

2.7.4. Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 micrometry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

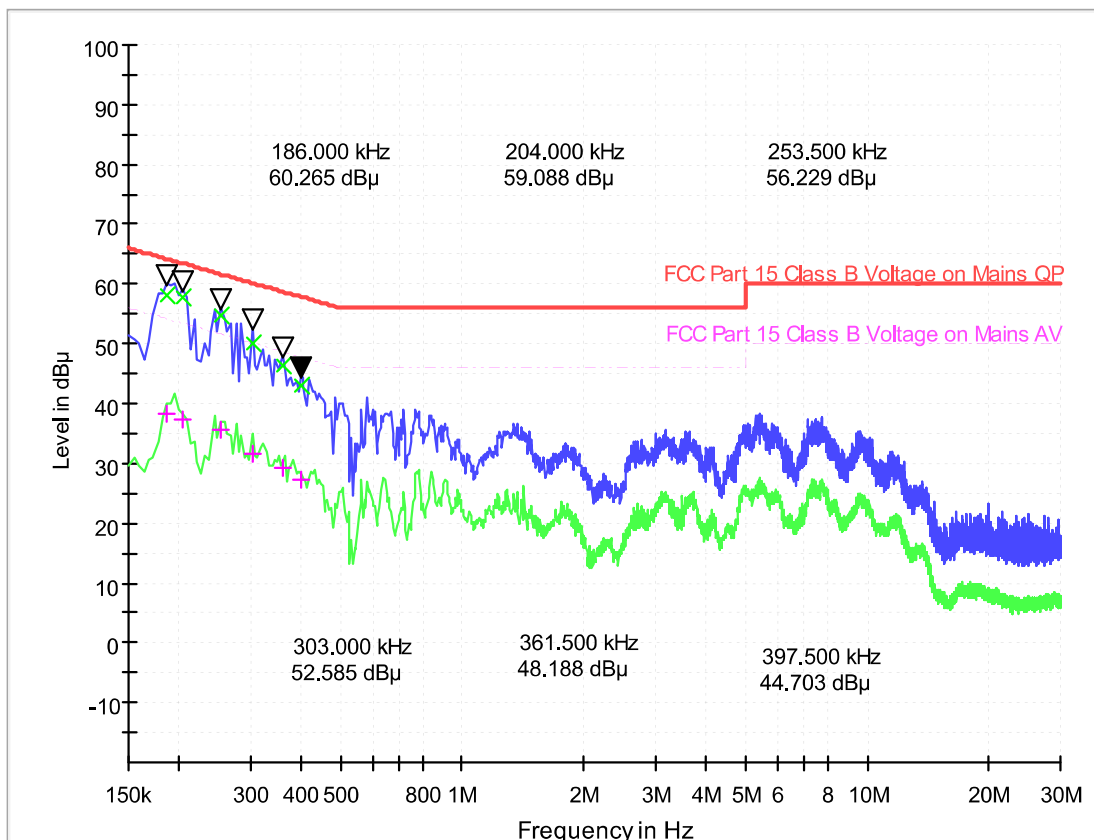
2.7.5. Test Results of Conducted Emission

The EUT configuration of the emission tests is 2.4G WLAN Link + USB Cable (Charging from Adapter).

All of the EUT Configure mode were tested and found 1Mbps_2440MHz (Ant2) channel is the worst mode, the worst case is recorded in this report.



Test site:	Shield ROOM 2	Environment:	Temp: 23°C; Humi:53%;101kPa
Operator:	HUANG CHUTING	Test Date:	2024.12.19
Test Mode:	BLE- TX	Test Part:	L Line



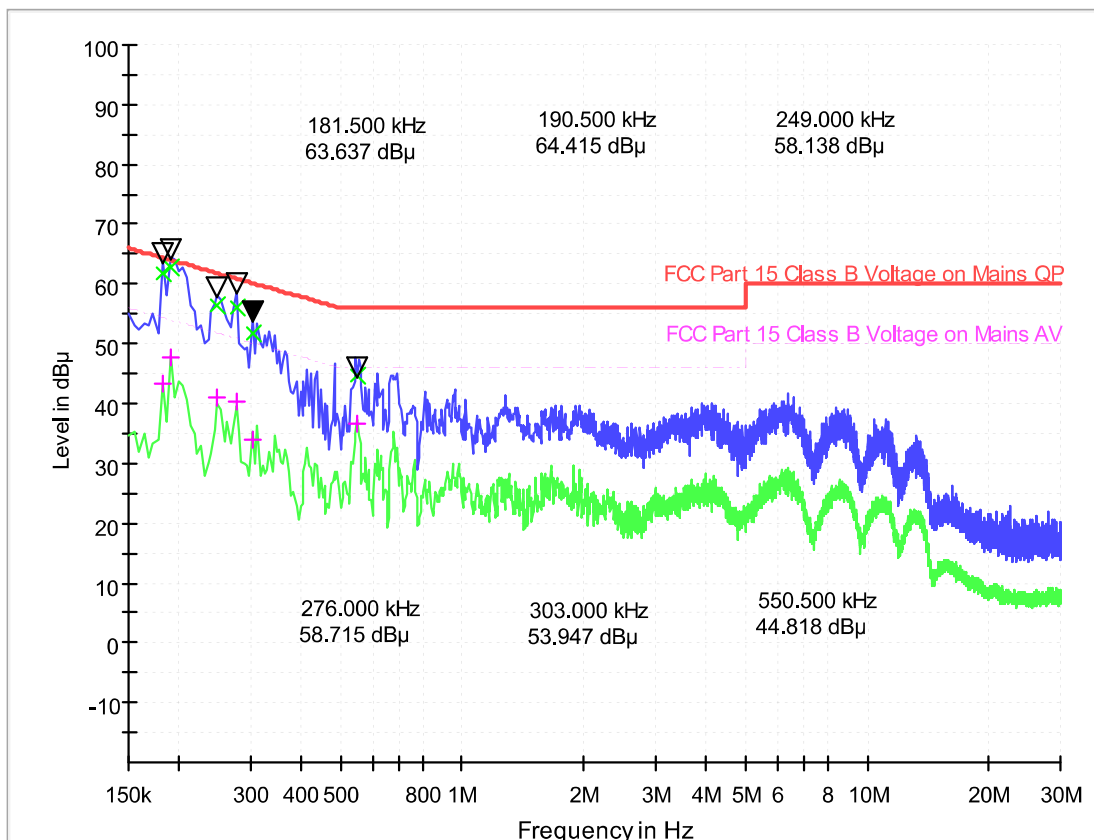
Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Corr.Factor (dB)	Margin - QPK	Limit - QPK (dBμV)	Margin - AV (dB)	Limit - AV (dBμV)
0.186000	58.11	38.38	10.1	6.10	64.2	15.83	54.2
0.204000	57.86	37.47	10.1	5.59	63.4	15.98	53.4
0.253500	54.69	35.79	10.1	6.95	61.6	15.85	51.6
0.303000	50.20	31.55	10.1	9.96	60.2	18.61	50.2
0.361500	46.52	29.14	10.1	12.17	58.7	19.55	48.7
0.397500	42.86	27.24	10.1	15.05	57.9	20.67	47.9

Test Result : Pass

Note: Final Level = Receiver Read level + Correction factor.



Test site:	Shield ROOM 2	Environment:	Temp: 23°C; Humi:53%;101kPa
Operator:	HUANG CHUTING	Test Date:	2024.12.19
Test Mode:	BLE- TX	Test Part:	N Line



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Corr.Factor (dB)	Margin - QPK	Limit - QPK (dBμV)	Margin - AV (dB)	Limit - AV (dBμV)
0.181500	61.86	43.23	10.1	2.56	64.4	21.19	64.4
0.190500	62.86	47.74	10.1	1.15	64.0	16.27	64.0
0.249000	56.29	40.86	10.1	5.50	61.8	20.93	61.8
0.276000	56.25	40.49	10.1	4.69	60.9	20.45	60.9
0.303000	51.86	33.97	10.1	8.30	60.2	26.19	60.2
0.550500	44.56	36.81	10.1	11.44	56.0	19.19	56.0

Test Result : Pass

Note: Final Level = Receiver Read level + Correction factor.



3. List of measuring equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	5M Anechoic Chamber	Albatross	SAC-5MAC 12.8x6.8x6.4m	A0304210	2023.08.01	2026.07.31
2	EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2024.05.23	2025.05.22
3	Loop Antenna	Schwarz beck	HFH2-Z2	A0304220	2022.05.02	2025.05.01
4	Broadband antenna (30MHz~1GHz)	R&S	HL562	A0304224	2024.07.04	2027.07.03
5	EMI Horn Ant. (1-18G)	ETC	MCTD-1209	A150402241	2024.05.18	2027.05.17
6	Horn antenna (18GHz~26.5GHz)	AR	AT4510	A0804450	2024.03.31	2027.03.30
7	Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2024.01.18	2025.01.17
8	Test Receiver	R&S	ESIB7	A0501375	2024.02.28	2025.02.27
9	Broadband Ant.	ETC	MCTD 2786	A150402240	2023.05.22	2026.05.21
10	3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2024.02.27	2027.02.26
11	Temperature chamber	ESPEC	SU-642	A150802409	2024.02.22	2025.02.21
12	Test Receiver	KEYSIGHT	N9038A	A141202036	2024.06.05	2025.06.04
13	LISN	ROHDE&SCHWARZ	ENV216	A140701847	2024.05.23	2025.05.22
14	Cable(9kHz~30MHz)	/	/	C230800587	2023.08.21	2026.08.20
15	Cable(30MHz~18GHz)	/	XSMJA750-SMN M(RA)-12M	C230800588	2023.08.21	2026.08.20
16	Cable(18GHz~40GHz)	/	SUCOFLEX102	C230800590	2023.08.21	2026.08.20

4. Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2020. All the measurement uncertainty value were shown with a coverage $K=2$ to indicate 95% level of confidence . The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of AC Power Line Conducted Emission Measurement (150kHz~30MHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	2.8dB
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Uncertainty of Radiated Emission Measurement (9kHz~30MHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	3.5dB
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Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	3.91dB
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Uncertainty of Radiated Emission Measurement (1GHz~18GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	4.5dB
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Uncertainty of Radiated Emission Measurement (18GHz~40GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	4.9dB
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Uncertainty of RF Conducted Measurement (9kHz~40GHz)

Measuring Uncertainty for a level of confidence of 95%($U=2U_c(y)$)	1.3dB
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Appendix A

Duty Cycle

Test Result and Data

TestMode	Antenna	Frequency[MHz]	ON Time[ms]	Period[ms]	Duty Cycle[%]	DC Factor
BLE_1M	Ant1	2402	0.39	0.62	62.90	2.01
BLE_1M	Ant2	2402	0.40	0.63	63.49	1.97
BLE_1M	Ant1	2440	0.40	0.63	63.49	1.97
BLE_1M	Ant2	2440	0.40	0.63	63.49	1.97
BLE_1M	Ant1	2480	0.39	0.62	62.90	2.01
BLE_1M	Ant2	2480	0.39	0.62	62.90	2.01
BLE_2M	Ant1	2402	0.22	0.63	34.92	4.57
BLE_2M	Ant2	2402	0.21	0.62	33.87	4.70
BLE_2M	Ant1	2440	0.21	0.62	33.87	4.70
BLE_2M	Ant2	2440	0.21	0.62	33.87	4.70
BLE_2M	Ant1	2480	0.21	0.62	33.87	4.70
BLE_2M	Ant2	2480	0.22	0.63	34.92	4.57



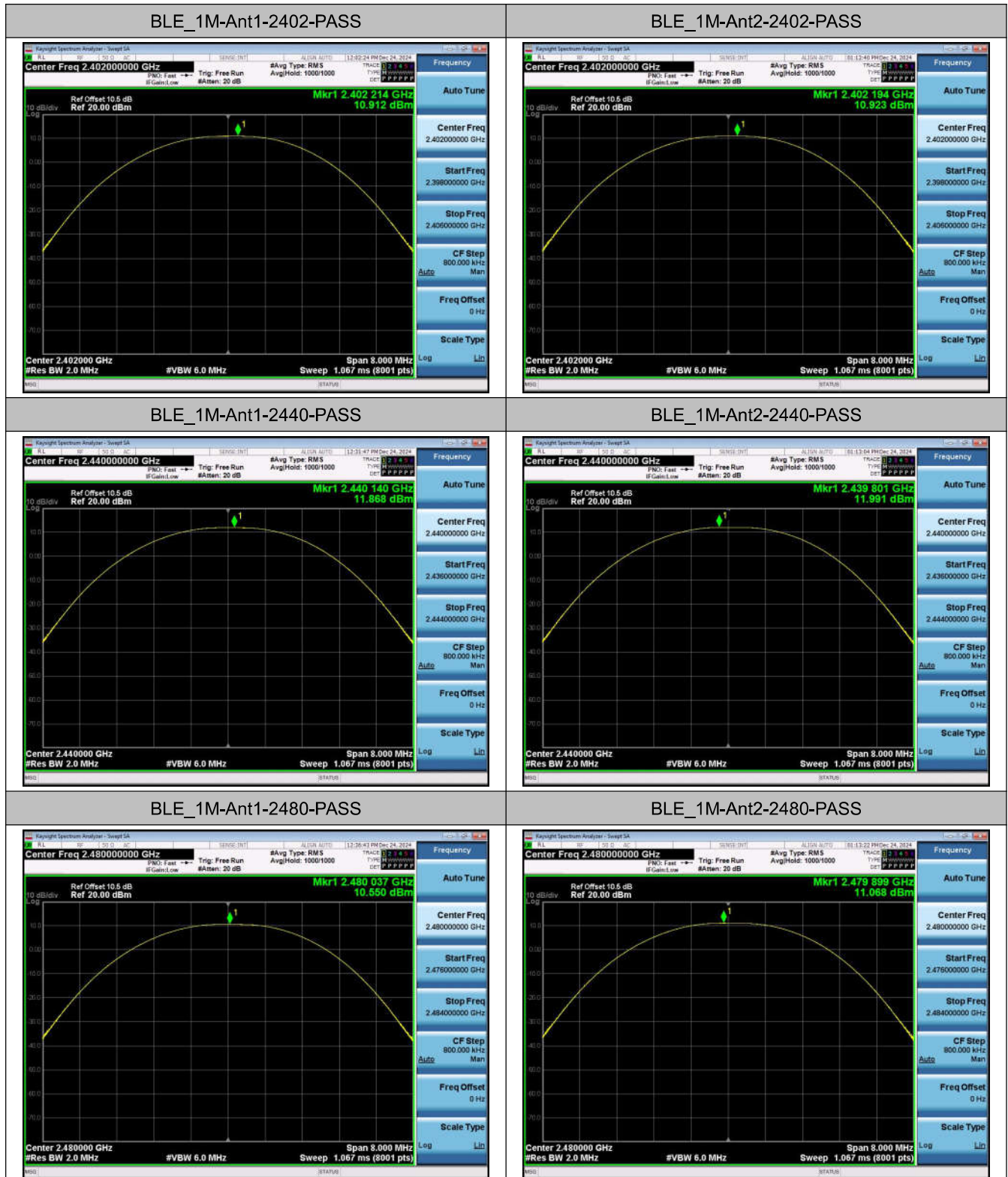
Maximum Conducted Output Power

Test Result and Data

Test Mode	Antenna	Frequency[MHz]	Peak Output Power[dBm]	Limit [dBm]	Verdict
BLE_1M	Ant1	2402	10.91	≤30	PASS
BLE_1M	Ant2	2402	10.92	≤30	PASS
BLE_1M	Ant1	2440	11.87	≤30	PASS
BLE_1M	Ant2	2440	11.99	≤30	PASS
BLE_1M	Ant1	2480	10.55	≤30	PASS
BLE_1M	Ant2	2480	11.07	≤30	PASS
BLE_2M	Ant1	2402	11.01	≤30	PASS
BLE_2M	Ant2	2402	10.95	≤30	PASS
BLE_2M	Ant1	2440	11.95	≤30	PASS
BLE_2M	Ant2	2440	11.96	≤30	PASS
BLE_2M	Ant1	2480	10.65	≤30	PASS
BLE_2M	Ant2	2480	11.06	≤30	PASS



Test Graphs





BLE_2M-Ant1-2402-PASS



BLE_2M-Ant2-2402-PASS



BLE_2M-Ant1-2440-PASS



BLE_2M-Ant2-2440-PASS



BLE_2M-Ant1-2480-PASS



BLE_2M-Ant2-2480-PASS



**6dB Bandwidth****Test Result and Data**

Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.678	0.5	PASS
BLE_1M	Ant2	2402	0.675	0.5	PASS
BLE_1M	Ant1	2440	0.678	0.5	PASS
BLE_1M	Ant2	2440	0.675	0.5	PASS
BLE_1M	Ant1	2480	0.678	0.5	PASS
BLE_1M	Ant2	2480	0.669	0.5	PASS
BLE_2M	Ant1	2402	1.160	0.5	PASS
BLE_2M	Ant2	2402	1.160	0.5	PASS
BLE_2M	Ant1	2440	1.160	0.5	PASS
BLE_2M	Ant2	2440	1.150	0.5	PASS
BLE_2M	Ant1	2480	1.160	0.5	PASS
BLE_2M	Ant2	2480	1.160	0.5	PASS

Test Graphs

BLE_1M-Ant1-2402-PASS



BLE_1M-Ant2-2402-PASS



BLE_1M-Ant1-2440-PASS



BLE_1M-Ant2-2440-PASS

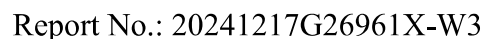


BLE_1M-Ant1-2480-PASS



BLE_1M-Ant2-2480-PASS





BLE 2M-Ant1-2402-PASS



BLE 2M-Ant2-2402-PASS



BLE 2M-Ant1-2440-PASS



BLE 2M-Ant2-2440-PASS



BLE 2M-Ant1-2480-PASS



BLE 2M-Ant2-2480-PASS



**99% Occupied Bandwidth****Test Result and Data**

Test Mode	Antenna	Frequency[MHz]	99% OBW[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0312	---	---
BLE_1M	Ant2	2402	1.0273	---	---
BLE_1M	Ant1	2440	1.0326	---	---
BLE_1M	Ant2	2440	1.0289	---	---
BLE_1M	Ant1	2480	1.0287	---	---
BLE_1M	Ant2	2480	1.0289	---	---
BLE_2M	Ant1	2402	2.0475	---	---
BLE_2M	Ant2	2402	2.0412	---	---
BLE_2M	Ant1	2440	2.0474	---	---
BLE_2M	Ant2	2440	2.0425	---	---
BLE_2M	Ant1	2480	2.0430	---	---
BLE_2M	Ant2	2480	2.0440	---	---



Test Graphs

BLE_1M-Ant1-2402



BLE_1M-Ant2-2402



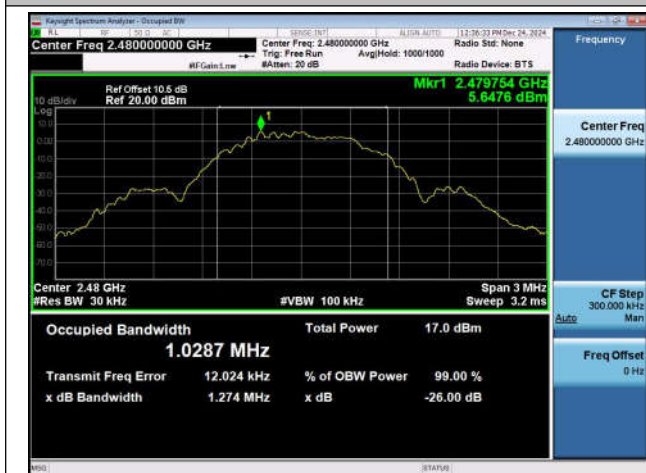
BLE_1M-Ant1-2440



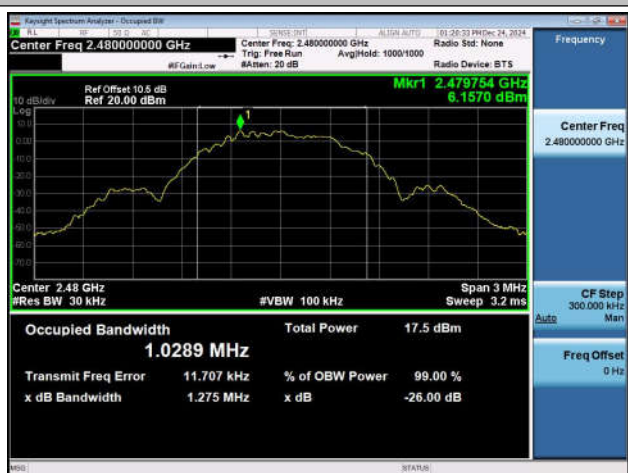
BLE_1M-Ant2-2440



BLE_1M-Ant1-2480



BLE_1M-Ant2-2480





BLE_2M-Ant1-2402



BLE_2M-Ant2-2402



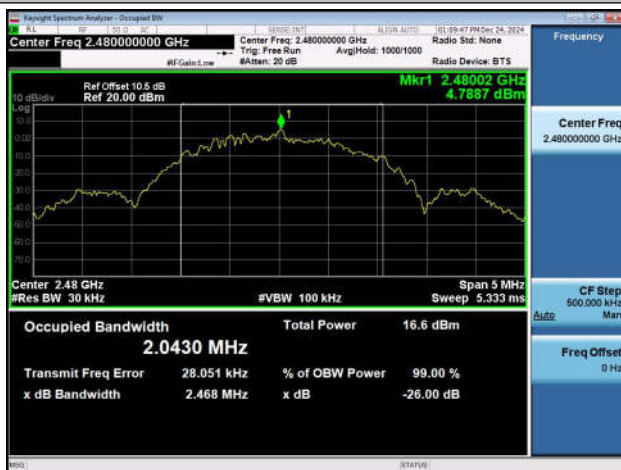
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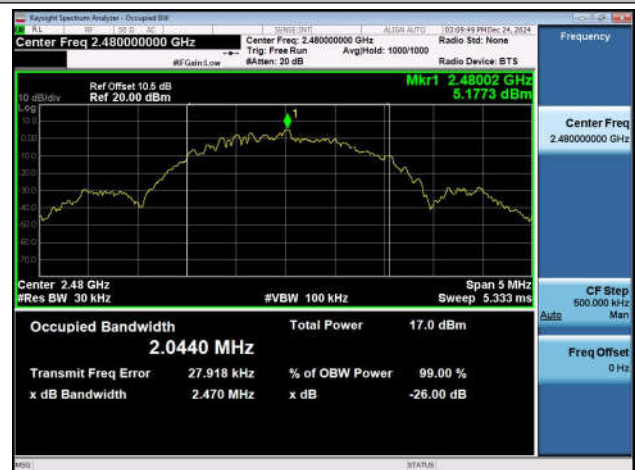
BLE_2M-Ant2-2440



BLE_2M-Ant1-2480



BLE_2M-Ant2-2480



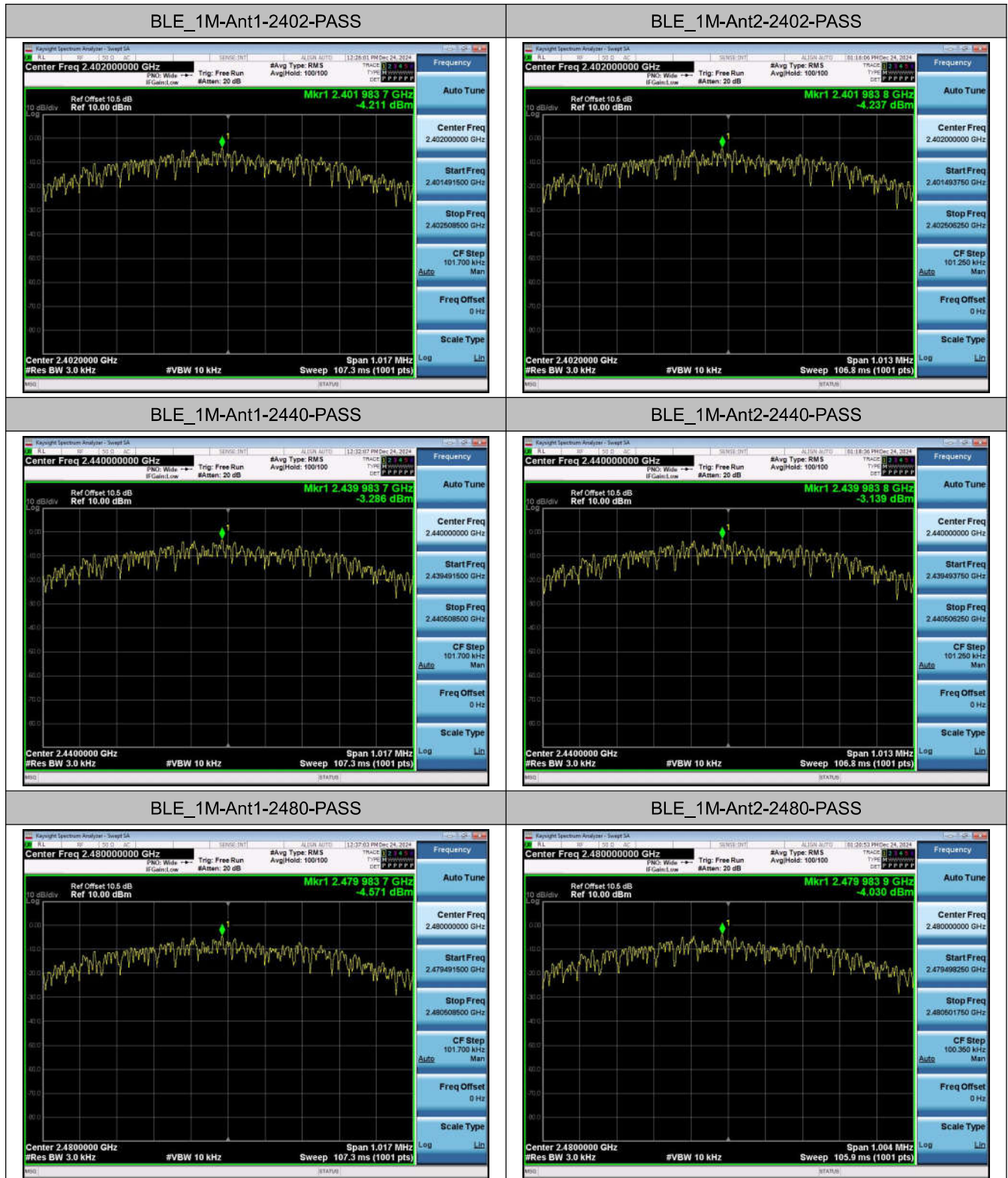


Power Spectral Density

Test Result and Data

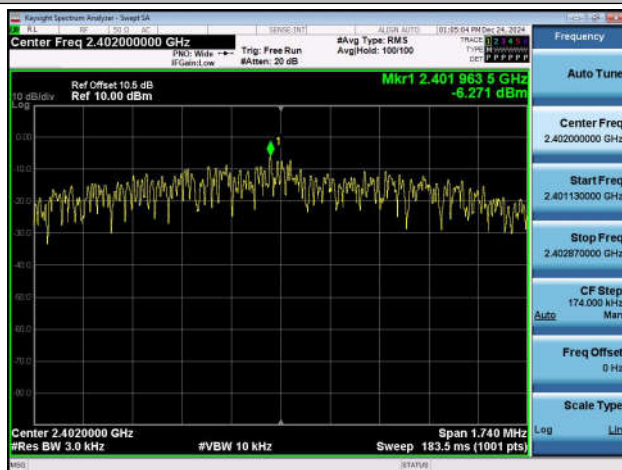
Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-4.21	≤8.00	PASS
BLE_1M	Ant2	2402	-4.24	≤8.00	PASS
BLE_1M	Ant1	2440	-3.29	≤8.00	PASS
BLE_1M	Ant2	2440	-3.14	≤8.00	PASS
BLE_1M	Ant1	2480	-4.57	≤8.00	PASS
BLE_1M	Ant2	2480	-4.03	≤8.00	PASS
BLE_2M	Ant1	2402	-6.27	≤8.00	PASS
BLE_2M	Ant2	2402	-6.30	≤8.00	PASS
BLE_2M	Ant1	2440	-5.24	≤8.00	PASS
BLE_2M	Ant2	2440	-5.27	≤8.00	PASS
BLE_2M	Ant1	2480	-6.55	≤8.00	PASS
BLE_2M	Ant2	2480	-6.20	≤8.00	PASS

Test Graphs

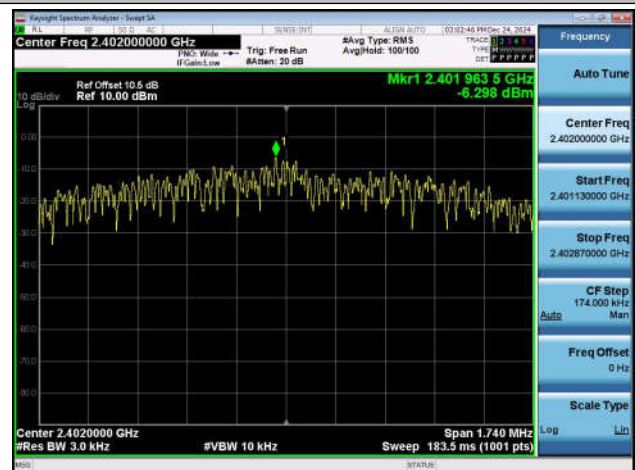




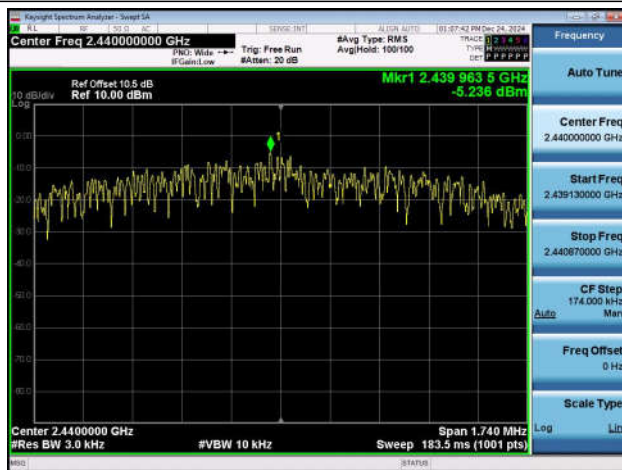
BLE_2M-Ant1-2402-PASS



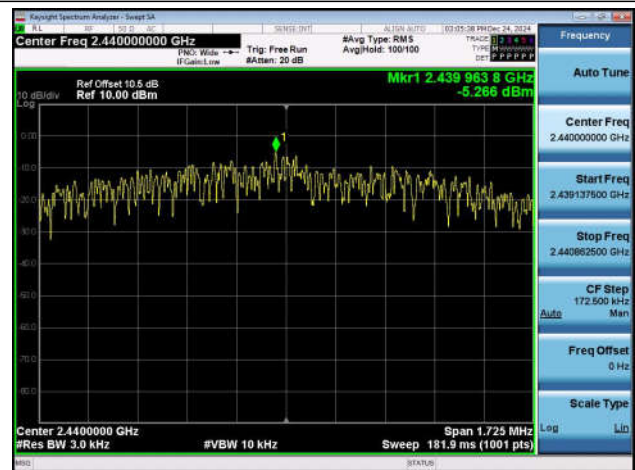
BLE_2M-Ant2-2402-PASS



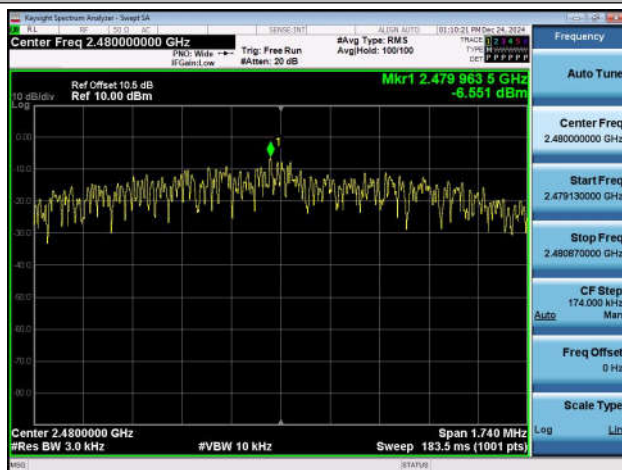
BLE_2M-Ant1-2440-PASS



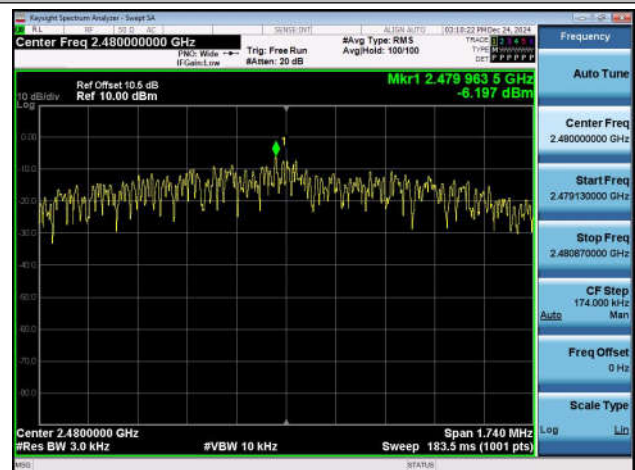
BLE_2M-Ant2-2440-PASS



BLE_2M-Ant1-2480-PASS



BLE_2M-Ant2-2480-PASS

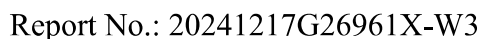


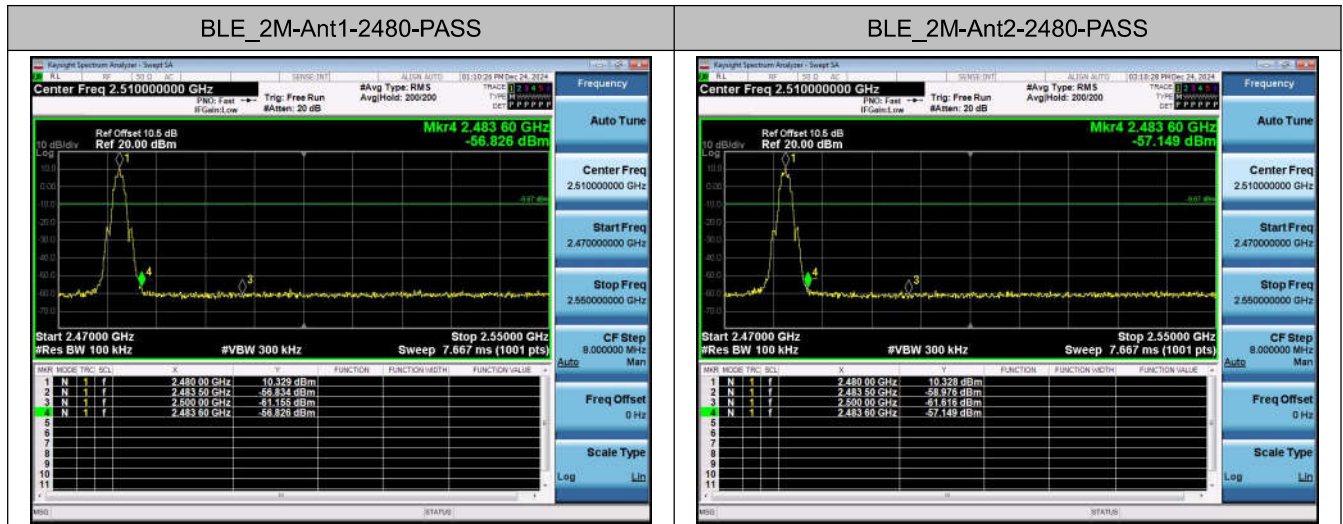


Conducted Band Edges

Test Result and Data

Test Mode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	10.75	-53.15	≤ -9.25	PASS
BLE_1M	Ant2	Low	2402	10.23	-53.72	≤ -9.77	PASS
BLE_1M	Ant1	High	2480	10.34	-57.91	≤ -9.66	PASS
BLE_1M	Ant2	High	2480	10.45	-57.93	≤ -9.55	PASS
BLE_2M	Ant1	Low	2402	10.64	-23.04	≤ -9.36	PASS
BLE_2M	Ant2	Low	2402	10.17	-25.79	≤ -9.83	PASS
BLE_2M	Ant1	High	2480	10.33	-56.83	≤ -9.67	PASS
BLE_2M	Ant2	High	2480	10.33	-57.15	≤ -9.67	PASS







Conducted Spurious Emissions

Test Result and Data

Test Mode	Antenna	Frequency[MHz]	FreqRange[Mhz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0~Reference	10.42	10.42	---	PASS
BLE_1M	Ant2	2402	0~Reference	10.40	10.40	---	PASS
BLE_1M	Ant1	2402	30~25000	10.42	-45.53	≤ -9.58	PASS
BLE_1M	Ant2	2402	30~25000	10.40	-47.1	≤ -9.6	PASS
BLE_1M	Ant1	2440	0~Reference	11.25	11.25	---	PASS
BLE_1M	Ant2	2440	0~Reference	11.41	11.41	---	PASS
BLE_1M	Ant1	2440	30~25000	11.25	-46.5	≤ -8.75	PASS
BLE_1M	Ant2	2440	30~25000	11.41	-45.78	≤ -8.59	PASS
BLE_1M	Ant1	2480	0~Reference	10.02	10.02	---	PASS
BLE_1M	Ant2	2480	0~Reference	10.45	10.45	---	PASS
BLE_1M	Ant1	2480	30~25000	10.02	-46.33	≤ -9.98	PASS
BLE_1M	Ant2	2480	30~25000	10.45	-46.58	≤ -9.55	PASS
BLE_2M	Ant1	2402	0~Reference	10.50	10.50	---	PASS
BLE_2M	Ant2	2402	0~Reference	10.36	10.36	---	PASS
BLE_2M	Ant1	2402	30~25000	10.50	-46.14	≤ -9.5	PASS
BLE_2M	Ant2	2402	30~25000	10.36	-47.08	≤ -9.64	PASS
BLE_2M	Ant1	2440	0~Reference	11.39	11.39	---	PASS
BLE_2M	Ant2	2440	0~Reference	11.47	11.47	---	PASS
BLE_2M	Ant1	2440	30~25000	11.39	-46.08	≤ -8.61	PASS
BLE_2M	Ant2	2440	30~25000	11.47	-46.85	≤ -8.53	PASS
BLE_2M	Ant1	2480	0~Reference	10.07	10.07	---	PASS
BLE_2M	Ant2	2480	0~Reference	10.53	10.53	---	PASS
BLE_2M	Ant1	2480	30~25000	10.07	-45.98	≤ -9.93	PASS
BLE_2M	Ant2	2480	30~25000	10.53	-46.29	≤ -9.47	PASS

Test Graphs

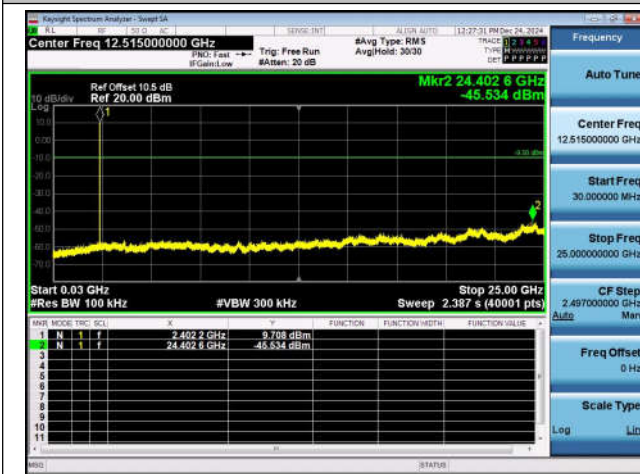
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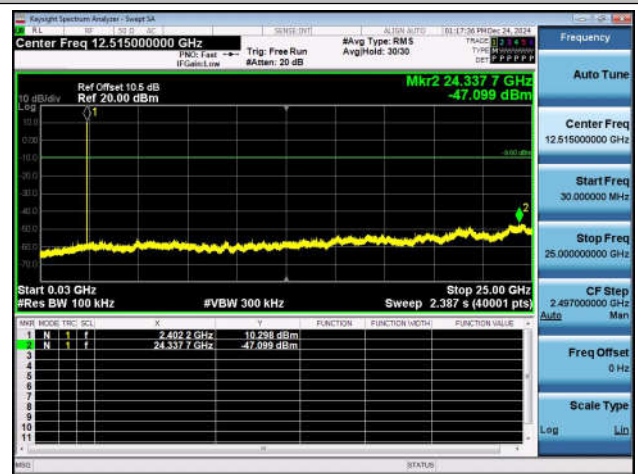
BLE_1M-Ant2-2402-0~Reference-PASS



BLE_1M-Ant1-2402-30~25000-PASS



BLE_1M-Ant2-2402-30~25000-PASS



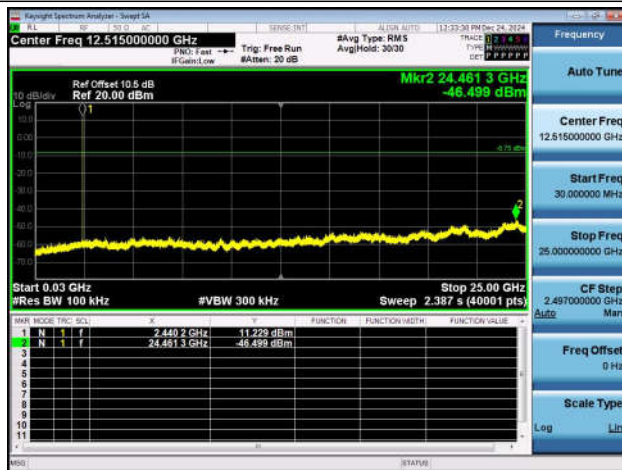
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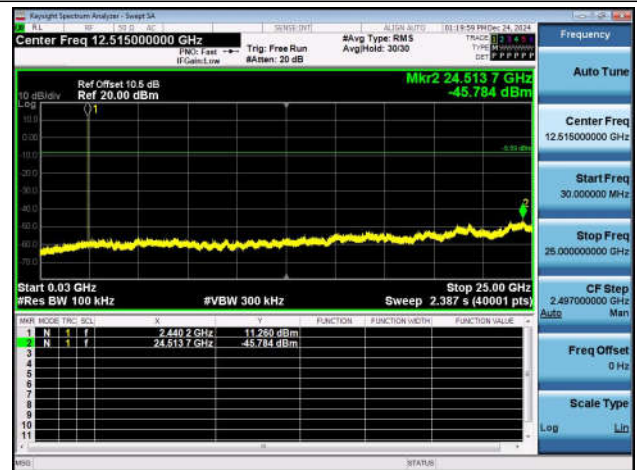
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BLE_1M-Ant1-2440-30~25000-PASS



BLE_1M-Ant2-2440-30~25000-PASS



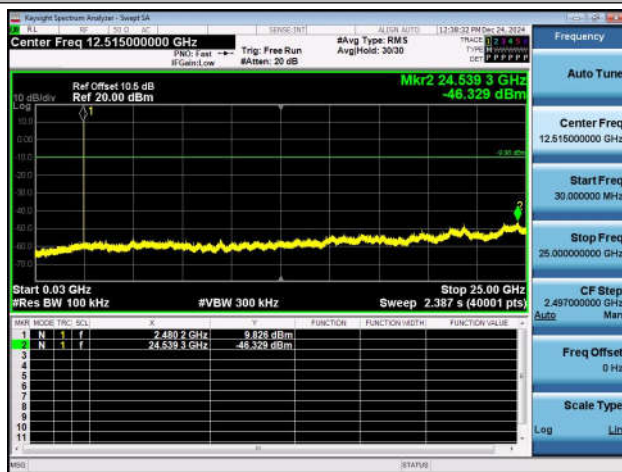
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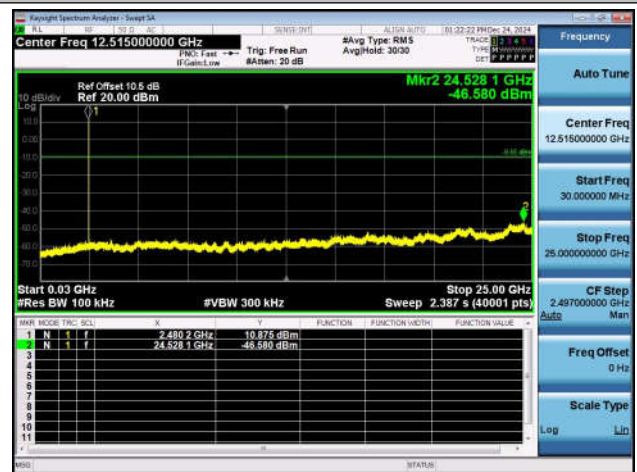
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BLE_1M-Ant1-2480-30~25000-PASS



BLE_1M-Ant2-2480-30~25000-PASS



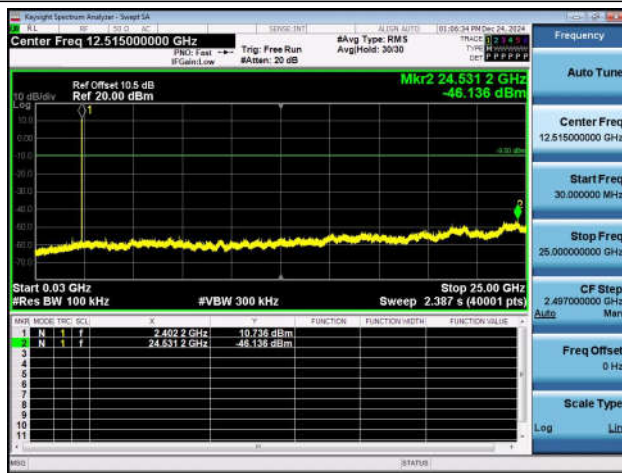
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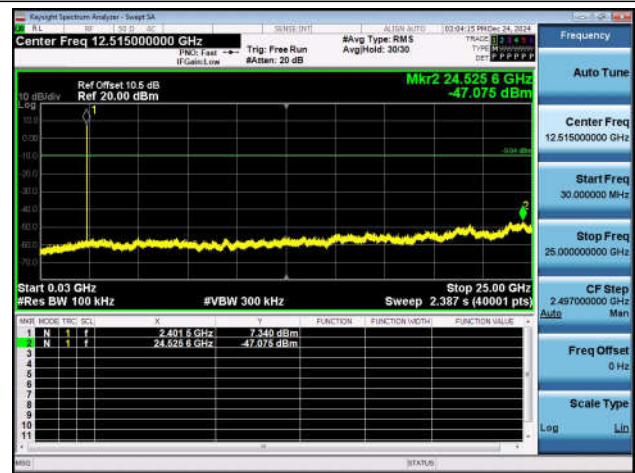
BLE_2M-Ant2-2402-0~Reference-PASS



BLE_2M-Ant1-2402-30~25000-PASS



BLE_2M-Ant2-2402-30~25000-PASS



BLE_2M-Ant1-2440-0~Reference-PASS

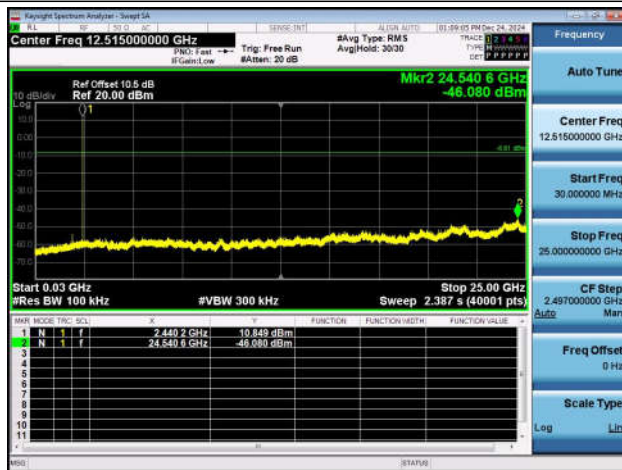


BLE_2M-Ant2-2440-0~Reference-PASS

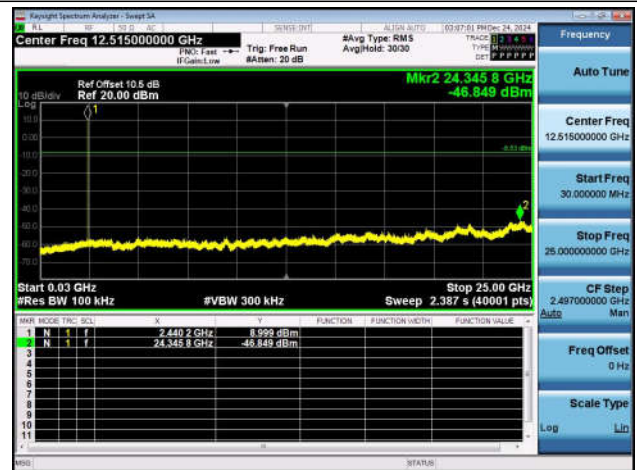




BLE_2M-Ant1-2440-30~25000-PASS



BLE_2M-Ant2-2440-30~25000-PASS



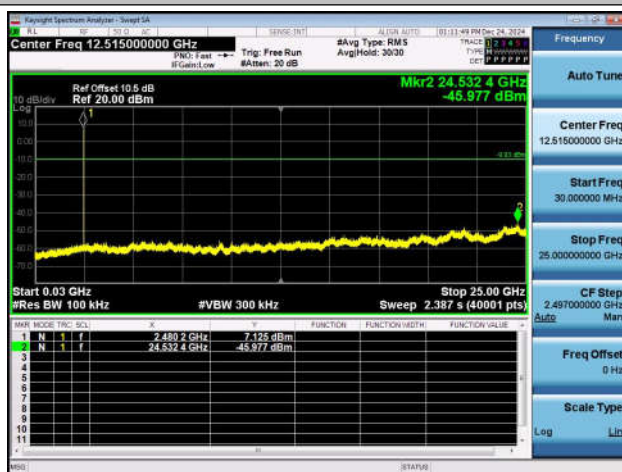
BLE_2M-Ant1-2480-0~Reference-PASS



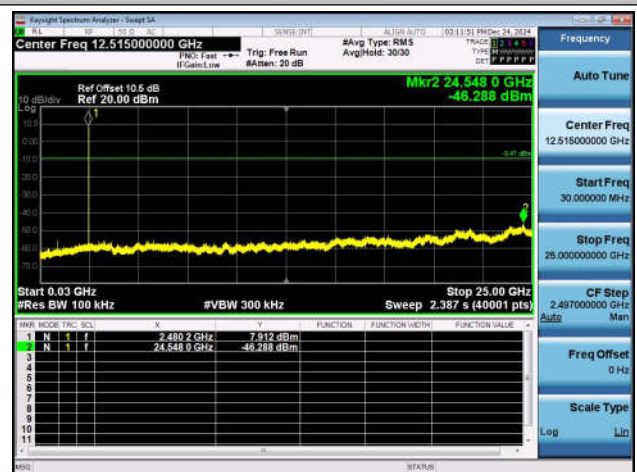
BLE_2M-Ant2-2480-0~Reference-PASS



BLE_2M-Ant1-2480-30~25000-PASS



BLE_2M-Ant2-2480-30~25000-PASS



END OF REPORT