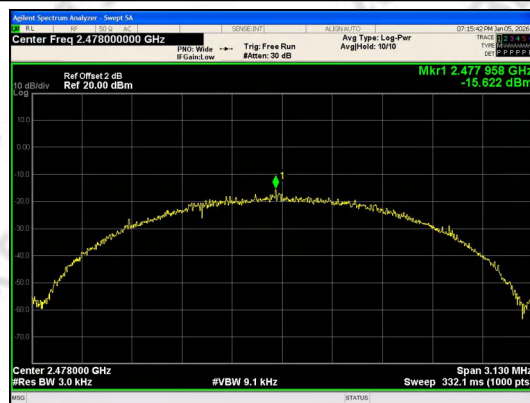
BLE 1M_Channel 19



BLE 2M_Channel 19



BLE 1M_Channel 39



BLE 2M_Channel 38

B5.Conducted Band Edge and Conducted Spurious Emission

Test Result

Mode	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
BLE 1M	0	2400.00	-56.877	-18.04	-38.837	PASS
		4802.39	-65.280	-18.04	-47.240	PASS
		6004.70	-44.813	-18.04	-26.773	PASS
		7205.13	-64.115	-18.04	-46.075	PASS
		9609.74	-65.104	-18.04	-47.064	PASS
	19	4880.42	-64.488	-16.88	-47.608	PASS
		6100.21	-45.922	-16.88	-29.042	PASS
		7320.62	-62.912	-16.88	-46.032	PASS
		9759.56	-64.575	-16.88	-47.695	PASS
	39	2483.50	-61.020	-17.8	-43.220	PASS
		4958.45	-65.037	-17.8	-47.237	PASS
		6200.09	-46.479	-17.8	-28.679	PASS
		7438.60	-63.361	-17.8	-45.561	PASS
		9921.24	-64.174	-17.8	-46.374	PASS
BLE 2M	1	2483.50	-60.078	-18.68	-41.398	PASS
		4806.14	-65.394	-18.68	-46.714	PASS
		6010.31	-44.318	-18.68	-25.638	PASS
		7210.75	-63.691	-18.68	-45.011	PASS
		9617.23	-64.812	-18.68	-46.132	PASS
	19	4880.42	-64.652	-17.78	-46.872	PASS
		6100.21	-45.433	-17.78	-27.653	PASS
		7319.99	-62.799	-17.78	-45.019	PASS
		9760.81	-66.029	-17.78	-48.249	PASS
	38	2483.50	-59.673	-18.1	-41.573	PASS
		4954.08	-64.731	-18.1	-46.631	PASS
		6195.09	-47.184	-18.1	-29.084	PASS
		7433.60	-63.363	-18.1	-45.263	PASS
		9911.25	-65.492	-18.1	-47.392	PASS
Note: input compensation coefficient (dB)= Cable Loss (dB)						

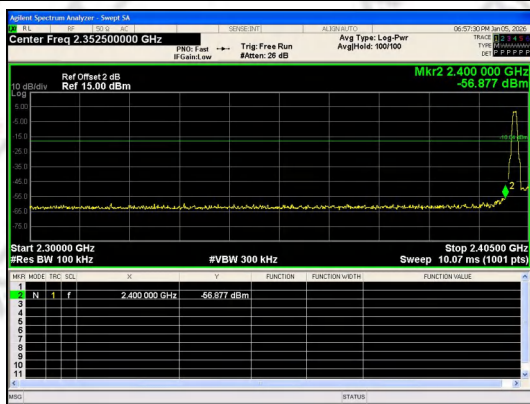
Test Graphs



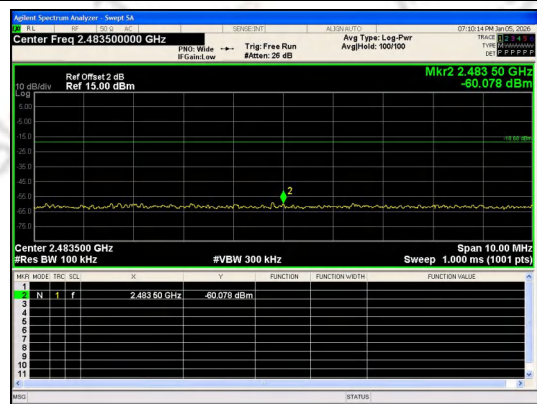
In-Band Reference Level
BLE 1M_Channel 0



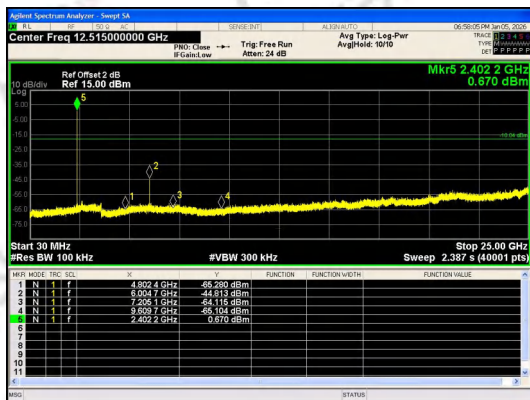
In-Band Reference Level
BLE 2M_Channel 1



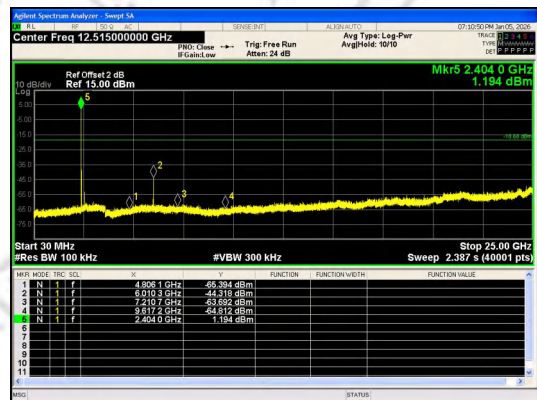
Out Of Band Emission
BLE 1M_Channel 0



Out Of Band Emission
BLE 2M_Channel 1



30.0 MHz - 25000.0 MHz
BLE 1M_Channel 0



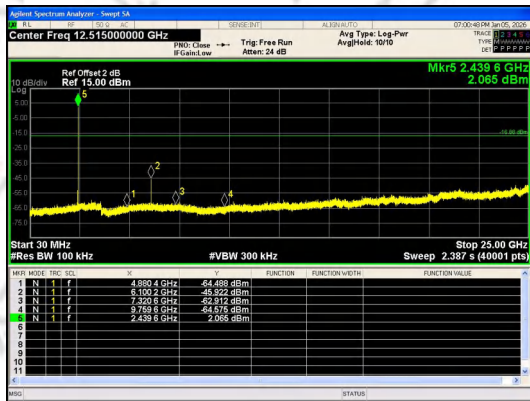
30.0 MHz - 25000.0 MHz
BLE 2M_Channel 1



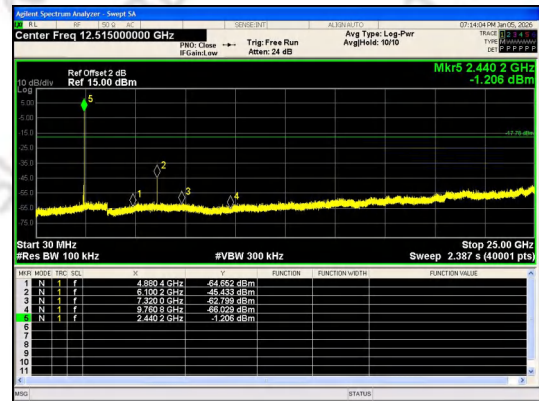
In-Band Reference Level
BLE 1M_Channel 19



In-Band Reference Level
BLE 2M_Channel 19



30.0 MHz - 25000.0 MHz
BLE 1M_Channel 19



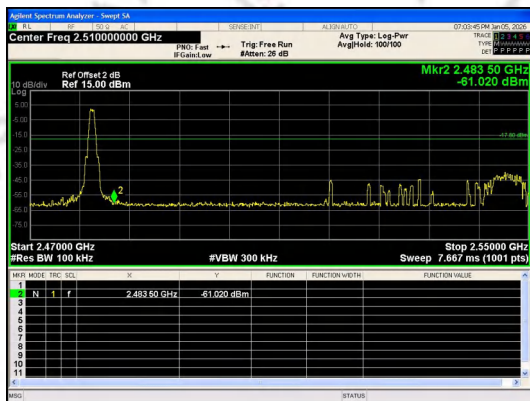
30.0 MHz - 25000.0 MHz
BLE 2M_Channel 19



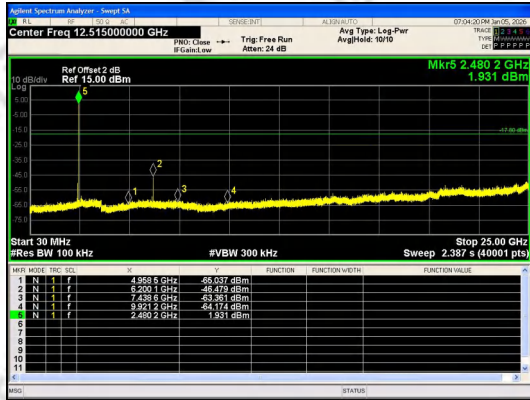
In-Band Reference Level
BLE 1M_Channel 39



In-Band Reference Level
BLE 2M_Channel 38

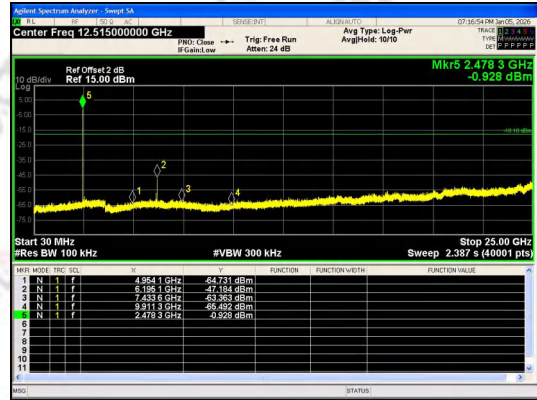


Out Of Band Emission BLE 1M_Channel 39



30.0 MHz - 25000.0 MHz
BLE 1M_Channel 39

Out Of Band Emission BLE 2M_Channel 38



30.0 MHz - 25000.0 MHz
BLE 2M_Channel 38

B6.Radiated Spurious Emission and Restricted Band

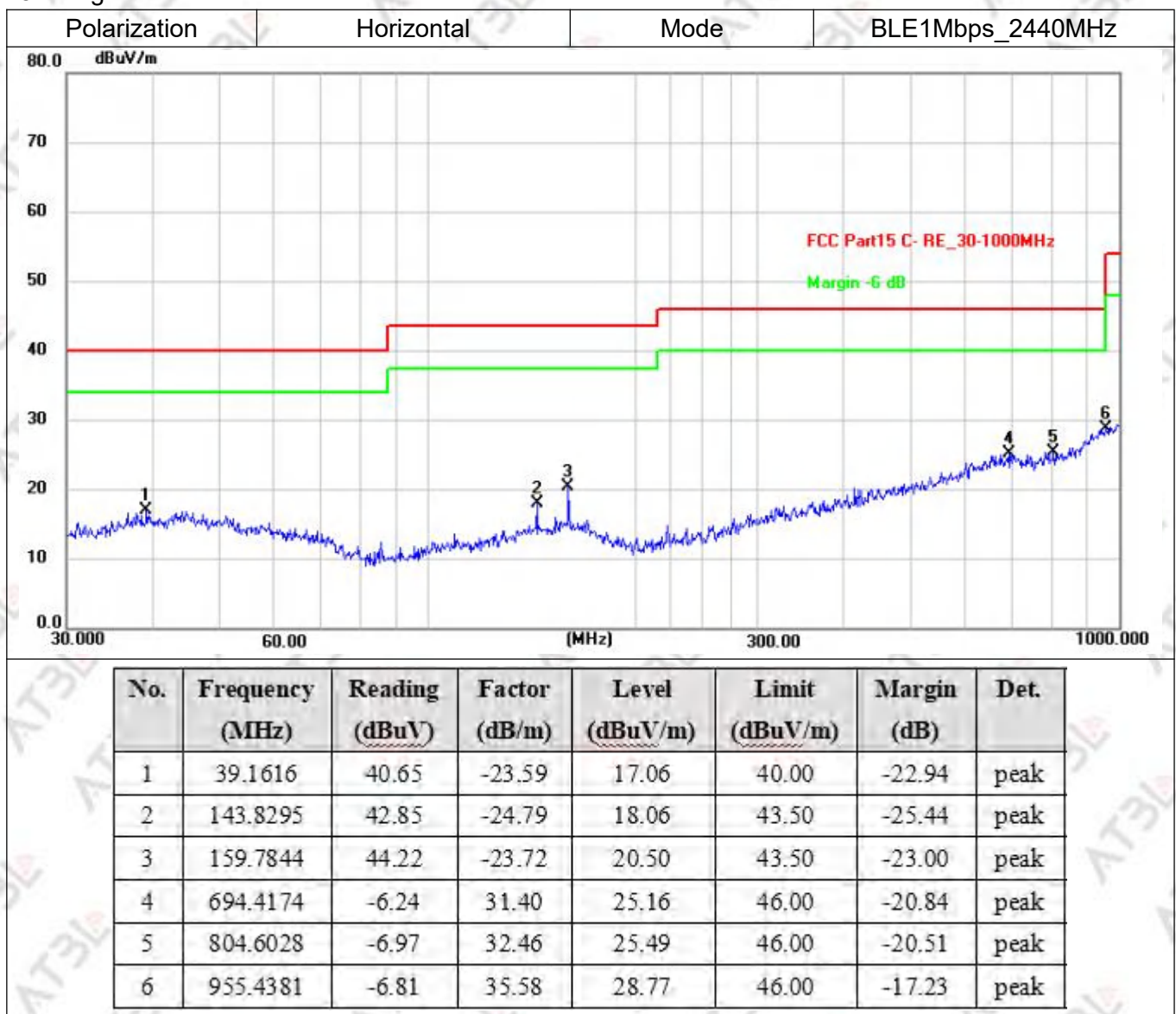
For 9 kHz ~ 30 MHz

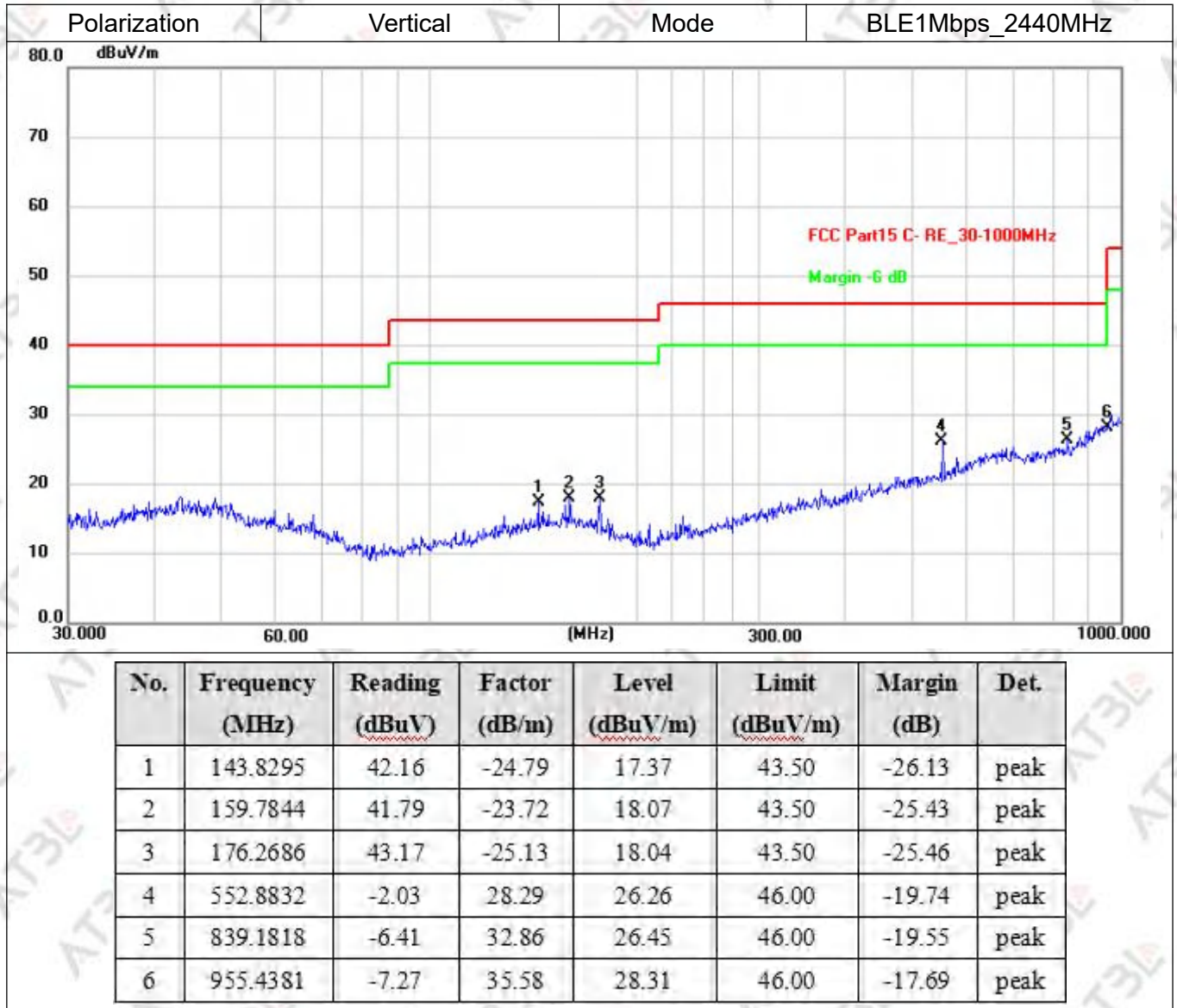
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

For 30 MHz ~ 1 GHz:

Note:

- 1.All modes have been tested, only worst (BLE1Mbps_2440MHz)mode was recorded in the test report.
- 2.Emission Level (dBUV/m) = Reading Value (dBUV) + Correction Factor (dB/m).
3. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)-Amplifier Gain.
4. The emission levels of other frequencies were less than 20dB margin against the limit.
5. Margin value = Emission level-Limit value.





For 1 GHz ~ 18GHz:

Note:

1. In frequency ranges 18 ~25GHz no any other harmonic emissions detected which are tested to compliance with the limit. No recording in the test report. No any other emissions level which are attenuated less than 20dB below the limit. No recording in the test report.
2. We used the filter to test and the main frequency was filtered out.
3. Emission Level (dBuV/m) = Reading Value (dBuV) + Correction Factor (dB/m).
4. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)-Amplifier Gain.
5. The emission levels of other frequencies were less than 20dB margin against the limit.
6. Margin value = Emission level-Limit value.
7. All modes have been tested, only worst mode(BLE1Mbps and BLE2Mbps) was recorded in the test report.

Test Mode: BLE1Mbps							
Test Channel:Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4804.000	49.29	-1.34	47.95	74	-26.05	peak	Pass
4804.000	38.32	-1.34	36.98	54	-17.02	AV	Pass
7206.000	47.18	5.26	52.44	74	-21.56	peak	Pass
7206.000	35.50	5.26	40.76	54	-13.24	AV	Pass
Test Channel:Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4804.000	49.62	-1.34	48.28	74	-25.72	peak	Pass
4804.000	38.99	-1.34	37.65	54	-16.35	AVG	Pass
7206.000	47.25	5.26	52.51	74	-21.49	peak	Pass
7206.000	36.42	5.26	41.68	54	-12.32	AVG	Pass
Test Channel:Middle channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4880.000	48.45	-1.12	47.33	74	-26.67	peak	Pass
4880.000	37.90	-1.12	36.78	54	-17.22	AV	Pass
7320.000	45.73	5.65	51.38	74	-22.62	peak	Pass
7320.000	35.97	5.65	41.62	54	-12.38	AV	Pass
Test Channel: Middle channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4880.000	48.76	-1.12	47.64	74	-26.36	peak	Pass
4880.000	38.67	-1.12	37.55	54	-16.45	AV	Pass
7320.000	46.53	5.65	52.18	74	-21.82	peak	Pass
7320.000	36.31	5.65	41.96	54	-12.04	AV	Pass
Test Channel:Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4960.000	48.81	-0.7	48.11	74	-25.89	peak	Pass

4960.000	37.93	-0.61	37.32	54	-16.68	AV	Pass
7440.000	46.41	5.97	52.38	74	-21.62	peak	Pass
7440.000	35.31	5.97	41.28	54	-12.72	AV	Pass
Test Channel:Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4960.000	49.41	-0.7	48.71	74	-25.29	peak	Pass
4960.000	38.34	-0.61	37.73	54	-16.27	AV	Pass
7440.000	47.19	5.97	53.16	74	-20.84	peak	Pass
7440.000	35.42	5.97	41.39	54	-12.61	AV	Pass

Test Mode: BLE2Mbps							
Test Channel:Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4804.000	48.19	-1.34	46.85	74	-27.15	peak	Pass
4804.000	37.08	-1.34	35.74	54	-18.26	AV	Pass
7206.000	46.14	5.26	51.40	74	-22.60	peak	Pass
7206.000	35.82	5.26	41.08	54	-12.92	AV	Pass
Test Channel:Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4804.000	48.95	-1.34	47.61	74	-26.39	peak	Pass
4804.000	37.59	-1.34	36.25	54	-17.75	AVG	Pass
7206.000	46.58	5.26	51.84	74	-22.16	peak	Pass
7206.000	35.87	5.26	41.13	54	-12.87	AVG	Pass
Test Channel:Middle channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4880.000	48.19	-1.12	47.07	74	-26.93	peak	Pass
4880.000	36.35	-1.12	35.23	54	-18.77	AV	Pass
7320.000	45.21	5.65	50.86	74	-23.14	peak	Pass
7320.000	34.61	5.65	40.26	54	-13.74	AV	Pass
Test Channel: Middle channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4880.000	48.77	-1.12	47.65	74	-26.35	peak	Pass
4880.000	36.85	-1.12	35.73	54	-18.27	AV	Pass
7320.000	45.71	5.65	51.36	74	-22.64	peak	Pass
7320.000	35.06	5.65	40.71	54	-13.29	AV	Pass
Test Channel:Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4960.000	47.82	-0.7	47.12	74	-26.88	peak	Pass
4960.000	36.00	-0.61	35.39	54	-18.61	AV	Pass
7440.000	44.79	5.97	50.76	74	-23.24	peak	Pass
7440.000	34.71	5.97	40.68	54	-13.32	AV	Pass
Test Channel:Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
4960.000	48.31	-0.7	47.61	74	-26.39	peak	Pass
4960.000	36.74	-0.61	36.13	54	-17.87	AV	Pass
7440.000	45.60	5.97	51.57	74	-22.43	peak	Pass
7440.000	35.51	5.97	41.48	54	-12.52	AV	Pass

Test Result of Restricted Band

Note:

All modes have been tested, only worst case(BLE1Mbps and BLE2Mbps)mode was recorded in the test report.

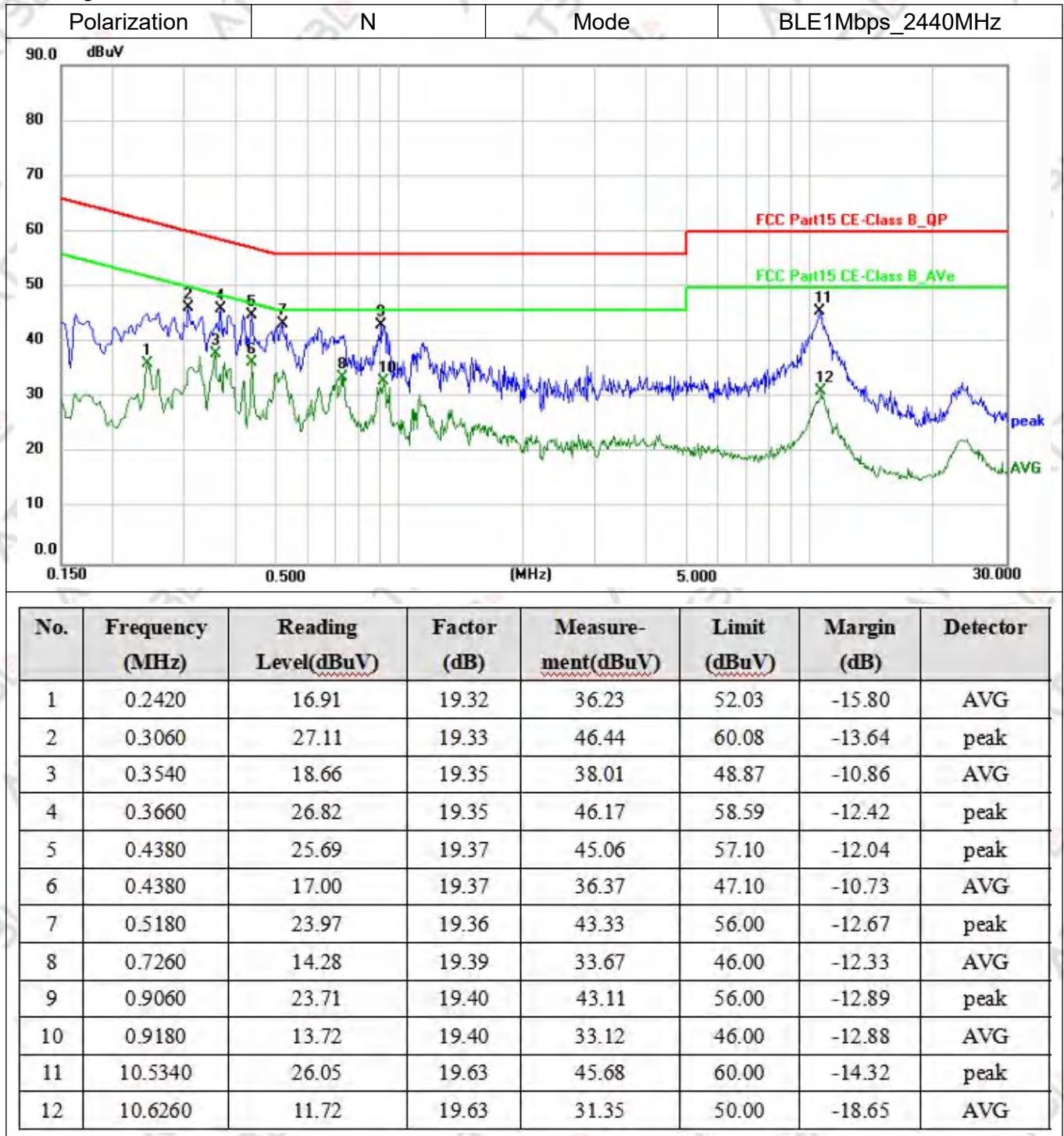
Test Mode: BLE1Mbps							
Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2310.000	47.66	-10.95	36.71	74	-37.29	peak	Pass
2310.000	38.43	-10.95	27.48	54	-26.52	AV	Pass
2390.000	52.35	-10.86	41.49	74	-32.51	peak	Pass
2390.000	40.53	-10.86	29.67	54	-24.33	AV	Pass
Test Channel: Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2310.000	48.56	-10.95	37.61	74	-36.39	peak	Pass
2310.000	38.79	-10.95	27.84	54	-26.16	AV	Pass
2390.000	52.36	-10.86	41.5	74	-32.5	peak	Pass
2390.000	41.28	-10.86	30.42	54	-23.58	AV	Pass
Test Channel: Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2483.500	47.54	-10.34	37.20	74	-36.80	peak	Pass
2483.500	37.80	-10.34	27.46	54	-26.54	AV	Pass
2500.000	51.69	-10.24	41.45	74	-32.55	peak	Pass
2500.000	39.33	-10.24	29.09	54	-24.91	AV	Pass
Test Channel: Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2483.500	48.44	-10.34	38.10	74	-35.90	peak	Pass
2483.500	37.84	-10.34	27.50	54	-26.50	AV	Pass
2500.000	52.02	-10.24	41.78	74	-32.22	peak	Pass
2500.000	40.29	-10.24	30.05	54	-23.95	AV	Pass

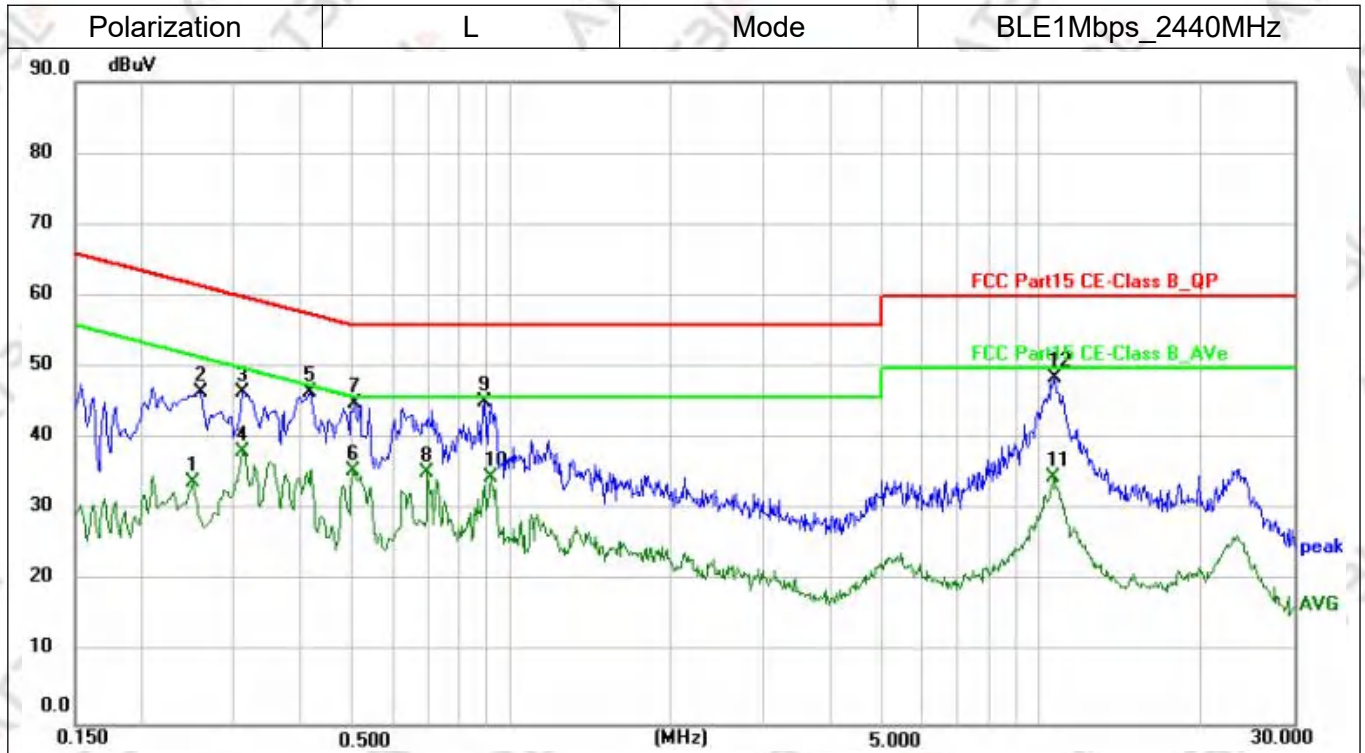
Test Mode: BLE2Mbps							
Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2310.000	47.03	-10.95	36.08	74	-37.92	peak	Pass
2310.000	36.79	-10.95	25.84	54	-28.16	AV	Pass
2390.000	51.41	-10.86	40.55	74	-33.45	peak	Pass
2390.000	39.54	-10.86	28.68	54	-25.32	AV	Pass
Test Channel: Lowest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2310.000	47.69	-10.95	36.74	74	-37.26	peak	Pass
2310.000	37.56	-10.95	26.61	54	-27.39	AV	Pass
2390.000	51.98	-10.86	41.12	74	-32.88	peak	Pass
2390.000	40.49	-10.86	29.63	54	-24.37	AV	Pass
Test Channel: Highest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2483.500	47.07	-10.34	36.73	74	-37.27	peak	Pass
2483.500	36.85	-10.34	26.51	54	-27.49	AV	Pass
2500.000	50.62	-10.24	40.38	74	-33.62	peak	Pass
2500.000	39.64	-10.24	29.40	54	-24.60	AV	Pass
Test Channel: Highest channel, Test Polarization: Horizontal							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2483.500	47.15	-10.34	36.81	74	-37.19	peak	Pass
2483.500	37.14	-10.34	26.80	54	-27.20	AV	Pass
2500.000	51.42	-10.24	41.18	74	-32.82	peak	Pass
2500.000	40.09	-10.24	29.85	54	-24.15	AV	Pass

B7.AC Power-Line Conducted Emission

Note:

- 1.All modes have been tested, only worst mode(BLE1Mbps_2440MHz) was recorded in the test report.
- 2.Emission Level (dBUV/m) = Reading Value (dBUV) + Correction Factor (dB/m).
3. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. The emission levels of other frequencies were less than 20dB margin against the limit.
5. Margin value = Emission level-Limit value.





No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2500	14.74	19.35	34.09	51.76	-17.67	AVG
2	0.2580	27.21	19.35	46.56	61.50	-14.94	peak
3	0.3100	27.24	19.37	46.61	59.97	-13.36	peak
4	0.3100	18.85	19.37	38.22	49.97	-11.75	AVG
5	0.4140	27.24	19.39	46.63	57.57	-10.94	peak
6	0.5020	16.29	19.36	35.65	46.00	-10.35	AVG
7	0.5060	25.73	19.36	45.09	56.00	-10.91	peak
8	0.6940	15.92	19.37	35.29	46.00	-10.71	AVG
9	0.8940	25.89	19.41	45.30	56.00	-10.70	peak
10	0.9140	15.37	19.40	34.77	46.00	-11.23	AVG
11	10.5580	15.00	19.57	34.57	50.00	-15.43	AVG
12	10.6260	29.00	19.57	48.57	60.00	-11.43	peak

*****END*****