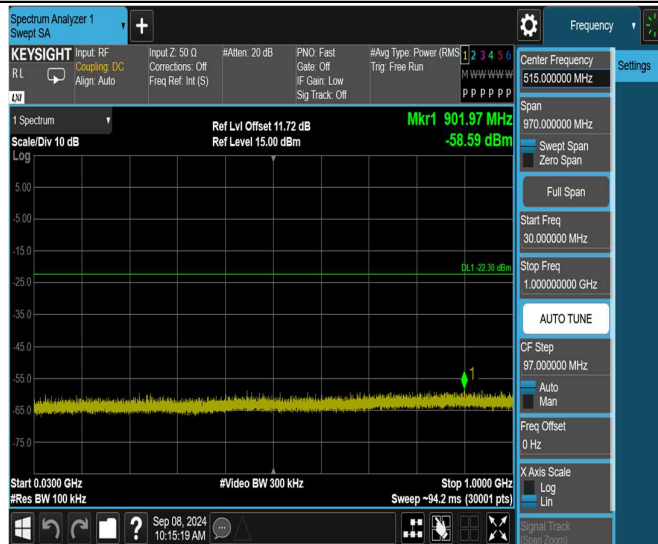




BLE_2M_Ant1_2440_30~1000



BLE_2M_Ant1_2440_1000~26500



BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500



Appendix G: Duty Cycle

Test Result

TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]
BLE_1M	Ant1	2402	19.00	19.00	100.00
		2440	19.00	19.00	100.00
		2480	19.00	19.00	100.00
BLE_2M	Ant1	2402	15.00	15.00	100.00
		2440	19.00	19.00	100.00
		2480	15.00	15.00	100.00

BLE_1M_Ant1_2402

Spectrum Analyzer 1
Sweep 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) Trg: Free Run 1 2 3 4 5 6 WWWWWW P P P P P P

Center Frequency: 2.402000000 GHz Settings

Span: 0.00000000 Hz Sweep Span: Zero Span Full Span

Start Freq: 2.402000000 GHz Stop Freq: 2.402000000 GHz AUTO TUNE

CF Step: 8.0000000 MHz Auto Man

Freq Offset: 0 Hz X Axis Scale: Log Lin Signal Track (Span Zoom)

1 Spectrum Ref Lvl Offset 11.88 dB Scale/Div 10 dB Ref Level 15.00 dBm

Log

Center 2.402000000 GHz #Video BW 8.0 MHz Span 0 Hz Res BW 8 MHz Sweep 19.0 ms (1001 pts)

5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1								
2								
3								
4								
5								
6								

Sep 08, 2024 9:47:17 AM

BLE_1M_Ant1_2440

Spectrum Analyzer 1
Sweep 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) Trg: Free Run 1 2 3 4 5 6 WWWWWW P P P P P P

Center Frequency: 2.440000000 GHz Settings

Span: 0.00000000 Hz Sweep Span: Zero Span Full Span

Start Freq: 2.440000000 GHz Stop Freq: 2.440000000 GHz AUTO TUNE

CF Step: 8.0000000 MHz Auto Man

Freq Offset: 0 Hz X Axis Scale: Log Lin Signal Track (Span Zoom)

1 Spectrum Ref Lvl Offset 11.72 dB Scale/Div 10 dB Ref Level 15.00 dBm

Log

Center 2.440000000 GHz #Video BW 8.0 MHz Span 0 Hz Res BW 8 MHz Sweep 19.0 ms (1001 pts)

5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1								
2								
3								
4								
5								
6								

Sep 08, 2024 9:53:36 AM

BLE_1M_Ant1_2480

BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440





Appendix H: Emissions in Restricted Bands

Test Result

Mode:	BLE 1M-2402
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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	6.68	43.42	74.00	30.58	40.90	54.00	13.10	150	194	Horizontal	PASS
2	2324.24	6.79	44.82	74.00	29.18	42.37	54.00	11.63	150	100	Horizontal	PASS
3	2336.8	6.79	45.83	74.00	28.17	41.96	54.00	12.04	150	323	Horizontal	PASS
4	2357.2	7.03	45.53	74.00	28.47	42.04	54.00	11.96	150	6	Horizontal	PASS
5	2374.08	7.45	45.91	74.00	28.09	42.92	54.00	11.08	150	217	Horizontal	PASS
6	2390	8.15	44.94	74.00	29.06	42.37	54.00	11.63	150	356	Horizontal	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	6.68	46.59	74.00	27.41	41.58	54.00	12.42	150	220	Vertical	PASS
2	2331.52	6.89	45.60	74.00	28.40	41.40	54.00	12.60	150	292	Vertical	PASS
3	2349.92	6.90	45.87	74.00	28.13	43.22	54.00	10.78	150	178	Vertical	PASS
4	2360.48	7.02	44.83	74.00	29.17	42.42	54.00	11.58	150	217	Vertical	PASS
5	2387.52	7.99	47.58	74.00	26.42	44.55	54.00	9.45	150	322	Vertical	PASS
6	2390	8.15	46.37	74.00	27.63	42.90	54.00	11.10	150	102	Vertical	PASS

Mode:	BLE 1M-2480
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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	2483.5165	8.67	57.95	74.00	16.05	48.35	54.00	5.65	150	275	Horizontal	PASS
2	2483.7145	8.64	56.81	74.00	17.19	50.62	54.00	3.38	150	278	Horizontal	PASS
3	2483.863	8.63	55.71	74.00	18.29	49.25	54.00	4.75	150	280	Horizontal	PASS
4	2484.4405	8.59	54.66	74.00	19.34	46.09	54.00	7.91	150	275	Horizontal	PASS
5	2485.1005	8.55	52.56	74.00	21.44	43.53	54.00	10.47	150	155	Horizontal	PASS
6	2500	8.20	46.23	74.00	27.77	42.54	54.00	11.46	150	167	Horizontal	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	8.67	46.42	74.00	27.58	44.31	54.00	9.69	150	103	Vertical	PASS
2	2483.6485	8.65	50.61	74.00	23.39	44.40	54.00	9.60	150	115	Vertical	PASS
3	2483.896	8.63	49.22	74.00	24.78	43.69	54.00	10.31	150	103	Vertical	PASS
4	2485.744	8.46	47.77	74.00	26.23	45.46	54.00	8.54	150	241	Vertical	PASS
5	2493.5815	8.55	46.94	74.00	27.06	43.48	54.00	10.52	150	154	Vertical	PASS
6	2500	8.20	47.02	74.00	26.98	43.76	54.00	10.24	150	329	Vertical	PASS

Mode:	BLE 2M-2402
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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	6.68	43.24	74.00	30.76	41.41	54.00	12.59	150	176	Horizontal	PASS
2	2328.64	6.79	45.60	74.00	28.40	41.52	54.00	12.48	150	135	Horizontal	PASS
3	2345.28	6.94	46.28	74.00	27.72	42.60	54.00	11.40	150	223	Horizontal	PASS
4	2364.48	7.16	45.62	74.00	28.38	42.43	54.00	11.57	150	323	Horizontal	PASS
5	2378	7.59	46.61	74.00	27.39	44.15	54.00	9.85	150	103	Horizontal	PASS
6	2390	8.15	45.79	74.00	28.21	42.87	54.00	11.13	150	103	Horizontal	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	6.68	43.13	74.00	30.87	40.58	54.00	13.42	150	64	Vertical	PASS
2	2330.8	6.84	46.12	74.00	27.88	42.14	54.00	11.86	150	226	Vertical	PASS
3	2351.68	6.89	45.85	74.00	28.15	43.30	54.00	10.70	150	247	Vertical	PASS
4	2363.04	7.09	46.26	74.00	27.74	43.61	54.00	10.39	150	226	Vertical	PASS
5	2372.64	7.36	48.71	74.00	25.29	46.37	54.00	7.63	150	226	Vertical	PASS
6	2390	8.15	45.04	74.00	28.96	42.69	54.00	11.31	150	212	Vertical	PASS

Mode:	BLE 2M-2480
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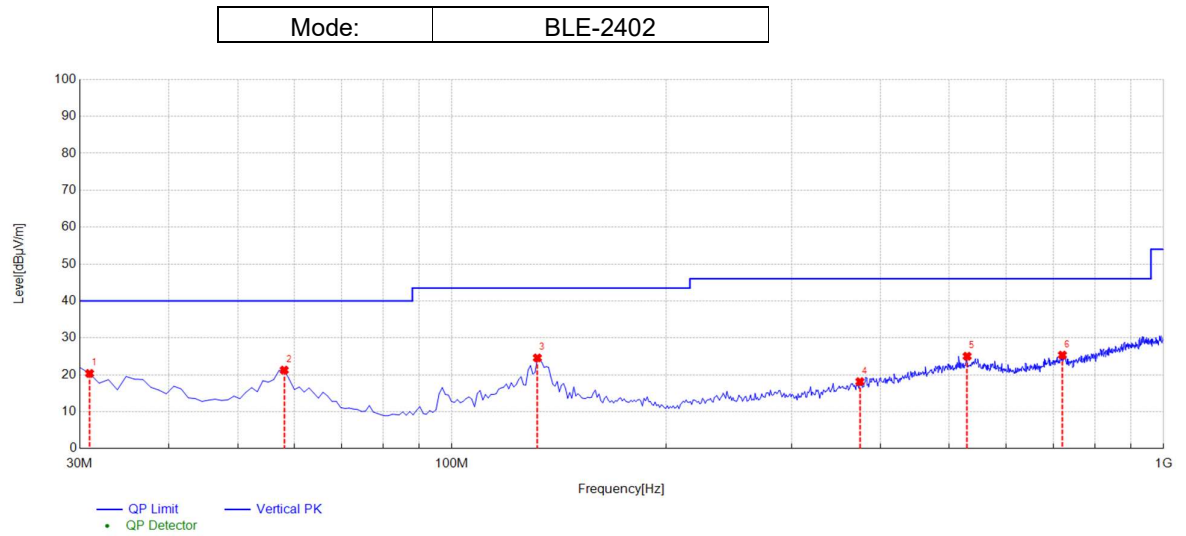
Final Data List												
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	2483.5	8.67	55.72	74.00	18.28	48.90	54.00	5.10	150	132	Horizontal	PASS
2	2483.7145	8.64	56.34	74.00	17.66	49.49	54.00	4.51	150	144	Horizontal	PASS
3	2483.8465	8.63	56.09	74.00	17.91	51.96	54.00	2.04	150	274	Horizontal	PASS
4	2484.2425	8.60	54.44	74.00	19.56	49.24	54.00	4.76	150	267	Horizontal	PASS
5	2484.7705	8.57	53.31	74.00	20.69	47.00	54.00	7.00	150	286	Horizontal	PASS
6	2500	8.20	45.56	74.00	28.44	42.95	54.00	11.05	150	298	Horizontal	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	8.67	50.25	74.00	23.75	46.43	54.00	7.57	150	113	Vertical	PASS
2	2483.797	8.64	50.43	74.00	23.57	45.52	54.00	8.48	150	110	Vertical	PASS
3	2484.094	8.61	48.81	74.00	25.19	45.61	54.00	8.39	150	142	Vertical	PASS
4	2485.051	8.55	47.60	74.00	26.40	43.94	54.00	10.06	150	205	Vertical	PASS
5	2486.8495	8.41	47.75	74.00	26.25	45.10	54.00	8.90	150	360	Vertical	PASS
6	2500	8.20	44.85	74.00	29.15	42.90	54.00	11.10	150	23	Vertical	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.

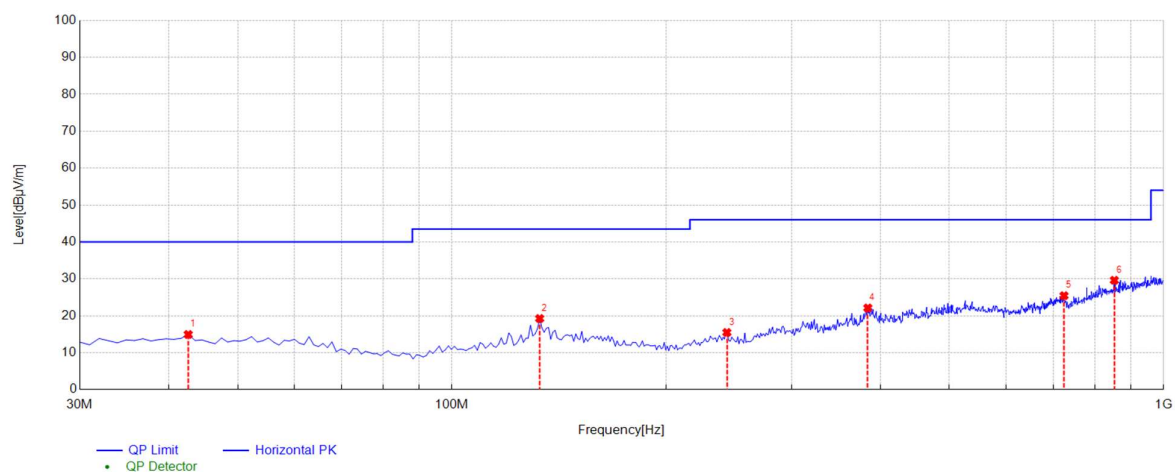
Appendix I: Spurious emissions



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	30.9700	20.37	-17.31	40.00	19.63	100	214	Vertical	PASS
2	58.1300	21.27	-16.47	40.00	18.73	100	18	Vertical	PASS
3	131.850	24.59	-16.92	43.50	18.91	100	114	Vertical	PASS
4	374.350	18.15	-13.90	46.00	27.85	100	256	Vertical	PASS
5	529.550	25.03	-10.28	46.00	20.97	100	264	Vertical	PASS
6	720.640	25.35	-6.63	46.00	20.65	100	264	Vertical	PASS

Mode:

BLE-2402



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	42.6100	14.95	-15.71	40.00	25.05	100	145	Horizontal	PASS
2	132.820	19.27	-16.87	43.50	24.23	100	56	Horizontal	PASS
3	243.400	15.49	-17.17	46.00	30.51	100	223	Horizontal	PASS
4	384.050	22.13	-13.46	46.00	23.87	100	23	Horizontal	PASS
5	724.520	25.46	-6.60	46.00	20.54	100	184	Horizontal	PASS
6	852.560	29.63	-3.85	46.00	16.37	100	236	Horizontal	PASS

Mode:	BLE 1M-2402
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NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1316	42.73	2.28	74.00	31.27	150	105	Horizontal	PASS
2	1888	45.02	5.61	74.00	28.98	150	356	Horizontal	PASS
3	4803	47.95	-14.80	74.00	26.05	150	246	Horizontal	PASS
4	5925	45.14	-12.46	74.00	28.86	150	360	Horizontal	PASS
5	7206	48.12	-12.33	74.00	25.88	150	160	Horizontal	PASS
6	12111	47.27	-3.89	74.00	26.73	150	99	Horizontal	PASS

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1226	42.59	2.16	74.00	31.41	150	332	Vertical	PASS
2	1934	45.68	5.64	74.00	28.32	150	0	Vertical	PASS
3	4737	50.96	-14.66	74.00	23.04	150	218	Vertical	PASS
4	5262	46.47	-14.03	74.00	27.53	150	124	Vertical	PASS
5	7206	48.21	-12.33	74.00	25.79	150	75	Vertical	PASS
6	11904	47.42	-4.37	74.00	26.58	150	360	Vertical	PASS

Mode:	BLE 1M-2441
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NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1340	42.85	2.14	74.00	31.15	150	55	Horizontal	PASS
2	1830	45.31	5.15	74.00	28.69	150	131	Horizontal	PASS
3	4878	49.16	-14.70	74.00	24.84	150	248	Horizontal	PASS
4	7320	49.36	-11.65	74.00	24.64	150	74	Horizontal	PASS
5	10338	46.09	-7.39	74.00	27.91	150	46	Horizontal	PASS
6	11835	47.66	-4.52	74.00	26.34	150	300	Horizontal	PASS

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1248	42.96	2.18	74.00	31.04	150	27	Vertical	PASS
2	1854	44.41	5.38	74.00	29.59	150	299	Vertical	PASS
3	4881	45.89	-14.63	74.00	28.11	150	7	Vertical	PASS
4	5271	45.29	-13.96	74.00	28.71	150	81	Vertical	PASS
5	7320	49.07	-11.65	74.00	24.93	150	255	Vertical	PASS
6	10941	46.67	-6.60	74.00	27.33	150	343	Vertical	PASS

Mode:	BLE 1M-2480
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NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1270	42.45	2.26	74.00	31.55	150	136	Horizontal	PASS
2	1818	45.53	5.03	74.00	28.47	150	226	Horizontal	PASS
3	4197	42.73	-16.39	74.00	31.27	150	240	Horizontal	PASS
4	4962	47.96	-15.20	74.00	26.04	150	292	Horizontal	PASS
5	7440	50.57	-11.61	74.00	23.43	150	74	Horizontal	PASS
6	11115	47.11	-5.63	74.00	26.89	150	30	Horizontal	PASS

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1314	42.74	2.28	74.00	31.26	150	35	Vertical	PASS
2	1826	44.36	5.12	74.00	29.64	150	136	Vertical	PASS
3	3939	43.51	-17.11	74.00	30.49	150	233	Vertical	PASS
4	4959	45.64	-15.23	74.00	28.36	150	4	Vertical	PASS
5	7440	48.32	-11.61	74.00	25.68	150	183	Vertical	PASS
6	11949	47.09	-4.85	74.00	26.91	150	55	Vertical	PASS

Mode:	BLE 2M-2402
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NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1226	42.80	2.16	74.00	31.20	150	228	Horizontal	PASS
2	1874	45.17	5.52	74.00	28.83	150	298	Horizontal	PASS
3	4803	46.84	-14.80	74.00	27.16	150	267	Horizontal	PASS
4	7209	47.03	-12.30	74.00	26.97	150	73	Horizontal	PASS
5	9774	45.60	-7.77	74.00	28.40	150	196	Horizontal	PASS
6	13191	48.03	-2.33	74.00	25.97	150	38	Horizontal	PASS

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1316	43.97	2.28	74.00	30.03	150	156	Vertical	PASS
2	1938	48.65	5.63	74.00	25.35	150	78	Vertical	PASS
3	4737	46.18	-14.66	74.00	27.82	150	253	Vertical	PASS
4	6576	46.94	-12.26	74.00	27.06	150	158	Vertical	PASS
5	7206	48.32	-12.33	74.00	25.68	150	72	Vertical	PASS
6	11241	47.28	-5.88	74.00	26.72	150	136	Vertical	PASS

Mode:	BLE 2M-2441
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NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1306	41.97	2.34	74.00	32.03	150	181	Horizontal	PASS
2	1796	45.51	4.78	74.00	28.49	150	297	Horizontal	PASS
3	4878	49.22	-14.70	74.00	24.78	150	251	Horizontal	PASS
4	7320	47.54	-11.65	74.00	26.46	150	355	Horizontal	PASS
5	8346	44.93	-10.05	74.00	29.07	150	13	Horizontal	PASS
6	11871	47.03	-4.45	74.00	26.97	150	76	Horizontal	PASS

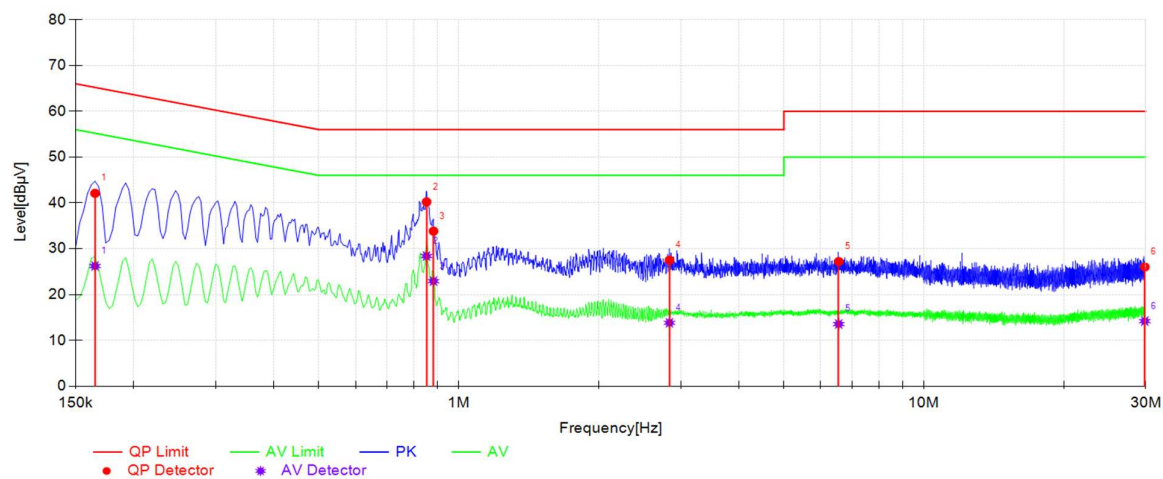
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1602	42.31	2.23	74.00	31.69	150	300	Vertical	PASS
2	2018	45.14	5.95	74.00	28.86	150	65	Vertical	PASS
3	4743	47.60	-14.56	74.00	26.40	150	232	Vertical	PASS
4	7320	47.72	-11.65	74.00	26.28	150	185	Vertical	PASS
5	11109	46.98	-5.63	74.00	27.02	150	4	Vertical	PASS
6	13158	47.48	-2.74	74.00	26.52	150	241	Vertical	PASS

Mode:	BLE 2M-2480
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NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1260	42.80	2.22	74.00	31.20	150	45	Horizontal	PASS
2	1900	45.46	5.69	74.00	28.54	150	295	Horizontal	PASS
3	4962	48.11	-15.20	74.00	25.89	150	248	Horizontal	PASS
4	7440	49.28	-11.61	74.00	24.72	150	71	Horizontal	PASS
5	10557	46.27	-6.88	74.00	27.73	150	333	Horizontal	PASS
6	15117	49.12	-0.17	74.00	24.88	150	268	Horizontal	PASS

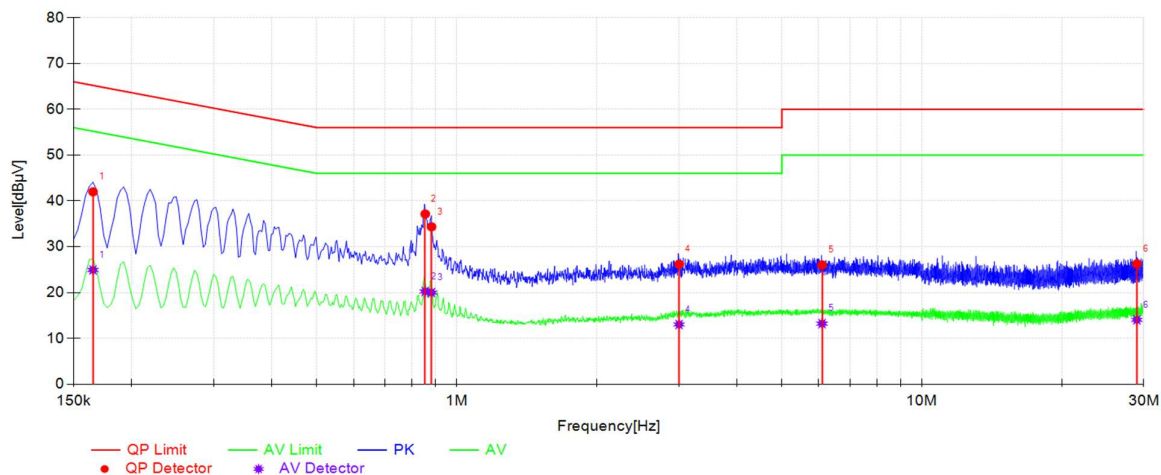
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	1282	42.64	2.30	74.00	31.36	150	249	Vertical	PASS
2	2092	45.80	6.06	74.00	28.20	150	193	Vertical	PASS
3	3945	43.75	-17.20	74.00	30.25	150	313	Vertical	PASS
4	4725	47.56	-14.85	74.00	26.44	150	196	Vertical	PASS
5	7443	48.14	-11.63	74.00	25.86	150	204	Vertical	PASS
6	11202	47.13	-5.62	74.00	26.87	150	166	Vertical	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	0.165	10.25	42.10	65.21	23.11	26.23	55.21	28.98	L1	PASS
2	0.852	10.26	40.23	56.00	15.77	28.41	46.00	17.59	L1	PASS
3	0.882	10.26	33.85	56.00	22.15	22.94	46.00	23.06	L1	PASS
4	2.838	10.29	27.53	56.00	28.47	13.84	46.00	32.16	L1	PASS
5	6.561	10.40	27.21	60.00	32.79	13.57	50.00	36.43	L1	PASS
6	29.869	10.82	26.04	60.00	33.96	14.21	50.00	35.79	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	0.165	10.25	41.99	65.21	23.22	24.94	55.21	30.27	N	PASS
2	0.855	10.26	37.15	56.00	18.85	20.25	46.00	25.75	N	PASS
3	0.882	10.26	34.36	56.00	21.64	20.01	46.00	25.99	N	PASS
4	3.006	10.34	26.19	56.00	29.81	13.04	46.00	32.96	N	PASS
5	6.102	10.41	26.04	60.00	33.96	13.23	50.00	36.77	N	PASS
6	29.005	10.81	26.28	60.00	33.72	14.05	50.00	35.95	N	PASS