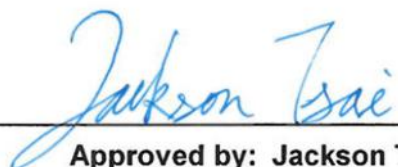


FCC Radio Test Report

FCC ID : U2M-IAP4701A
Equipment : WiFi 7 Tri-radio concurrent indoor ceiling mount AP
Brand Name : Senao
Model Name : IAP4701A
Applicant : Senao Networks, Inc.
3F., No.529, Zhongzheng Rd., Xindian Dist.,
New Taipei City, Taiwan
Manufacturer : Senao Networks, Inc.
3F., No.529, Zhongzheng Rd., Xindian Dist.,
New Taipei City, Taiwan
Standard : 47 CFR FCC Part 15.247

The product was received on Oct. 31, 2023, and testing was started from Nov. 07, 2023 and completed on Nov. 21, 2023. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.



Approved by: Jackson Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)



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[illegible]

Summary of Test Result

Report Clause	Ref.Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and explanations:

None

Reviewed by: Barry Hsiao

Report Producer: Michelle Tsai

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(125kbps)	1.0	1TX
2.4-2.4835GHz	BT-LE(500kbps)	1.0	1TX
2.4-2.4835GHz	BT-LE(1Mbps)	1.0	1TX
2.4-2.4835GHz	BT-LE(2Mbps)	2.0	1TX

Note:

- ♦ Bluetooth LE uses a GFSK (125k/500k/1Mbps/2Mbps) modulation.
- ♦ Bluetooth LE 125k/500k/1Mbps uses the same modulation, and 1Mbps was found to be the worst case scenario which was performed full test and recorded in this test report.
- ♦ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Support	Radio
1	Senao	5718A0738300	PIFA	I-Pex	2.4G	Radio 1
2	Senao	5718A0739300	PIFA	I-Pex	2.4G	
3	Senao	5718A0740300	PIFA	I-Pex	2.4G	
4	Senao	5718A0741300	PIFA	I-Pex	2.4G	
5	Senao	5718A0742300	PIFA	I-Pex	5G	Radio 2
6	Senao	5718A0743300	PIFA	I-Pex	5G	
7	Senao	5718A0744300	PIFA	I-Pex	5G	
8	Senao	5718A0745300	PIFA	I-Pex	5G	
9	ADVANCED WIRELESS & ANTENNA Inc.	A8P8P-100089	Alford loop	I-Pex	6E	Radio 3
10	ADVANCED WIRELESS & ANTENNA Inc.	A8P8P-100090	Alford loop	I-Pex	6E	
11	ADVANCED WIRELESS & ANTENNA Inc.	A8P8P-100091	Alford loop	I-Pex	6E	
12	ADVANCED WIRELESS & ANTENNA Inc.	A8P8P-100092	Alford loop	I-Pex	6E	
13	ADVANCED WIRELESS & ANTENNA Inc.	A8P8P-100093	Dipole	I-Pex	BT	-

Ant.	Port	Gain (dBi)									
		2.4G	BT	5G				6E			
				UNII-1	UNII-2A	UNII-2C	UNII-3	6.175G	6.475G	6.695G	6.995G
1	1	2.82	-	-	-	-	-	-	-	-	-
2	2	2.39	-	-	-	-	-	-	-	-	-
3	3	2.33	-	-	-	-	-	-	-	-	-
4	4	2.69	-	-	-	-	-	-	-	-	-
5	1	-	-	4.81	4.19	5.45	4.98	-	-	-	-
6	2	-	-	2.63	3.44	5.31	5.17	-	-	-	-
7	3	-	-	5.06	5.29	4.27	3.96	-	-	-	-
8	4	-	-	3.72	3.52	4.66	4.51	-	-	-	-
9	1	-	-	-	-	-	-	4.96	4.99	4.98	4.78
10	2	-	-	-	-	-	-	4.72	4.74	4.53	4.69
11	3	-	-	-	-	-	-	4.88	4.63	4.47	4.94
12	4	-	-	-	-	-	-	4.77	4.84	4.61	4.26
13	1	-	3.07	-	-	-	-	-	-	-	-

Composite Gain (dBi)									
	2.4G	UNII-1	UNII-2A	UNII-2C	UNII-3	6.175G	6.475G	6.695G	6.995G
DG [1SS]	6.46	7.31	7.57	8.57	8.92	9.98	9.93	9.53	9.86
DG [2SS]	3.46	5.06	5.29	5.57	5.92	6.98	6.93	6.53	6.86
DG [4SS]	2.82	5.06	5.29	5.45	5.17	4.96	4.99	4.98	4.94

Note 1: The EUT has thirteen antennas.

Note 2: The composite gain is derived as KDB 662911 D03 v01 which was used as directional gain. For more detail information, please refer to the Antenna Pattern Report AP381814.

For 2.4GHz function:

For IEEE 802.11 b/g/n/VHT/ax/be mode (4TX/4RX)

Ant. 1 (port 1), Ant. 2 (port 2), Ant. 3 (port 3) and Ant. 4 (port 4) could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax/be mode (4TX/4RX)

Ant. 5 (port 1), Ant. 6 (port 2), Ant. 7 (port 3) and Ant. 8 (port 4) could transmit/receive simultaneously.

For 6GHz function:

For IEEE 802.11 ax/be mode (4TX/4RX)

Ant. 9 (port 1), Ant. 10 (port 2), Ant. 11(port 3) and Ant. 12 (port 4) could transmit/receive simultaneously.

For BT function:

For IEEE 802.15.1 Bluetooth mode (1TX/1RX)

Ant. 13 (port 1) could transmit/receive.

**1.1.3 EUT Information**

Operational Condition			
EUT Power Type	From AC Adapter		
EUT Function	☒ Point-to-multipoint	☐ Point-to-point	
Type of EUT			
☒	Stand-alone		
☐	Combined (EUT where the radio part is fully integrated within another device)		
	Combined Equipment - Brand Name / Model No.:	...	
☐	Plug-in radio (EUT intended for a variety of host systems)		
	Host System - Brand Name / Model No.:	...	
☐	Other:		

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.32	4.95	400.312u	3k
BT-LE(2Mbps)	0.341	4.67	214.687u	10k

Note. If DC < 0.98, the DCF was added while measuring Output power and PSD.

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF:

- ♦ KDB 558074 D01 v05r02
- ♦ KDB 414788 D01 v01r01

1.3 Testing Location Information

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
☒ Hsinhua (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
	TEL: 886-3-327-3456		FAX: 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Simon Cheng	21.8~23.7°C / 57~62%	21/Nov/2023
RF Conducted	TH07-HY	Yuna Lin	22.2~23.1°C / 43~48%	07/Nov/2023
Radiated	03CH02-HY	Edward Wang	23.1~23.4°C / 50~52%	09/Nov/2023~10/Nov/2023
☒ Wenhua 3rd. (TAF: 3785)	ADD: No. 58, Aly. 75, Ln. 564, Wenhua 3rd Rd., Guishan Dist. Taoyuan City 333, Taiwan (R.O.C.)			
	TEL: 886-3-327-0868			
Test site Designation No. TW0036 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated (Co-location)	03CH25-HY	Billy Wang	22.6~22.8°C / 51~54%	17/Nov/2023

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
AC Power-line Conducted Emissions	4.53 dB	Confidence levels of 95%
Bandwidth	3 MHz	Confidence levels of 95%
Maximum Conducted Output Power	2 dB	Confidence levels of 95%
Power Spectral Density	2 dB	Confidence levels of 95%
Emissions in Non-restricted Frequency Bands	0.14 dB	Confidence levels of 95%
Emissions in Restricted Frequency Bands	4.8 dB	Confidence levels of 95%
Receiver Radiated Unwanted Emissions	4.8 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Channel Mode

Test Software Version	PuTTY Release 0.62
-----------------------	--------------------

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default
BT-LE(2Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	CTX
1	Adapter Mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	CTX		
1	Adapter Mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT		V	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Operating Mode	CTX
1	WLAN 2.4GHz+ WLAN 5GHz+ WLAN 6GHz+Bluetooth
Refer to Sporton Test Report No.: FA381814 for Co-location RF Exposure Evaluation and Appendix G for Radiated Emission Co-location.	

2.3 Accessories

Accessories				
Bracket	Brand Name	Dragonjet	Model Name	6301A6543000

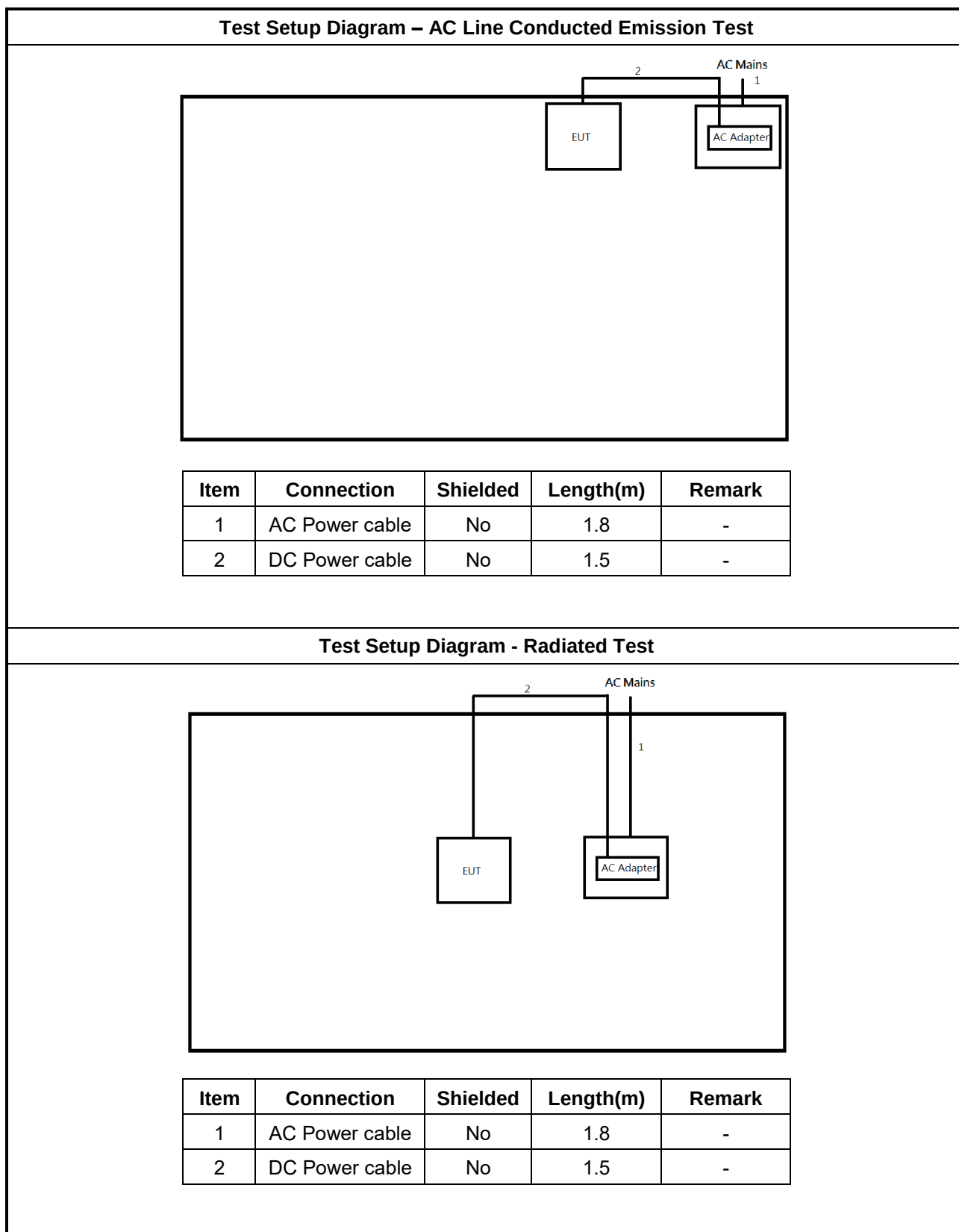
Reminder: Regarding to more detail and other information, please refer to user manual.

2.4 Support Equipment

Support Equipment – AC Conduction and Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	AC Adapter	ASIAN POWER DEVICES INC.	WA-48A12R	-	Provided by Customer

Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-
3	AC Adapter	ASIAN POWER DEVICES INC.	WA-48A12R	-	Provided by Customer

2.5 Test Setup Diagram



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

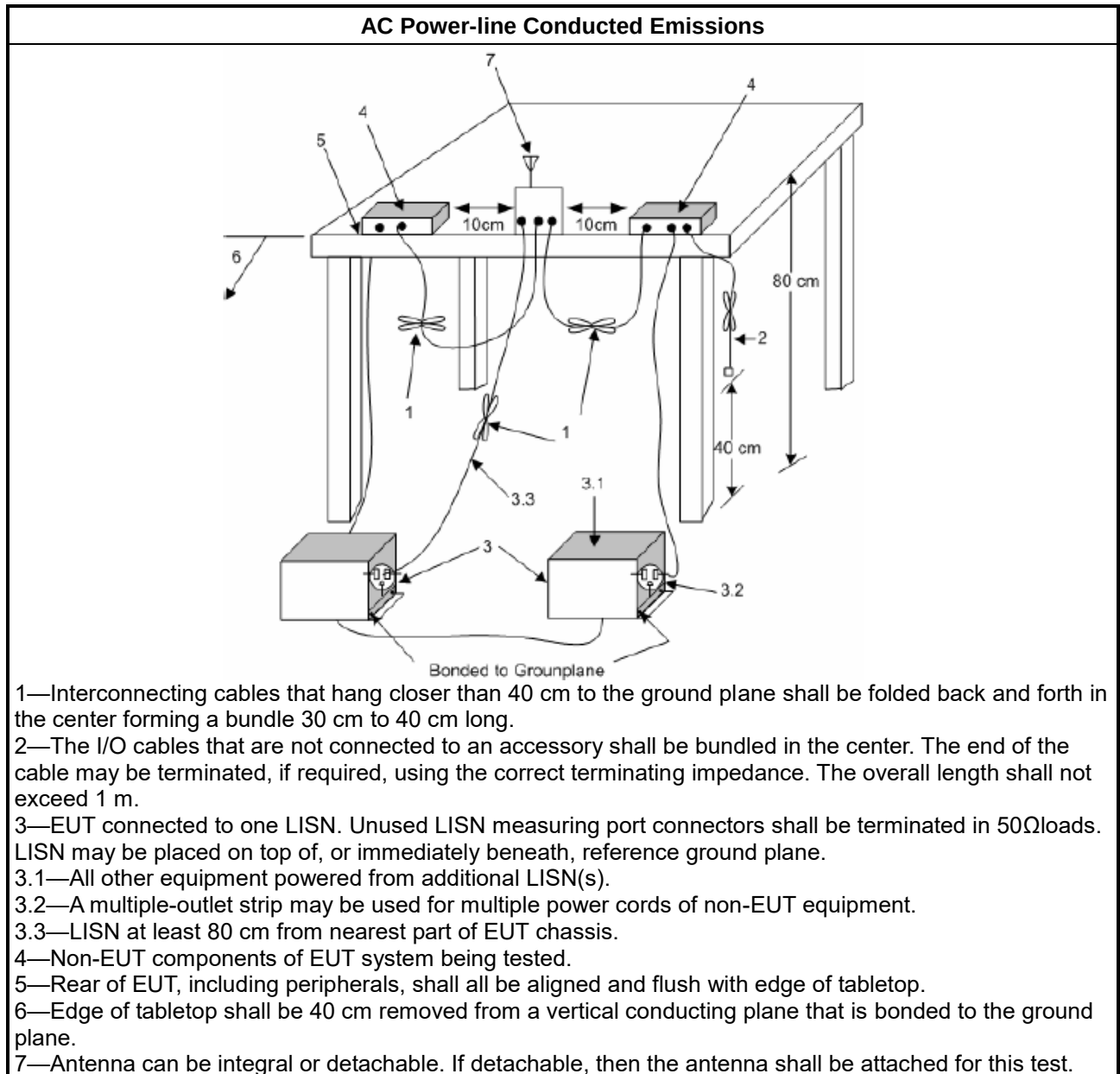
Test Method
Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

3.1.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + LISN(LISN Factor) + CL(Cable Loss) + AT(Attenuator).

3.1.5 Test Setup



3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit	
Systems using digital modulation techniques:	
▪	6 dB bandwidth $\geq$ 500 kHz.

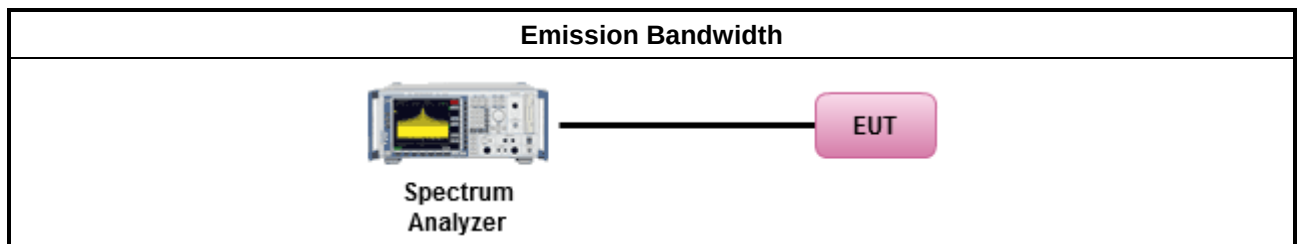
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
▪	For the emission bandwidth shall be measured using one of the options below:
☒	Refer as KDB 558074, clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
☐	Refer as RSS-Gen, clause 6.7 for occupied bandwidth testing.
☐	Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
	Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	Smart antenna system (SAS):
	- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm
e.i.r.p. Power Limit:	
	2400-2483.5 MHz Band
	Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)
	Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm
	Smart antenna system (SAS)
	- Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

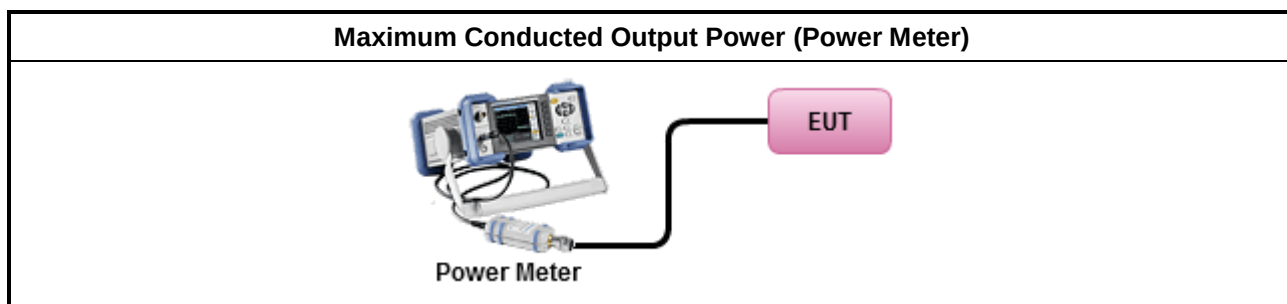
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
Maximum Peak Conducted Output Power	
☐	Refer as KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
☐	Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
☐	Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
Maximum Average Conducted Output Power	
☐	Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
☒	Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a power meter.
For conducted measurement.	
If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.	
If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
Power Spectral Density (PSD) ≤ 8 dBm/3kHz

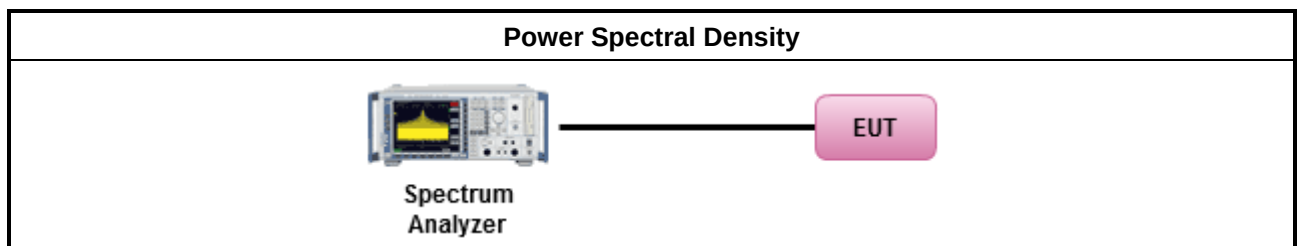
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method
Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
☒ Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Max. PSD.
For conducted measurement.
If The EUT supports multiple transmit chains using options given below:
Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak level. Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average level.	

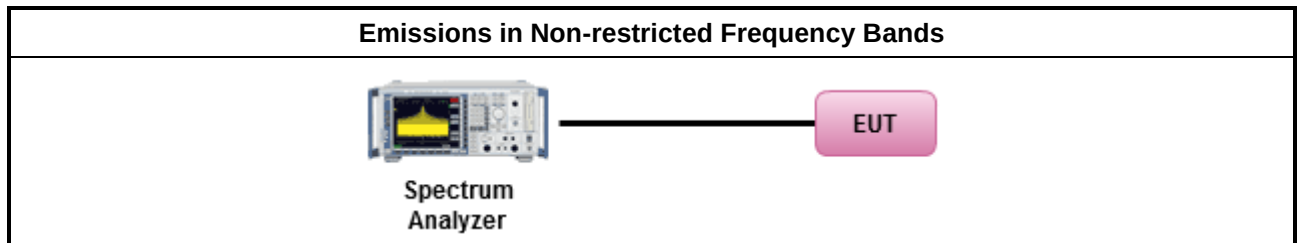
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
Refer as KDB 558074, clause 8.5 (11.11 of ANSI C63.10) for non-restricted frequency bands.

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

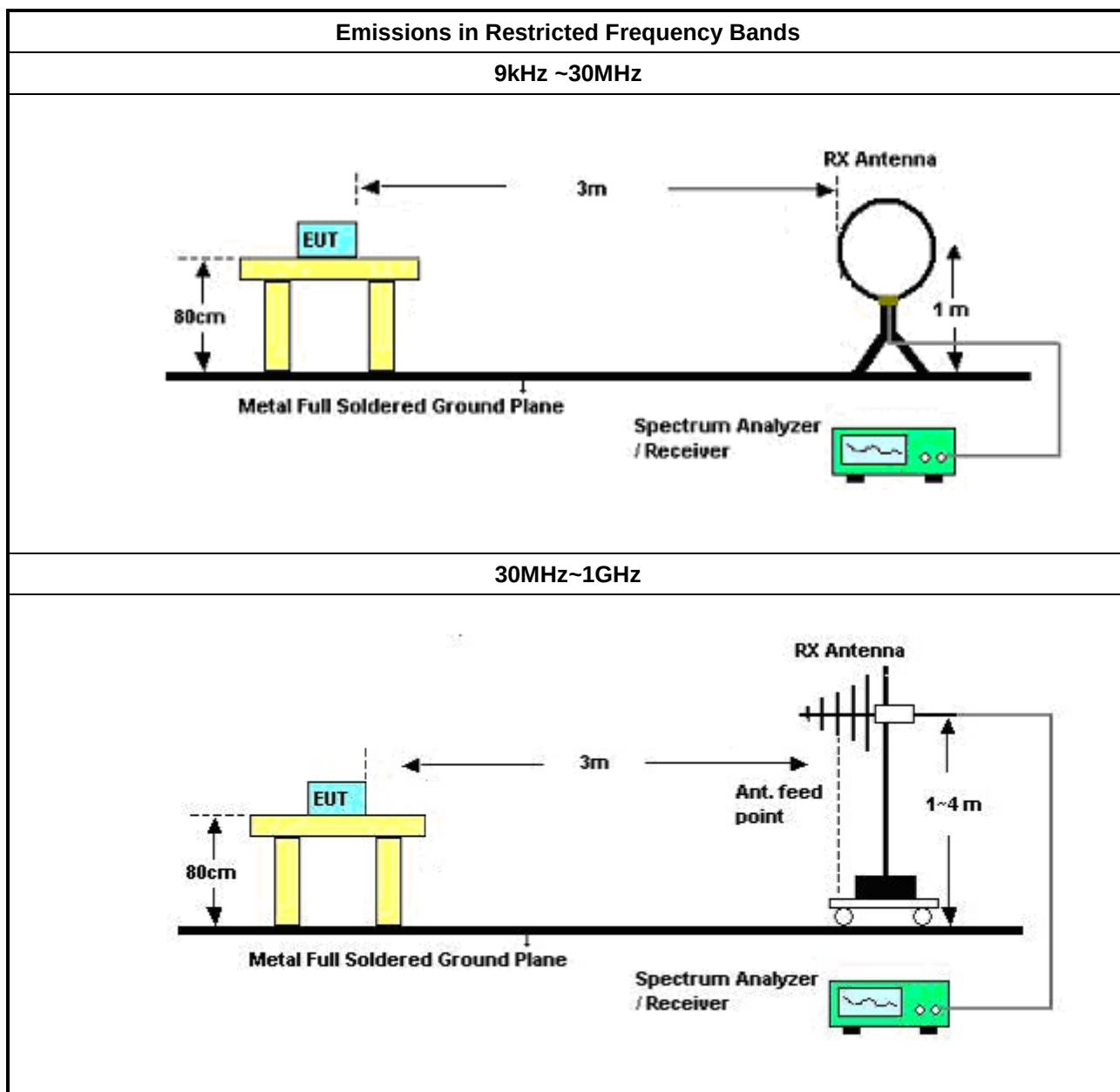
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
For the transmitter band-edge emissions shall be measured using following options below:	
	Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.
	Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels.
Use the following spectrum analyzer settings:	
	Set RBW=100 kHz for $f < 1$ GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold.
	Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement. For average measurement, refer as 1.1.4.
KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.	
	Based on FCC 15.31(f)(2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field.
	Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

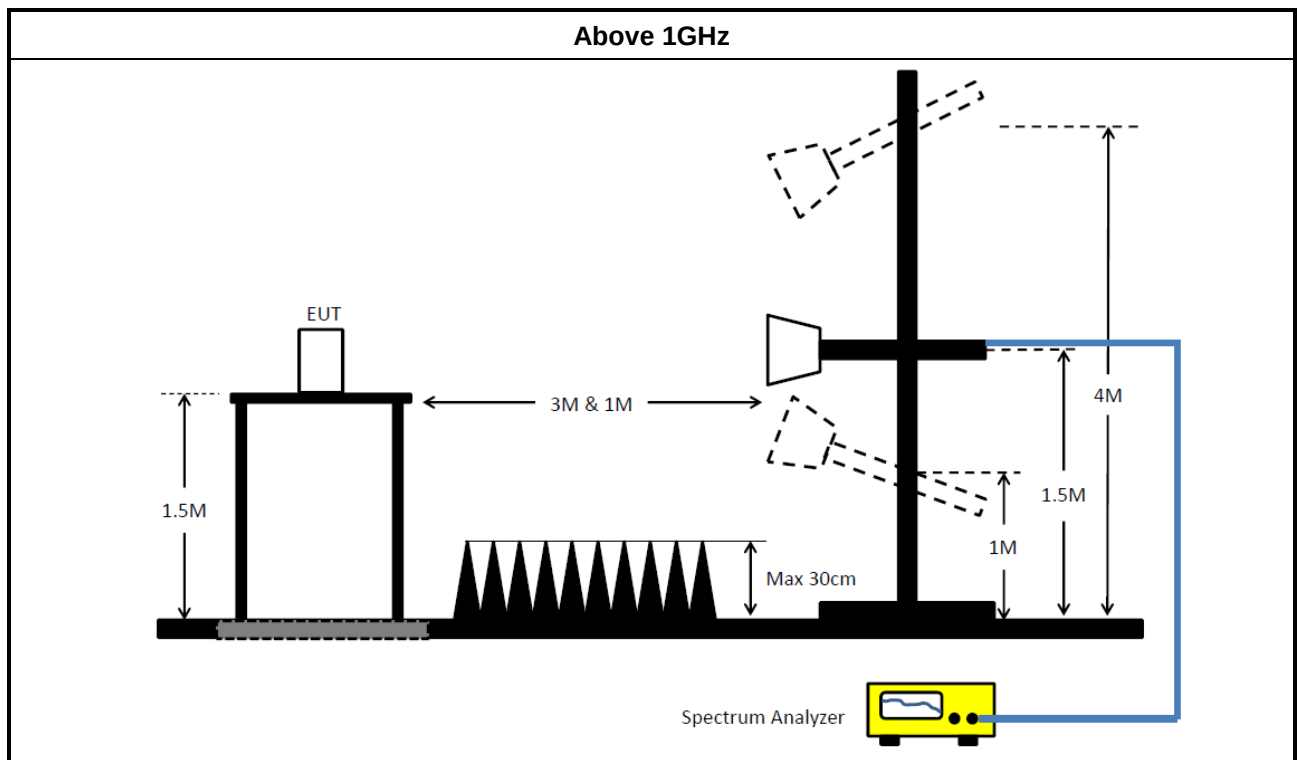
3.6.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

3.6.5 Test Setup





3.6.6 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR	102051	9kHz ~ 3.6GHz	16/May/2023	15/May/2024
Two-Line V-Network	R&S	ENV 216	100003	9kHz ~ 30MHz	07/Sep/2023	06/Sep/2024
RF Cable 5m	TITAN	TITAN	CO04-cable-01	9 kHz~200MHz	28/Feb/2023	27/Feb/2024
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	18/Oct/2023	17/Oct/2024
Software	Sporton	SENSE-EMI	V5.11.3	-	NCR	NCR

NCR: No Calibration Required

Instrument for Conducted Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101515	9kHz~40GHz	14/Feb/2023	13/Feb/2024
SMB100A Signal Generator	R&S	SMB100A	177785	1MHz~40GHz	19/Sep/2023	18/Sep/2024
Pulse Sensor	Anritsu	MA2411B	1339407	300MHz~40GHz	14/Dec/2022	13/Dec/2023
Power Meter	Anritsu	ML2495A	1517010	300MHz~40GHz	14/Dec/2022	13/Dec/2023
SENSE-15247_FS	Sporton	V5.11.2	N/A	N/A	N/A	N/A

**Instrument for Radiated Test (03CH02-HY)**

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	29/Jul/2023	28/Jul/2024
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz~18GHz 3m	28/Jul/2023	27/Jul/2024
Signal Analyzer	R&S	FSP 40	100305	9kHz~40GHz	25/Mar/2023	24/Oct/2024
EMI Test Receiver	R&S	ESR	102052	9kHz~3.6GHz	26/May/2023	25/May/2024
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	23/Mar/2023	22/Mar/2024
Bilog Antenna & 6dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723	30MHz~1GHz	27/Aug/2023	26/Aug/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1534	1GHz~18GHz	23/Mar/2023	22/Mar/2024
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	15GHz~40GHz	25/Mar/2023	24/Mar/2024
RF Cable	MVE	400LL+SN 200207	03CH02-cable-02	9kHz~30MHz	20/Dec/2022	19/Dec/2023
RF Cable	MVE	400LL+SN 200207	03CH02-cable-02	30MHz~1GHz	20/Dec/2022	19/Dec/2023
RF Cable-R03m	HUBER+SUHNER	SUCOFLEX104	03CH02-cable-01	1GHz~40GHz	10/Feb/2023	09/Feb/2024
Amplifier	Agilent	8447D	2944A11149	100kHz~1.3GHz	27/Jun/2023	26/Jun/2024
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz~26.5GHz	24/Oct/2023	23/Oct/2024
Microwave Preamplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz ~ 40GHz	16/Mar/2023	15/Mar/2024
SENSE-15247_FS	Sporton	V5.11	N/A	N/A	N/A	N/A

Instrument for Radiated Test (03CH25-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH25-HY	1GHz~18GHz 3m	09/Aug/2023	08/Aug/2024
Signal Analyzer	ROHDE&SCHWARZ	FSV40	101500	10Hz ~ 40 GHz	26/Oct/2023	25/Oct/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02876	1GHz~18GHz	12/Jul/2023	11/Jul/2024
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz ~ 40GHz	01/Jun/2023	31/May/2024
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB007	1GHz~40GHz	24/Apr/2023	23/Apr/2024
Preamplifier	SGH	PRAMP 118-H	20230515-3	1GHz ~ 18GHz	25/May/2023	24/May/2024
Microwave Preamplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz ~ 40GHz	16/Mar/2023	15/Mar/2024
SENSE-EMI	Sporton	V5.11.6	NA	NA	NA	NA



Conducted Emissions at Powerline

Appendix A

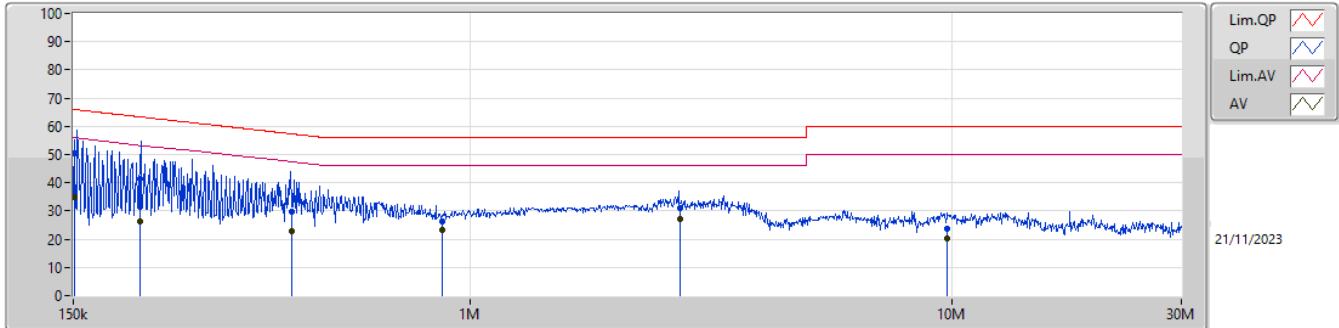
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	150.7k	50.62	65.96	-15.34	Line

Result

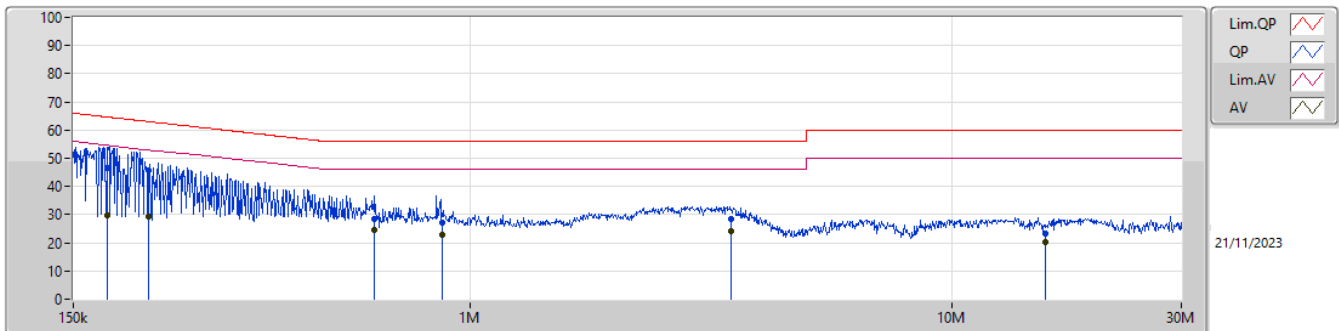
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	150.7k	50.62	65.96	-15.34	Line
Mode 1	Pass	AV	150.7k	34.73	55.96	-21.23	Line
Mode 1	Pass	QP	206.176k	41.22	63.36	-22.14	Line
Mode 1	Pass	AV	206.176k	26.33	53.36	-27.03	Line
Mode 1	Pass	QP	425.633k	29.62	57.34	-27.72	Line
Mode 1	Pass	AV	425.633k	22.65	47.34	-24.69	Line
Mode 1	Pass	QP	874.682k	26.31	56.00	-29.69	Line
Mode 1	Pass	AV	874.682k	23.42	46.00	-22.58	Line
Mode 1	Pass	QP	2.73M	31.22	56.00	-24.78	Line
Mode 1	Pass	AV	2.73M	27.32	46.00	-18.68	Line
Mode 1	Pass	QP	9.814M	23.75	60.00	-36.25	Line
Mode 1	Pass	AV	9.814M	20.15	50.00	-29.85	Line
Mode 1	Pass	QP	175.97k	46.66	64.68	-18.02	Neutral
Mode 1	Pass	AV	175.97k	29.73	54.68	-24.95	Neutral
Mode 1	Pass	QP	214.43k	45.82	63.04	-17.22	Neutral
Mode 1	Pass	AV	214.43k	29.22	53.04	-23.82	Neutral
Mode 1	Pass	QP	631.573k	28.42	56.00	-27.58	Neutral
Mode 1	Pass	AV	631.573k	24.62	46.00	-21.38	Neutral
Mode 1	Pass	QP	875.207k	27.34	56.00	-28.66	Neutral
Mode 1	Pass	AV	875.207k	22.76	46.00	-23.24	Neutral
Mode 1	Pass	QP	3.493M	28.63	56.00	-27.37	Neutral
Mode 1	Pass	AV	3.493M	24.23	46.00	-21.77	Neutral
Mode 1	Pass	QP	15.632M	23.43	60.00	-36.57	Neutral
Mode 1	Pass	AV	15.632M	20.22	50.00	-29.78	Neutral

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)						
QP	150.7k	50.62	65.96	-15.34	19.36	Line	-	31.26	9.57	0.03	9.76						
AV	150.7k	34.73	55.96	-21.23	19.36	Line	-	15.37	9.57	0.03	9.76						
QP	206.176k	41.22	63.36	-22.14	19.27	Line	-	21.95	9.56	0.03	9.68						
AV	206.176k	26.33	53.36	-27.03	19.27	Line	-	7.06	9.56	0.03	9.68						
QP	425.633k	29.62	57.34	-27.72	19.37	Line	-	10.25	9.57	0.04	9.76						
AV	425.633k	22.65	47.34	-24.69	19.37	Line	-	3.28	9.57	0.04	9.76						
QP	874.682k	26.31	56.00	-29.69	19.41	Line	-	6.90	9.57	0.05	9.79						
AV	874.682k	23.42	46.00	-22.58	19.41	Line	-	4.01	9.57	0.05	9.79						
QP	2.73M	31.22	56.00	-24.78	19.49	Line	-	11.73	9.59	0.10	9.80						
AV	2.73M	27.32	46.00	-18.68	19.49	Line	-	7.83	9.59	0.10	9.80						
QP	9.814M	23.75	60.00	-36.25	19.68	Line	-	4.07	9.71	0.18	9.79						
AV	9.814M	20.15	50.00	-29.85	19.68	Line	-	0.47	9.71	0.18	9.79						

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)						
QP	175.97k	46.66	64.68	-18.02	19.37	Neutral	-	27.29	9.62	0.03	9.72						
AV	175.97k	29.73	54.68	-24.95	19.37	Neutral	-	10.36	9.62	0.03	9.72						
QP	214.43k	45.82	63.04	-17.22	19.34	Neutral	-	26.48	9.62	0.03	9.69						
AV	214.43k	29.22	53.04	-23.82	19.34	Neutral	-	9.88	9.62	0.03	9.69						
QP	631.573k	28.42	56.00	-27.58	19.44	Neutral	-	8.98	9.62	0.04	9.78						
AV	631.573k	24.62	46.00	-21.38	19.44	Neutral	-	5.18	9.62	0.04	9.78						
QP	875.207k	27.34	56.00	-28.66	19.46	Neutral	-	7.88	9.62	0.05	9.79						
AV	875.207k	22.76	46.00	-23.24	19.46	Neutral	-	3.30	9.62	0.05	9.79						
QP	3.493M	28.63	56.00	-27.37	19.57	Neutral	-	9.06	9.66	0.12	9.79						
AV	3.493M	24.23	46.00	-21.77	19.57	Neutral	-	4.66	9.66	0.12	9.79						
QP	15.632M	23.43	60.00	-36.57	19.96	Neutral	-	3.47	9.89	0.24	9.83						
AV	15.632M	20.22	50.00	-29.78	19.96	Neutral	-	0.26	9.89	0.24	9.83						



Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	676.25k	1.062M	1M06F1D	670k	1.056M
BT-LE(2Mbps)	1.138M	2.036M	2M04F1D	1.128M	2.031M

Max-N dB = Maximum 6dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

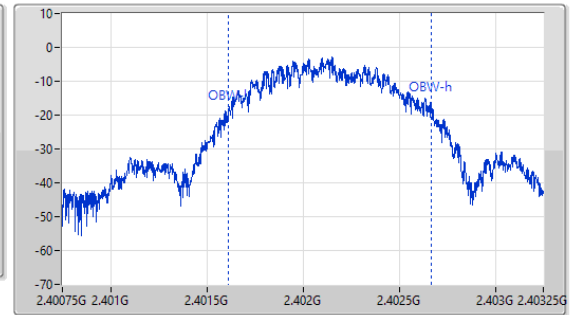
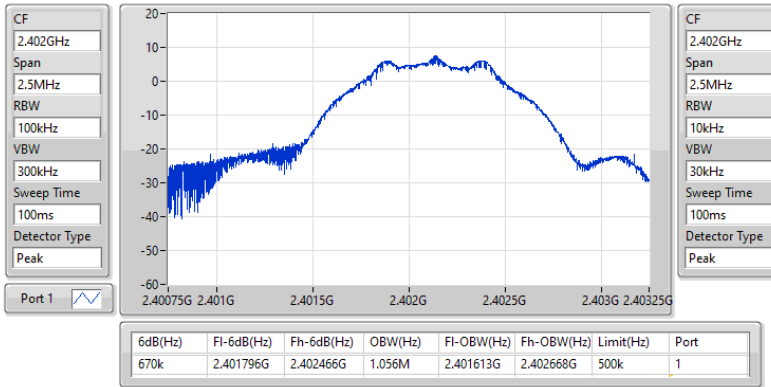
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	670k	1.056M
2440MHz	Pass	500k	672.5k	1.062M
2480MHz	Pass	500k	676.25k	1.056M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.138M	2.034M
2440MHz	Pass	500k	1.128M	2.031M
2480MHz	Pass	500k	1.133M	2.036M

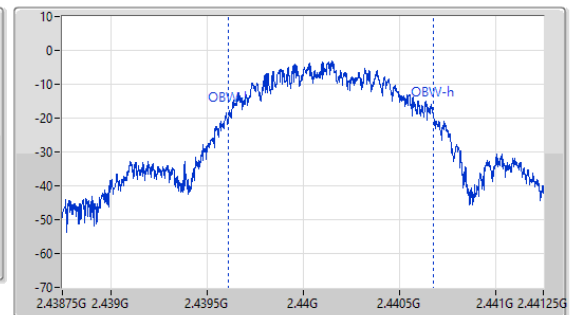
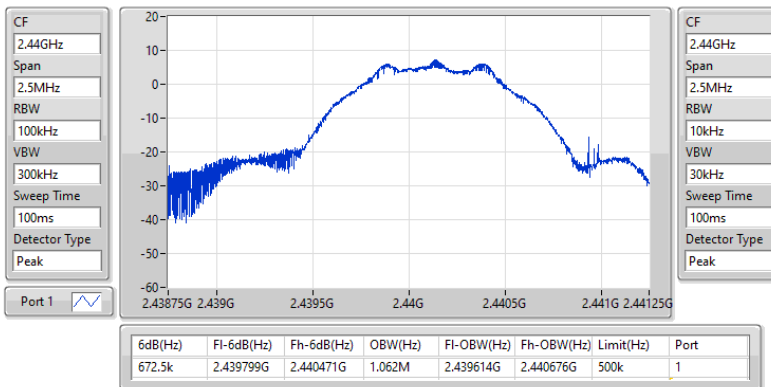
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

2.4-2.4835GHz_BT-LE(1Mbps)
EBW-DTS
2402MHz

07/11/2023

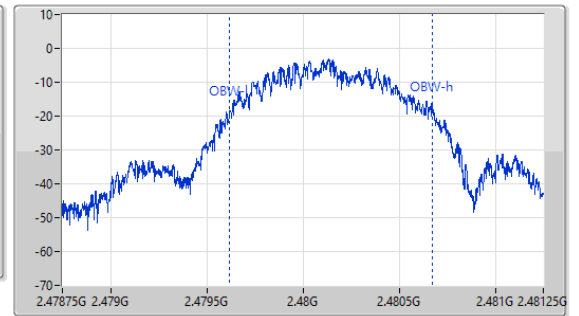
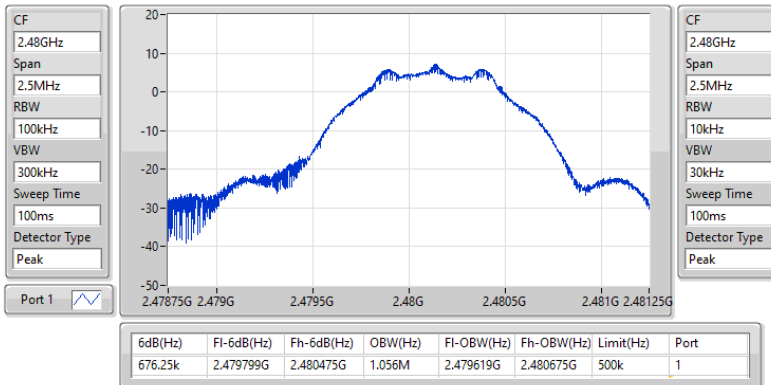

2.4-2.4835GHz_BT-LE(1Mbps)
EBW-DTS
2440MHz

07/11/2023

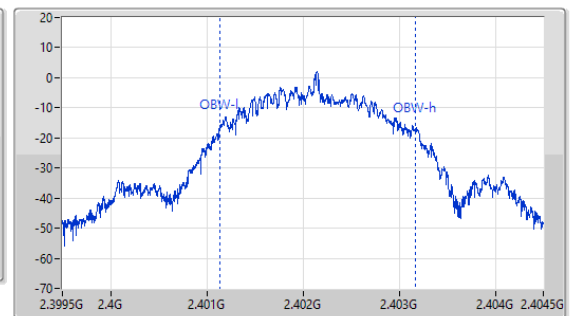
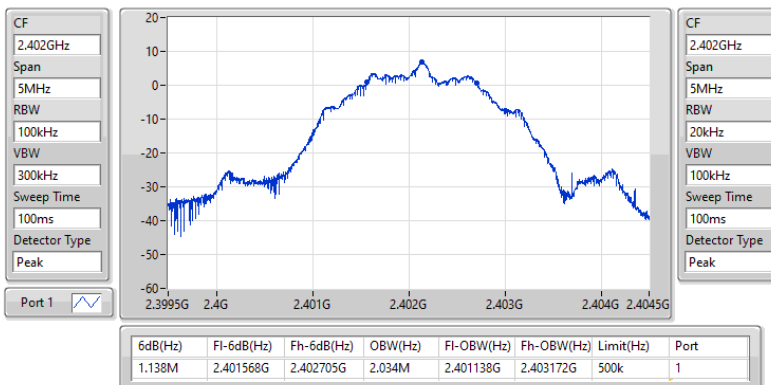


2.4-2.4835GHz_BT-LE(1Mbps)
EBW-DTS
2480MHz

07/11/2023


2.4-2.4835GHz_BT-LE(2Mbps)
EBW-DTS
2402MHz

07/11/2023

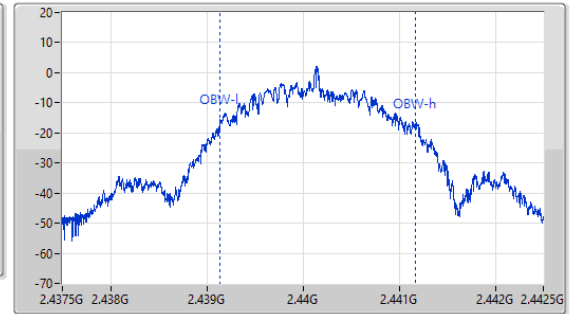
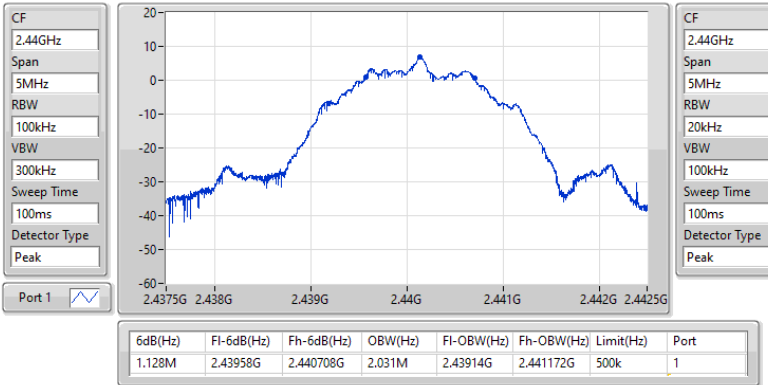


2.4-2.4835GHz_BT-LE(2Mbps)

EBW-DTS

2440MHz

07/11/2023

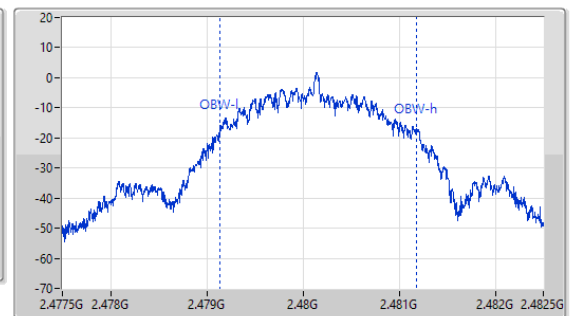
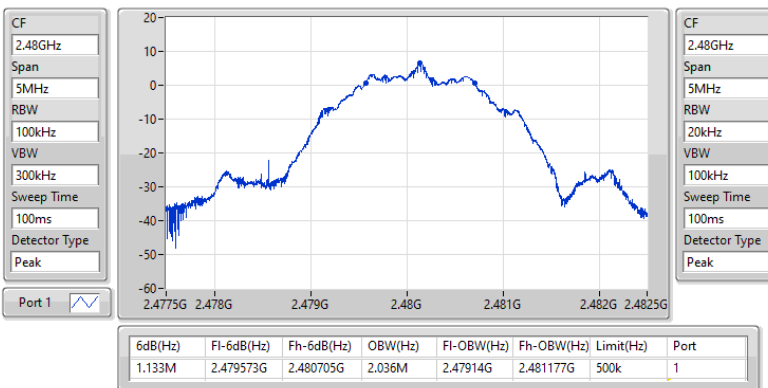


2.4-2.4835GHz_BT-LE(2Mbps)

EBW-DTS

2480MHz

07/11/2023





Summary

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	6.57	0.00454
BT-LE(2Mbps)	6.38	0.00435



Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.07	6.57	30.00
2440MHz	Pass	3.07	6.49	30.00
2480MHz	Pass	3.07	6.41	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	3.07	6.38	30.00
2440MHz	Pass	3.07	6.21	30.00
2480MHz	Pass	3.07	6.17	30.00

DG = Directional Gain; Port X = Port X output power



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-8.90
BT-LE(2Mbps)	-10.62

RBW = 3kHz;



Result

Mode	Result	DG (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.07	-8.96	8.00
2440MHz	Pass	3.07	-8.90	8.00
2480MHz	Pass	3.07	-9.05	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	3.07	-10.62	8.00
2440MHz	Pass	3.07	-10.73	8.00
2480MHz	Pass	3.07	-10.80	8.00

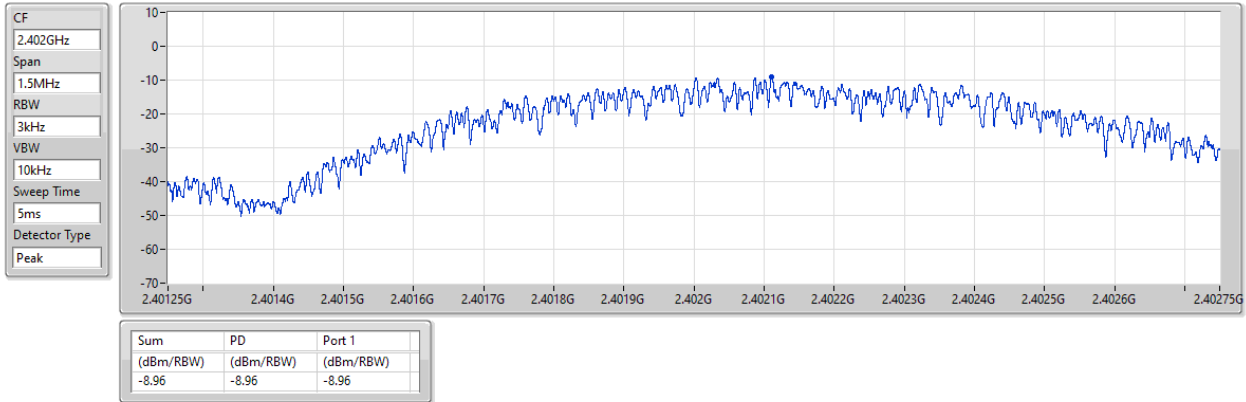
DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2402MHz

07/11/2023

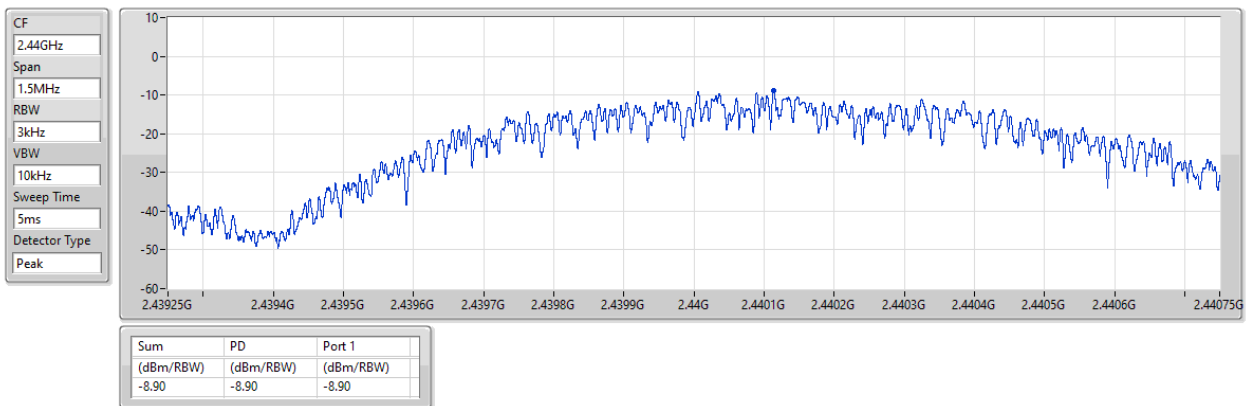


2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2440MHz

07/11/2023

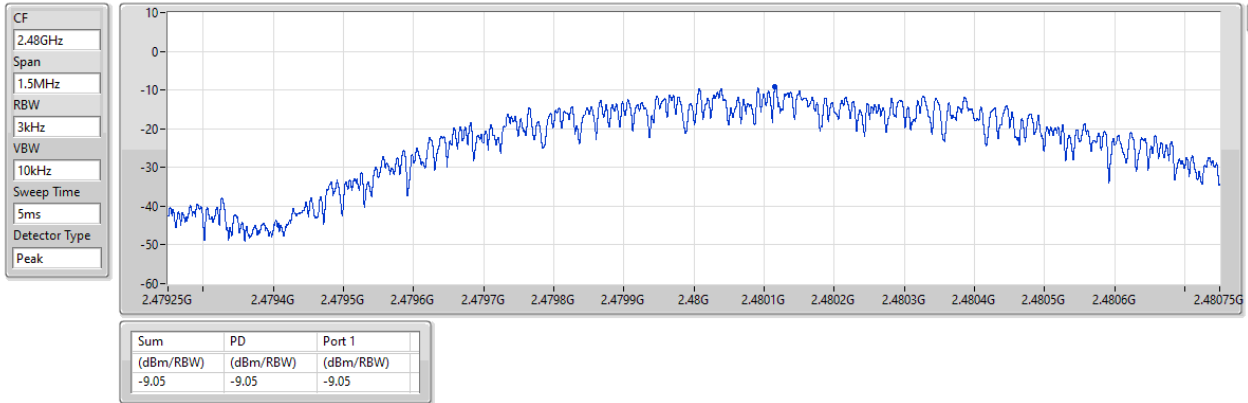


2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2480MHz

07/11/2023

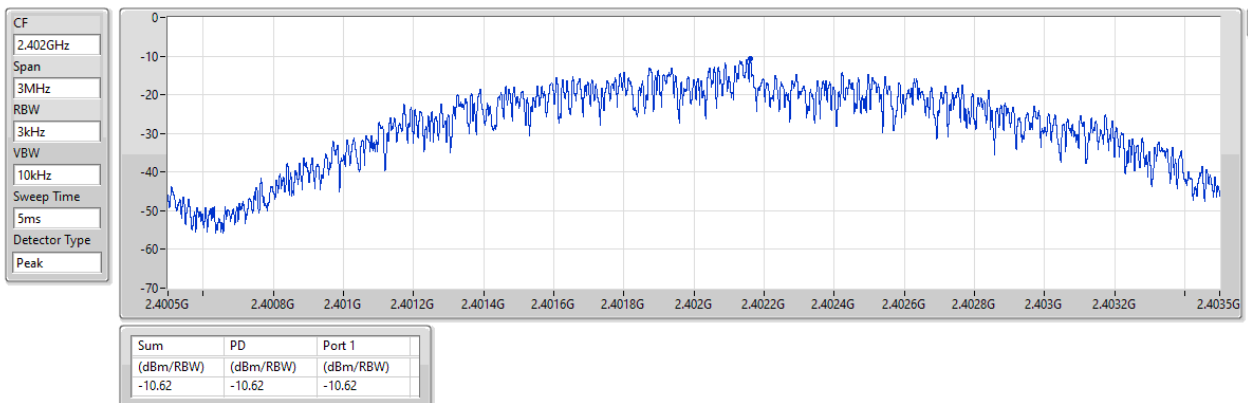


2.4-2.4835GHz_BT-LE(2Mbps)

PSD

2402MHz

07/11/2023



2.4-2.4835GHz_BT-LE(2Mbps)

PSD

2440MHz

07/11/2023

CF
2.44GHz

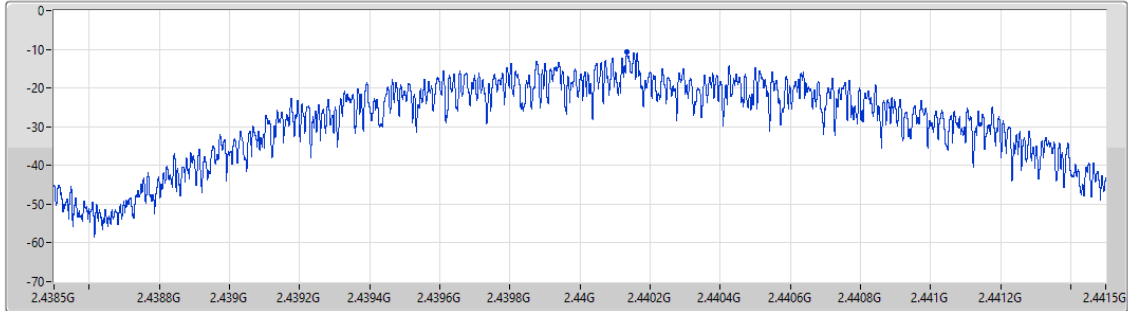
Span
3MHz

RBW
3kHz

VBW
10kHz

Sweep Time
5ms

Detector Type
Peak



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.73	-10.73	-10.73

2.4-2.4835GHz_BT-LE(2Mbps)

PSD

2480MHz

07/11/2023

CF
2.48GHz

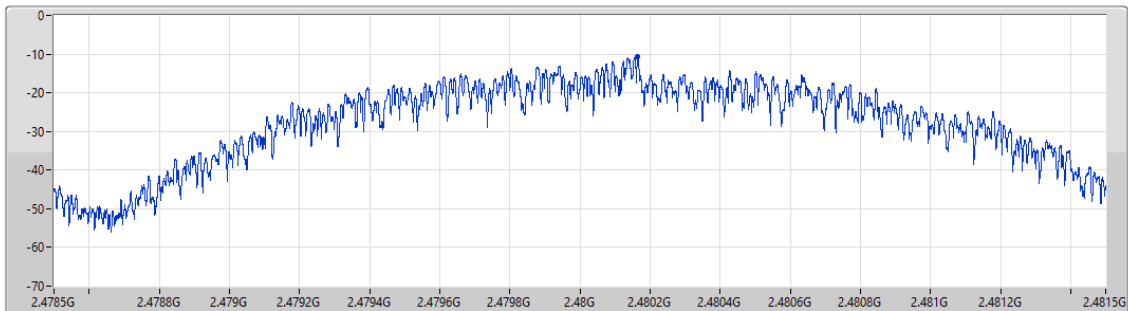
Span
3MHz

RBW
3kHz

VBW
10kHz

Sweep Time
5ms

Detector Type
Peak



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.80	-10.80	-10.80

Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.402G	6.71	-23.29	2.00518G	-54.01	2.4G	-33.33	2.4G	-30.99	2.50062G	-52.99	16.57225G	-40.73	1
BT-LE(2Mbps)	Pass	2.402G	6.53	-23.47	2.09565G	-54.67	2.4G	-31.80	2.4G	-25.81	2.50302G	-52.71	23.23402G	-42.40	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	6.71	-23.29	2.00518G	-54.01	2.4G	-33.33	2.4G	-30.99	2.50062G	-52.99	16.57225G	-40.73	1
2440MHz	Pass	2.402G	6.71	-23.29	2.14265G	-53.39	2.39436G	-53.23	2.4G	-55.40	2.50022G	-53.16	24.89314G	-41.98	1
2480MHz	Pass	2.402G	6.71	-23.29	1.95113G	-54.59	2.3928G	-52.73	2.4G	-54.98	2.50162G	-52.27	23.24809G	-42.33	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	6.53	-23.47	2.09565G	-54.67	2.4G	-31.80	2.4G	-25.81	2.50302G	-52.71	23.23402G	-42.40	1
2440MHz	Pass	2.402G	6.53	-23.47	2.11798G	-54.68	2.39916G	-53.70	2.4G	-55.26	2.50018G	-53.28	24.99719G	-42.12	1
2480MHz	Pass	2.402G	6.53	-23.47	2.18378G	-54.68	2.39816G	-53.98	2.4G	-56.03	2.50338G	-52.21	16.91251G	-41.69	1

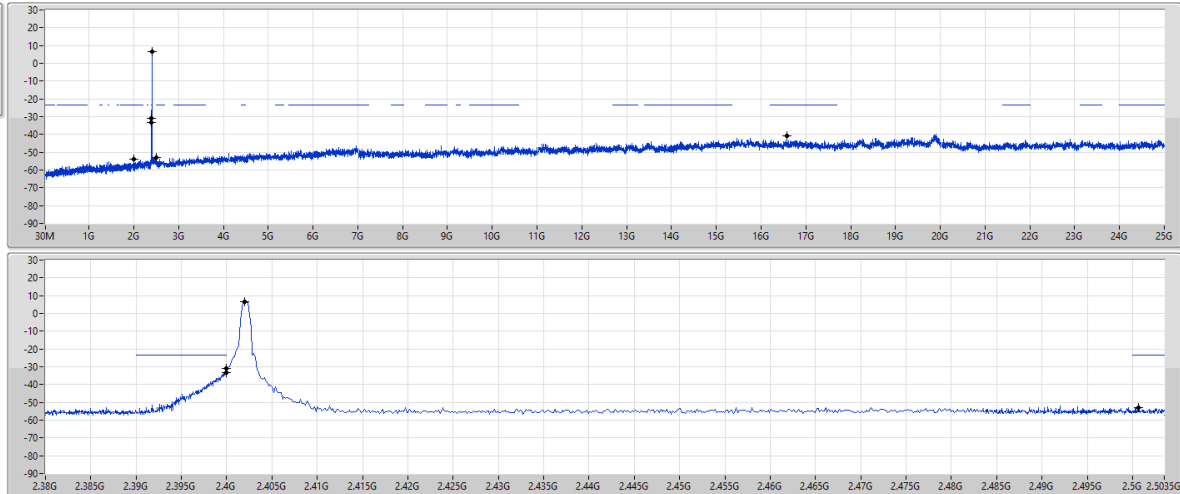
2.4-2.4835GHz_BT-LE(1Mbps)

CSEndB-DTS

2402MHz

07/11/2023

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402G	6.71	-23.29	2.00518G	-54.01	2.4G	-33.33	2.4G	-30.99	2.50062G	-52.99	16.57225G	-40.73	1

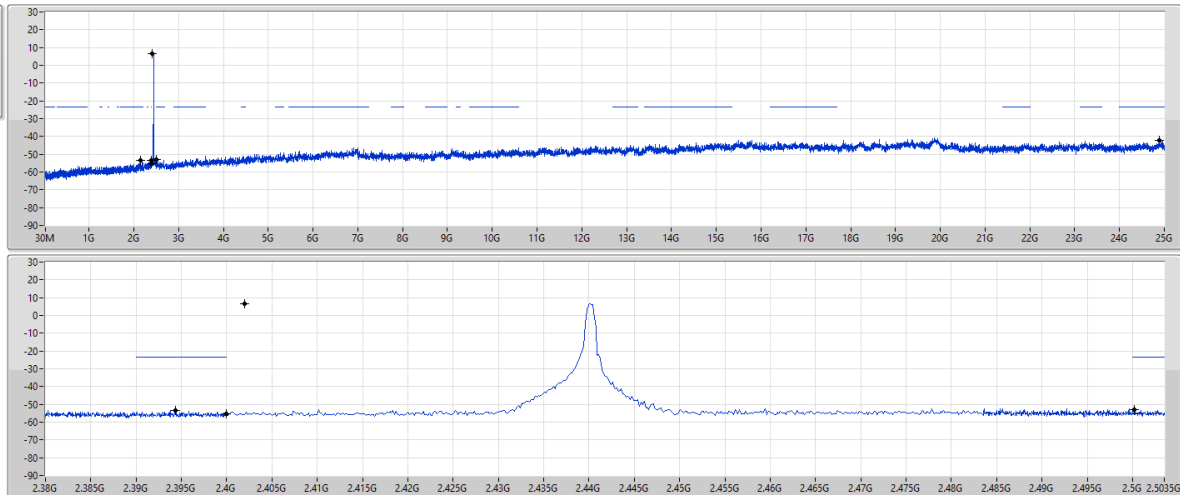
2.4-2.4835GHz_BT-LE(1Mbps)

CSEndB-DTS

2440MHz

07/11/2023

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402G	6.71	-23.29	2.14265G	-53.39	2.39436G	-53.23	2.4G	-55.40	2.50022G	-53.16	24.89314G	-41.98	1

2.4-2.4835GHz_BT-LE(1Mbps)

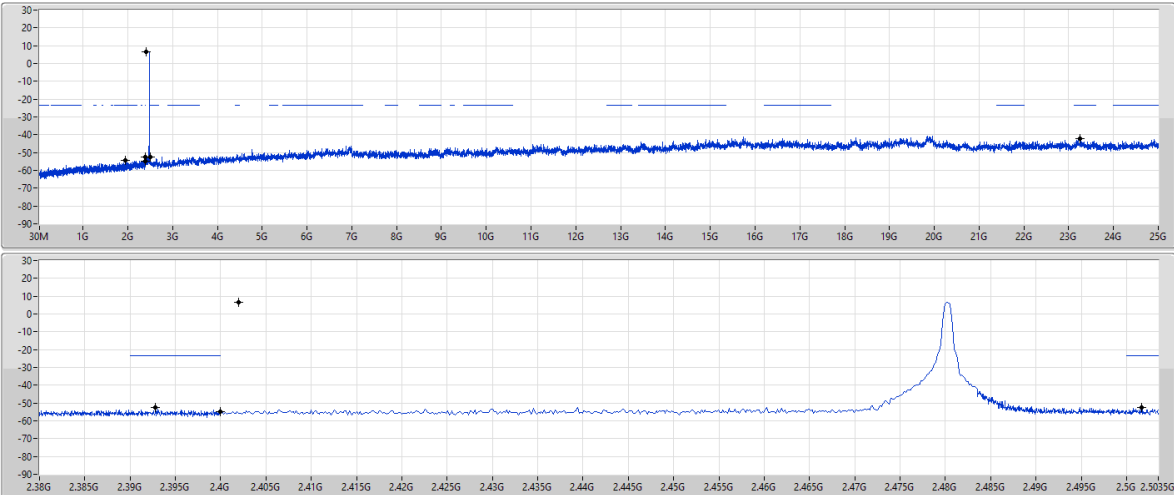
CSEndB-DTS

2480MHz

07/11/2023

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Port 1



2.4-2.4835GHz_BT-LE(2Mbps)

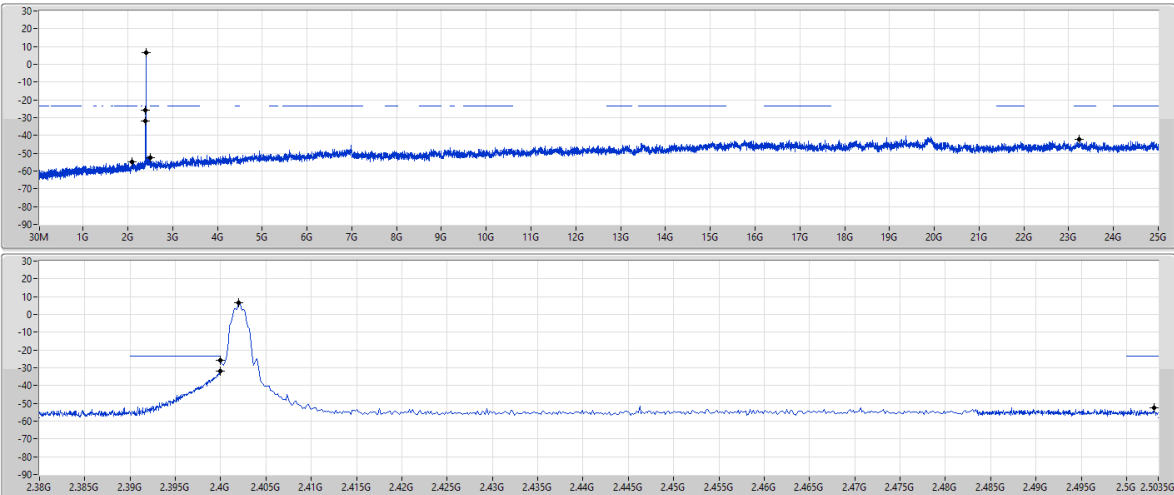
CSEndB-DTS

2402MHz

07/11/2023

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Port 1

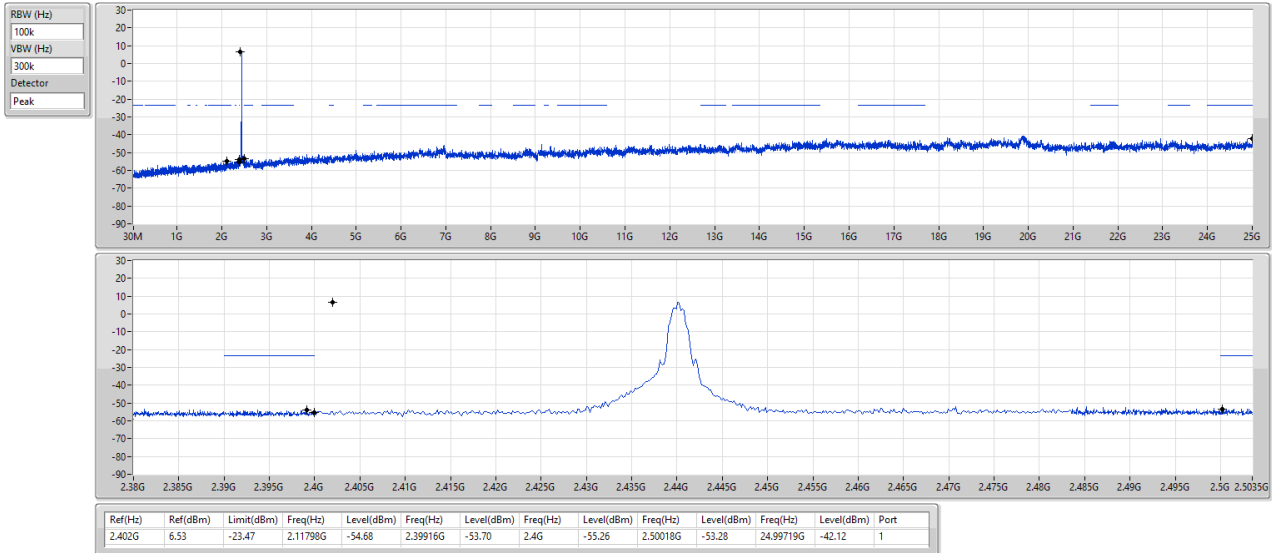


2.4-2.4835GHz_BT-LE(2Mbps)

CSEndB-DTS

2440MHz

07/11/2023

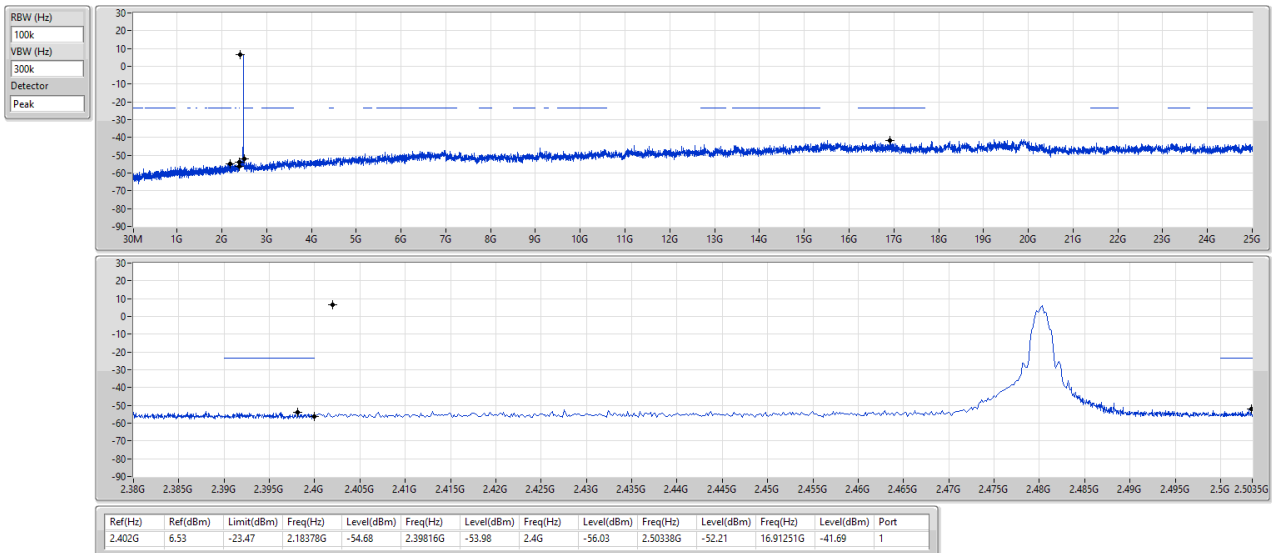


2.4-2.4835GHz_BT-LE(2Mbps)

CSEndB-DTS

2480MHz

07/11/2023





Summary

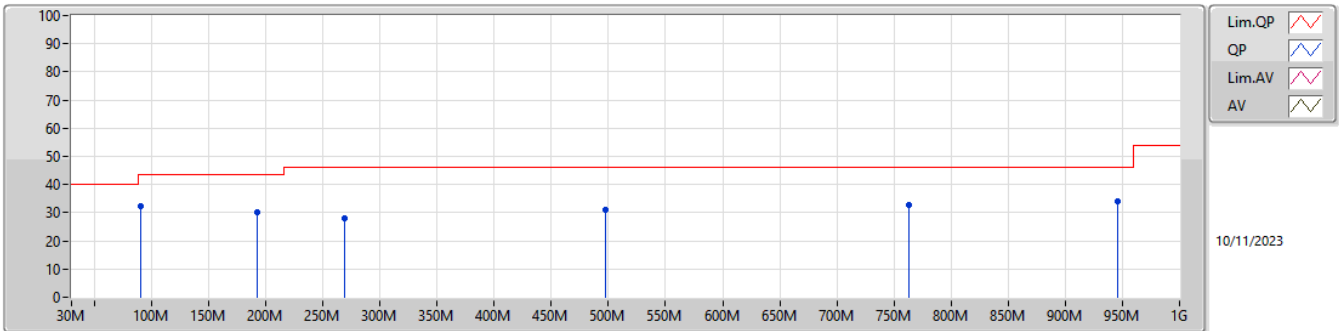
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-LE(2Mbps)	Pass	PK	41.64M	34.29	40.00	-5.71	3	Horizontal	360	1.00

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	90.14M	32.20	43.50	-11.30	3	Vertical	0	1.00
2440MHz	Pass	PK	192.96M	30.09	43.50	-13.41	3	Vertical	0	1.00
2440MHz	Pass	PK	268.62M	27.94	46.00	-18.06	3	Vertical	0	1.00
2440MHz	Pass	PK	497.54M	31.08	46.00	-14.92	3	Vertical	0	1.00
2440MHz	Pass	PK	763.32M	32.57	46.00	-13.43	3	Vertical	0	1.00
2440MHz	Pass	PK	945.68M	34.15	46.00	-11.85	3	Vertical	0	1.00
2440MHz	Pass	PK	41.64M	34.29	40.00	-5.71	3	Horizontal	360	1.00
2440MHz	Pass	PK	192.96M	29.79	43.50	-13.71	3	Horizontal	360	1.00
2440MHz	Pass	PK	266.68M	28.67	46.00	-17.33	3	Horizontal	360	1.00
2440MHz	Pass	PK	522.76M	31.37	46.00	-14.63	3	Horizontal	360	1.00
2440MHz	Pass	PK	542.16M	30.07	46.00	-15.93	3	Horizontal	360	1.00
2440MHz	Pass	PK	784.66M	32.00	46.00	-14.00	3	Horizontal	360	1.00

2.4-2.4835GHz_BT-LE(2Mbps)

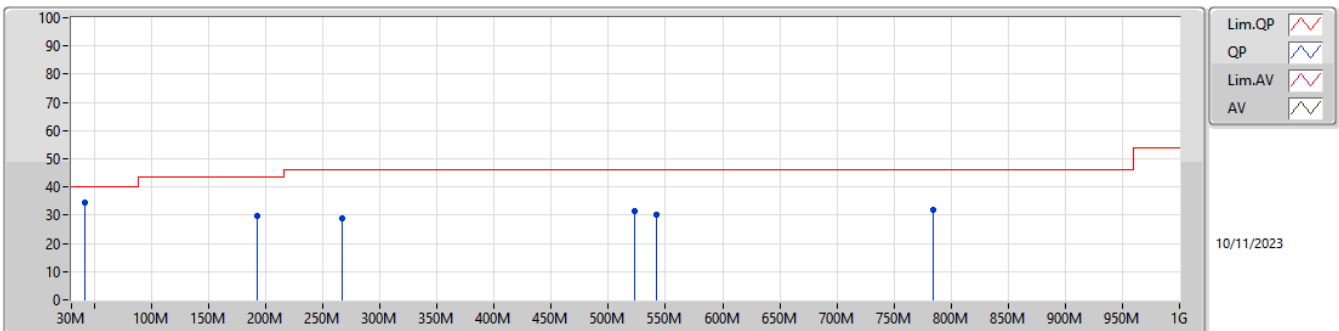
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	90.14M	32.20	43.50	-11.30	-11.69	3	Vertical	0	1.00	43.89	14.14	2.00	27.83
PK	192.96M	30.09	43.50	-13.41	-10.52	3	Vertical	0	1.00	40.61	14.29	2.70	27.51
PK	268.62M	27.94	46.00	-18.06	-5.93	3	Vertical	0	1.00	33.87	18.18	3.13	27.24
PK	497.54M	31.08	46.00	-14.92	-1.43	3	Vertical	0	1.00	32.51	22.58	4.40	28.41
PK	763.32M	32.57	46.00	-13.43	2.09	3	Vertical	0	1.00	30.48	24.86	5.56	28.33
PK	945.68M	34.15	46.00	-11.85	4.51	3	Vertical	0	1.00	29.64	25.82	6.40	27.71

2.4-2.4835GHz_BT-LE(2Mbps)

2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	41.64M	34.29	40.00	-5.71	-7.89	3	Horizontal	360	1.00	42.18	17.36	1.43	26.68
PK	192.96M	29.79	43.50	-13.71	-10.52	3	Horizontal	360	1.00	40.31	14.29	2.70	27.51
PK	266.68M	28.67	46.00	-17.33	-5.72	3	Horizontal	360	1.00	34.39	18.40	3.12	27.24
PK	522.76M	31.37	46.00	-14.63	-1.38	3	Horizontal	360	1.00	32.75	22.70	4.46	28.54
PK	542.16M	30.07	46.00	-15.93	-0.64	3	Horizontal	360	1.00	30.71	23.51	4.50	28.65
PK	784.66M	32.00	46.00	-14.00	2.28	3	Horizontal	360	1.00	29.72	24.95	5.66	28.33



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	2.4835G	72.83	74.00	-1.17	3	Horizontal	19	1.98
BT-LE(2Mbps)	Pass	AV	2.4835G	53.78	54.00	-0.22	3	Horizontal	13	1.99

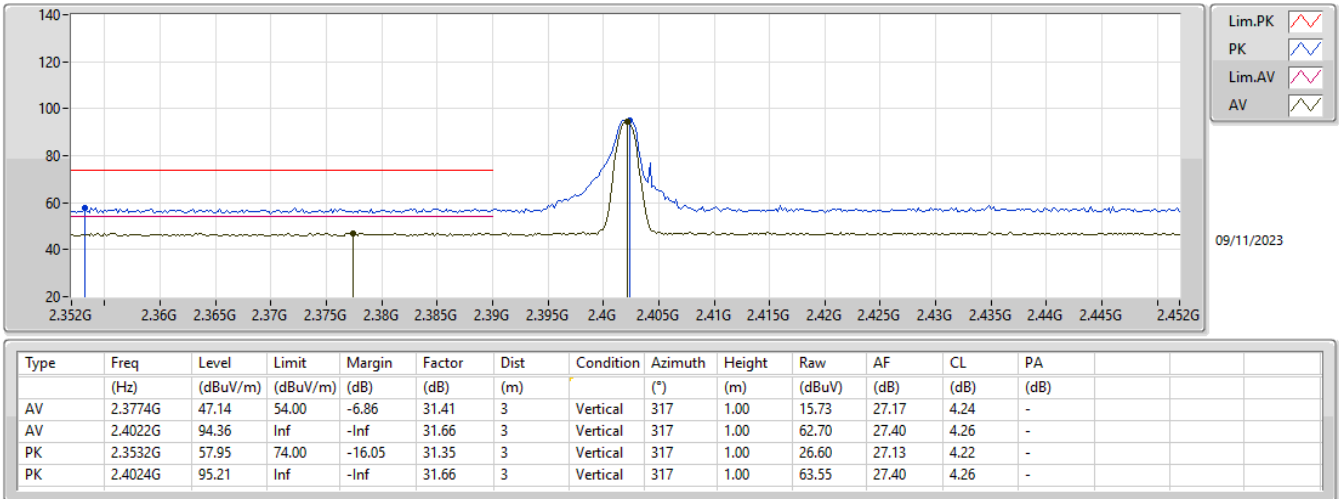
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3774G	47.14	54.00	-6.86	3	Vertical	317	1.00
2402MHz	Pass	AV	2.4022G	94.36	Inf	-Inf	3	Vertical	317	1.00
2402MHz	Pass	PK	2.3532G	57.95	74.00	-16.05	3	Vertical	317	1.00
2402MHz	Pass	PK	2.4024G	95.21	Inf	-Inf	3	Vertical	317	1.00
2402MHz	Pass	AV	2.3878G	47.37	54.00	-6.63	3	Horizontal	352	2.54
2402MHz	Pass	AV	2.402G	107.06	Inf	-Inf	3	Horizontal	352	2.54
2402MHz	Pass	PK	2.39G	57.92	74.00	-16.08	3	Horizontal	352	2.54
2402MHz	Pass	PK	2.4018G	107.88	Inf	-Inf	3	Horizontal	352	2.54
2402MHz	Pass	AV	4.8037G	37.50	54.00	-16.50	3	Vertical	352	1.19
2402MHz	Pass	PK	4.80445G	45.33	74.00	-28.67	3	Vertical	352	1.19
2402MHz	Pass	AV	4.80372G	33.47	54.00	-20.53	3	Horizontal	73	1.50
2402MHz	Pass	PK	4.80466G	42.81	74.00	-31.19	3	Horizontal	73	1.50
2402MHz	Pass	AV	2.3436G	46.80	54.00	-7.20	3	Vertical	324	1.14
2440MHz	Pass	AV	2.44G	97.56	Inf	-Inf	3	Vertical	324	1.14
2440MHz	Pass	AV	2.4984G	47.71	54.00	-6.29	3	Vertical	324	1.14
2440MHz	Pass	PK	2.3832G	57.86	74.00	-16.14	3	Vertical	324	1.14
2440MHz	Pass	PK	2.44G	98.39	Inf	-Inf	3	Vertical	324	1.14
2440MHz	Pass	PK	2.488G	58.71	74.00	-15.29	3	Vertical	324	1.14
2440MHz	Pass	AV	2.3856G	47.07	54.00	-6.93	3	Horizontal	0	1.30
2440MHz	Pass	AV	2.4404G	106.98	Inf	-Inf	3	Horizontal	0	1.30
2440MHz	Pass	AV	2.4984G	47.32	54.00	-6.68	3	Horizontal	0	1.30
2440MHz	Pass	PK	2.3512G	58.22	74.00	-15.78	3	Horizontal	0	1.30
2440MHz	Pass	PK	2.44G	107.80	Inf	-Inf	3	Horizontal	0	1.30
2440MHz	Pass	PK	2.4956G	57.80	74.00	-16.20	3	Horizontal	0	1.30
2440MHz	Pass	AV	4.87996G	36.79	54.00	-17.21	3	Vertical	344	2.51
2440MHz	Pass	PK	4.88044G	44.58	74.00	-29.42	3	Vertical	344	2.51
2440MHz	Pass	AV	4.8797G	36.01	54.00	-17.99	3	Horizontal	303	2.26
2440MHz	Pass	PK	4.88072G	44.18	74.00	-29.82	3	Horizontal	303	2.26
2480MHz	Pass	AV	2.48G	99.57	Inf	-Inf	3	Vertical	322	1.49
2480MHz	Pass	AV	2.4864G	47.46	54.00	-6.54	3	Vertical	322	1.49
2480MHz	Pass	PK	2.4798G	100.43	Inf	-Inf	3	Vertical	322	1.49
2480MHz	Pass	PK	2.4836G	67.64	74.00	-6.36	3	Vertical	322	1.49
2480MHz	Pass	AV	2.48G	104.51	Inf	-Inf	3	Horizontal	19	1.98
2480MHz	Pass	AV	2.4846G	48.82	54.00	-5.18	3	Horizontal	19	1.98
2480MHz	Pass	PK	2.4804G	105.35	Inf	-Inf	3	Horizontal	19	1.98
2480MHz	Pass	PK	2.4835G	72.83	74.00	-1.17	3	Horizontal	19	1.98
2480MHz	Pass	AV	4.96018G	34.88	54.00	-19.12	3	Vertical	296	1.35
2480MHz	Pass	PK	4.95972G	43.78	74.00	-30.22	3	Vertical	296	1.35
2480MHz	Pass	AV	4.95975G	33.97	54.00	-20.03	3	Horizontal	321	1.50
2480MHz	Pass	PK	4.96074G	43.26	74.00	-30.74	3	Horizontal	321	1.50
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3758G	47.50	54.00	-6.50	3	Vertical	324	1.00
2402MHz	Pass	AV	2.4022G	93.50	Inf	-Inf	3	Vertical	324	1.00
2402MHz	Pass	PK	2.369G	58.15	74.00	-15.85	3	Vertical	324	1.00
2402MHz	Pass	PK	2.4026G	95.79	Inf	-Inf	3	Vertical	324	1.00
2402MHz	Pass	AV	2.375G	47.40	54.00	-6.60	3	Horizontal	357	2.54
2402MHz	Pass	AV	2.402G	106.36	Inf	-Inf	3	Horizontal	357	2.54
2402MHz	Pass	PK	2.39G	59.80	74.00	-14.20	3	Horizontal	357	2.54
2402MHz	Pass	PK	2.4016G	108.65	Inf	-Inf	3	Horizontal	357	2.54
2402MHz	Pass	AV	4.80427G	36.53	54.00	-17.47	3	Vertical	346	1.18
2402MHz	Pass	PK	4.80311G	44.59	74.00	-29.41	3	Vertical	346	1.18
2402MHz	Pass	AV	4.80419G	32.97	54.00	-21.03	3	Horizontal	66	1.50
2402MHz	Pass	PK	4.80436G	42.39	74.00	-31.61	3	Horizontal	66	1.50
2440MHz	Pass	AV	2.3808G	47.11	54.00	-6.89	3	Vertical	317	1.16
2440MHz	Pass	AV	2.44G	96.07	Inf	-Inf	3	Vertical	317	1.16
2440MHz	Pass	AV	2.4928G	47.63	54.00	-6.37	3	Vertical	317	1.16
2440MHz	Pass	PK	2.3544G	57.59	74.00	-16.41	3	Vertical	317	1.16
2440MHz	Pass	PK	2.4408G	98.36	Inf	-Inf	3	Vertical	317	1.16
2440MHz	Pass	PK	2.4948G	58.22	74.00	-15.78	3	Vertical	317	1.16
2440MHz	Pass	AV	2.3608G	47.14	54.00	-6.86	3	Horizontal	353	1.08

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2440MHz	Pass	AV	2.44G	106.02	Inf	-Inf	3	Horizontal	353	1.08
2440MHz	Pass	AV	2.486G	47.54	54.00	-6.46	3	Horizontal	353	1.08
2440MHz	Pass	PK	2.3804G	58.65	74.00	-15.35	3	Horizontal	353	1.08
2440MHz	Pass	PK	2.4396G	108.35	Inf	-Inf	3	Horizontal	353	1.08
2440MHz	Pass	PK	2.4848G	58.55	74.00	-15.45	3	Horizontal	353	1.08
2440MHz	Pass	AV	4.88021G	36.00	54.00	-18.00	3	Vertical	348	2.51
2440MHz	Pass	PK	4.88138G	45.26	74.00	-28.74	3	Vertical	348	2.51
2440MHz	Pass	AV	4.88029G	35.24	54.00	-18.76	3	Horizontal	309	2.32
2440MHz	Pass	PK	4.88131G	44.18	74.00	-29.82	3	Horizontal	309	2.32
2480MHz	Pass	AV	2.48G	98.00	Inf	-Inf	3	Vertical	312	1.76
2480MHz	Pass	AV	2.4835G	49.54	54.00	-4.46	3	Vertical	312	1.76
2480MHz	Pass	PK	2.4796G	100.34	Inf	-Inf	3	Vertical	312	1.76
2480MHz	Pass	PK	2.4835G	68.12	74.00	-5.88	3	Vertical	312	1.76
2480MHz	Pass	AV	2.48G	103.05	Inf	-Inf	3	Horizontal	13	1.99
2480MHz	Pass	AV	2.4835G	53.78	54.00	-0.22	3	Horizontal	13	1.99
2480MHz	Pass	PK	2.4806G	105.36	Inf	-Inf	3	Horizontal	13	1.99
2480MHz	Pass	PK	2.4835G	73.51	74.00	-0.49	3	Horizontal	13	1.99
2480MHz	Pass	AV	4.95851G	35.20	54.00	-18.80	3	Vertical	308	1.30
2480MHz	Pass	PK	4.96036G	44.12	74.00	-29.88	3	Vertical	308	1.30
2480MHz	Pass	AV	4.95863G	32.92	54.00	-21.08	3	Horizontal	333	1.39
2480MHz	Pass	PK	4.96212G	43.20	74.00	-30.80	3	Horizontal	333	1.39

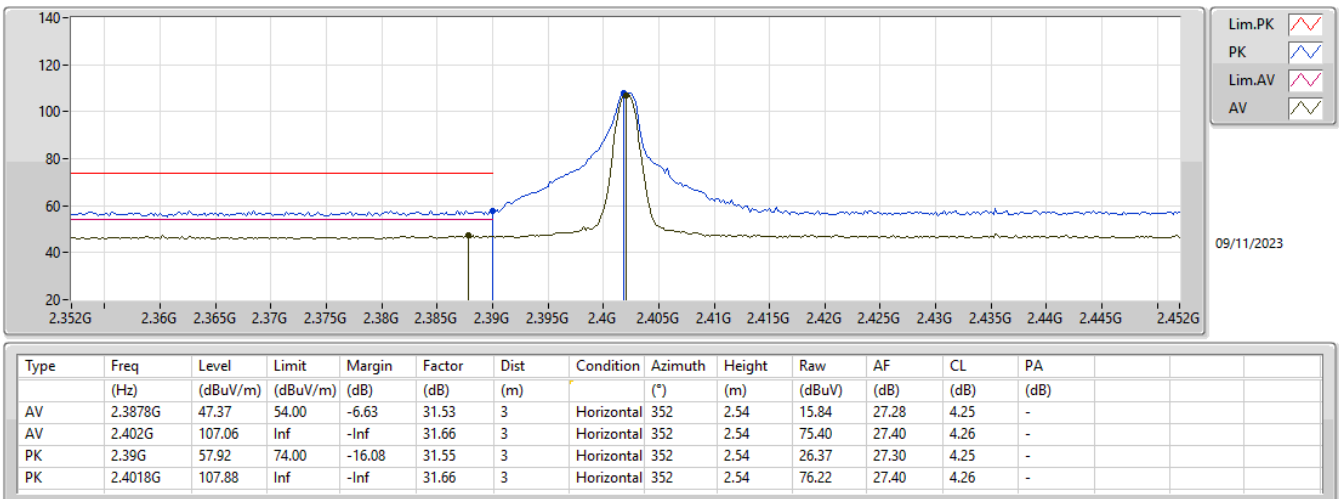
2.4-2.4835GHz_BT-LE(1Mbps)

2402MHz_TX



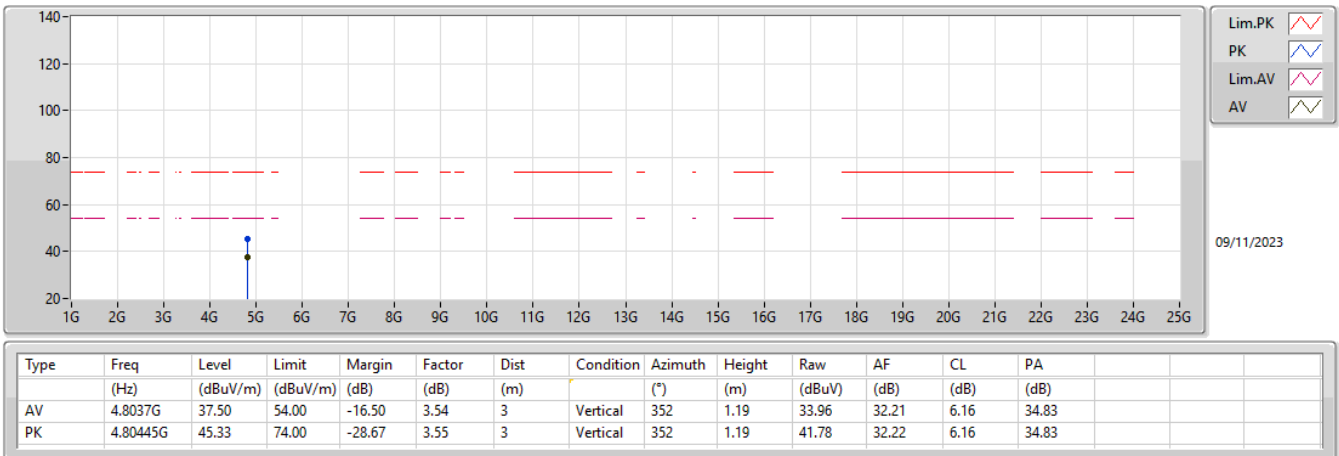
2.4-2.4835GHz_BT-LE(1Mbps)

2402MHz_TX



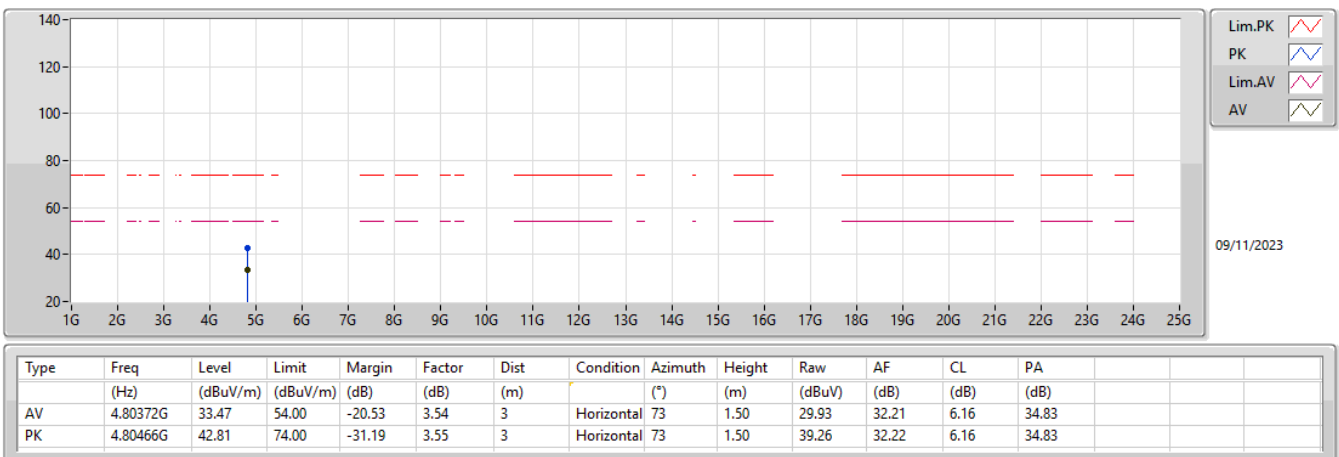
2.4-2.4835GHz_BT-LE(1Mbps)

2402MHz_TX



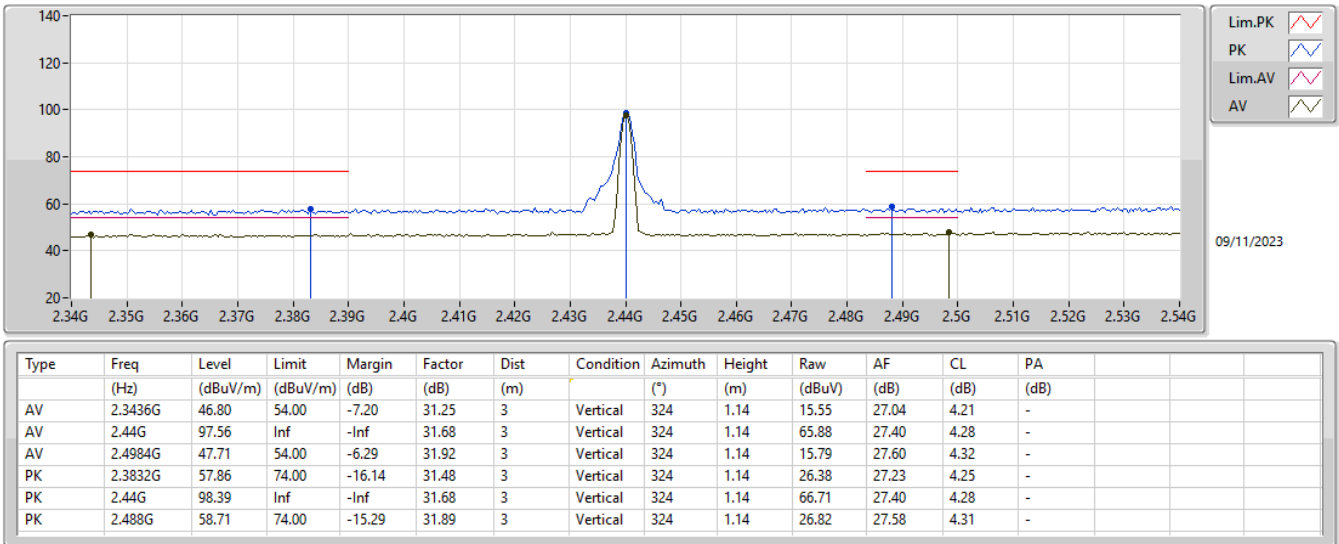
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2402MHz_TX



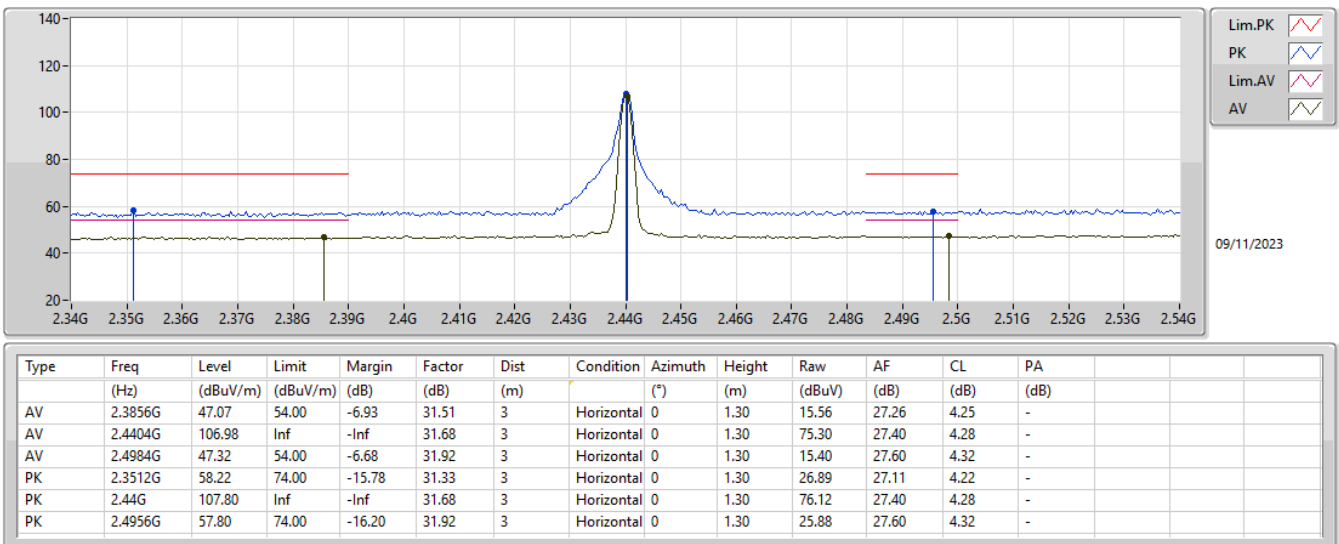
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2440MHz_TX



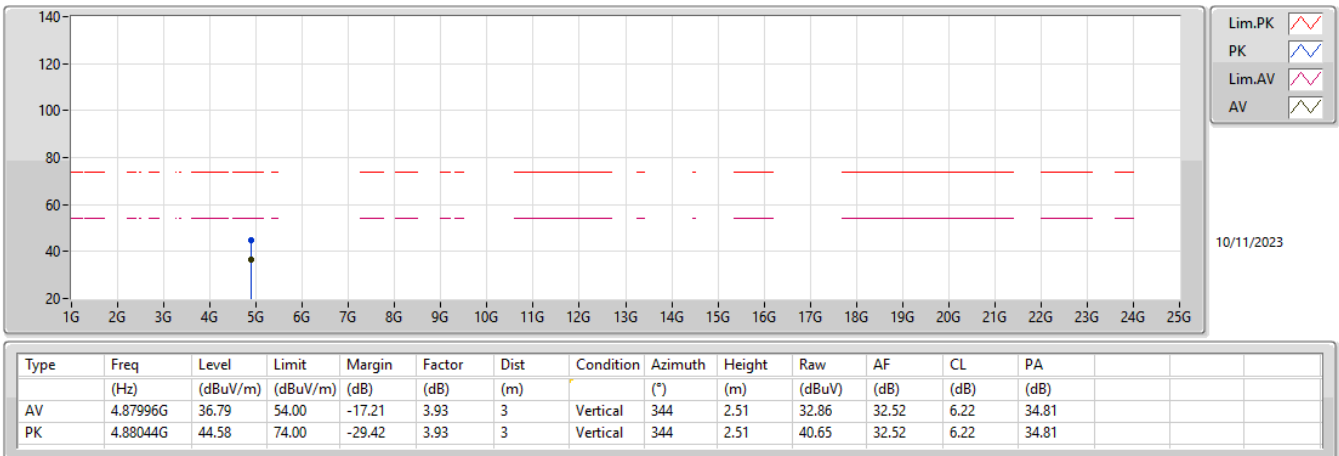
2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX



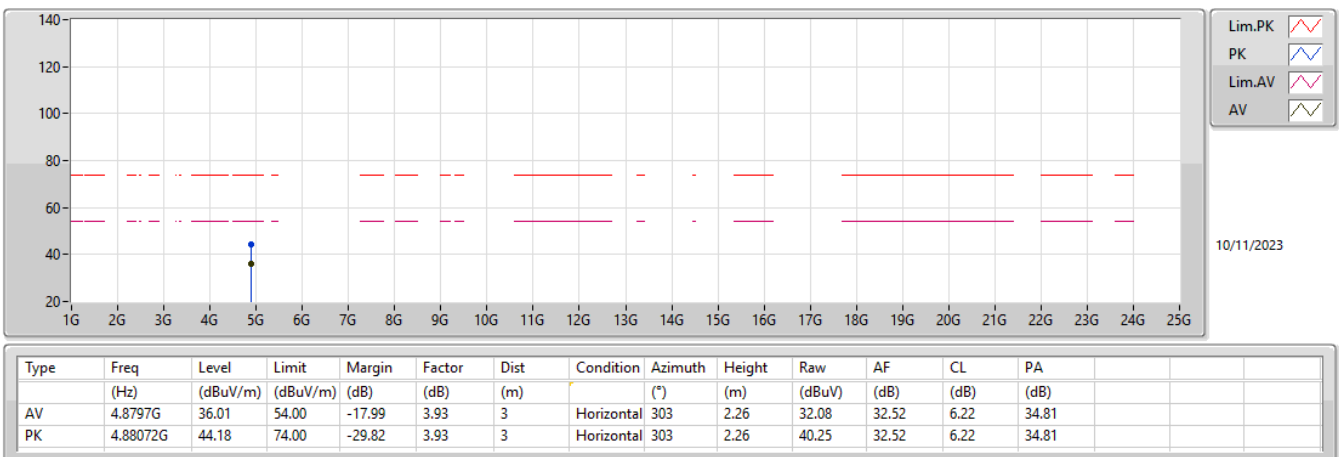
2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX



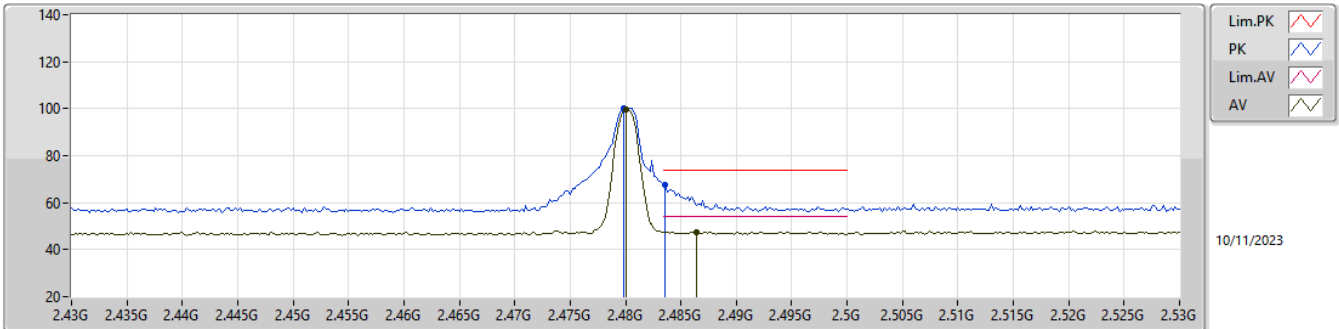
2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX



2.4-2.4835GHz_BT-LE(1Mbps)

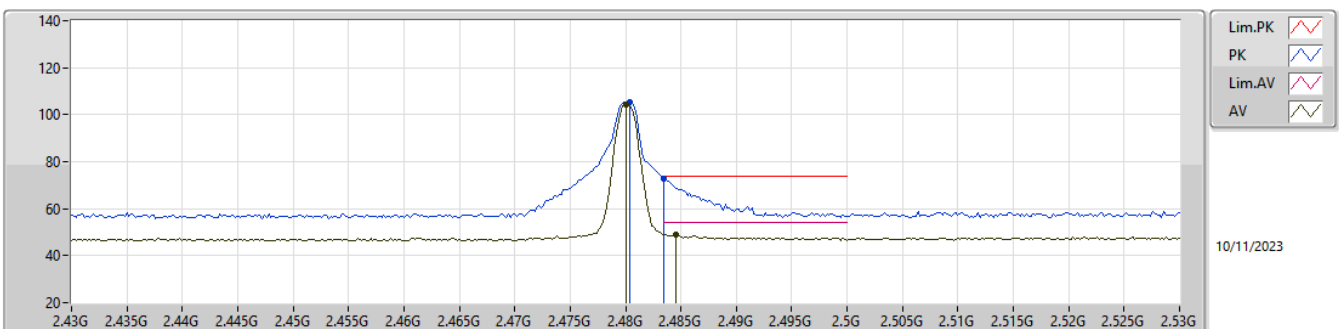
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	99.57	Inf	-Inf	31.81	3	Vertical	322	1.49	67.76	27.50	4.31	-
AV	2.4864G	47.46	54.00	-6.54	31.87	3	Vertical	322	1.49	15.59	27.56	4.31	-
PK	2.4798G	100.43	Inf	-Inf	31.81	3	Vertical	322	1.49	68.62	27.50	4.31	-
PK	2.4836G	67.64	74.00	-6.36	31.85	3	Vertical	322	1.49	35.79	27.54	4.31	-

2.4-2.4835GHz_BT-LE(1Mbps)

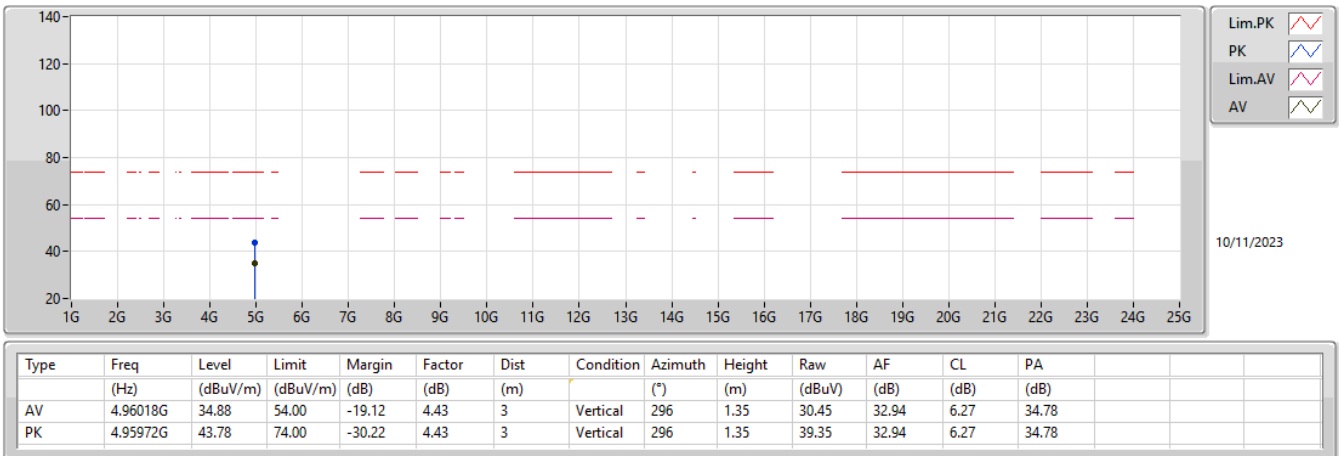
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	104.51	Inf	-Inf	31.81	3	Horizontal	19	1.98	72.70	27.50	4.31	-
AV	2.4846G	48.82	54.00	-5.18	31.86	3	Horizontal	19	1.98	16.96	27.55	4.31	-
PK	2.4804G	105.35	Inf	-Inf	31.81	3	Horizontal	19	1.98	73.54	27.50	4.31	-
PK	2.4835G	72.83	74.00	-1.17	31.85	3	Horizontal	19	1.98	40.98	27.54	4.31	-

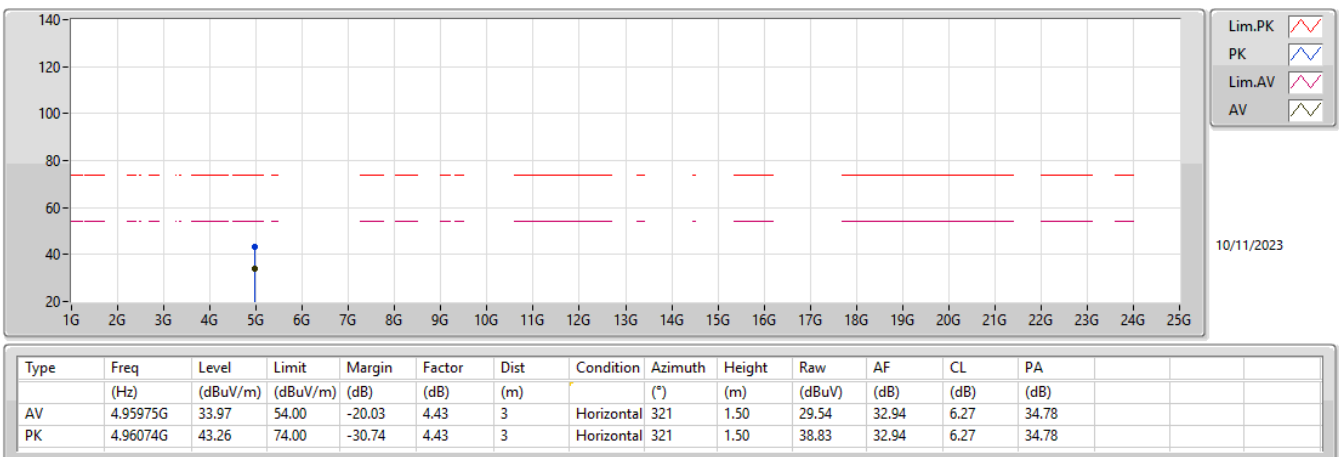
2.4-2.4835GHz_BT-LE(1Mbps)

2480MHz_TX



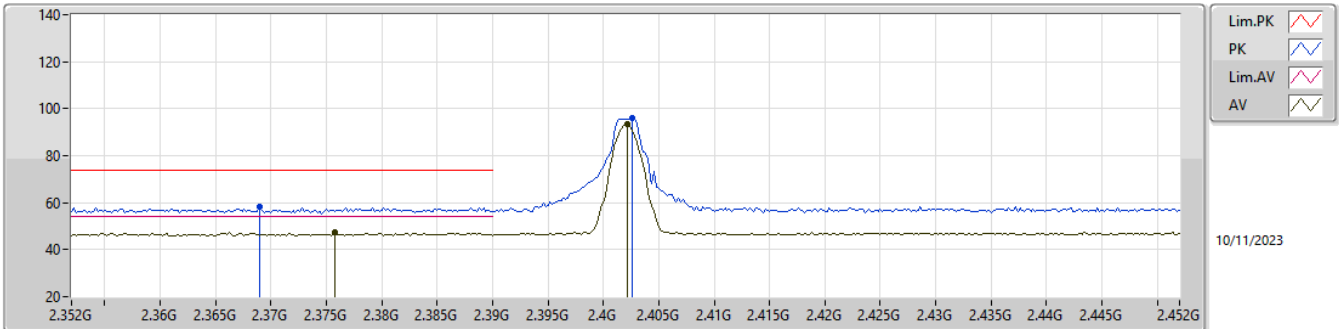
2.4-2.4835GHz_BT-LE(1Mbps)

2480MHz_TX



2.4-2.4835GHz_BT-LE(2Mbps)

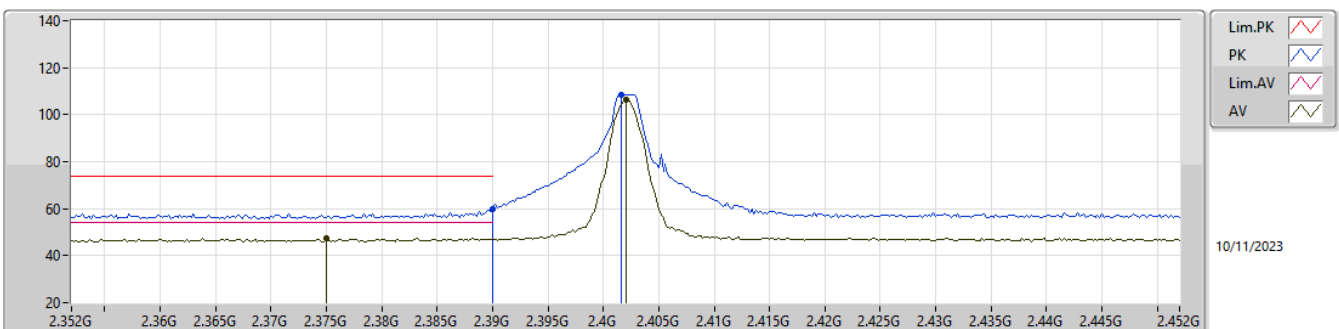
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3758G	47.50	54.00	-6.50	31.40	3	Vertical	324	1.00	16.10	27.16	4.24	-
AV	2.4022G	93.50	Inf	-Inf	31.66	3	Vertical	324	1.00	61.84	27.40	4.26	-
PK	2.369G	58.15	74.00	-15.85	31.34	3	Vertical	324	1.00	26.81	27.11	4.23	-
PK	2.4026G	95.79	Inf	-Inf	31.66	3	Vertical	324	1.00	64.13	27.40	4.26	-

2.4-2.4835GHz_BT-LE(2Mbps)

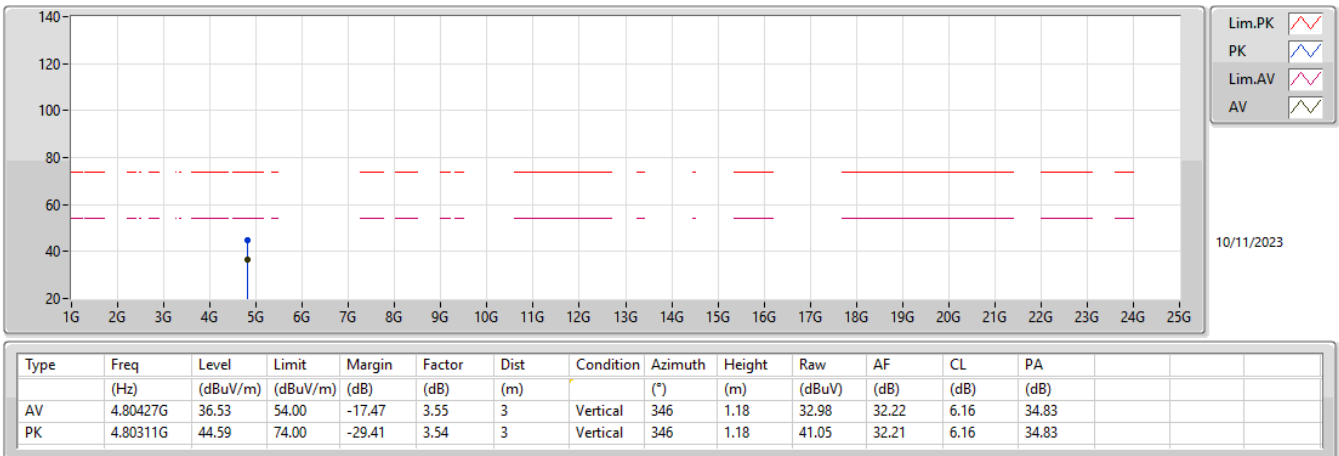
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.375G	47.40	54.00	-6.60	31.39	3	Horizontal	357	2.54	16.01	27.15	4.24	-
AV	2.402G	106.36	Inf	-Inf	31.66	3	Horizontal	357	2.54	74.70	27.40	4.26	-
PK	2.39G	59.80	74.00	-14.20	31.55	3	Horizontal	357	2.54	28.25	27.30	4.25	-
PK	2.4016G	108.65	Inf	-Inf	31.66	3	Horizontal	357	2.54	76.99	27.40	4.26	-

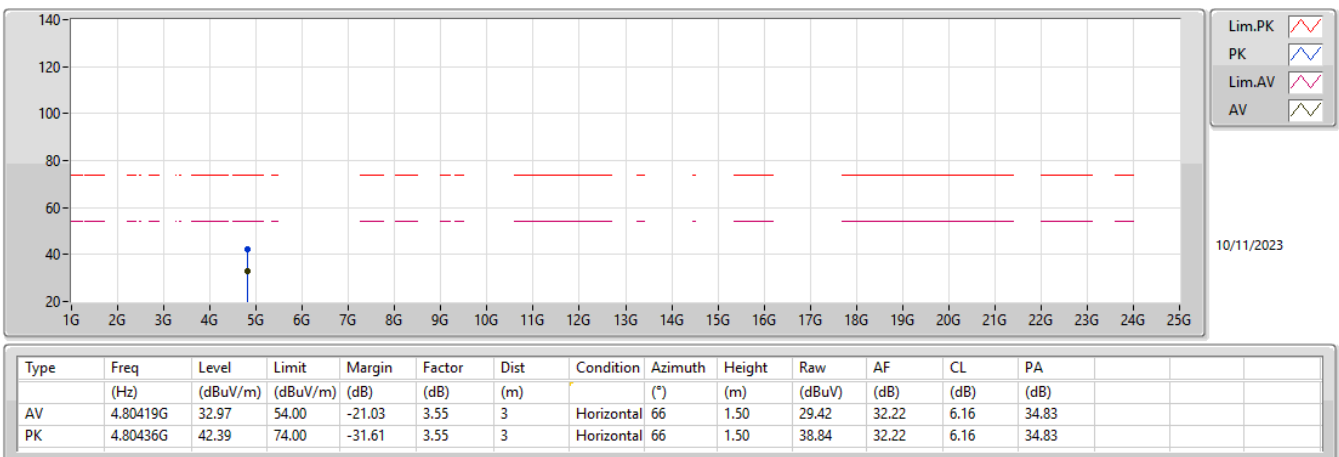
2.4-2.4835GHz_BT-LE(2Mbps)

2402MHz_TX



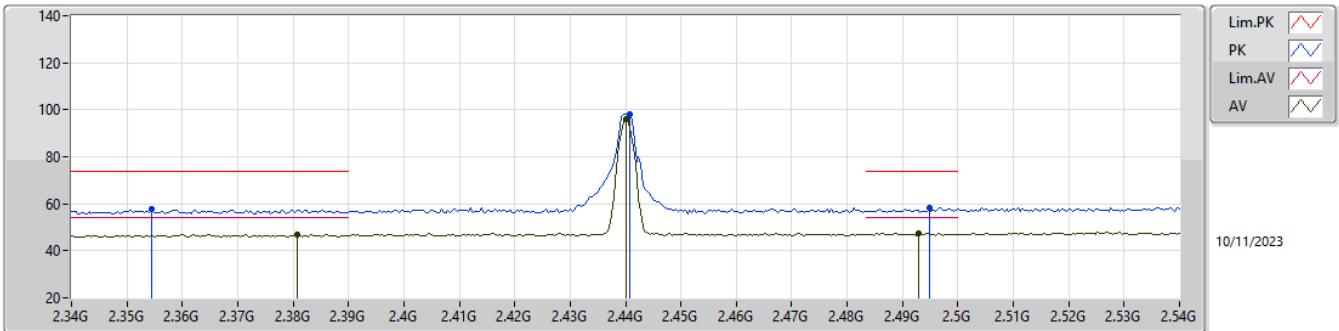
2.4-2.4835GHz_BT-LE(2Mbps)

2402MHz_TX



2.4-2.4835GHz_BT-LE(2Mbps)

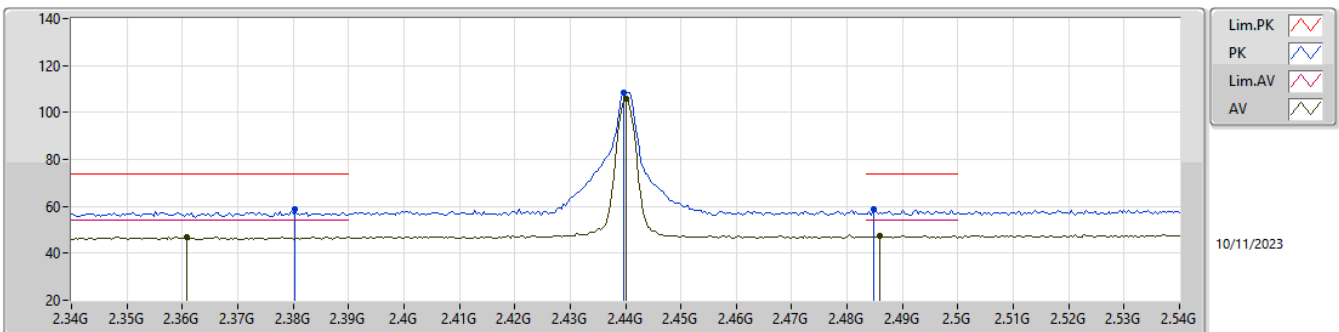
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3808G	47.11	54.00	-6.89	31.45	3	Vertical	317	1.16	15.66	27.21	4.24	-
AV	2.44G	96.07	Inf	-Inf	31.68	3	Vertical	317	1.16	64.39	27.40	4.28	-
AV	2.4928G	47.63	54.00	-6.37	31.92	3	Vertical	317	1.16	15.71	27.60	4.32	-
PK	2.3544G	57.59	74.00	-16.41	31.36	3	Vertical	317	1.16	26.23	27.14	4.22	-
PK	2.4408G	98.36	Inf	-Inf	31.68	3	Vertical	317	1.16	66.68	27.40	4.28	-
PK	2.4948G	58.22	74.00	-15.78	31.92	3	Vertical	317	1.16	26.30	27.60	4.32	-

2.4-2.4835GHz_BT-LE(2Mbps)

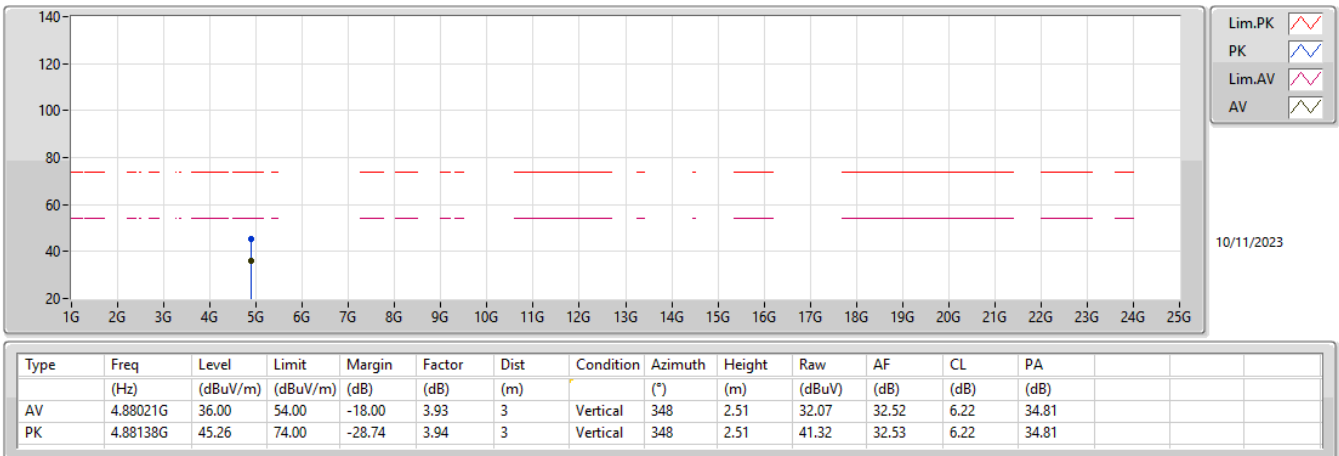
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3608G	47.14	54.00	-6.86	31.42	3	Horizontal	353	1.08	15.72	27.19	4.23	-
AV	2.44G	106.02	Inf	-Inf	31.68	3	Horizontal	353	1.08	74.34	27.40	4.28	-
AV	2.486G	47.54	54.00	-6.46	31.87	3	Horizontal	353	1.08	15.67	27.56	4.31	-
PK	2.3804G	58.65	74.00	-15.35	31.44	3	Horizontal	353	1.08	27.21	27.20	4.24	-
PK	2.4396G	108.35	Inf	-Inf	31.68	3	Horizontal	353	1.08	76.67	27.40	4.28	-
PK	2.4848G	58.55	74.00	-15.45	31.86	3	Horizontal	353	1.08	26.69	27.55	4.31	-

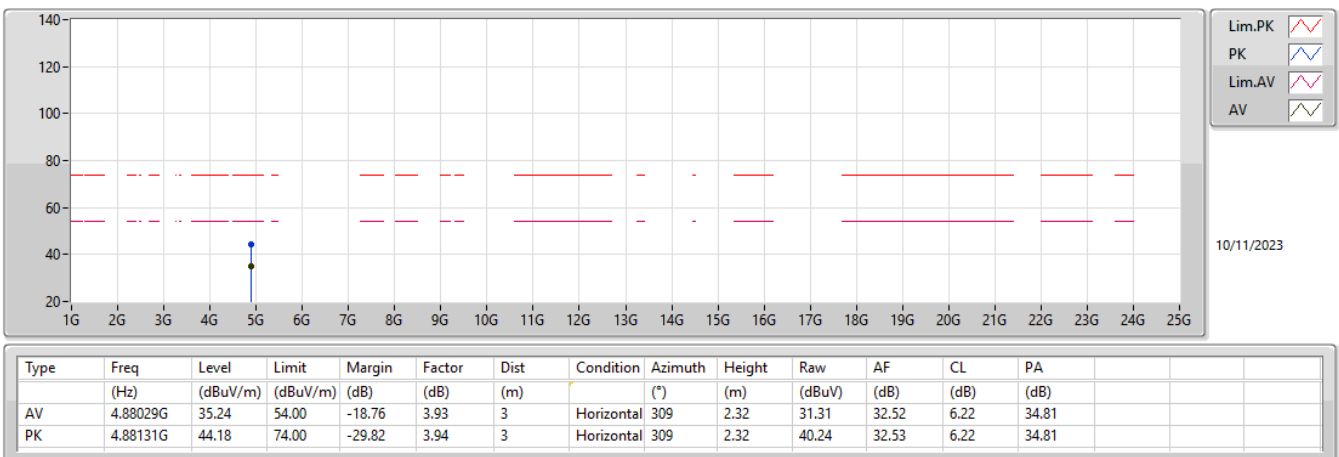
2.4-2.4835GHz_BT-LE(2Mbps)

2440MHz_TX



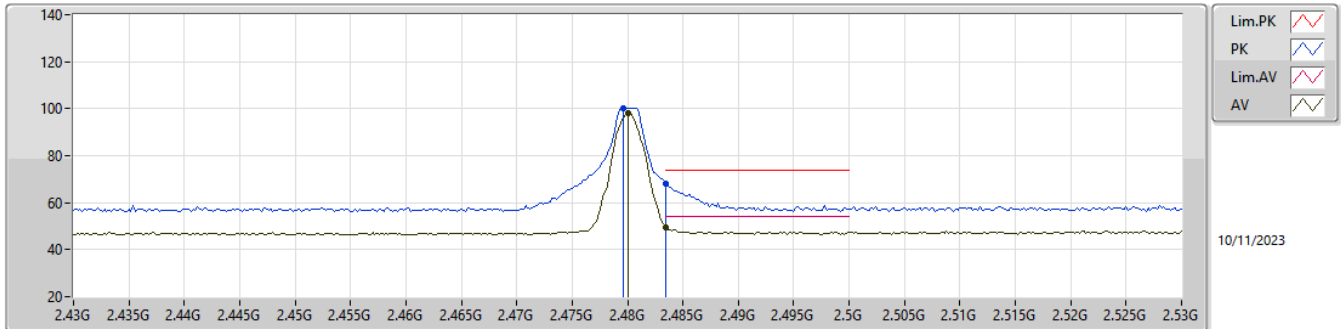
2.4-2.4835GHz_BT-LE(2Mbps)

2440MHz_TX



2.4-2.4835GHz_BT-LE(2Mbps)

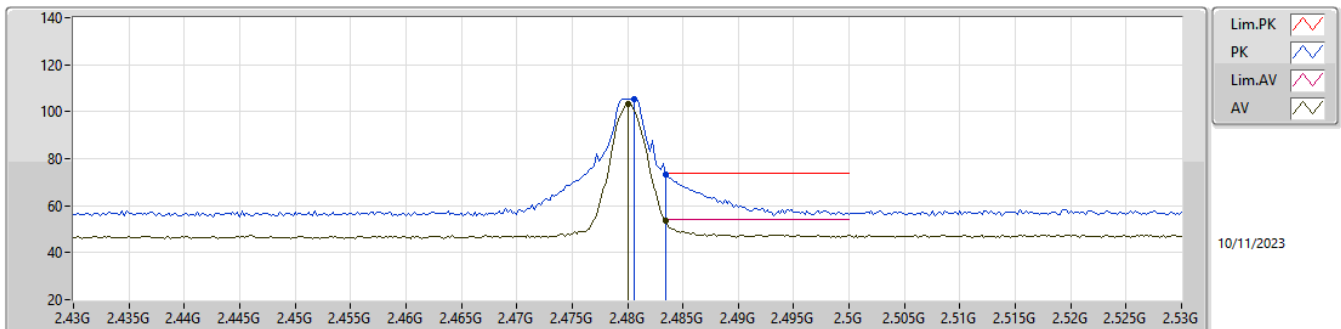
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	98.00	Inf	-Inf	31.81	3	Vertical	312	1.76	66.19	27.50	4.31	-
AV	2.4835G	49.54	54.00	-4.46	31.85	3	Vertical	312	1.76	17.69	27.54	4.31	-
PK	2.4796G	100.34	Inf	-Inf	31.81	3	Vertical	312	1.76	68.53	27.50	4.31	-
PK	2.4835G	68.12	74.00	-5.88	31.85	3	Vertical	312	1.76	36.27	27.54	4.31	-

2.4-2.4835GHz_BT-LE(2Mbps)

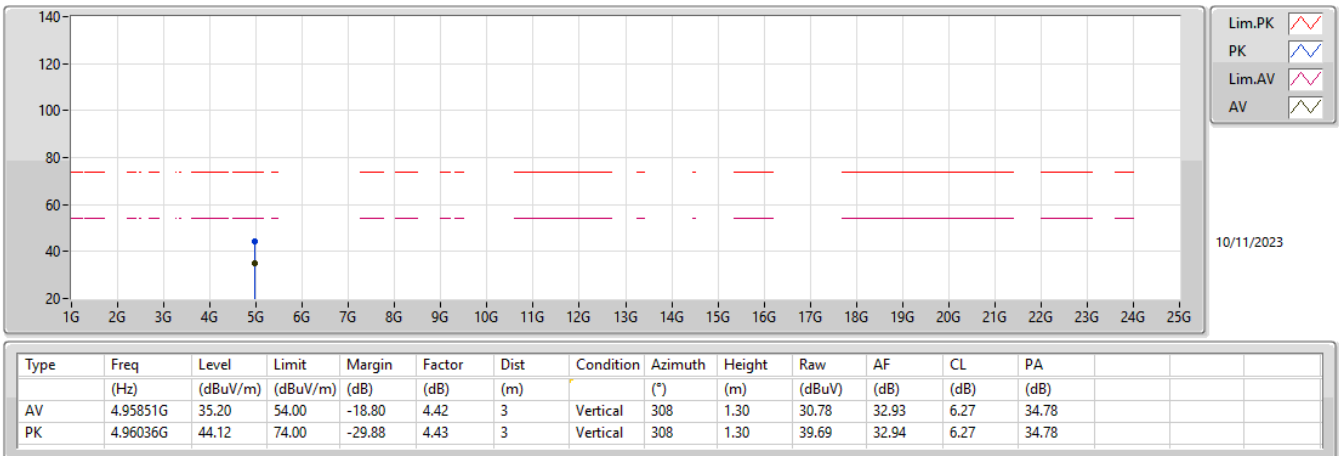
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	103.05	Inf	-Inf	31.81	3	Horizontal	13	1.99	71.24	27.50	4.31	-
AV	2.4835G	53.78	54.00	-0.22	31.85	3	Horizontal	13	1.99	21.93	27.54	4.31	-
PK	2.4806G	105.36	Inf	-Inf	31.82	3	Horizontal	13	1.99	73.54	27.51	4.31	-
PK	2.4835G	73.51	74.00	-0.49	31.85	3	Horizontal	13	1.99	41.66	27.54	4.31	-

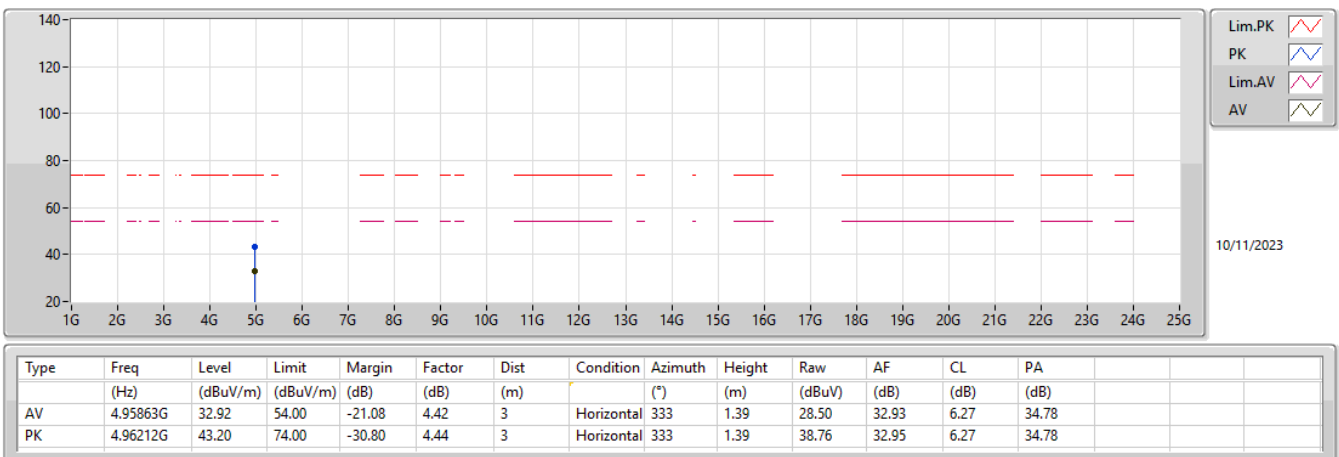
2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX



2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX





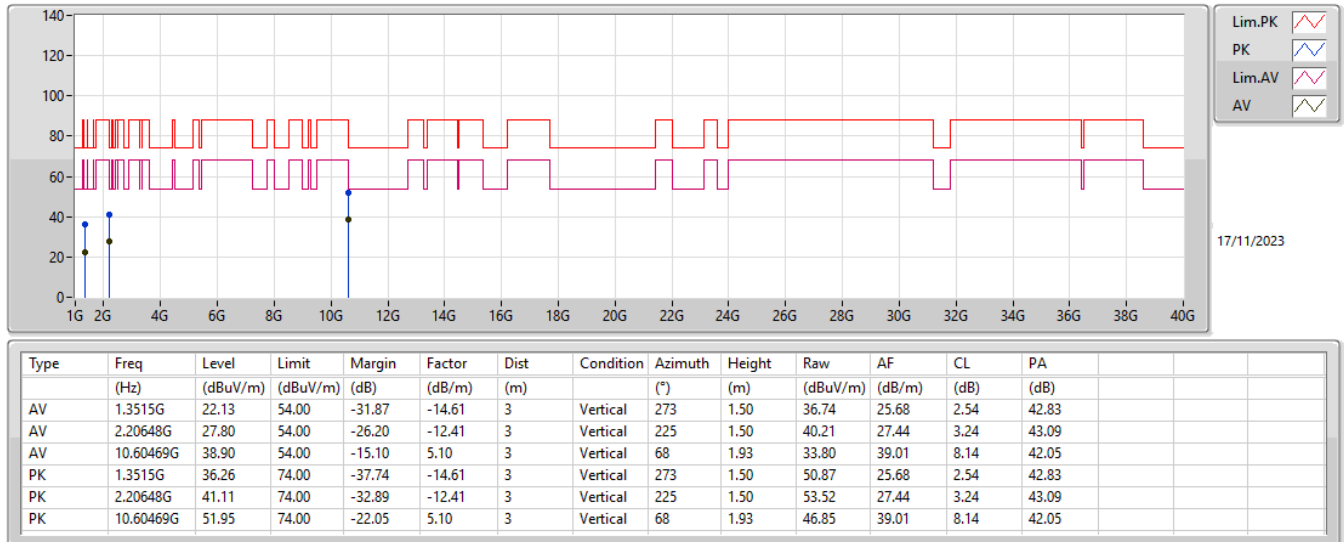
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	AV	10.60469G	38.90	54.00	-15.10	Vertical

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Mode 1	Pass	AV	1.3515G	22.13	54.00	-31.87	3	Vertical	273	1.50
Mode 1	Pass	AV	2.20648G	27.80	54.00	-26.20	3	Vertical	225	1.50
Mode 1	Pass	AV	10.60469G	38.90	54.00	-15.10	3	Vertical	68	1.93
Mode 1	Pass	PK	1.3515G	36.26	74.00	-37.74	3	Vertical	273	1.50
Mode 1	Pass	PK	2.20648G	41.11	74.00	-32.89	3	Vertical	225	1.50
Mode 1	Pass	PK	10.60469G	51.95	74.00	-22.05	3	Vertical	68	1.93
Mode 1	Pass	AV	1.35012G	25.30	54.00	-28.70	3	Horizontal	222	1.20
Mode 1	Pass	AV	2.0395G	22.29	68.20	-45.91	3	Horizontal	162	2.40
Mode 1	Pass	AV	3.70771G	26.39	54.00	-27.61	3	Horizontal	208	1.76
Mode 1	Pass	PK	1.35012G	37.45	74.00	-36.55	3	Horizontal	222	1.20
Mode 1	Pass	PK	2.0395G	36.15	88.20	-52.05	3	Horizontal	162	2.40
Mode 1	Pass	PK	3.70771G	40.46	74.00	-33.54	3	Horizontal	208	1.76

Radiated Emissions above 1GHz_Mode 1



Radiated Emissions above 1GHz_Mode 1

