

Appendix B of data

B1.Maximum Peak Conducted Output Power

Test Result

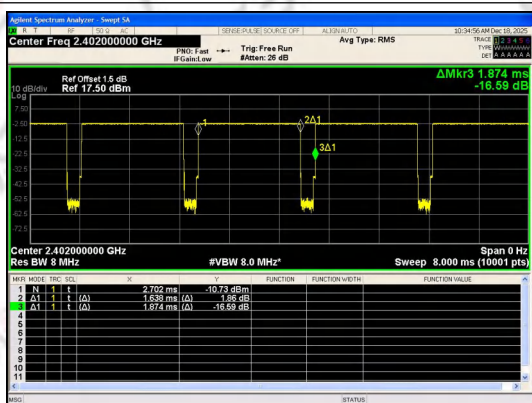
Mode	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
BLE 1M	0	-2.03	0.627	≤30	PASS
	19	-0.74	0.843	≤30	PASS
	39	-2.27	0.593	≤30	PASS
BLE 2M	0	-1.95	0.638	≤30	PASS
	19	-0.73	0.845	≤30	PASS
	39	-2.26	0.594	≤30	PASS

B2.Duty Cycle

Test Result

Mode	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)
BLE 1M	0	1.638	1.874	87.37	0.8737	0.5864
	19	1.637	1.874	87.32	0.8732	0.5889
	39	1.637	1.874	87.32	0.8732	0.5889
BLE 2M	0	0.823	1.249	65.92	0.6592	1.8098
	19	0.823	1.250	65.91	0.6591	1.8105
	39	0.823	1.250	65.88	0.6588	1.8125

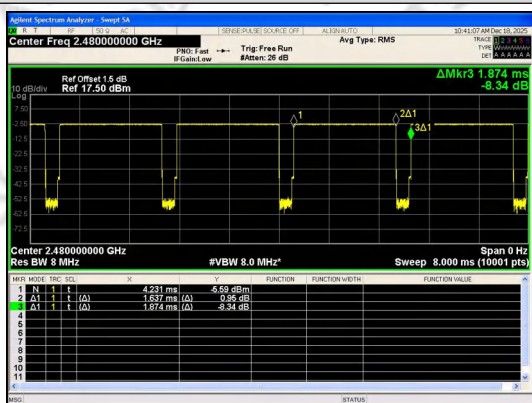
Test Graphs



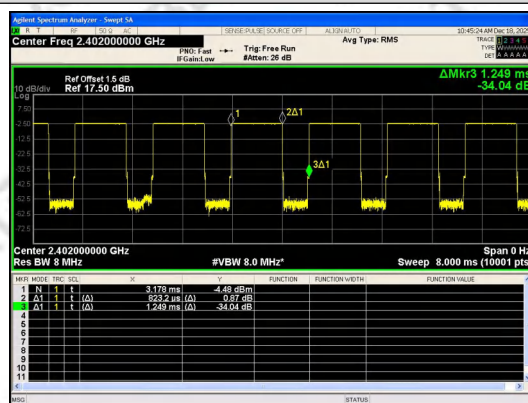
BLE 1M_Channel 0



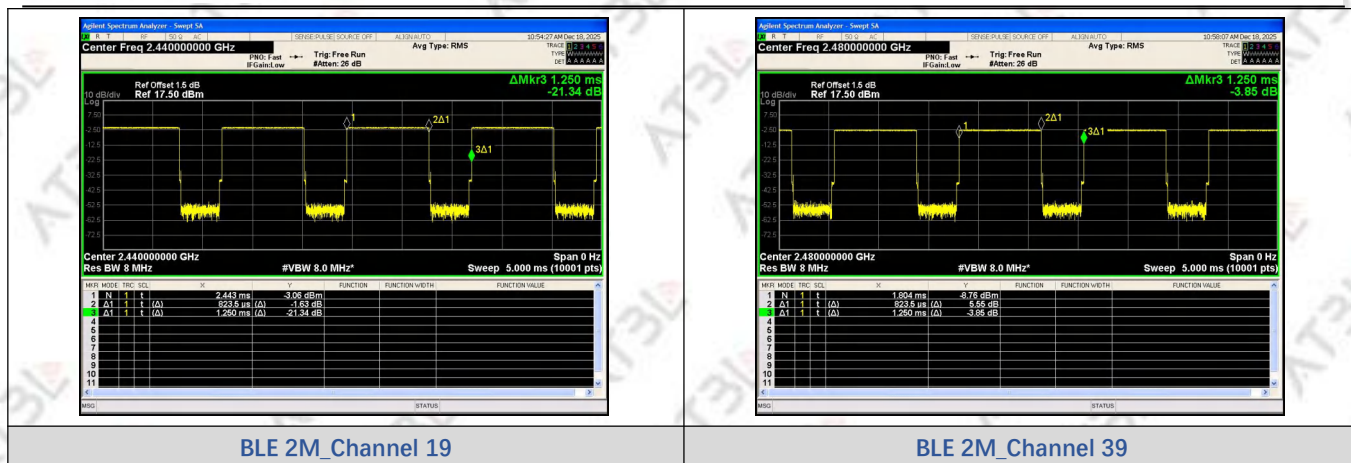
BLE 1M_Channel 19



BLE 1M_Channel 39



BLE 2M_Channel 0

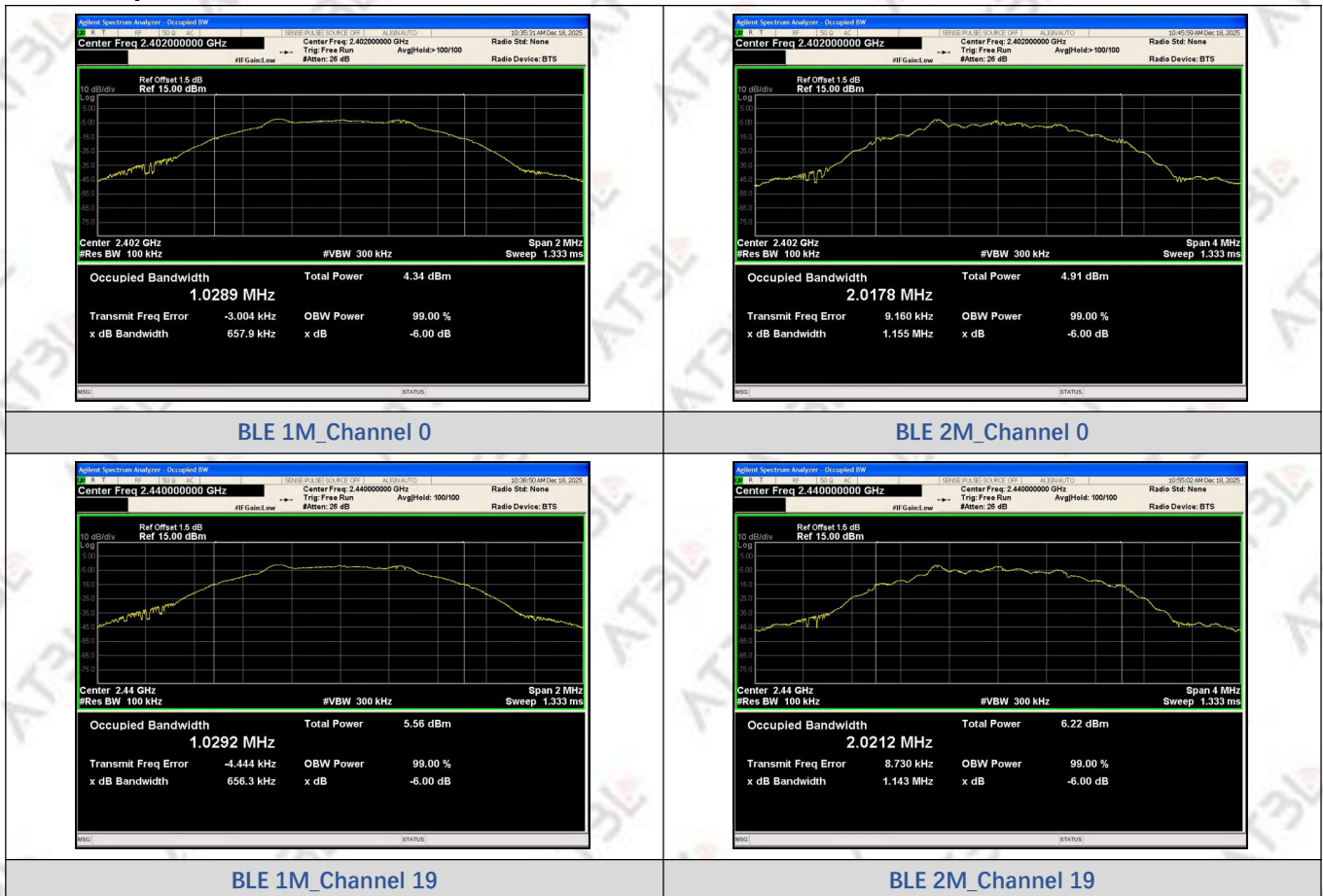


B3.6dB Bandwidth and 99% Bandwidth

6dB Bandwidth Test Result

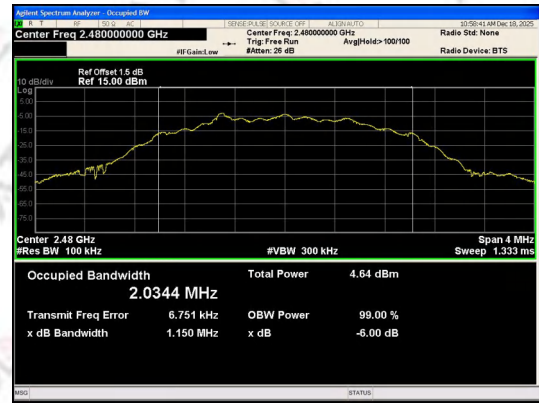
Mode	Channel	Center Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
BLE 1M	0	2402	0.6579	≥0.5	PASS
	19	2440	0.6563		PASS
	39	2480	0.6600		PASS
BLE 2M	0	2402	1.155		PASS
	19	2440	1.143		PASS
	39	2480	1.150		PASS

Test Graphs





BLE 1M_Channel 39

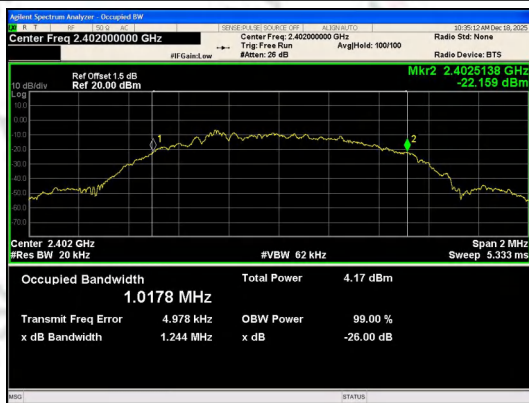


BLE 2M_Channel 39

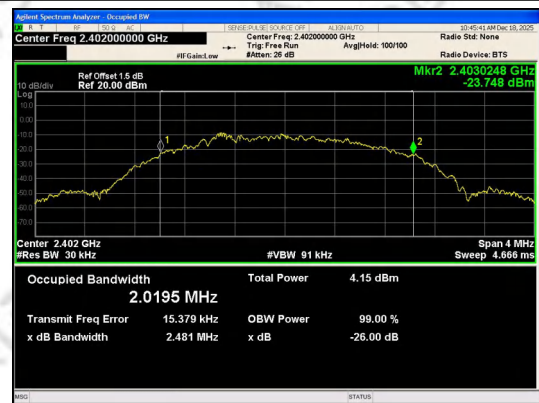
99%dB Bandwidth Test Result

Mode	Channel	Center Frequency (MHz)	99% BW (MHz)
BLE 1M	0	2402	1.0178
	19	2440	1.0182
	39	2480	1.0182
BLE 2M	0	2402	2.0195
	19	2440	2.0211
	39	2480	2.0252

Test Graphs



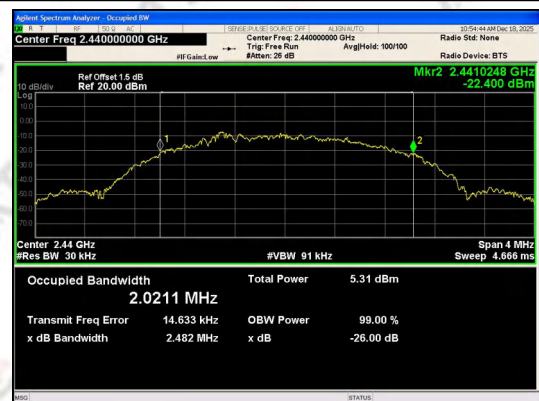
BLE 1M_Channel 0



BLE 2M_Channel 0



BLE 1M_Channel 19



BLE 2M_Channel 19

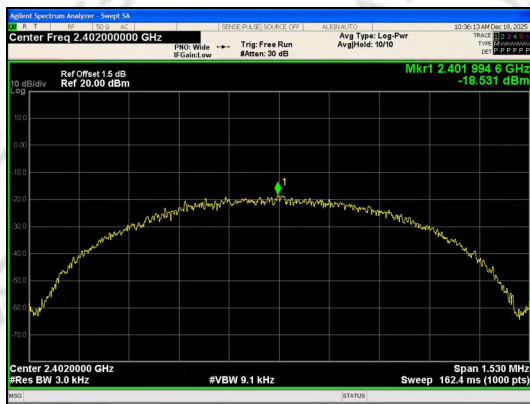


B4.Power Spectral Density

Test Result

Mode	Channel	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
BLE 1M	0	-18.530	≤8	PASS
	19	-17.330	≤8	PASS
	39	-18.890	≤8	PASS
BLE 2M	0	-21.850	≤8	PASS
	19	-20.840	≤8	PASS
	39	-22.280	≤8	PASS

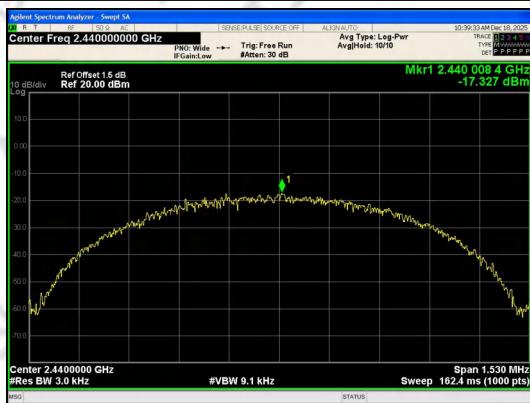
Test Graphs



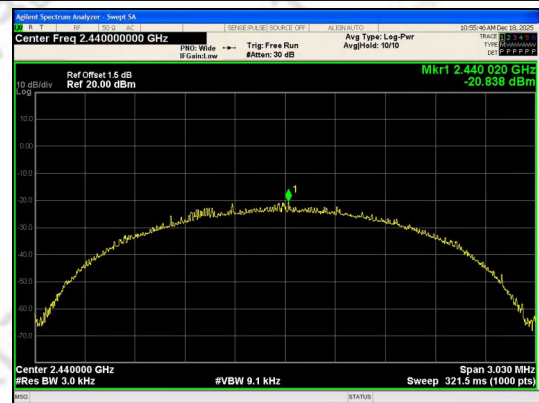
BLE 1M_Channel 0



BLE 2M_Channel 0



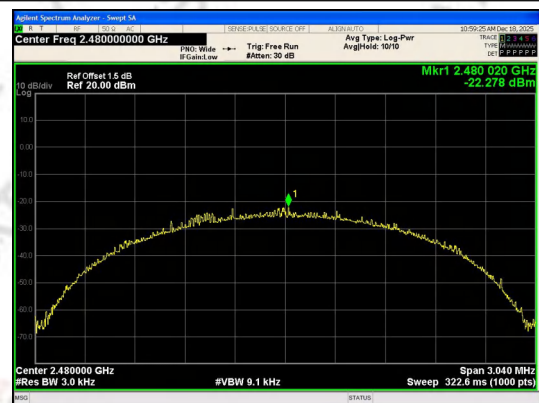
BLE 1M_Channel 19



BLE 2M_Channel 19



BLE 1M_Channel 39



BLE 2M_Channel 39

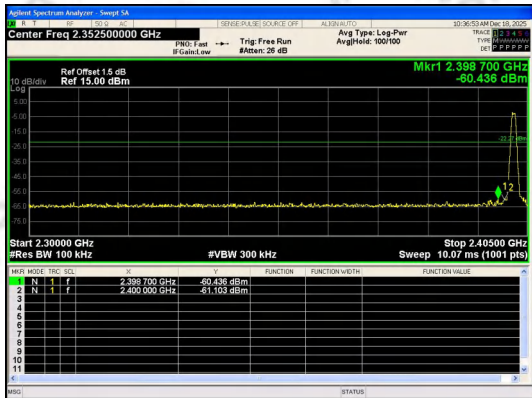
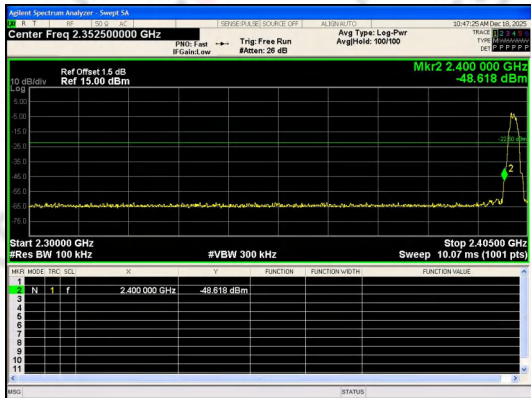
B5. Conducted Band Edge and Conducted Spurious Emission

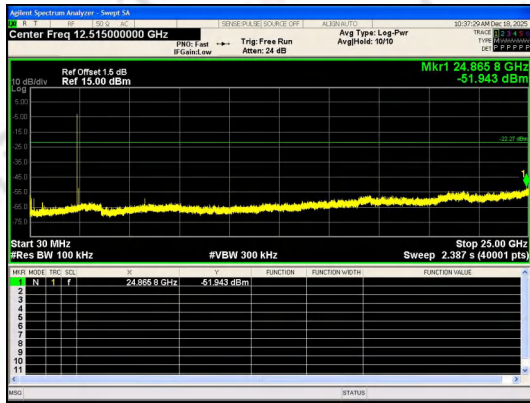
Test Result

Mode	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
BLE 1M	0	2398.70	-60.436	-22.27	-38.166	PASS
		2400.00	-61.103	-22.27	-38.833	PASS
		24865.8	-51.943	-22.27	-29.673	PASS
	19	24890.8	-52.294	-21.02	-31.274	PASS
	39	2483.50	-59.136	-22.6	-36.536	PASS
		2529.50	-44.412	-22.6	-21.812	PASS
BLE 2M	0	2400.00	-48.618	-22.5	-26.118	PASS
		24958.8	-52.060	-22.5	-29.560	PASS
	19	2538.86	-48.630	-21.33	-27.300	PASS
	39	2483.50	-61.923	-22.92	-39.003	PASS
		24988.8	-51.730	-22.92	-28.809	PASS

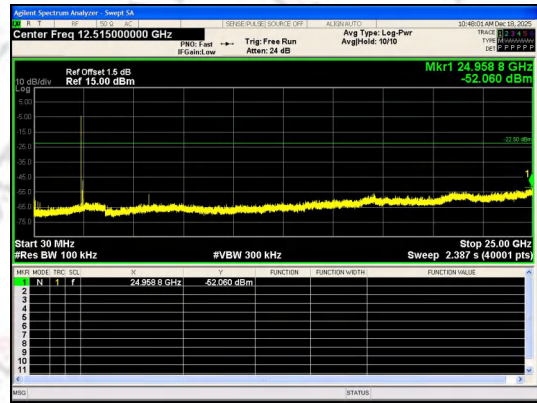
Note: input compensation coefficient (dB)= Cable Loss (dB)

Test Graphs

	
In-Band Reference Level BLE 1M_Channel 0	In-Band Reference Level BLE 2M_Channel 0
	
Out Of Band Emission BLE 1M_Channel 0	Out Of Band Emission BLE 2M_Channel 0



30.0 MHz - 25000.0 MHz
BLE 1M_Channel 0



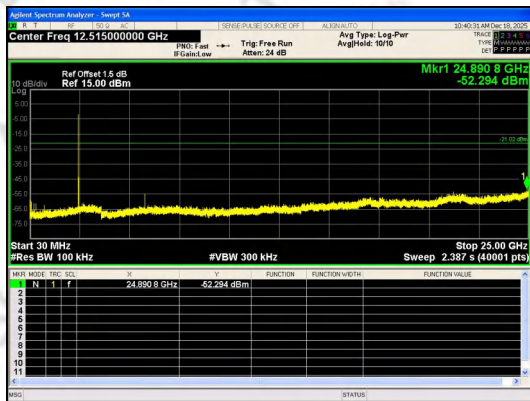
30.0 MHz - 25000.0 MHz
BLE 2M_Channel 0



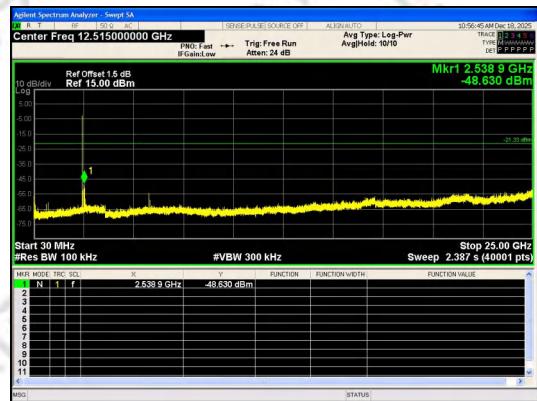
In-Band Reference Level
BLE 1M_Channel 19



In-Band Reference Level
BLE 2M_Channel 19



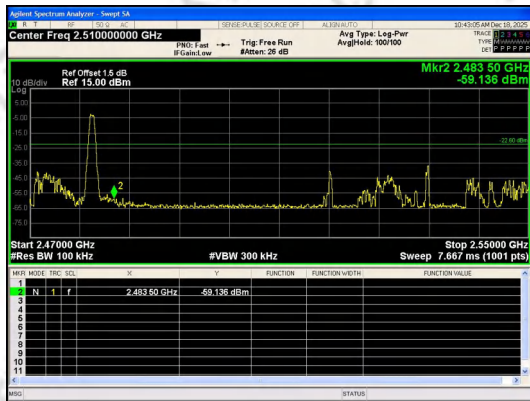
30.0 MHz - 25000.0 MHz
BLE 1M_Channel 19



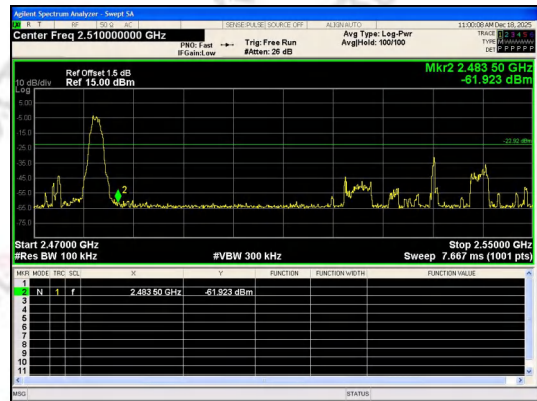
30.0 MHz - 25000.0 MHz
BLE 2M_Channel 19



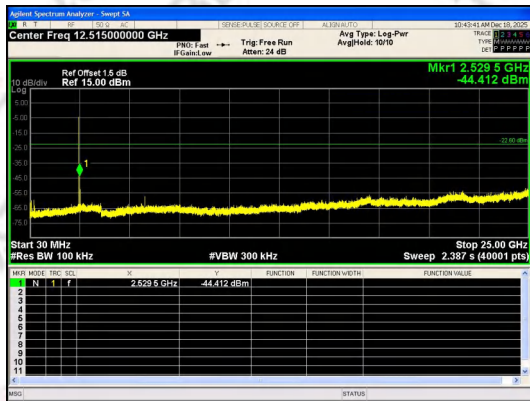
In-Band Reference Level BLE 1M_Channel 39



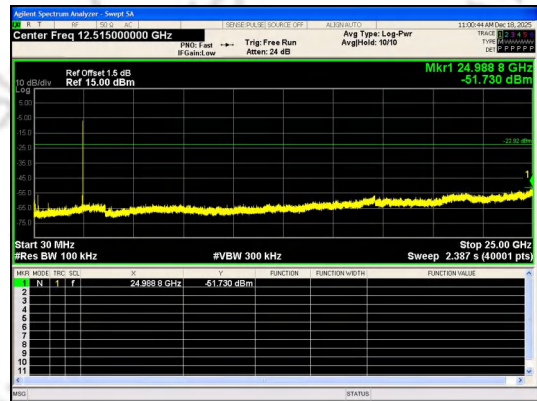
In-Band Reference Level BLE 2M_Channel 39



Out Of Band Emission BLE 1M_Channel 39



Out Of Band Emission BLE 2M_Channel 39



30.0 MHz - 25000.0 MHz BLE 1M_Channel 39

30.0 MHz - 25000.0 MHz BLE 2M_Channel 39

B6.Radiated Spurious Emission and Restricted Band

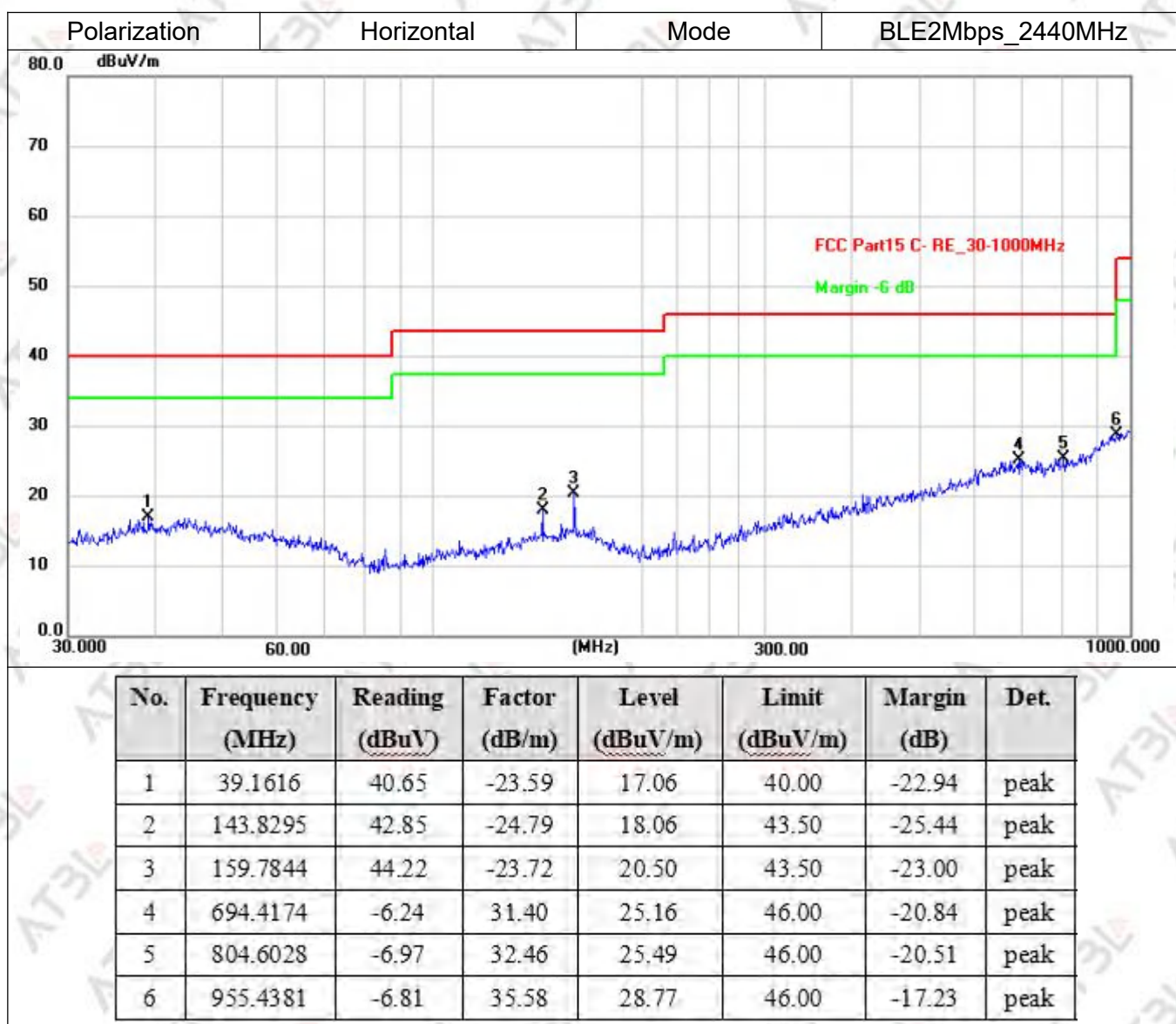
For 9 kHz ~ 30 MHz

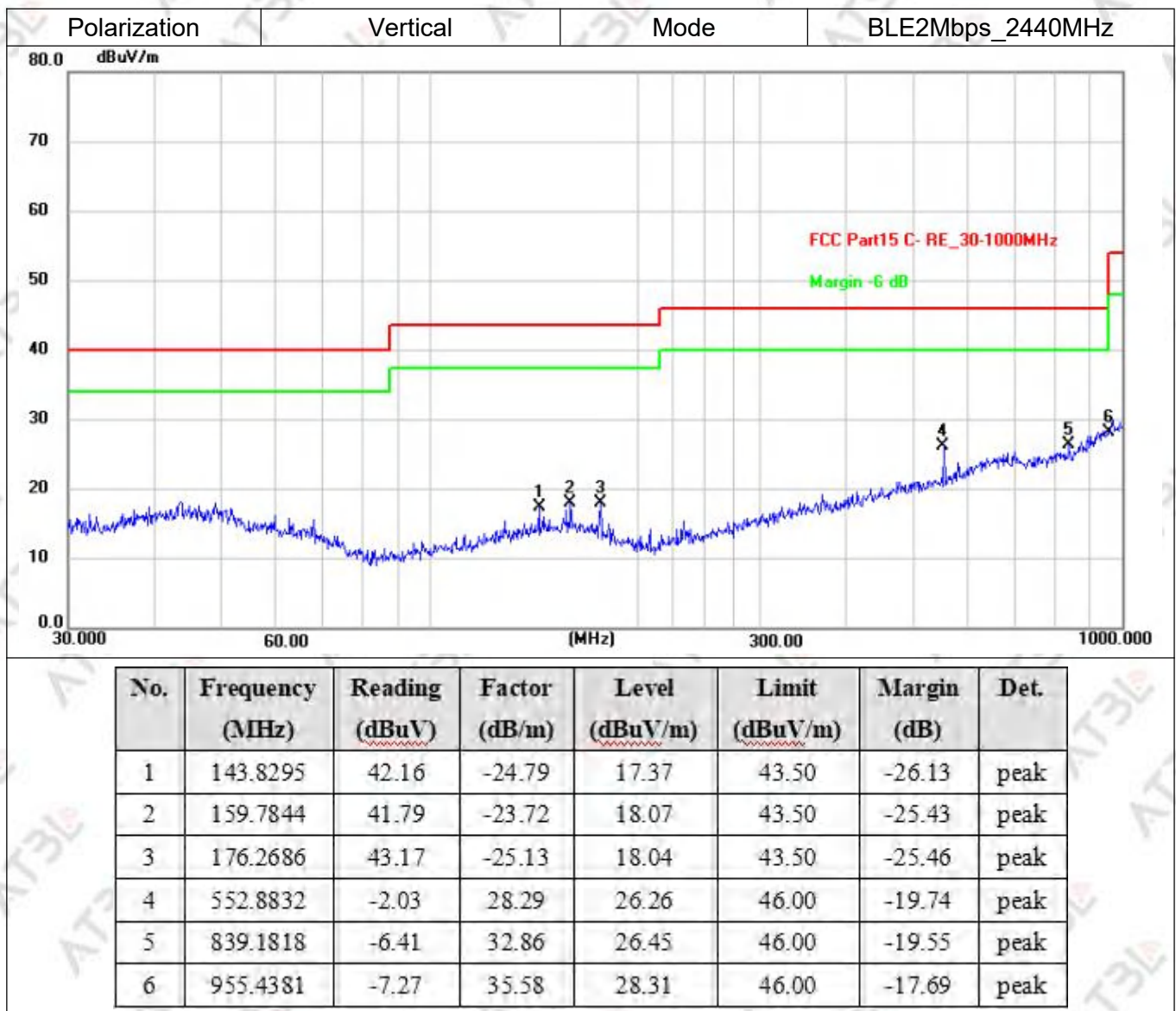
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

For 30 MHz ~ 1 GHz:

Note:

- 1.All modes have been tested, only worst (BLE2Mbps_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	47.36	0.32	47.68	74.00	-26.32	peak	Pass
4804.000	35.25	0.34	35.59	54.00	-18.41	AV	Pass
7206.000	45.54	2.90	48.44	74.00	-25.56	peak	Pass
7206.000	34.77	2.90	37.67	54.00	-16.33	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
4804.000	45.95	2.92	48.87	74.00	-25.13	peak	Pass
4804.000	35.06	2.90	37.96	54.00	-16.04	AVG	Pass
7206.000	44.86	5.60	50.46	74.00	-23.54	peak	Pass
7206.000	34.67	5.64	40.31	54.00	-13.69	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	48.73	-7.88	40.85	74.00	-33.15	peak	Pass
4880.000	38.59	-7.88	30.71	54.00	-23.29	AV	Pass
7320.000	47.54	-7.83	39.71	74.00	-34.29	peak	Pass
7320.000	38.42	-7.83	30.59	54.00	-23.41	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	48.83	-7.88	40.95	74.00	-33.05	peak	Pass
4880.000	38.78	-7.88	30.90	54.00	-23.10	AV	Pass
7320.000	48.17	-7.83	40.34	74.00	-33.66	peak	Pass
7320.000	38.00	-7.83	30.17	54.00	-23.83	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	48.73	-7.88	40.85	74.00	-33.15	peak	Pass
4960.000	38.59	-7.88	30.71	54.00	-23.29	AV	Pass
7440.000	47.54	-7.83	39.71	74.00	-34.29	peak	Pass
7440.000	38.42	-7.83	30.59	54.00	-23.41	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	48.83	-7.88	40.95	74.00	-33.05	peak	Pass
4960.000	38.78	-7.88	30.90	54.00	-23.10	AV	Pass
7440.000	48.17	-7.83	40.34	74.00	-33.66	peak	Pass
7440.000	38.00	-7.83	30.17	54.00	-23.83	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	47.36	0.32	47.68	74.00	-26.32	peak	Pass
4804.000	35.25	0.34	35.59	54.00	-18.41	AV	Pass
7206.000	45.54	2.90	48.44	74.00	-25.56	peak	Pass
7206.000	34.77	2.90	37.67	54.00	-16.33	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
4804.000	45.95	2.92	48.87	74.00	-25.13	peak	Pass
4804.000	35.06	2.90	37.96	54.00	-16.04	AVG	Pass
7206.000	44.86	5.60	50.46	74.00	-23.54	peak	Pass
7206.000	34.67	5.64	40.31	54.00	-13.69	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	48.73	-7.88	40.85	74.00	-33.15	peak	Pass
4880.000	38.59	-7.88	30.71	54.00	-23.29	AV	Pass
7320.000	47.54	-7.83	39.71	74.00	-34.29	peak	Pass
7320.000	38.42	-7.83	30.59	54.00	-23.41	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	48.83	-7.88	40.95	74.00	-33.05	peak	Pass
4880.000	38.78	-7.88	30.90	54.00	-23.10	AV	Pass
7320.000	48.17	-7.83	40.34	74.00	-33.66	peak	Pass
7320.000	38.00	-7.83	30.17	54.00	-23.83	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	48.73	-7.88	40.85	74.00	-33.15	peak	Pass
4960.000	38.59	-7.88	30.71	54.00	-23.29	AV	Pass
7440.000	47.54	-7.83	39.71	74.00	-34.29	peak	Pass
7440.000	38.42	-7.83	30.59	54.00	-23.41	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	48.83	-7.88	40.95	74.00	-33.05	peak	Pass
4960.000	38.78	-7.88	30.90	54.00	-23.10	AV	Pass
7440.000	48.17	-7.83	40.34	74.00	-33.66	peak	Pass
7440.000	38.00	-7.83	30.17	54.00	-23.83	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.

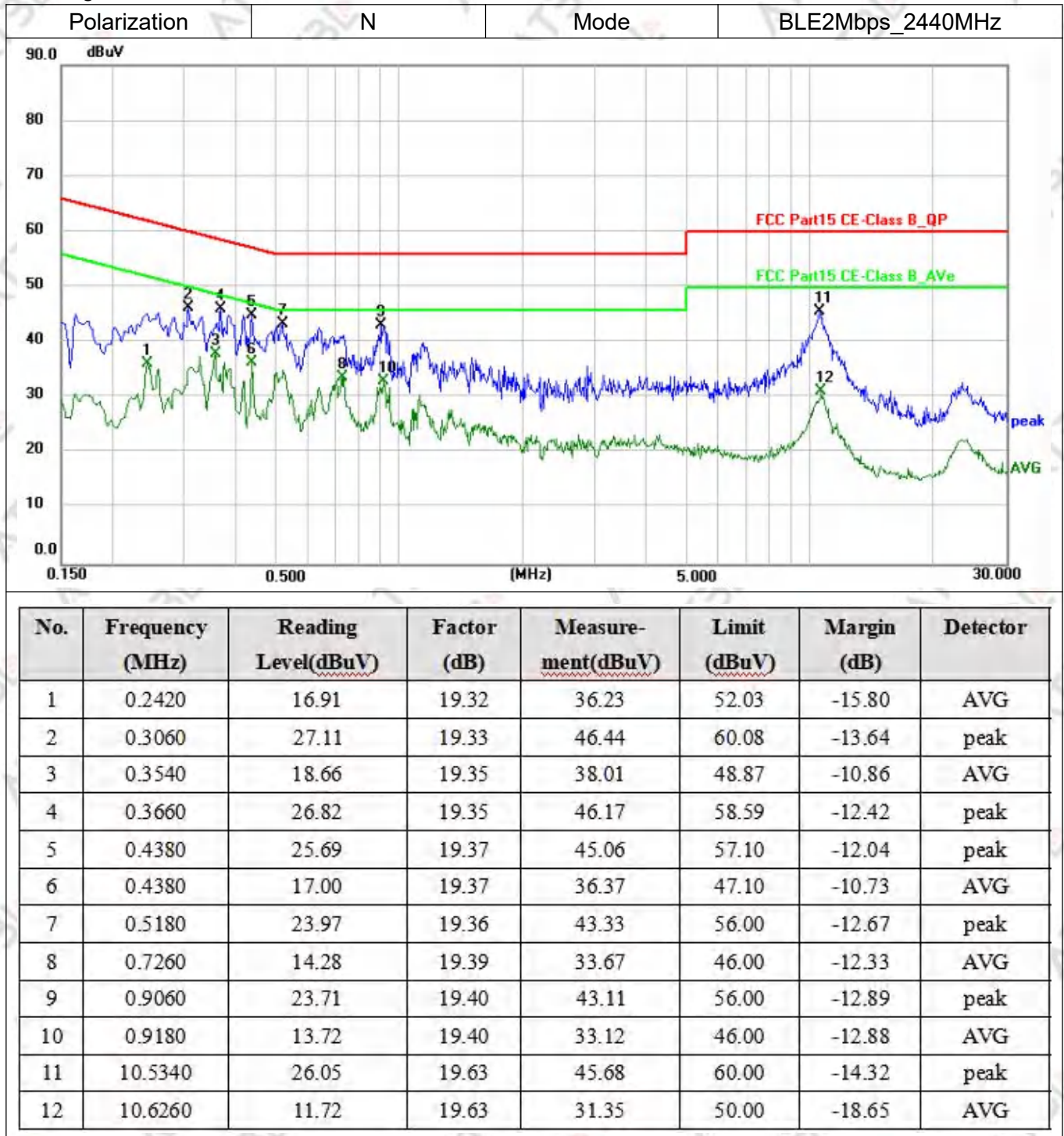
Test Mode: BLE1Mbps							
Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2310.000	43.54	-10.95	32.59	74.00	-41.41	peak	Pass
2310.000	34.67	-10.95	23.72	54.00	-30.28	AV	Pass
2390.000	53.34	-10.86	42.48	74.00	-31.52	peak	Pass
2390.000	39.05	-10.86	28.19	54.00	-25.81	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	45.13	-10.95	34.18	74.00	-39.82	peak	Pass
2310.000	35.58	-10.95	24.63	54.00	-29.37	AV	Pass
2390.000	53.98	-10.86	43.12	74.00	-30.88	peak	Pass
2390.000	39.05	-10.86	28.19	54.00	-25.81	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	58.04	-10.34	47.70	74.00	-26.30	peak	Pass
2483.500	42.03	-10.34	31.69	54.00	-22.31	AV	Pass
2500.000	44.71	-10.24	34.47	74.00	-39.53	peak	Pass
2500.000	36.17	-10.24	25.93	54.00	-28.07	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	52.10	-10.34	41.76	74.00	-32.24	peak	Pass
2483.500	36.85	-10.34	26.51	54.00	-27.49	AV	Pass
2500.000	45.82	-10.24	35.58	74.00	-38.42	peak	Pass
2500.000	35.18	-10.24	24.94	54.00	-29.06	AV	Pass

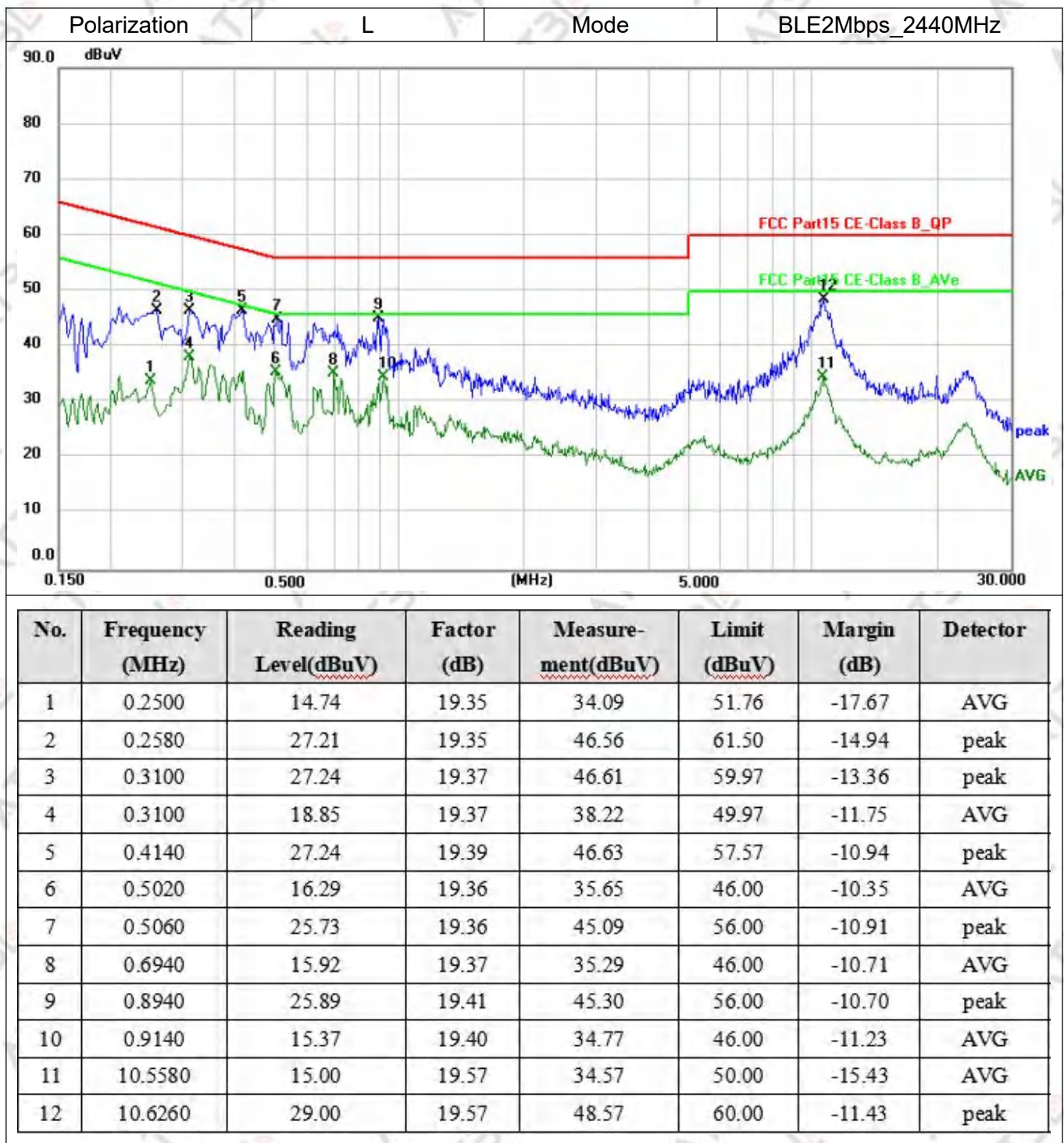
Test Mode: BLE2Mbps							
Test Channel: Lowest channel, Test Polarization: Vertical							
Frequency (MHz)	Reading (dBμV)	Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Marging (dB)	Detector	Result
2310.000	44.87	-10.95	33.92	74.00	-40.08	peak	Pass
2310.000	34.90	-10.95	23.95	54.00	-30.05	AV	Pass
2390.000	54.43	-10.86	43.57	74.00	-30.43	peak	Pass
2390.000	39.22	-10.86	28.36	54.00	-25.64	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	44.20	-10.95	33.25	74.00	-40.75	peak	Pass
2310.000	35.21	-10.95	24.26	54.00	-29.74	AV	Pass
2390.000	54.32	-10.86	43.46	74.00	-30.54	peak	Pass
2390.000	37.41	-10.86	26.55	54.00	-27.45	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	50.37	-10.34	40.03	74.00	-33.97	peak	Pass
2483.500	38.51	-10.34	28.17	54.00	-25.83	AV	Pass
2500.000	44.53	-10.24	34.29	74.00	-39.71	peak	Pass
2500.000	35.07	-10.24	24.83	54.00	-29.17	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	47.48	-10.34	37.14	74.00	-36.86	peak	Pass
2483.500	34.77	-10.34	24.43	54.00	-29.57	AV	Pass
2500.000	45.02	-10.24	34.78	74.00	-39.22	peak	Pass
2500.000	38.53	-10.24	28.29	54.00	-25.71	AV	Pass

B7.AC Power-Line Conducted Emission

Note:

- 1.All modes have been tested, only worst mode(BLE2Mbps_2440MHz) was recorded in the test report.
- 2.Emission Level= Reading Value+ Correction Factor.
3. Correction Factor= Insertion loss+ Cable Factor.
4. The emission levels of other frequencies were less than 20dB margin against the limit.
5. Margin value = Emission level-Limit value.





*****END*****