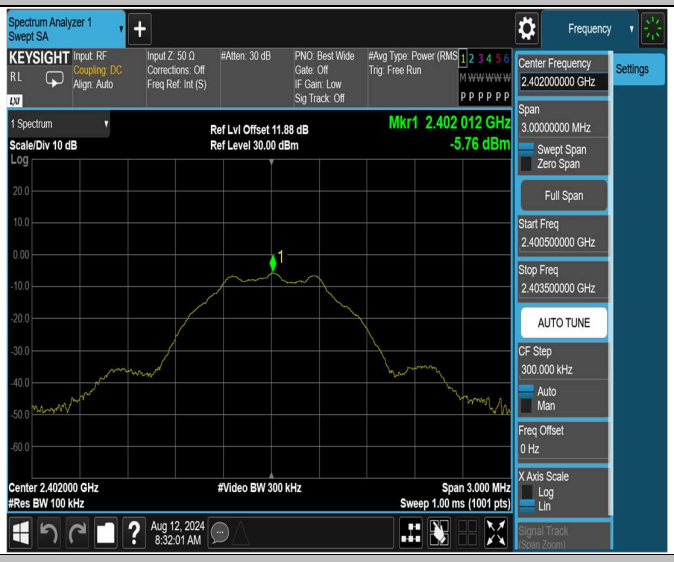
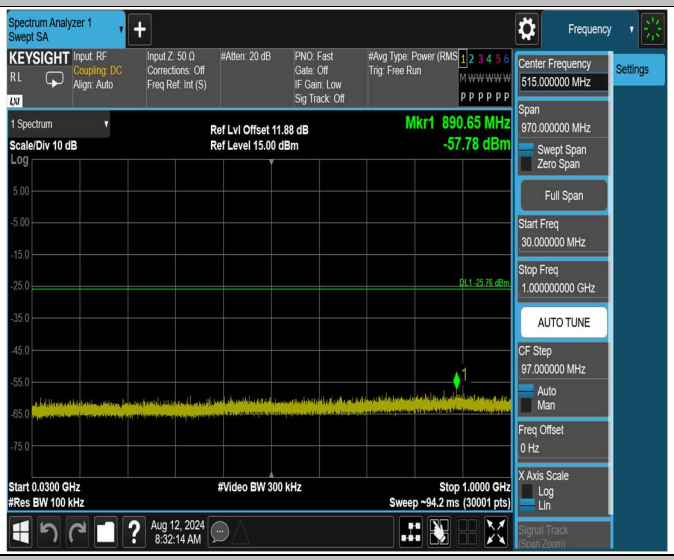
Test Graphs

BLE_1M_Ant1_2402_0~Reference

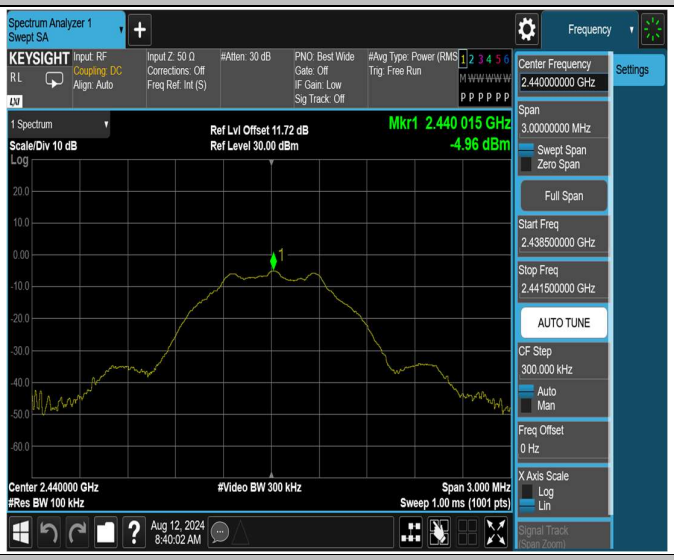


BLE_1M_Ant1_2402_30~1000

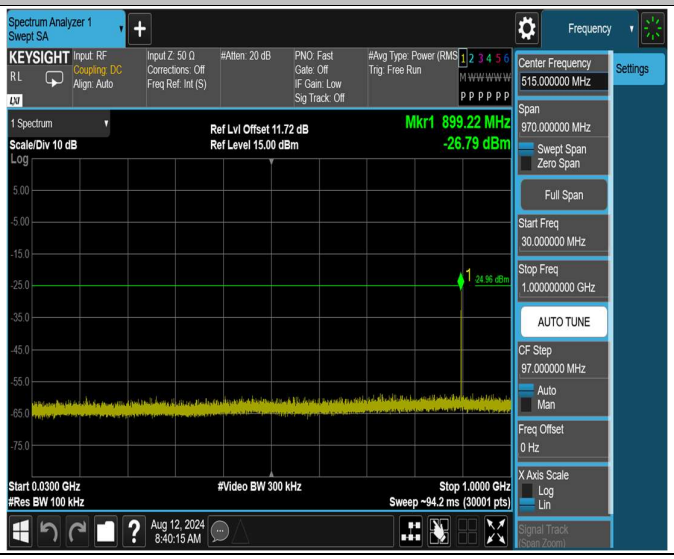


BLE_1M_Ant1_2402_1000~26500

BLE_1M_Ant1_2440_0~Reference

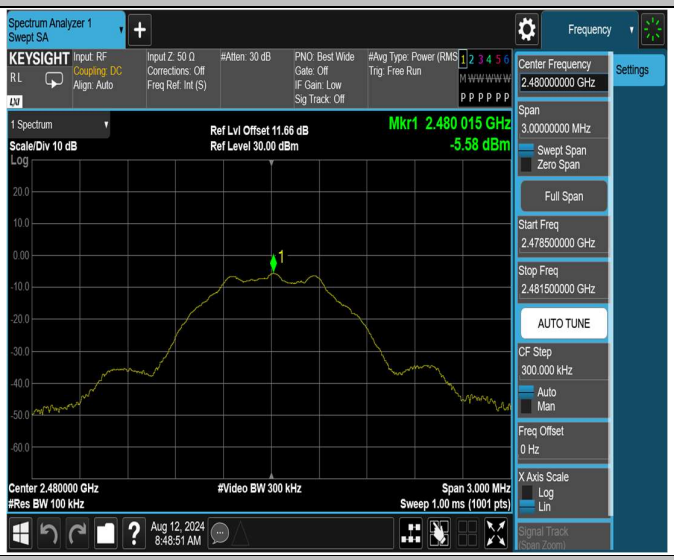


BLE_1M_Ant1_2440_30~1000

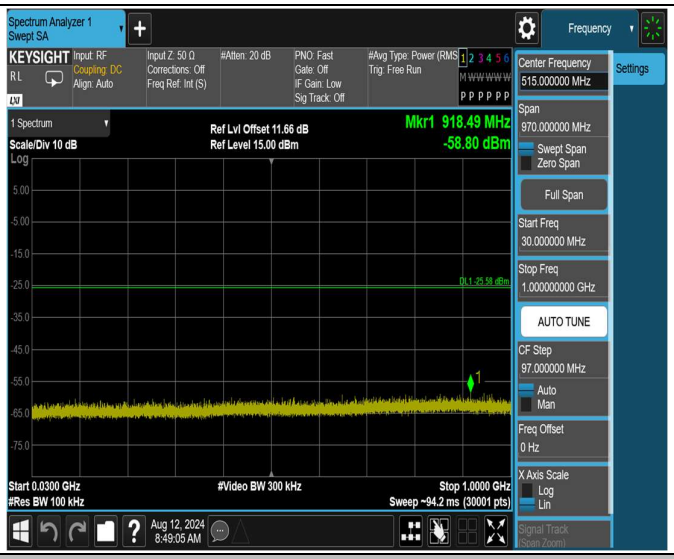


BLE_1M_Ant1_2440_1000~26500

BLE_1M_Ant1_2480_0~Reference



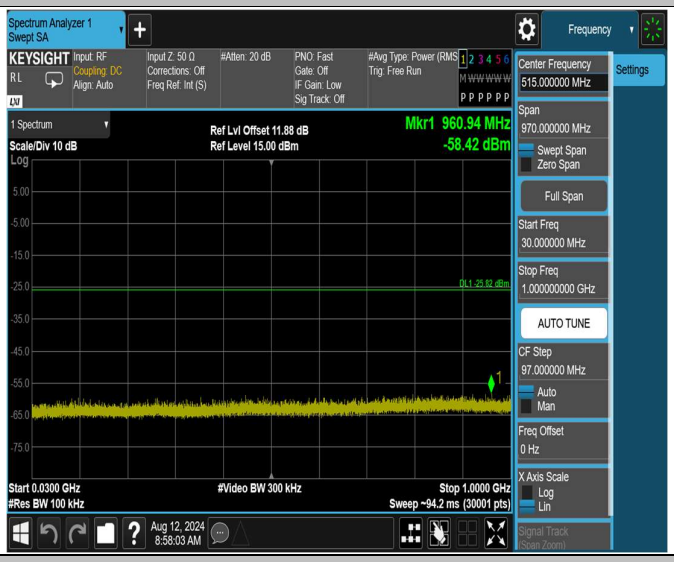
BLE_1M_Ant1_2480_30~1000



BLE_1M_Ant1_2480_1000~26500

BLE_2M_Ant1_2402_0~Reference

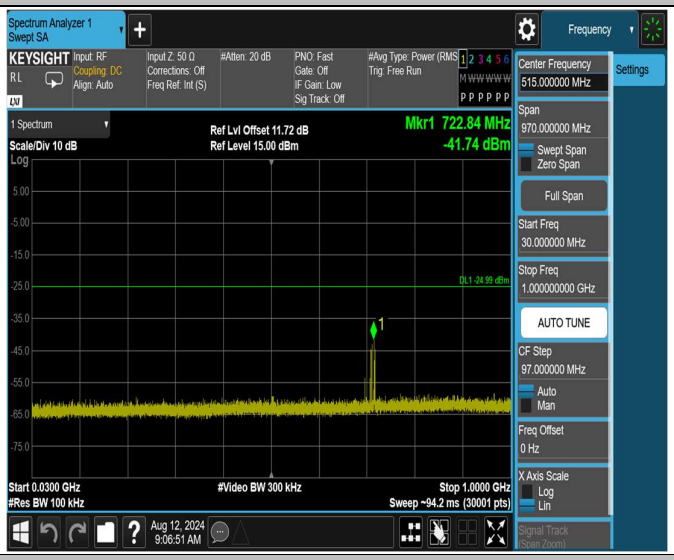
BLE_2M_Ant1_2402_30~1000



BLE_2M_Ant1_2402_1000~26500

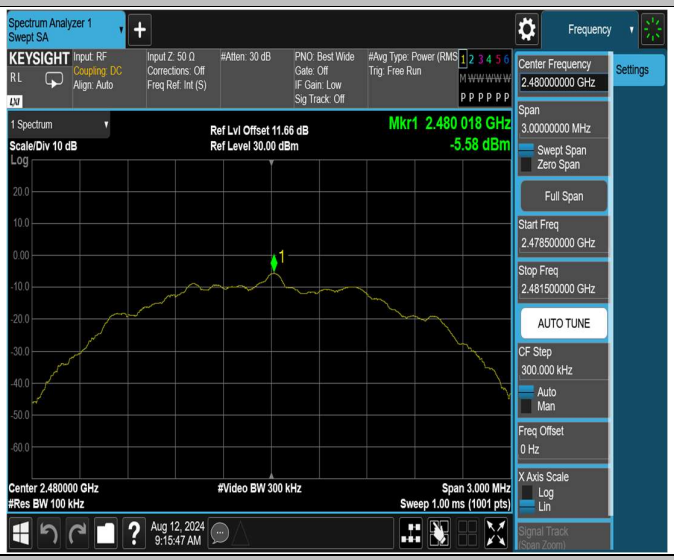
BLE_2M_Ant1_2440_0~Reference

BLE_2M_Ant1_2440_30~1000

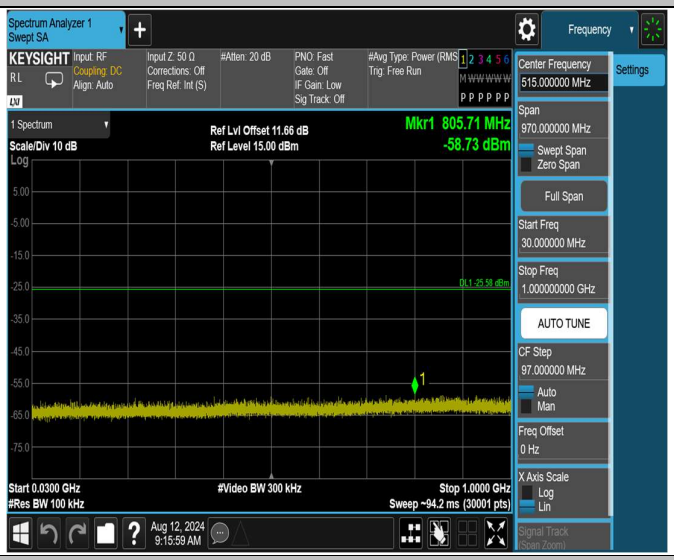


BLE_2M_Ant1_2440_1000~26500

BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500

Spectrum Analyzer 1
Swept SA
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
#Atten: 20 dB
PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off
#Avg Type: Power (RMS)
Trig: Free Run
1 Spectrum
Scale/Div 10 dB
Ref Lvl Offset 11.66 dB
Ref Level 15.00 dBm
Mkr2 26.482 15 GHz
-49.95 dBm
Start 1.00 GHz
#Res BW 100 kHz
#Video BW 300 kHz
Stop 26.50 GHz
Sweep ~2.44 s (30001 pts)
5 Marker Table
Mode Trace Scale X Y Function Function Width Function Value
1 N 1 f 2.479 85 GHz -7.812 dBm
2 N 1 f 26.482 15 GHz -49.95 dBm
Aug 12, 2024
9:17:38 AM
Frequency
Settings
Center Frequency
13.750000000 GHz
Span
25.5000000 GHz
Swept Span
Zero Span
Full Span
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
AUTO TUNE
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
X Axis Scale
Log
Lin
Signal Track
(Span Zoom)

Appendix G: Duty Cycle

Test Result

TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]
BLE_1M	Ant1	2402	0.40	0.63	63.49
		2440	0.40	0.63	63.49
		2480	0.40	0.63	63.49
BLE_2M	Ant1	2402	0.21	0.63	33.33
		2440	0.21	0.63	33.33
		2480	0.21	0.63	33.33

Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

BLE_2M_Ant1_2402

BLE_2M_Ant1_2440

BLE_2M_Ant1_2480

Appendix H: Emissions in Restricted Bands

Test Result

Mode:	BLE 1M-2402

Final Data List												
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	2310	-21.24	36.15	74.00	37.85	33.83	54.00	20.17	150	185	Vertical	PASS
2	2335.92	-21.05	38.42	74.00	35.58	36.68	54.00	17.32	150	352	Vertical	PASS
3	2361.68	-20.88	45.05	74.00	28.95	42.48	54.00	11.52	150	328	Vertical	PASS
4	2369.68	-20.84	45.19	74.00	28.81	43.11	54.00	10.89	150	328	Vertical	PASS
5	2373.28	-20.83	43.61	74.00	30.39	41.42	54.00	12.58	150	328	Vertical	PASS
6	2390	-20.73	37.21	74.00	36.79	34.21	54.00	19.79	150	123	Vertical	PASS

Final Data List												
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	2310	-21.24	35.86	74.00	38.14	33.92	54.00	20.08	150	225	Horizontal	PASS
2	2344.88	-20.99	37.77	74.00	36.23	35.04	54.00	18.96	150	225	Horizontal	PASS
3	2367.36	-20.86	41.41	74.00	32.59	39.60	54.00	14.40	150	58	Horizontal	PASS
4	2369.68	-20.84	41.49	74.00	32.51	34.79	54.00	19.21	150	225	Horizontal	PASS
5	2372.32	-20.83	40.09	74.00	33.91	37.41	54.00	16.59	150	111	Horizontal	PASS
6	2390	-20.73	36.53	74.00	37.47	34.39	54.00	19.61	150	357	Horizontal	PASS

Mode:	BLE 1M-2480

Final Data List												
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	2483.5	10.67	48.67	74.00	25.33	45.37	54.00	8.63	150	251	Vertical	PASS
2	2485.3975	10.51	49.97	74.00	24.03	46.44	54.00	7.56	150	278	Vertical	PASS
3	2488.153	10.28	48.52	74.00	25.48	45.36	54.00	8.64	150	178	Vertical	PASS
4	2490.331	10.37	49.55	74.00	24.45	46.52	54.00	7.48	150	0	Vertical	PASS
5	2494.9675	10.53	48.88	74.00	25.12	45.82	54.00	8.18	150	280	Vertical	PASS
6	2500	10.20	47.11	74.00	26.89	44.01	54.00	9.99	150	214	Vertical	PASS

Final Data List												
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	2483.5	10.67	50.99	74.00	23.01	46.12	54.00	7.88	150	6	Horizontal	PASS
2	2487.823	10.29	49.61	74.00	24.39	46.59	54.00	7.41	150	318	Horizontal	PASS
3	2489.77	10.34	50.06	74.00	23.94	47.36	54.00	6.64	150	296	Horizontal	PASS
4	2493.334	10.53	48.90	74.00	25.10	45.45	54.00	8.55	150	152	Horizontal	PASS
5	2497.0135	10.39	49.31	74.00	24.69	46.86	54.00	7.14	150	152	Horizontal	PASS
6	2500	10.20	46.63	74.00	27.37	44.62	54.00	9.38	150	160	Horizontal	PASS

Mode:	BLE 2M-2402

Final Data List												
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	2310	-21.24	36.31	74.00	37.69	34.76	54.00	19.24	150	141	Vertical	PASS
2	2362.16	-20.88	41.76	74.00	32.24	39.79	54.00	14.21	150	126	Vertical	PASS
3	2363.84	-20.87	42.55	74.00	31.45	40.42	54.00	13.58	150	126	Vertical	PASS
4	2366.24	-20.87	42.62	74.00	31.38	37.66	54.00	16.34	150	85	Vertical	PASS
5	2370.96	-20.84	43.47	74.00	30.53	42.50	54.00	11.50	150	82	Vertical	PASS
6	2390	-20.73	36.32	74.00	37.68	33.92	54.00	20.08	150	287	Vertical	PASS

Final Data List												
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	2310	-21.24	35.58	74.00	38.42	34.48	54.00	19.52	150	44	Horizontal	PASS
2	2319.76	-21.17	38.23	74.00	35.77	34.55	54.00	19.45	150	239	Horizontal	PASS
3	2336.88	-21.05	38.54	74.00	35.46	34.50	54.00	19.50	150	162	Horizontal	PASS
4	2361.84	-20.88	40.50	74.00	33.50	39.17	54.00	14.83	150	147	Horizontal	PASS
5	2370.96	-20.84	40.18	74.00	33.82	35.26	54.00	18.74	150	114	Horizontal	PASS
6	2390	-20.73	36.44	74.00	37.56	33.76	54.00	20.24	150	346	Horizontal	PASS

Mode:	BLE 2M-2480

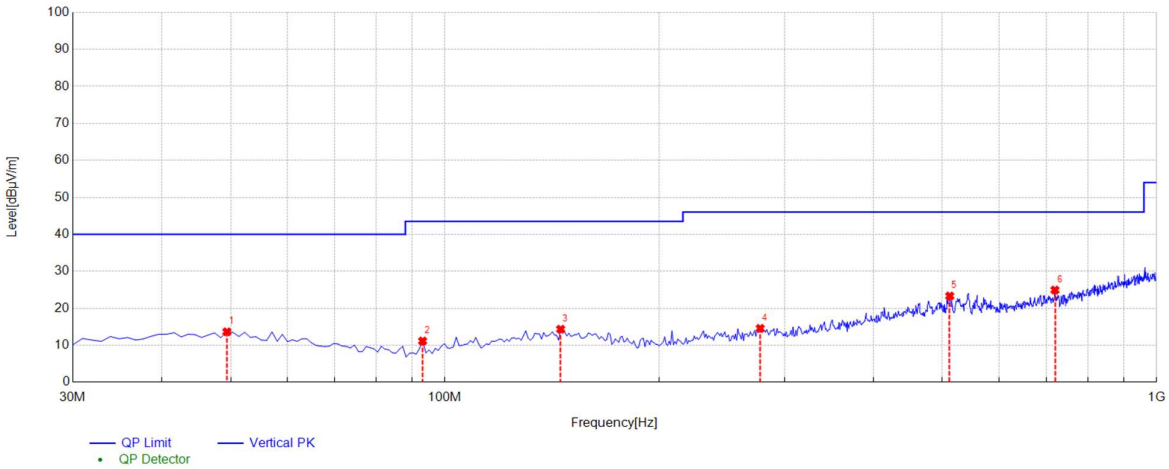
Final Data List												
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	2483.5	10.67	48.84	74.00	25.16	46.19	54.00	7.81	150	305	Vertical	PASS
2	2488.186	10.28	49.23	74.00	24.77	46.09	54.00	7.91	150	100	Vertical	PASS
3	2490.43	10.37	49.31	74.00	24.69	45.44	54.00	8.56	150	86	Vertical	PASS
4	2493.697	10.56	49.09	74.00	24.91	46.76	54.00	7.24	150	0	Vertical	PASS
5	2497.492	10.33	49.46	74.00	24.54	46.25	54.00	7.75	150	221	Vertical	PASS
6	2500	10.20	47.04	74.00	26.96	44.41	54.00	9.59	150	177	Vertical	PASS

Final Data List												
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	2483.5	10.67	49.11	74.00	24.89	45.24	54.00	8.76	150	335	Horizontal	PASS
2	2485.315	10.52	50.33	74.00	23.67	47.41	54.00	6.59	150	296	Horizontal	PASS
3	2487.0805	10.39	49.64	74.00	24.36	45.96	54.00	8.04	150	221	Horizontal	PASS
4	2489.473	10.33	50.51	74.00	23.49	46.28	54.00	7.72	150	330	Horizontal	PASS
5	2497.525	10.33	48.65	74.00	25.35	44.94	54.00	9.06	150	112	Horizontal	PASS
6	2500.0000	10.20	48.09	74.00	25.91	44.30	54.00	9.70	150	30	Horizontal	PASS

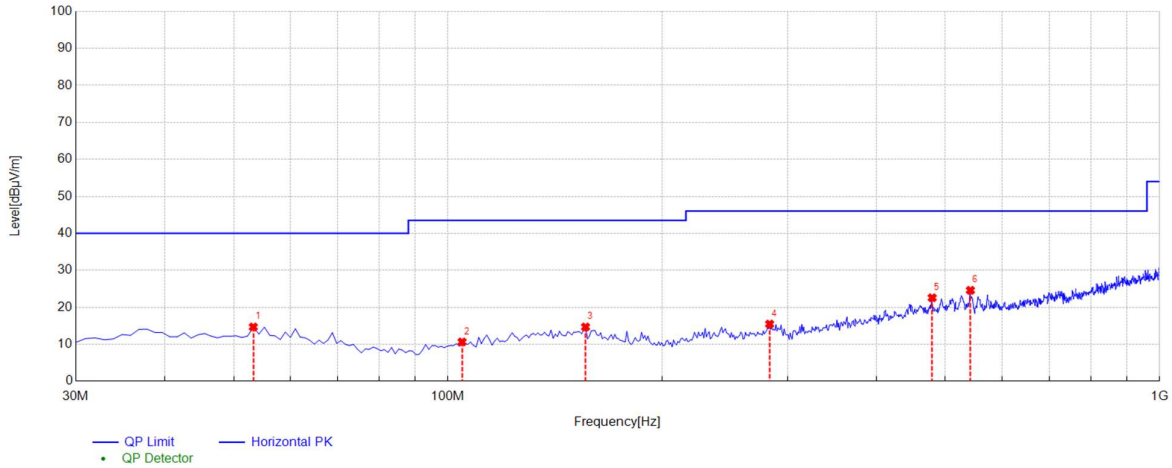
Note：

1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Appendix I: Spurious emissions



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	49.4000	13.65	-15.93	40.00	26.35	100	240	Vertical	PASS
2	93.0500	11.16	-20.17	43.50	32.34	100	100	Vertical	PASS
3	145.430	14.35	-16.44	43.50	29.15	100	270	Vertical	PASS
4	277.350	14.58	-16.01	46.00	31.42	100	340	Vertical	PASS
5	512.090	23.33	-10.55	46.00	22.67	100	240	Vertical	PASS
6	719.670	24.94	-6.64	46.00	21.06	100	240	Vertical	PASS



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	53.2800	14.69	-16.22	40.00	25.31	100	240	Horizontal	PASS
2	104.690	10.64	-19.02	43.50	32.86	100	290	Horizontal	PASS
3	156.100	14.69	-16.31	43.50	28.81	100	350	Horizontal	PASS
4	283.170	15.48	-15.86	46.00	30.52	100	210	Horizontal	PASS
5	479.110	22.58	-11.25	46.00	23.42	100	230	Horizontal	PASS
6	542.160	24.60	-9.98	46.00	21.40	100	210	Horizontal	PASS

Mode:	BLE 1M-2402

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1316	44.59	2.28	74.00	29.41	150	112	Vertical	PASS
2	1806	44.98	4.92	74.00	29.02	150	67	Vertical	PASS
3	3941.24	50.79	-17.15	74.00	23.21	150	138	Vertical	PASS
4	5272.18	45.05	-13.95	74.00	28.95	150	245	Vertical	PASS
5	6582.13	47.64	-12.31	74.00	26.36	150	289	Vertical	PASS
6	10416.0	46.93	-7.33	74.00	27.07	150	38	Vertical	PASS

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1340	43.34	2.14	74.00	30.66	150	168	Horizontal	PASS
2	1820	45.06	5.06	74.00	28.94	150	103	Horizontal	PASS
3	4942.44	44.38	-15.14	74.00	29.62	150	272	Horizontal	PASS
4	6579.13	43.83	-12.29	74.00	30.17	150	298	Horizontal	PASS
5	10245.2	46.81	-7.39	74.00	27.19	150	50	Horizontal	PASS
6	13362.7	48.97	-2.86	74.00	25.03	150	19	Horizontal	PASS

Mode:	BLE 1M-2440

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1318	44.73	2.27	74.00	29.27	150	111	Vertical	PASS
2	1888	45.50	5.61	74.00	28.50	150	250	Vertical	PASS
3	3948	44.38	-17.25	74.00	29.62	150	54	Vertical	PASS
4	5265	47.16	-14.01	74.00	26.84	150	116	Vertical	PASS
5	6588	50.07	-12.35	74.00	23.93	150	285	Vertical	PASS
6	11898	48.89	-4.33	74.00	25.11	150	142	Vertical	PASS

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1248	43.23	2.18	74.00	30.77	150	270	Horizontal	PASS
2	1844	45.45	5.29	74.00	28.55	150	231	Horizontal	PASS
3	4881	45.72	-14.63	74.00	28.28	150	266	Horizontal	PASS
4	7554	45.78	-11.88	74.00	28.22	150	132	Horizontal	PASS
5	10050	45.96	-7.63	74.00	28.04	150	213	Horizontal	PASS
6	13575	48.94	-2.62	74.00	25.06	150	348	Horizontal	PASS

Mode:	BLE 1M-2480

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1316	45.39	2.28	74.00	28.61	150	111	Vertical	PASS
2	1886	45.15	5.59	74.00	28.85	150	288	Vertical	PASS
3	4737	50.53	-14.66	74.00	23.47	150	258	Vertical	PASS
4	7092	47.69	-11.69	74.00	26.31	150	292	Vertical	PASS
5	11181	48.02	-5.62	74.00	25.98	150	39	Vertical	PASS
6	14349	49.44	-0.72	74.00	24.56	150	81	Vertical	PASS

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1318	42.54	2.27	74.00	31.46	150	148	Horizontal	PASS
2	1888	45.96	5.61	74.00	28.04	150	86	Horizontal	PASS
3	4959	47.98	-15.23	74.00	26.02	150	244	Horizontal	PASS
4	6222	45.06	-12.48	74.00	28.94	150	354	Horizontal	PASS
5	9744	46.02	-7.74	74.00	27.98	150	191	Horizontal	PASS
6	11895	48.56	-4.34	74.00	25.44	150	360	Horizontal	PASS

Mode:	BLE 2M-2402

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1318	46.32	2.27	74.00	27.68	150	128	Vertical	PASS
2	1808	44.50	4.93	74.00	29.50	150	140	Vertical	PASS
3	4743	48.29	-14.56	74.00	25.71	150	111	Vertical	PASS
4	6564	47.04	-12.17	74.00	26.96	150	294	Vertical	PASS
5	9000	45.81	-9.75	74.00	28.19	150	4	Vertical	PASS
6	11823	48.08	-4.49	74.00	25.92	150	296	Vertical	PASS

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1306	42.59	2.34	74.00	31.41	150	191	Horizontal	PASS
2	2012	45.82	5.95	74.00	28.18	150	273	Horizontal	PASS
3	4803	44.98	-14.80	74.00	29.02	150	199	Horizontal	PASS
4	5955	44.64	-12.05	74.00	29.36	150	91	Horizontal	PASS
5	7626	44.81	-11.40	74.00	29.19	150	184	Horizontal	PASS
6	12762	48.03	-3.57	74.00	25.97	150	290	Horizontal	PASS

Mode:	BLE 2M-2440

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1318	44.09	2.27	74.00	29.91	150	140	Vertical	PASS
2	1898	45.61	5.67	74.00	28.39	150	0	Vertical	PASS
3	4878	45.65	-14.70	74.00	28.35	150	67	Vertical	PASS
4	6573	49.77	-12.24	74.00	24.23	150	285	Vertical	PASS
5	9999	46.02	-7.60	74.00	27.98	150	306	Vertical	PASS
6	13338	48.35	-2.95	74.00	25.65	150	240	Vertical	PASS

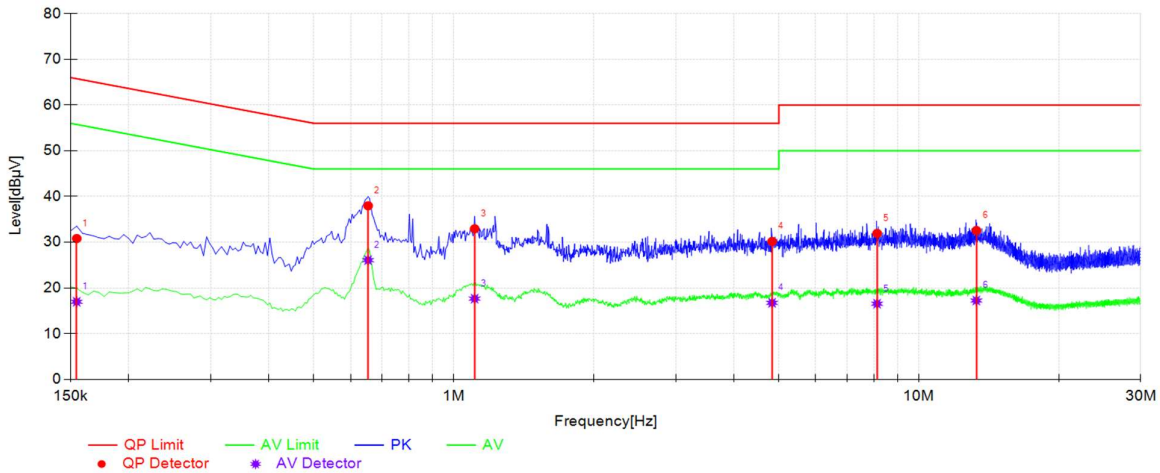
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1340	42.28	2.14	74.00	31.72	150	344	Horizontal	PASS
2	1864	46.11	5.45	74.00	27.89	150	292	Horizontal	PASS
3	4881	45.29	-14.63	74.00	28.71	150	360	Horizontal	PASS
4	6642	44.21	-12.23	74.00	29.79	150	126	Horizontal	PASS
5	9225	45.25	-8.97	74.00	28.75	150	329	Horizontal	PASS
6	12120	47.76	-4.08	74.00	26.24	150	4	Horizontal	PASS

Mode:	BLE 2M-2480

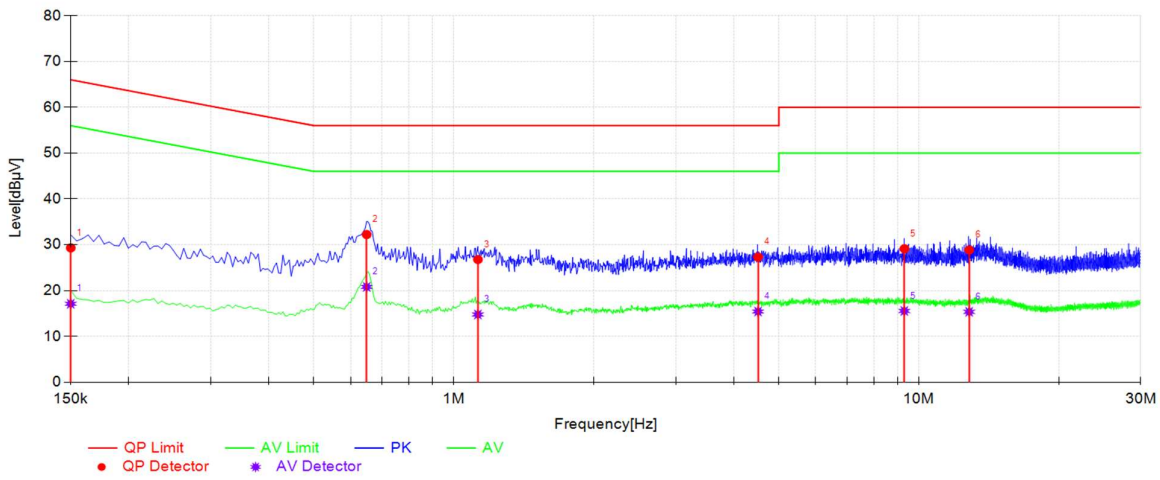
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1318	45.08	2.27	74.00	28.92	150	134	Vertical	PASS
2	1644	43.63	2.71	74.00	30.37	150	60	Vertical	PASS
3	3948	44.96	-17.25	74.00	29.04	150	53	Vertical	PASS
4	4959	45.74	-15.23	74.00	28.26	150	245	Vertical	PASS
5	6579	44.96	-12.28	74.00	29.04	150	299	Vertical	PASS
6	11304	47.31	-5.71	74.00	26.69	150	257	Vertical	PASS

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1350	43.52	2.08	74.00	30.48	150	66	Horizontal	PASS
2	1846	44.68	5.31	74.00	29.32	150	41	Horizontal	PASS
3	4959	47.53	-15.23	74.00	26.47	150	10	Horizontal	PASS
4	6333	45.29	-12.35	74.00	28.71	150	275	Horizontal	PASS
5	8340	45.26	-10.14	74.00	28.74	150	102	Horizontal	PASS
6	13563	48.85	-2.42	74.00	25.15	150	72	Horizontal	PASS

Appendix J: Conducted emission AC power port



Final Data List										
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Type	Verdict
1	0.1545	11.65	30.81	65.75	34.94	16.98	55.75	38.77	L1	PASS
2	0.654	11.66	37.98	56.00	18.02	26.08	46.00	19.92	L1	PASS
3	1.1085	11.66	32.95	56.00	23.05	17.66	46.00	28.34	L1	PASS
4	4.8345	11.74	30.17	56.00	25.83	16.75	46.00	29.25	L1	PASS
5	8.133	11.84	31.94	60.00	28.06	16.55	50.00	33.45	L1	PASS
6	13.2945	11.94	32.58	60.00	27.42	17.25	50.00	32.75	L1	PASS



Final Data List										
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Type	Verdict
1	0.15	11.65	29.32	66.00	36.68	17.12	56.00	38.88	N	PASS
2	0.6495	11.66	32.24	56.00	23.76	20.80	46.00	25.20	N	PASS
3	1.1265	11.66	26.78	56.00	29.22	14.78	46.00	31.22	N	PASS
4	4.5105	11.81	27.33	56.00	28.67	15.43	46.00	30.57	N	PASS
5	9.3075	11.85	29.13	60.00	30.87	15.55	50.00	34.45	N	PASS
6	12.831	11.92	28.88	60.00	31.12	15.36	50.00	34.64	N	PASS