

FCC Radio Test Report

FCC ID : OSDAVENTHO300
Equipment : OVER-EAR WIRELESS HEADPHONES
Brand Name : beyerdynamic
Model Name : AVENTHO 300
Applicant : Beyerdynamic
56 Central Avenue, Farmingdale, New York
11735 United States
Manufacturer : beyerdynamic GmbH & Co. KG
Theresienstraße 8, 74072 Heilbronn, Germany
Standard : 47 CFR FCC Part 15.247

The product was received on Jul. 03, 2024, and testing was started from Aug. 02, 2024 and completed on Aug. 16, 2024. 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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PHOTOGRAPHS OF EUT V01



History of this test report

TEL : 886-3-3273456
FAX : 886-3-3270973
Report Template No.: HE1-C10 Ver4.3
FCC ID: OSDAVENTHO300

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: Ben Tseng

Report Producer: Debby Hung

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	BT-LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
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 (1Mbps/2Mbps) modulation.
- ♦ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Toongin	S306300001000-A	Couple Chip Antenna	N/A	-1.11

Note 1: The EUT has one antenna.

For BT function:

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

Ant. 1 could transmit/receive.

1.1.3 EUT Information

Operational Condition			
EUT Power Type	From Battery		
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)	0.856	0.68	2.141m	1k
BT-LE(2Mbps)	0.578	2.38	1.085m	1k

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	Wayne Chiu	21.7~22.4℃ / 55~58%	08/Aug/2024
RF Conducted	TH07-HY	Yuna Lin	23.3~23.7℃ / 52~57%	02/Aug/2024~03/Aug/2024
☒ 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. TW0008 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated (Below 1GHz)	03CH24-HY	Daniel Lin	22.7~24.6℃ / 52~57%	07/Aug/2024
Radiated (Above 1GHz)	03CH25-HY	Daniel Lin	22.5~24.1℃ / 51~55%	07/Aug/2024~16/Aug/2024

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%
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	BlueTest3 3.3.18
-----------------------	------------------

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
2	USB 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		
2	USB Mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT			V

2.3 Accessories

Accessories				
Battery	Brand Name	SYNERGY	Model Name	AHB723938PCT-04
	Power Rating	3,7 Vdc, 1110 mAh	Type	Rechargeable Li-ion Battery Pack
USB-C charging cable	Brand Name	beyerdynamic	Model Name	4021XW01978ZAU
	Signal Line	0.8 meter, D-shielded cable, w/o ferrite core		
3.5mm TRS audio cable	Brand Name	beyerdynamic	Model Name	4021XW01977ZAG
	Signal Line	1.2 meter, Non-shielded cable, w/o ferrite core		
USB-C to USB-A adapter	Brand Name	beyerdynamic	Model Name	2031JP00066ZA

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

2.4 Support Equipment

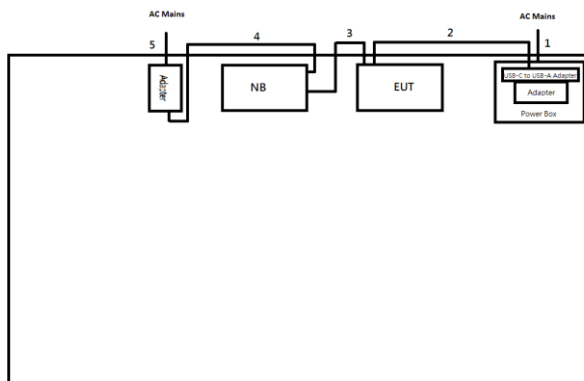
Support Equipment – AC Conduction					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	HP	HSTNN-142C	-	-
2	Adapter for NB	HP	HSTNN-CA40	-	-
3	Adapter	Apple	A2305	-	-
4	AC Power Cable	Power sync	TPCMRN0018	-	-

Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-

Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	HP	HSTNN-142C	-	-
2	Adapter for NB	HP	HSTNN-CA40	-	-
3	Adapter	Apple	A2305	-	-
4	AC Power Cable	Power sync	TPCMRN0018	-	-

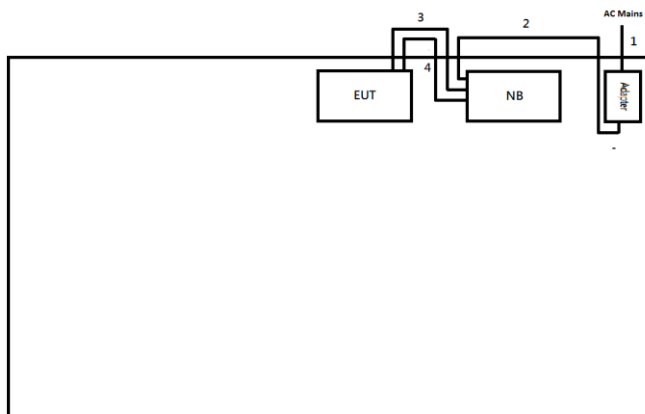
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test (Adapter Mode)

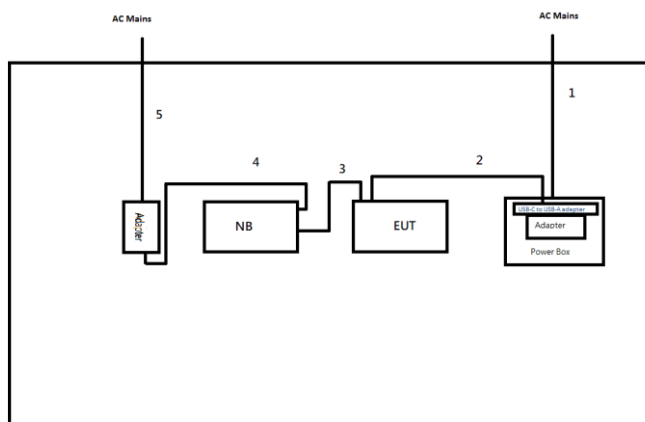


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.0	-
2	USB-C charging cable	Yes	0.8	-
3	Audio cable	No	1.2	-
4	DC Power cable	No	1.8	-
5	AC Power cable	No	1.8	-

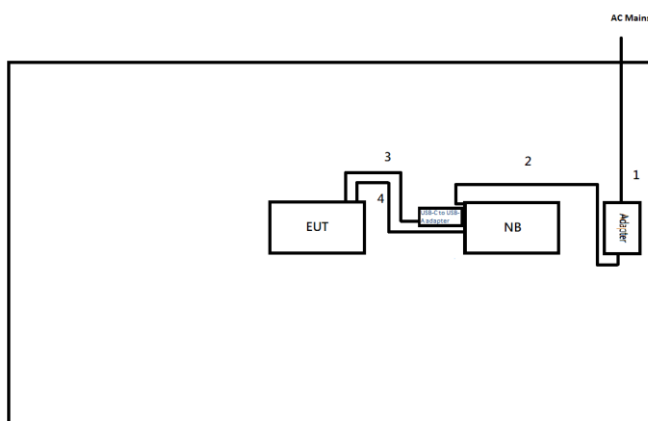
Test Setup Diagram – AC Line Conducted Emission Test (USB Mode)



Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	DC Power cable	No	1.8	-
3	USB-C charging cable	Yes	0.8	-
4	Audio cable	No	1.2	-

Test Setup Diagram - Radiated Test (Adapter Mode)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	USB-C charging cable	Yes	0.8	-
3	Audio cable	No	1.2	-
4	DC Power cable	No	1.8	-
5	AC Power cable	No	1.8	-

Test Setup Diagram - Radiated Test (USB Mode)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	DC Power cable	No	1.8	-
3	USB-C charging cable	Yes	0.8	-
4	Audio cable	No	1.2	-

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

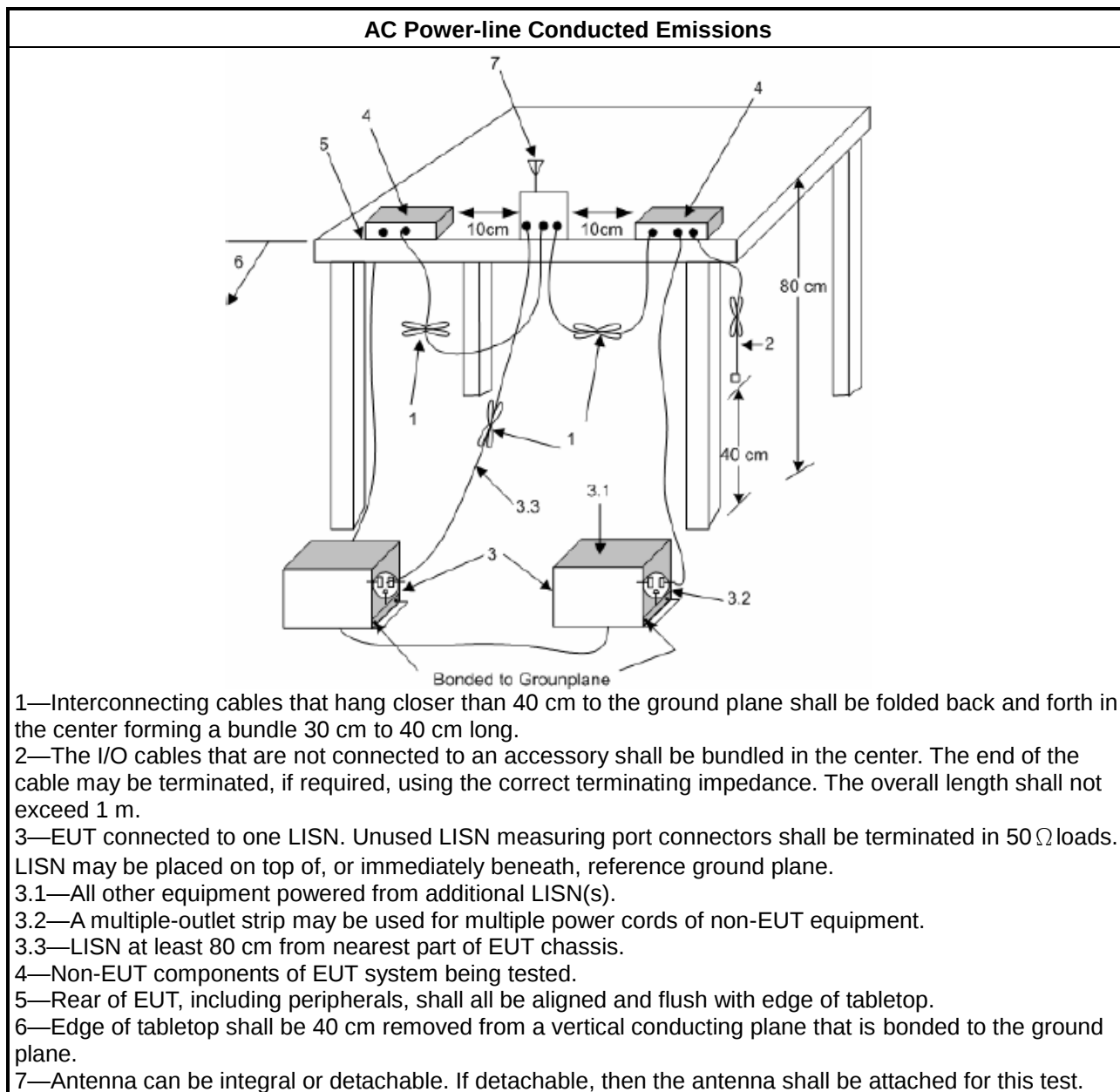
Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

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.

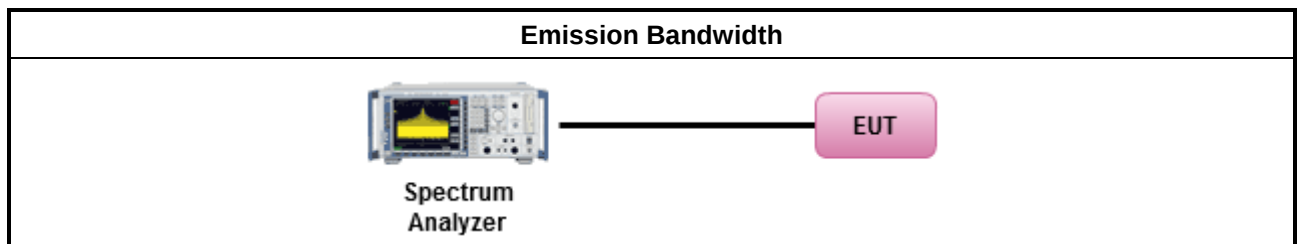
3.2.2 Measuring Instruments

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.	

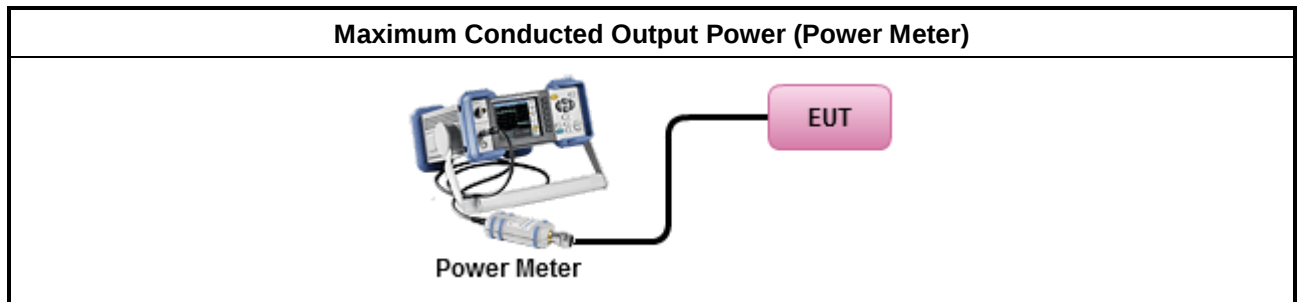
3.3.2 Measuring Instruments

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

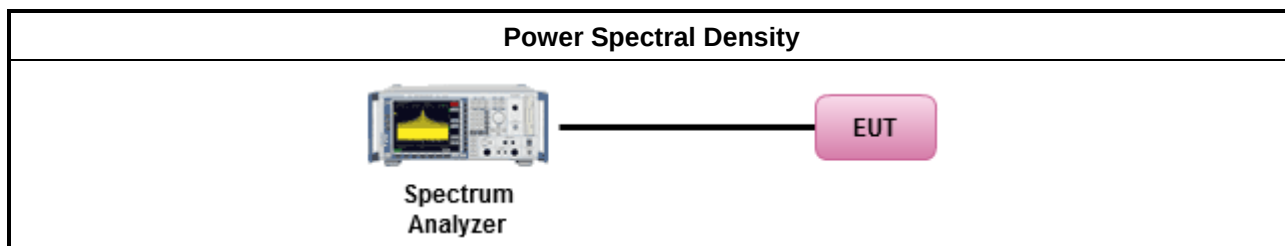
3.4.2 Measuring Instruments

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.	

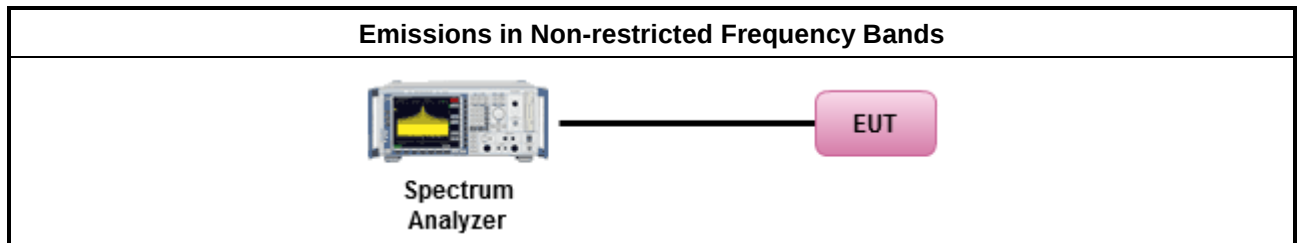
3.5.2 Measuring Instruments

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

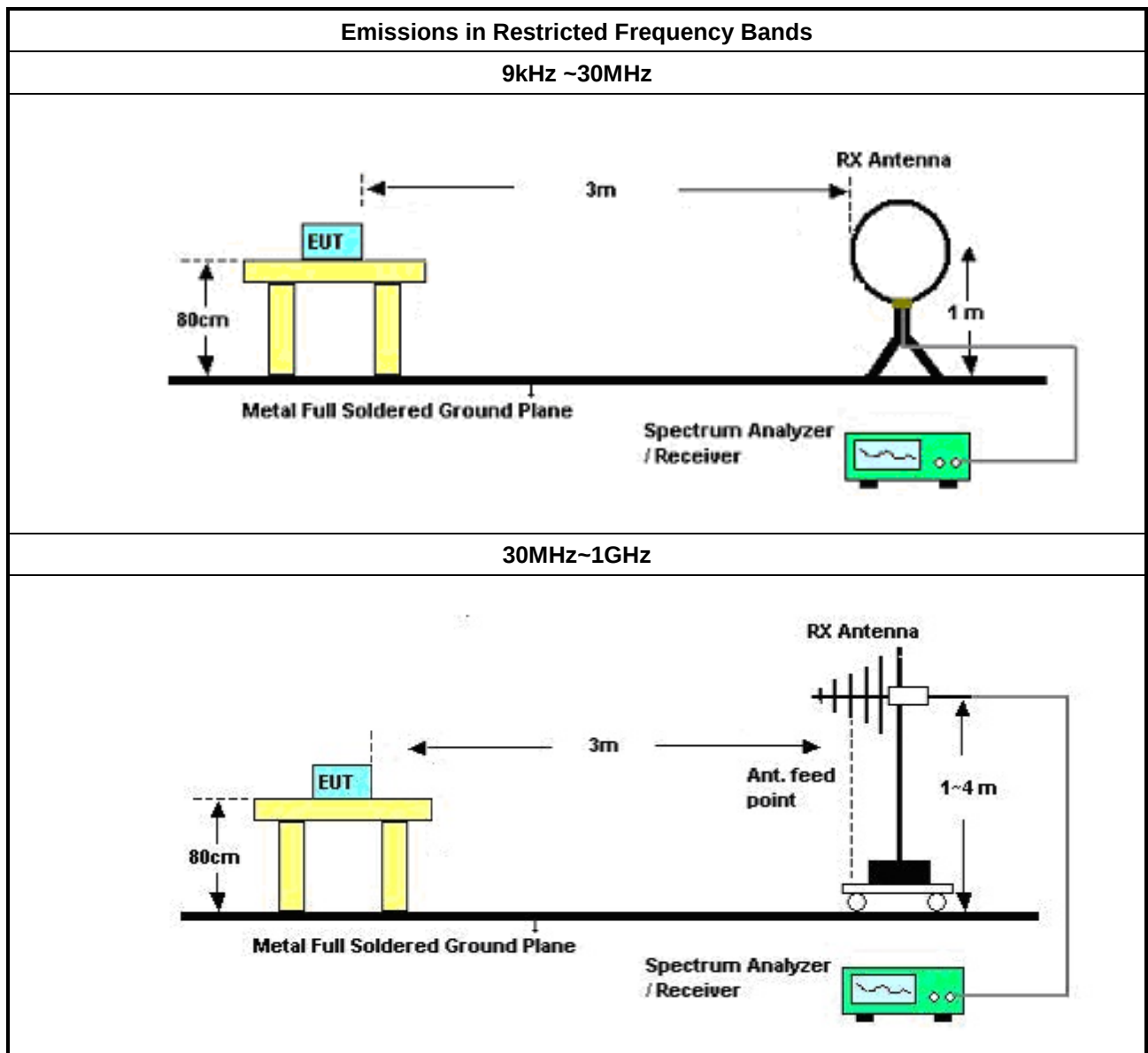
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted 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.

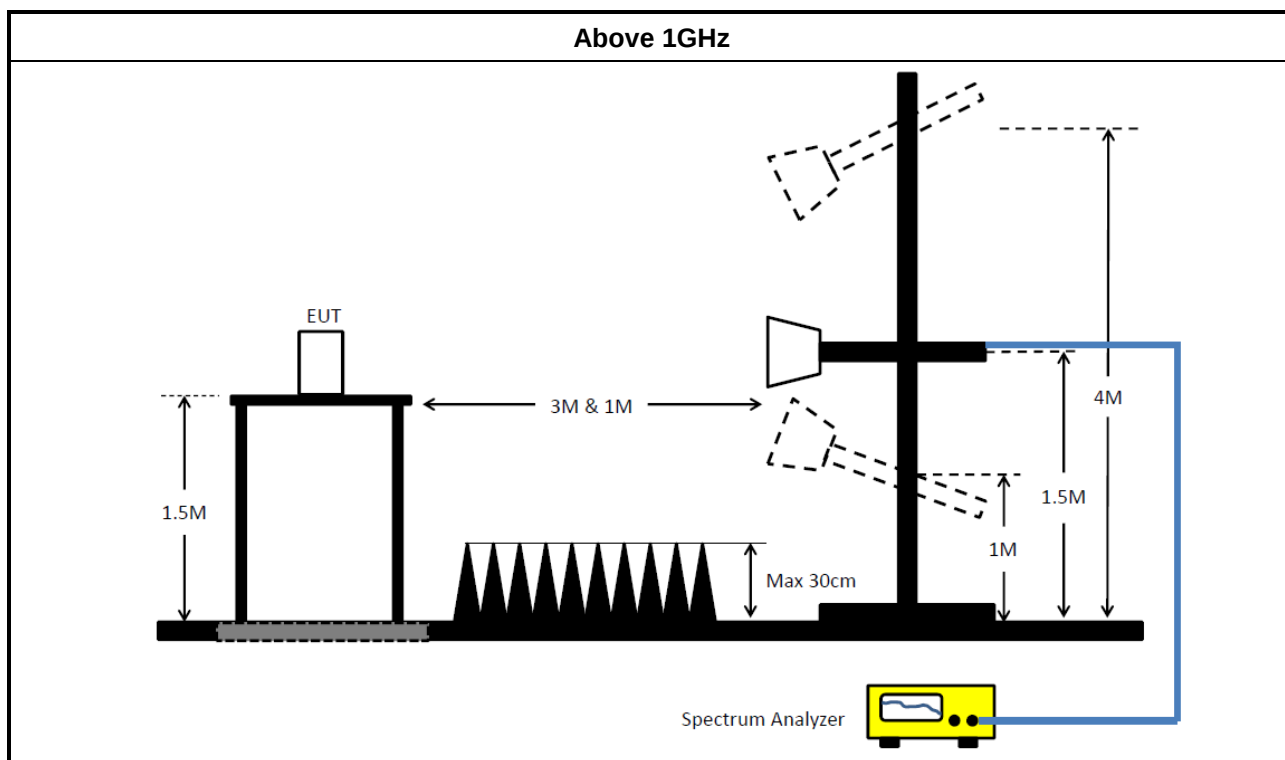
3.6.4 Measurement Results Calculation

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	ROHDE & SCHWARZ	ESR3	102051	9kHz ~ 3.6GHz	17/May/2024	16/May/2025
Two-Line V-Network	ROHDE & SCHWARZ	ENV 216	101274.00000	9kHz ~ 30MHz	18/Jun/2024	17/Jun/2025
RF Cable 5m	TITAN	TITAN	CO04-cable-01	9 kHz~200MHz	27/Feb/2024	26/Feb/2025
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	FSV3044	101439	10Hz~44GHz	30/Nov/2023	29/Nov/2024
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	20/Oct/2023	19/Oct/2024
Power Meter	Anritsu	ML2495A	1517010	300MHz~40GHz	15/Dec/2023	14/Dec/2024
Pulse Sensor	Anritsu	MA2411B	1339407	300MHz~40GHz	15/Dec/2023	14/Dec/2024
SENSE-15247_FS	Sporton	V5.11.18	N/A	N/A	N/A	N/A

Instrument for Radiated Test (Below 1GHz) (03CH24-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH24-HY	30MHz~1GHz 3m	17/Aug/2023	16/Aug/2024
EMI Test Receiver	ROHDE & SCHWARZ	ESR	102318	9kHz~3.6GHz	27/Dec/2023	26/Dec/2024
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	19/Mar/2024	18/Mar/2025
Bilog Antenna & 6dB Attenuator	TESEQ / Woken	CBL 6112D / 00800N1D01N-06	35376 / 02	30MHz~1GHz	14/Apr/2024	13/Apr/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB002	9kHz~1GHz	19/Jun/2024	18/Jun/2025
Pre-Amplifier	Aglient	8447D	2944A06292	30MHz~1GHz	18/Apr/2024	17/Apr/2025
SENSE-15247-FS	Sporton	V5.11.18	NA	NA	NA	NA

**Instrument for Radiated Test (Above 1GHz) (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	FSV3044	101410	10Hz~44GHz	17/Nov/2023	16/Nov/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02876	1GHz~18GHz	11/Jul/2024	10/Jul/2025
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz~40GHz	04/Jun/2024	03/Jun/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB007	1GHz~40GHz	23/Apr/2024	22/Apr/2025
Preamplifier	SGH	PRAMP 118-H	20230515-3	1GHz ~18GHz	24/May/2024	23/May/2025
Microwave Premplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz ~ 40GHz	19/Apr/2024	18/Apr/2025
SENSE-15247-FS	Sporton	V5.11.18	NA	NA	NA	NA



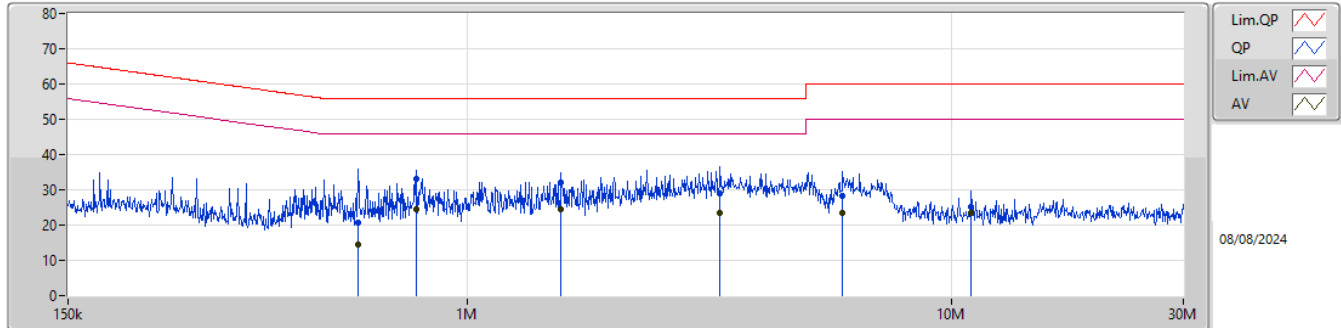
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	1.569M	28.66	46.00	-17.34	Neutral
Mode 2	Pass	QP	162.467k	47.66	65.33	-17.67	Neutral

Result

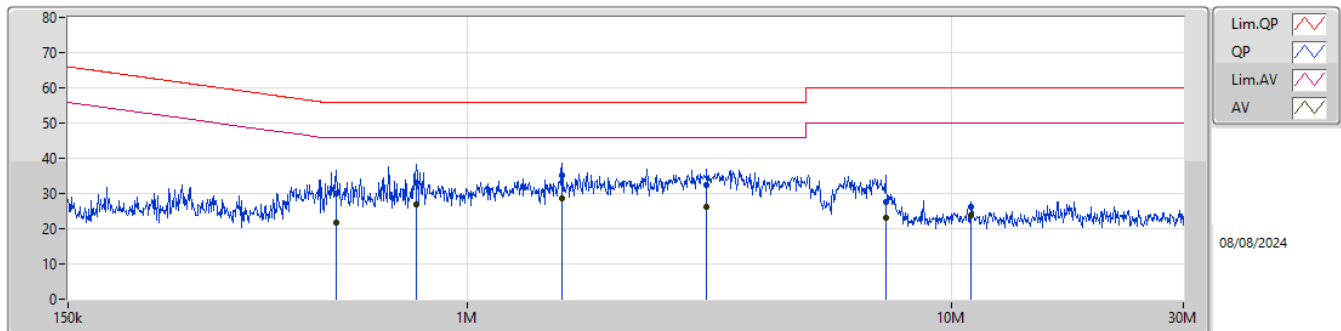
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	594.596k	20.70	56.00	-35.30	Line	-
Mode 1	Pass	AV	594.596k	14.37	46.00	-31.63	Line	-
Mode 1	Pass	QP	783.156k	33.18	56.00	-22.82	Line	-
Mode 1	Pass	AV	783.156k	24.38	46.00	-21.62	Line	-
Mode 1	Pass	QP	1.562M	32.22	56.00	-23.78	Line	-
Mode 1	Pass	AV	1.562M	24.50	46.00	-21.50	Line	-
Mode 1	Pass	QP	3.322M	28.98	56.00	-27.02	Line	-
Mode 1	Pass	AV	3.322M	23.30	46.00	-22.70	Line	-
Mode 1	Pass	QP	5.951M	28.24	60.00	-31.76	Line	-
Mode 1	Pass	AV	5.951M	23.62	50.00	-26.38	Line	-
Mode 1	Pass	QP	10.961M	25.19	60.00	-34.81	Line	-
Mode 1	Pass	AV	10.961M	23.34	50.00	-26.66	Line	-
Mode 1	Pass	QP	535.976k	29.83	56.00	-26.17	Neutral	-
Mode 1	Pass	AV	535.976k	21.73	46.00	-24.27	Neutral	-
Mode 1	Pass	QP	786.289k	33.06	56.00	-22.94	Neutral	-
Mode 1	Pass	AV	786.289k	26.83	46.00	-19.17	Neutral	-
Mode 1	Pass	QP	1.569M	35.11	56.00	-20.89	Neutral	-
Mode 1	Pass	AV	1.569M	28.66	46.00	-17.34	Neutral	-
Mode 1	Pass	QP	3.117M	32.48	56.00	-23.52	Neutral	-
Mode 1	Pass	AV	3.117M	26.05	46.00	-19.95	Neutral	-
Mode 1	Pass	QP	7.294M	27.65	60.00	-32.35	Neutral	-
Mode 1	Pass	AV	7.294M	22.95	50.00	-27.05	Neutral	-
Mode 1	Pass	QP	10.961M	26.12	60.00	-33.88	Neutral	-
Mode 1	Pass	AV	10.961M	23.66	50.00	-26.34	Neutral	-
Mode 2	Pass	QP	161.82k	46.88	65.37	-18.49	Line	-
Mode 2	Pass	AV	161.82k	32.77	55.37	-22.60	Line	-
Mode 2	Pass	QP	233.633k	36.84	62.31	-25.47	Line	-
Mode 2	Pass	AV	233.633k	22.88	52.31	-29.43	Line	-
Mode 2	Pass	QP	483.136k	31.93	56.29	-24.36	Line	-
Mode 2	Pass	AV	483.136k	26.55	46.29	-19.74	Line	-
Mode 2	Pass	QP	1.375M	24.95	56.00	-31.05	Line	-
Mode 2	Pass	AV	1.375M	21.57	46.00	-24.43	Line	-
Mode 2	Pass	QP	3.701M	27.01	56.00	-28.99	Line	-
Mode 2	Pass	AV	3.701M	19.92	46.00	-26.08	Line	-
Mode 2	Pass	QP	8.19M	25.67	60.00	-34.33	Line	-
Mode 2	Pass	AV	8.19M	21.63	50.00	-28.37	Line	-
Mode 2	Pass	QP	162.467k	47.66	65.33	-17.67	Neutral	-
Mode 2	Pass	AV	162.467k	32.58	55.33	-22.75	Neutral	-
Mode 2	Pass	QP	245.097k	35.80	61.93	-26.13	Neutral	-
Mode 2	Pass	AV	245.097k	23.57	51.93	-28.36	Neutral	-
Mode 2	Pass	QP	492.876k	28.08	56.11	-28.03	Neutral	-
Mode 2	Pass	AV	492.876k	22.01	46.11	-24.10	Neutral	-
Mode 2	Pass	QP	1.364M	25.76	56.00	-30.24	Neutral	-
Mode 2	Pass	AV	1.364M	22.87	46.00	-23.13	Neutral	-
Mode 2	Pass	QP	3.019M	23.33	56.00	-32.67	Neutral	-
Mode 2	Pass	AV	3.019M	19.57	46.00	-26.43	Neutral	-
Mode 2	Pass	QP	6.898M	28.39	60.00	-31.61	Neutral	-
Mode 2	Pass	AV	6.898M	24.08	50.00	-25.92	Neutral	-

Conducted Emissions at Powerline_Mode 1



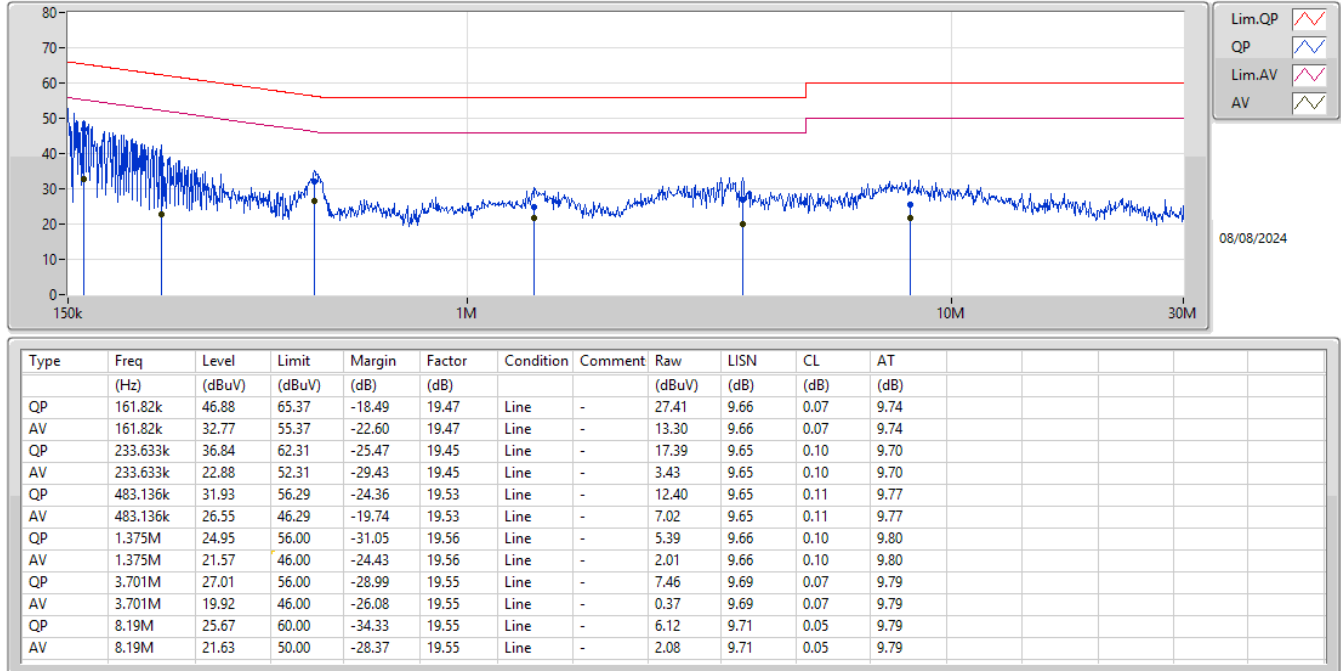
Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)						
QP	594.596k	20.70	56.00	-35.30	19.54	Line	-	1.16	9.65	0.11	9.78						
AV	594.596k	14.37	46.00	-31.63	19.54	Line	-	-5.17	9.65	0.11	9.78						
QP	783.156k	33.18	56.00	-22.82	19.55	Line	-	13.63	9.66	0.10	9.79						
AV	783.156k	24.38	46.00	-21.62	19.55	Line	-	4.83	9.66	0.10	9.79						
QP	1.562M	32.22	56.00	-23.78	19.57	Line	-	12.65	9.67	0.10	9.80						
AV	1.562M	24.50	46.00	-21.50	19.57	Line	-	4.93	9.67	0.10	9.80						
QP	3.322M	28.98	56.00	-27.02	19.55	Line	-	9.43	9.68	0.08	9.79						
AV	3.322M	23.30	46.00	-22.70	19.55	Line	-	3.75	9.68	0.08	9.79						
QP	5.951M	28.24	60.00	-31.76	19.55	Line	-	8.69	9.70	0.06	9.79						
AV	5.951M	23.62	50.00	-26.38	19.55	Line	-	4.07	9.70	0.06	9.79						
QP	10.961M	25.19	60.00	-34.81	19.57	Line	-	5.62	9.71	0.06	9.80						
AV	10.961M	23.34	50.00	-26.66	19.57	Line	-	3.77	9.71	0.06	9.80						

Conducted Emissions at Powerline_Mode 1

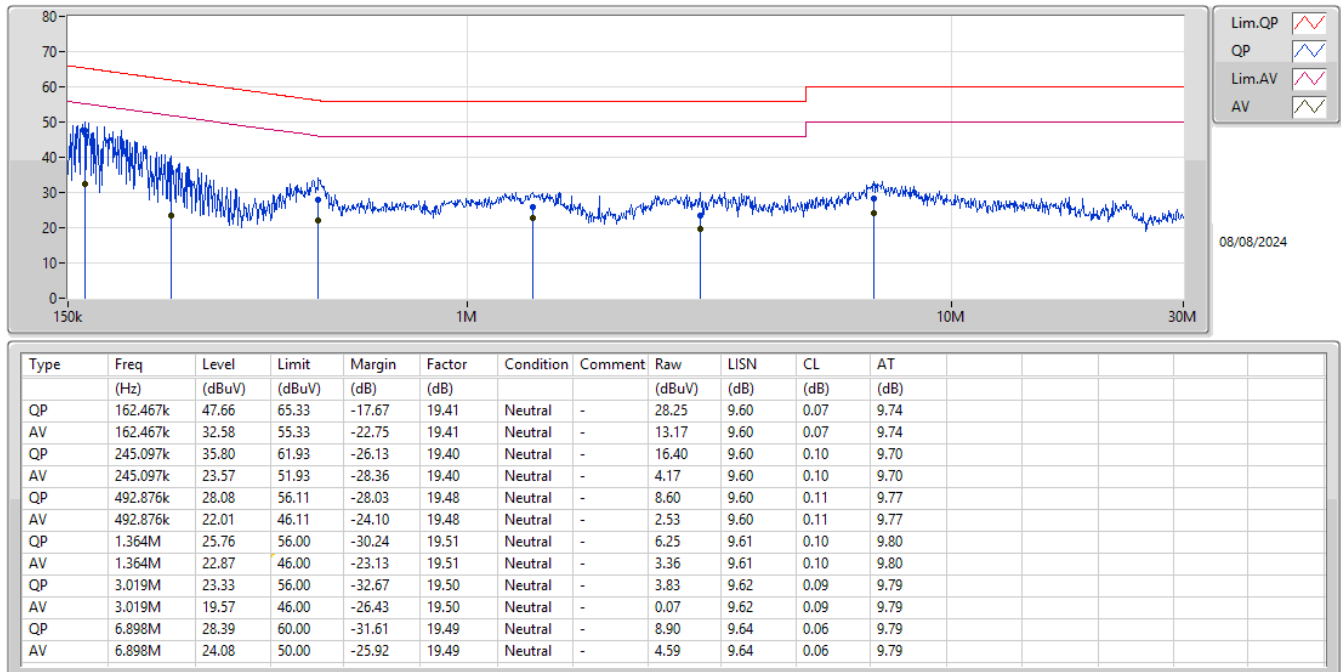


Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)						
QP	535.976k	29.83	56.00	-26.17	19.48	Neutral	-	10.35	9.60	0.11	9.77						
AV	535.976k	21.73	46.00	-24.27	19.48	Neutral	-	2.25	9.60	0.11	9.77						
QP	786.289k	33.06	56.00	-22.94	19.50	Neutral	-	13.56	9.61	0.10	9.79						
AV	786.289k	26.83	46.00	-19.17	19.50	Neutral	-	7.33	9.61	0.10	9.79						
QP	1.569M	35.11	56.00	-20.89	19.51	Neutral	-	15.60	9.61	0.10	9.80						
AV	1.569M	28.66	46.00	-17.34	19.51	Neutral	-	9.15	9.61	0.10	9.80						
QP	3.117M	32.48	56.00	-23.52	19.49	Neutral	-	12.99	9.62	0.08	9.79						
AV	3.117M	26.05	46.00	-19.95	19.49	Neutral	-	6.56	9.62	0.08	9.79						
QP	7.294M	27.65	60.00	-32.35	19.50	Neutral	-	8.15	9.65	0.06	9.79						
AV	7.294M	22.95	50.00	-27.05	19.50	Neutral	-	3.45	9.65	0.06	9.79						
QP	10.961M	26.12	60.00	-33.88	19.52	Neutral	-	6.60	9.66	0.06	9.80						
AV	10.961M	23.66	50.00	-26.34	19.52	Neutral	-	4.14	9.66	0.06	9.80						

Conducted Emissions at Powerline_Mode 2



Conducted Emissions at Powerline_Mode 2



**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)	725k	1.05M	1M05F1D	671.25k	1.036M
BT-LE(2Mbps)	1.405M	2.101M	2M10F1D	1.308M	2.08M

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

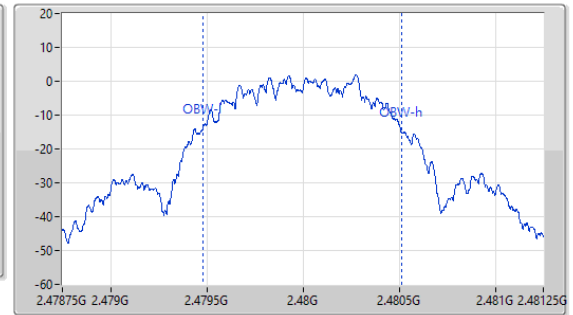
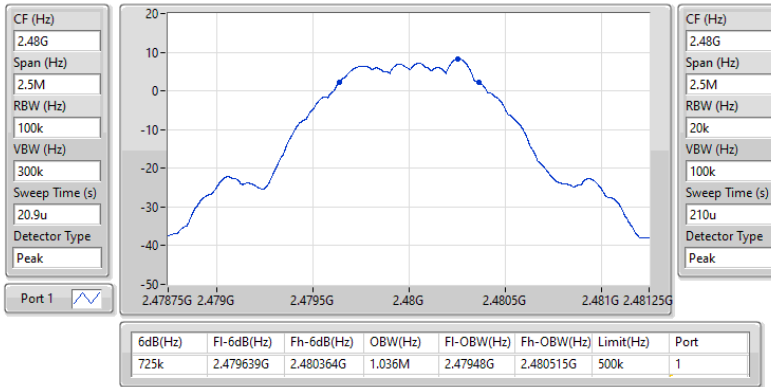
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	701.25k	1.05M
2440MHz	Pass	500k	671.25k	1.05M
2480MHz	Pass	500k	725k	1.036M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.308M	2.095M
2440MHz	Pass	500k	1.405M	2.08M
2480MHz	Pass	500k	1.373M	2.101M

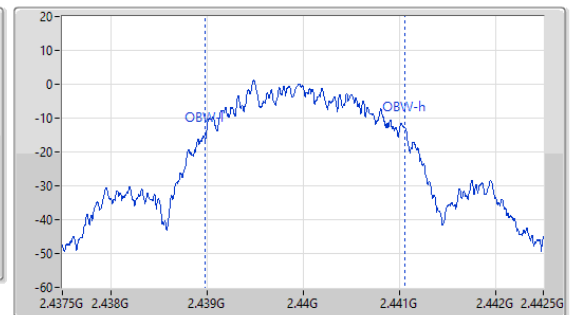
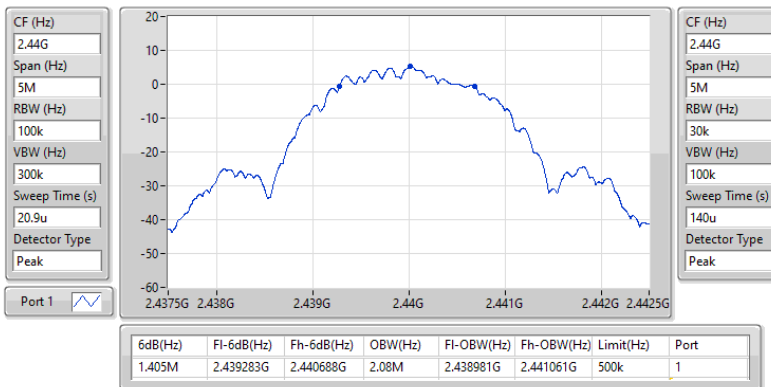
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

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

02/08/2024


2.4-2.4835GHz_BT-LE(2Mbps)
EBW-DTS
2440MHz

02/08/2024





Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	9.10	0.00813
BT-LE(2Mbps)	9.05	0.00804



Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	-1.11	8.01	30.00
2440MHz	Pass	-1.11	8.94	30.00
2480MHz	Pass	-1.11	9.10	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	-1.11	7.96	30.00
2440MHz	Pass	-1.11	8.81	30.00
2480MHz	Pass	-1.11	9.05	30.00

DG = Directional Gain; Port X = Port X output power;
Inf = There's no restriction for the limit.



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-7.94
BT-LE(2Mbps)	-10.12

RBW = 3kHz;

Result

Mode	Result	DG (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	-1.11	-8.85	8.00
2440MHz	Pass	-1.11	-8.32	8.00
2480MHz	Pass	-1.11	-7.94	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	-1.11	-11.24	8.00
2440MHz	Pass	-1.11	-10.99	8.00
2480MHz	Pass	-1.11	-10.12	8.00

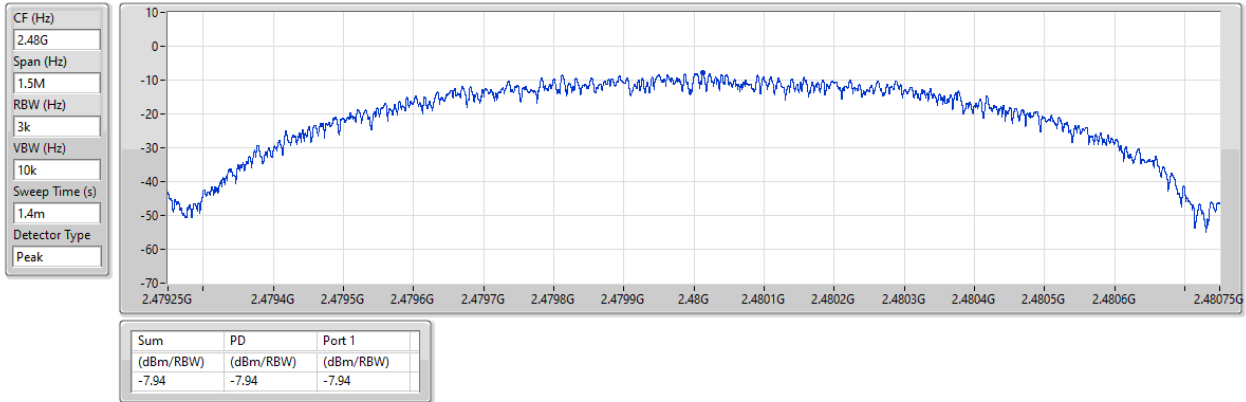
DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;
Inf = There's no restriction for the limit.

2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2480MHz

02/08/2024

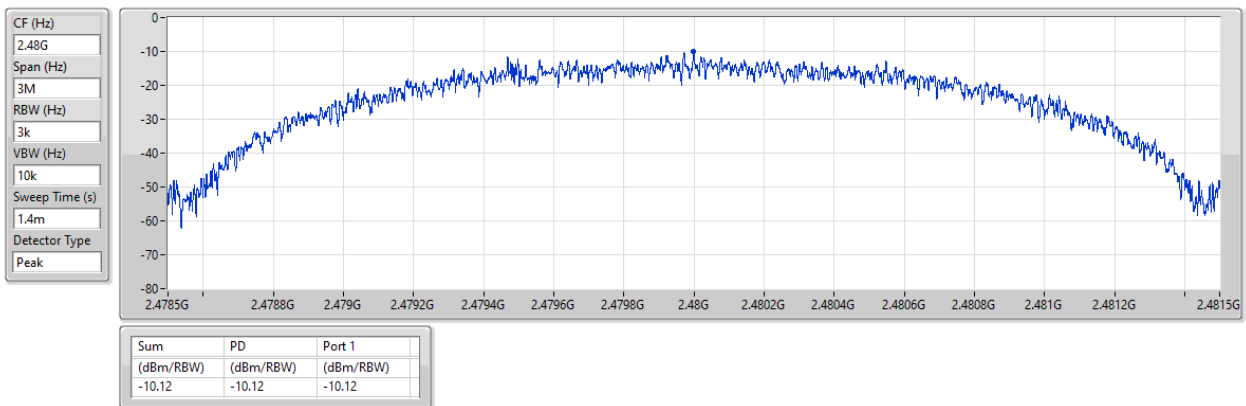


2.4-2.4835GHz_BT-LE(2Mbps)

PSD

2480MHz

02/08/2024





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	2.48033G	8.99	-21.01	2.192G	-54.63	2.4G	-44.44	2.4G	-44.75	2.50334G	-52.43	21.53554G	-43.64	1
BT-LE(2Mbps)	Pass	2.47949G	8.06	-21.94	1.863G	-53.68	2.4G	-24.29	2.4G	-23.60	2.50054G	-52.58	21.95735G	-44.06	1

Result

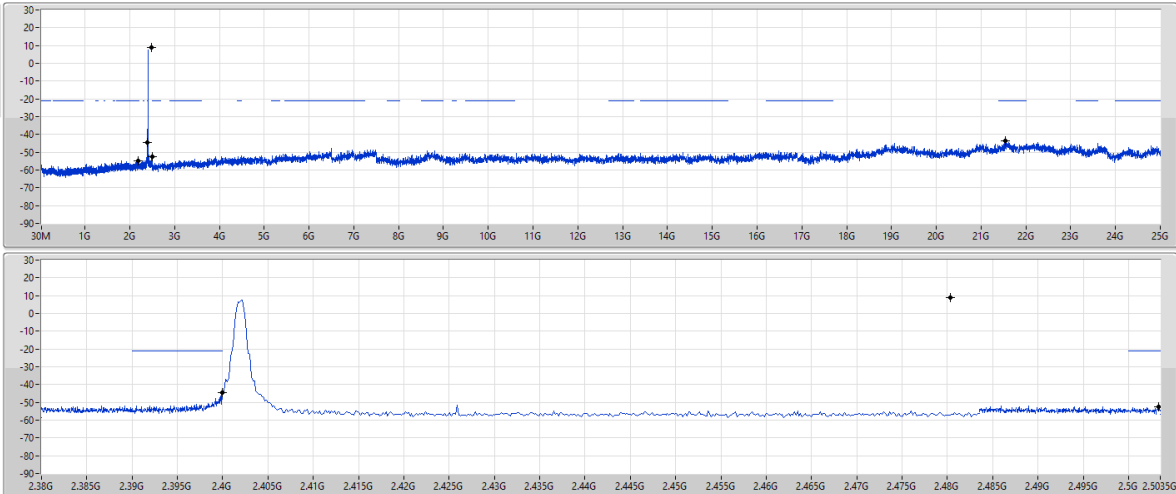
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.48033G	8.99	-21.01	2.192G	-54.63	2.4G	-44.44	2.4G	-44.75	2.50334G	-52.43	21.53554G	-43.64	1
2440MHz	Pass	2.48033G	8.99	-21.01	1.74785G	-55.04	2.39212G	-52.52	2.4G	-57.52	2.5029G	-52.46	21.59178G	-43.62	1
2480MHz	Pass	2.48033G	8.99	-21.01	2.30715G	-54.94	2.39776G	-51.88	2.4G	-57.99	2.5019G	-52.47	21.66771G	-43.92	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.47949G	8.06	-21.94	1.863G	-53.68	2.4G	-24.29	2.4G	-23.60	2.50054G	-52.58	21.95735G	-44.06	1
2440MHz	Pass	2.47949G	8.06	-21.94	1.74668G	-55.62	2.39248G	-52.59	2.4G	-56.86	2.50134G	-52.50	21.65646G	-44.24	1
2480MHz	Pass	2.47949G	8.06	-21.94	2.30245G	-54.77	2.39936G	-51.21	2.4G	-56.05	2.50114G	-52.90	21.61709G	-44.38	1

2.4-2.4835GHz_BT-LE(1Mbps)

CSEndB-DTS

2402MHz

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

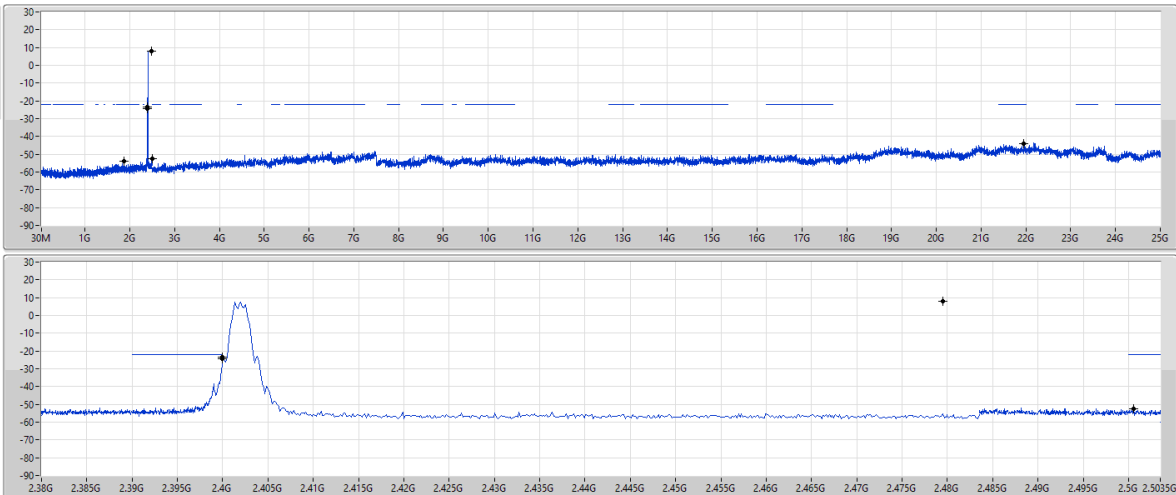


2.4-2.4835GHz_BT-LE(2Mbps)

CSEndB-DTS

2402MHz

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





Summary

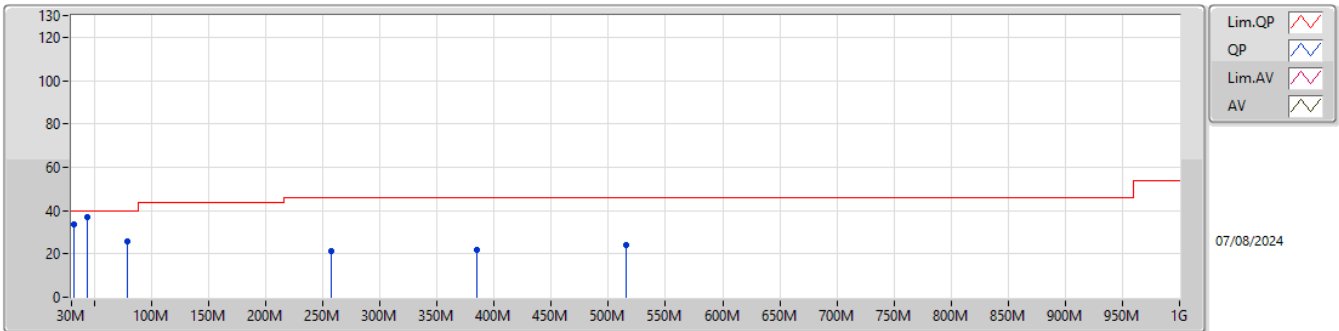
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-LE(2Mbps)	Pass	PK	43.58M	36.75	40.00	-3.25	3	Vertical	360	1.00

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-
2440MHz_USB	Pass	PK	31.94M	29.64	40.00	-10.36	3	Vertical	360	1.00
2440MHz_USB	Pass	PK	59.1M	21.19	40.00	-18.81	3	Vertical	360	1.00
2440MHz_USB	Pass	PK	90.14M	19.74	43.50	-23.76	3	Vertical	360	1.00
2440MHz_USB	Pass	PK	258.92M	20.72	46.00	-25.28	3	Vertical	360	1.00
2440MHz_USB	Pass	PK	390.84M	22.28	46.00	-23.72	3	Vertical	360	1.00
2440MHz_USB	Pass	PK	482.02M	24.02	46.00	-21.98	3	Vertical	360	1.00
2440MHz_USB	Pass	PK	30M	24.13	40.00	-15.87	3	Horizontal	0	1.00
2440MHz_USB	Pass	PK	61.04M	17.18	40.00	-22.82	3	Horizontal	0	1.00
2440MHz_USB	Pass	PK	101.78M	23.09	43.50	-20.41	3	Horizontal	0	1.00
2440MHz_USB	Pass	PK	258.92M	21.65	46.00	-24.35	3	Horizontal	0	1.00
2440MHz_USB	Pass	PK	346.22M	22.07	46.00	-23.93	3	Horizontal	0	1.00
2440MHz_USB	Pass	PK	427.7M	27.42	46.00	-18.58	3	Horizontal	0	1.00
2440MHz_Adapter	Pass	PK	31.94M	33.55	40.00	-6.45	3	Vertical	360	1.00
2440MHz_Adapter	Pass	PK	43.58M	36.75	40.00	-3.25	3	Vertical	360	1.00
2440MHz_Adapter	Pass	PK	78.5M	25.70	40.00	-14.30	3	Vertical	360	1.00
2440MHz_Adapter	Pass	PK	256.98M	21.39	46.00	-24.61	3	Vertical	360	1.00
2440MHz_Adapter	Pass	PK	385.02M	21.62	46.00	-24.38	3	Vertical	360	1.00
2440MHz_Adapter	Pass	PK	515M	24.13	46.00	-21.87	3	Vertical	360	1.00
2440MHz_Adapter	Pass	PK	30M	24.89	40.00	-15.11	3	Horizontal	0	1.00
2440MHz_Adapter	Pass	PK	45.52M	29.41	40.00	-10.59	3	Horizontal	0	1.00
2440MHz_Adapter	Pass	PK	80.44M	24.20	40.00	-15.80	3	Horizontal	0	1.00
2440MHz_Adapter	Pass	PK	144.46M	20.92	43.50	-22.58	3	Horizontal	0	1.00
2440MHz_Adapter	Pass	PK	194.9M	22.64	43.50	-20.86	3	Horizontal	0	1.00
2440MHz_Adapter	Pass	PK	518.88M	29.66	46.00	-16.34	3	Horizontal	0	1.00

2.4-2.4835GHz_BT-LE(2Mbps)

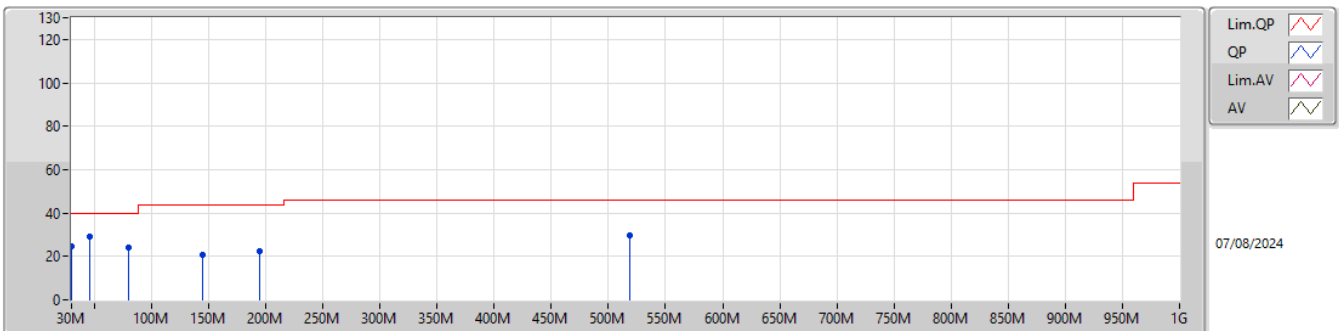
2440MHz_Adapter



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	31.94M	33.55	40.00	-6.45	-4.29	3	Vertical	360	1.00	37.84	22.46	0.63	27.38
PK	43.58M	36.75	40.00	-3.25	-10.38	3	Vertical	360	1.00	47.13	16.25	0.74	27.37
PK	78.5M	25.70	40.00	-14.30	-14.21	3	Vertical	360	1.00	39.91	12.07	1.02	27.30
PK	256.98M	21.39	46.00	-24.61	-6.46	3	Vertical	360	1.00	27.85	18.38	1.80	26.64
PK	385.02M	21.62	46.00	-24.38	-4.68	3	Vertical	360	1.00	26.30	20.29	2.30	27.27
PK	515M	24.13	46.00	-21.87	-2.99	3	Vertical	360	1.00	27.12	22.69	2.48	28.16

2.4-2.4835GHz_BT-LE(2Mbps)

2440MHz_Adapter



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	30M	24.89	40.00	-15.11	-3.45	3	Horizontal	0	1.00	28.34	23.36	0.57	27.38
PK	45.52M	29.41	40.00	-10.59	-11.31	3	Horizontal	0	1.00	40.72	15.33	0.73	27.37
PK	80.44M	24.20	40.00	-15.80	-14.01	3	Horizontal	0	1.00	38.21	12.30	0.98	27.29
PK	144.46M	20.92	43.50	-22.58	-9.77	3	Horizontal	0	1.00	30.69	15.93	1.38	27.08
PK	194.9M	22.64	43.50	-20.86	-11.16	3	Horizontal	0	1.00	33.80	14.10	1.60	26.86
PK	518.88M	29.66	46.00	-16.34	-3.11	3	Horizontal	0	1.00	32.77	22.59	2.49	28.19



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	AV	2.4924G	44.42	54.00	-9.58	3	Horizontal	49	1.05
BT-LE(2Mbps)	Pass	AV	2.4835G	45.03	54.00	-8.97	3	Vertical	196	2.43

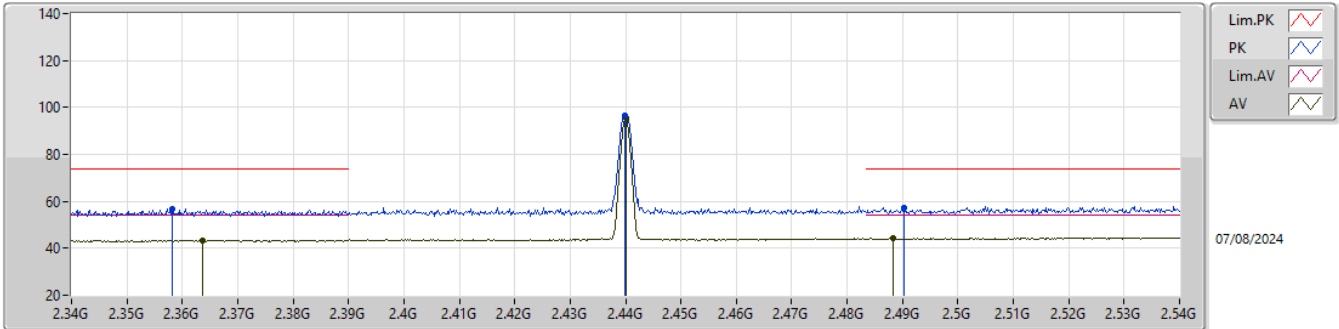
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	PK	2.374G	56.96	74.00	-17.04	3	Vertical	184	1.17
2402MHz	Pass	AV	2.3819G	43.53	54.00	-10.47	3	Vertical	184	1.17
2402MHz	Pass	PK	2.4022G	98.28	Inf	-Inf	3	Vertical	184	1.17
2402MHz	Pass	AV	2.402G	97.19	Inf	-Inf	3	Vertical	184	1.17
2402MHz	Pass	PK	2.3601G	56.71	74.00	-17.29	3	Horizontal	63	1.00
2402MHz	Pass	AV	2.3768G	43.46	54.00	-10.54	3	Horizontal	63	1.00
2402MHz	Pass	PK	2.4023G	98.56	Inf	-Inf	3	Horizontal	63	1.00
2402MHz	Pass	AV	2.402G	97.48	Inf	-Inf	3	Horizontal	63	1.00
2402MHz	Pass	PK	4.80333G	46.55	74.00	-27.45	3	Vertical	38	2.42
2402MHz	Pass	AV	4.80399G	37.86	54.00	-16.14	3	Vertical	38	2.42
2402MHz	Pass	PK	4.80458G	47.07	74.00	-26.93	3	Horizontal	292	1.00
2402MHz	Pass	AV	4.80405G	39.10	54.00	-14.90	3	Horizontal	292	1.00
2402MHz	Pass	PK	2.3582G	56.75	74.00	-17.25	3	Vertical	131	1.98
2440MHz	Pass	AV	2.3636G	43.44	54.00	-10.56	3	Vertical	131	1.98
2440MHz	Pass	PK	2.4398G	96.56	Inf	-Inf	3	Vertical	131	1.98
2440MHz	Pass	AV	2.44G	95.45	Inf	-Inf	3	Vertical	131	1.98
2440MHz	Pass	PK	2.4902G	57.42	74.00	-16.58	3	Vertical	131	1.98
2440MHz	Pass	AV	2.4882G	44.40	54.00	-9.60	3	Vertical	131	1.98
2440MHz	Pass	PK	2.3726G	56.36	74.00	-17.64	3	Horizontal	49	1.05
2440MHz	Pass	AV	2.3894G	43.59	54.00	-10.41	3	Horizontal	49	1.05
2440MHz	Pass	PK	2.4398G	97.55	Inf	-Inf	3	Horizontal	49	1.05
2440MHz	Pass	AV	2.44G	96.47	Inf	-Inf	3	Horizontal	49	1.05
2440MHz	Pass	PK	2.497G	57.23	74.00	-16.77	3	Horizontal	49	1.05
2440MHz	Pass	AV	2.4924G	44.42	54.00	-9.58	3	Horizontal	49	1.05
2440MHz	Pass	PK	4.88062G	45.78	74.00	-28.22	3	Vertical	39	2.27
2440MHz	Pass	AV	4.88G	37.66	54.00	-16.34	3	Vertical	39	2.27
2440MHz	Pass	PK	4.88047G	48.14	74.00	-25.86	3	Horizontal	209	2.71
2440MHz	Pass	AV	4.88003G	40.61	54.00	-13.39	3	Horizontal	209	2.71
2480MHz	Pass	PK	2.4797G	95.75	Inf	-Inf	3	Vertical	199	1.91
2480MHz	Pass	AV	2.48G	94.65	Inf	-Inf	3	Vertical	199	1.91
2480MHz	Pass	PK	2.4953G	57.78	74.00	-16.22	3	Vertical	199	1.91
2480MHz	Pass	AV	2.4894G	44.35	54.00	-9.65	3	Vertical	199	1.91
2480MHz	Pass	PK	2.4803G	95.70	Inf	-Inf	3	Horizontal	49	1.07
2480MHz	Pass	AV	2.48G	94.64	Inf	-Inf	3	Horizontal	49	1.07
2480MHz	Pass	PK	2.4924G	57.50	74.00	-16.50	3	Horizontal	49	1.07
2480MHz	Pass	AV	2.4891G	44.42	54.00	-9.58	3	Horizontal	49	1.07
2480MHz	Pass	PK	4.96067G	45.22	74.00	-28.78	3	Vertical	67	1.00
2480MHz	Pass	AV	4.96012G	34.57	54.00	-19.43	3	Vertical	67	1.00
2480MHz	Pass	PK	4.95966G	44.97	74.00	-29.03	3	Horizontal	190	1.50
2480MHz	Pass	AV	4.96007G	34.50	54.00	-19.50	3	Horizontal	190	1.50
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	PK	2.3549G	57.19	74.00	-16.81	3	Vertical	185	1.17
2402MHz	Pass	AV	2.3589G	43.67	54.00	-10.33	3	Vertical	185	1.17
2402MHz	Pass	PK	2.4025G	98.14	Inf	-Inf	3	Vertical	185	1.17
2402MHz	Pass	AV	2.402G	94.98	Inf	-Inf	3	Vertical	185	1.17
2402MHz	Pass	PK	2.3745G	56.90	74.00	-17.10	3	Horizontal	66	1.15
2402MHz	Pass	AV	2.3849G	43.53	54.00	-10.47	3	Horizontal	66	1.15
2402MHz	Pass	PK	2.4015G	98.08	Inf	-Inf	3	Horizontal	66	1.15
2402MHz	Pass	AV	2.402G	94.93	Inf	-Inf	3	Horizontal	66	1.15
2402MHz	Pass	PK	4.80477G	46.00	74.00	-28.00	3	Vertical	40	2.49
2402MHz	Pass	AV	4.80498G	35.07	54.00	-18.93	3	Vertical	40	2.49
2402MHz	Pass	PK	4.80503G	47.13	74.00	-26.87	3	Horizontal	291	1.00
2402MHz	Pass	AV	4.80503G	36.35	54.00	-17.65	3	Horizontal	291	1.00
2440MHz	Pass	PK	2.342G	57.35	74.00	-16.65	3	Vertical	131	1.97
2440MHz	Pass	AV	2.3898G	43.60	54.00	-10.40	3	Vertical	131	1.97
2440MHz	Pass	PK	2.4394G	96.65	Inf	-Inf	3	Vertical	131	1.97
2440MHz	Pass	AV	2.44G	93.48	Inf	-Inf	3	Vertical	131	1.97
2440MHz	Pass	PK	2.496G	56.91	74.00	-17.09	3	Vertical	131	1.97
2440MHz	Pass	AV	2.493G	44.23	54.00	-9.77	3	Vertical	131	1.97
2440MHz	Pass	PK	2.3806G	56.73	74.00	-17.27	3	Horizontal	50	1.06

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2440MHz	Pass	AV	2.359G	43.51	54.00	-10.49	3	Horizontal	50	1.06
2440MHz	Pass	PK	2.4396G	97.34	Inf	-Inf	3	Horizontal	50	1.06
2440MHz	Pass	AV	2.44G	94.17	Inf	-Inf	3	Horizontal	50	1.06
2440MHz	Pass	PK	2.4904G	57.59	74.00	-16.41	3	Horizontal	50	1.06
2440MHz	Pass	AV	2.4892G	44.40	54.00	-9.60	3	Horizontal	50	1.06
2440MHz	Pass	PK	4.88108G	46.21	74.00	-27.79	3	Vertical	39	2.28
2440MHz	Pass	AV	4.88102G	35.09	54.00	-18.91	3	Vertical	39	2.28
2440MHz	Pass	PK	4.87894G	46.45	74.00	-27.55	3	Horizontal	207	2.16
2440MHz	Pass	AV	4.88093G	35.78	54.00	-18.22	3	Horizontal	207	2.16
2480MHz	Pass	PK	2.4795G	96.66	Inf	-Inf	3	Vertical	196	2.43
2480MHz	Pass	AV	2.48G	93.52	Inf	-Inf	3	Vertical	196	2.43
2480MHz	Pass	PK	2.4964G	57.02	74.00	-16.98	3	Vertical	196	2.43
2480MHz	Pass	AV	2.4835G	45.03	54.00	-8.97	3	Vertical	196	2.43
2480MHz	Pass	PK	2.4805G	95.73	Inf	-Inf	3	Horizontal	49	1.08
2480MHz	Pass	AV	2.48G	92.58	Inf	-Inf	3	Horizontal	49	1.08
2480MHz	Pass	PK	2.4979G	57.07	74.00	-16.93	3	Horizontal	49	1.08
2480MHz	Pass	AV	2.4835G	44.90	54.00	-9.10	3	Horizontal	49	1.08
2480MHz	Pass	PK	4.95895G	44.13	74.00	-29.87	3	Vertical	89	1.50
2480MHz	Pass	AV	4.96109G	31.79	54.00	-22.21	3	Vertical	89	1.50
2480MHz	Pass	PK	4.9588G	44.39	74.00	-29.61	3	Horizontal	190	1.50
2480MHz	Pass	AV	4.95916G	32.84	54.00	-21.16	3	Horizontal	190	1.50

2.4-2.4835GHz_BT-LE(1Mbps)

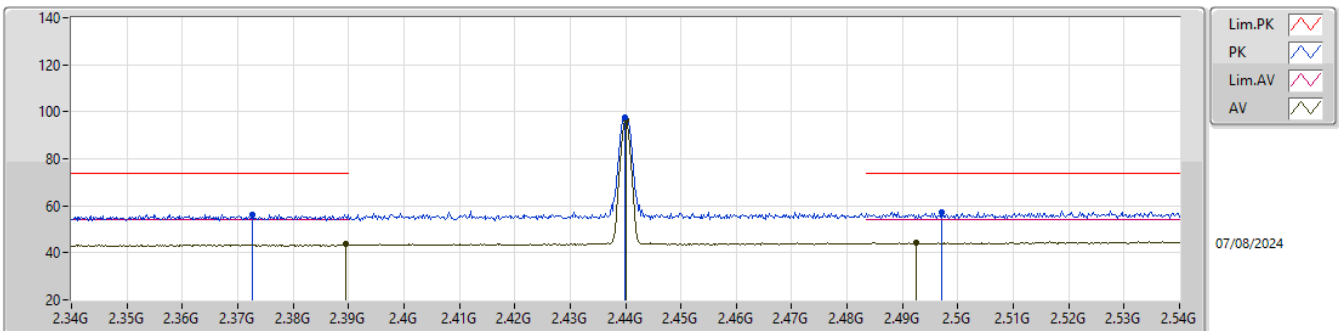
2440MHz_TX



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	2.3582G	56.75	74.00	-17.25	30.51	3	Vertical	131	1.98	26.24	27.38	3.13	-				
AV	2.3636G	43.44	54.00	-10.56	30.54	3	Vertical	131	1.98	12.90	27.40	3.14	-				
PK	2.4398G	96.56	Inf	-Inf	30.88	3	Vertical	131	1.98	65.68	27.70	3.18	-				
AV	2.44G	95.45	Inf	-Inf	30.88	3	Vertical	131	1.98	64.57	27.70	3.18	-				
PK	2.4902G	57.42	74.00	-16.58	31.21	3	Vertical	131	1.98	26.21	28.00	3.21	-				
AV	2.4882G	44.40	54.00	-9.60	31.19	3	Vertical	131	1.98	13.21	27.98	3.21	-				

2.4-2.4835GHz_BT-LE(1Mbps)

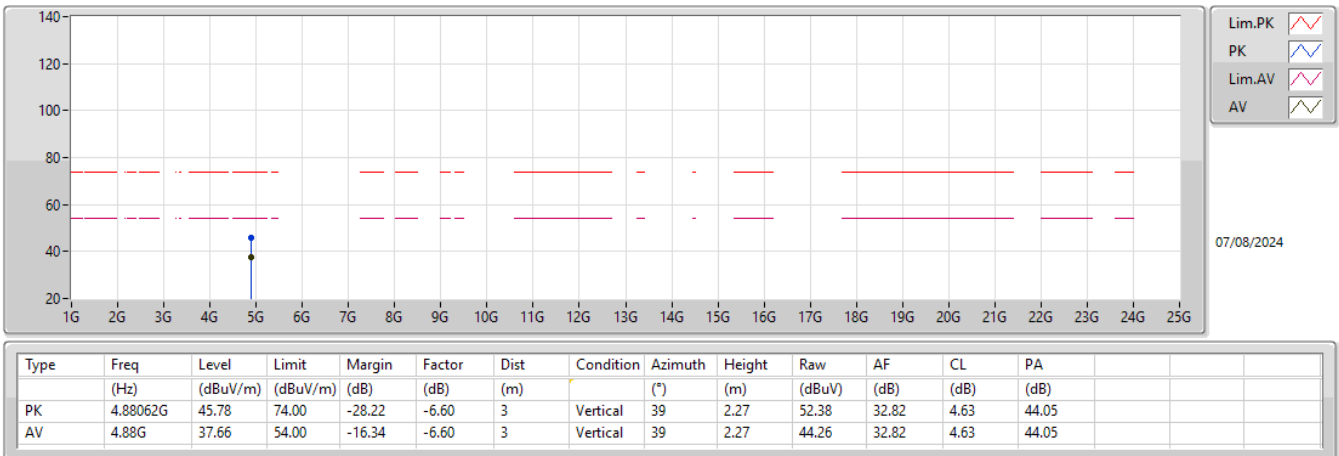
2440MHz_TX



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	2.3726G	56.36	74.00	-17.64	30.51	3	Horizontal	49	1.05	25.85	27.37	3.14	-				
AV	2.3894G	43.59	54.00	-10.41	30.54	3	Horizontal	49	1.05	13.05	27.39	3.15	-				
PK	2.4398G	97.55	Inf	-Inf	30.88	3	Horizontal	49	1.05	66.67	27.70	3.18	-				
AV	2.44G	96.47	Inf	-Inf	30.88	3	Horizontal	49	1.05	65.59	27.70	3.18	-				
PK	2.497G	57.23	74.00	-16.77	31.14	3	Horizontal	49	1.05	26.09	27.93	3.21	-				
AV	2.4924G	44.42	54.00	-9.58	31.19	3	Horizontal	49	1.05	13.23	27.98	3.21	-				

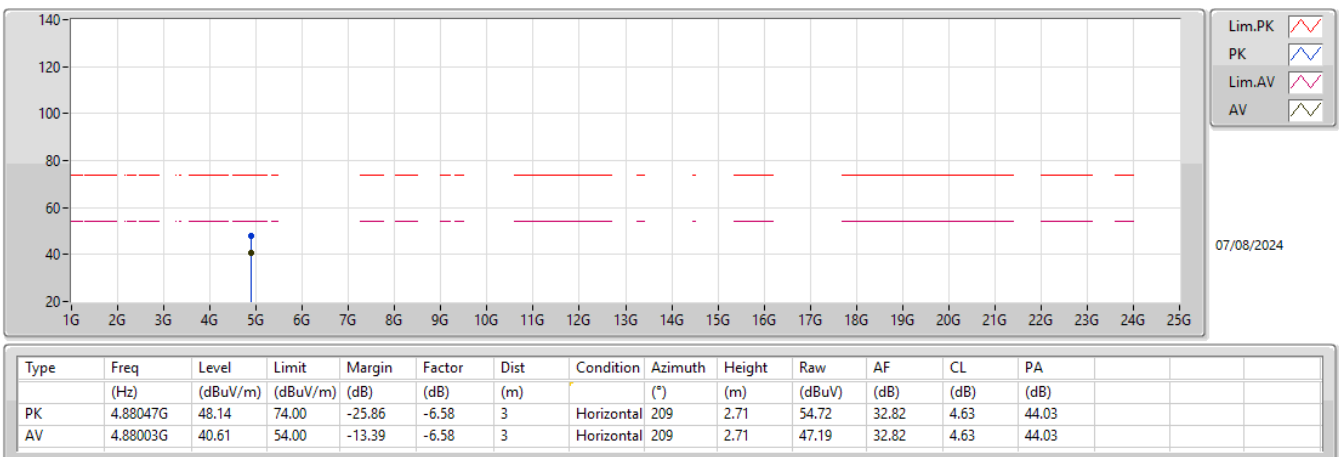
2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX



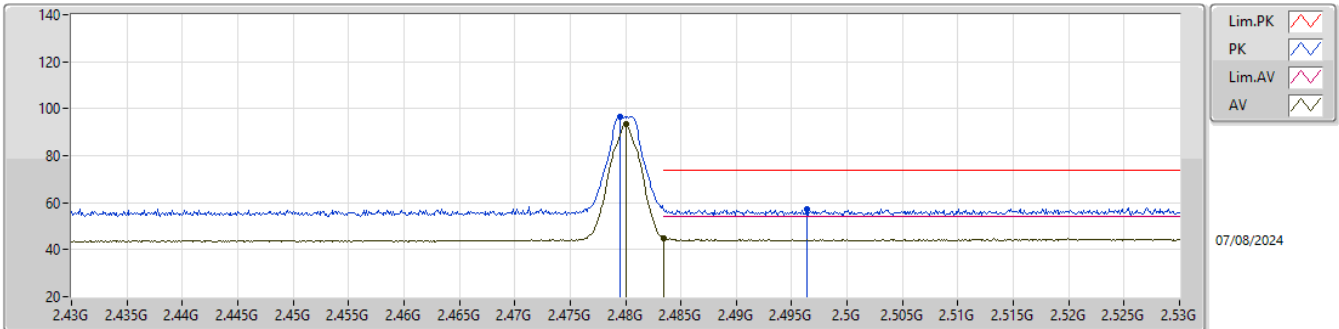
2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX



2.4-2.4835GHz_BT-LE(2Mbps)

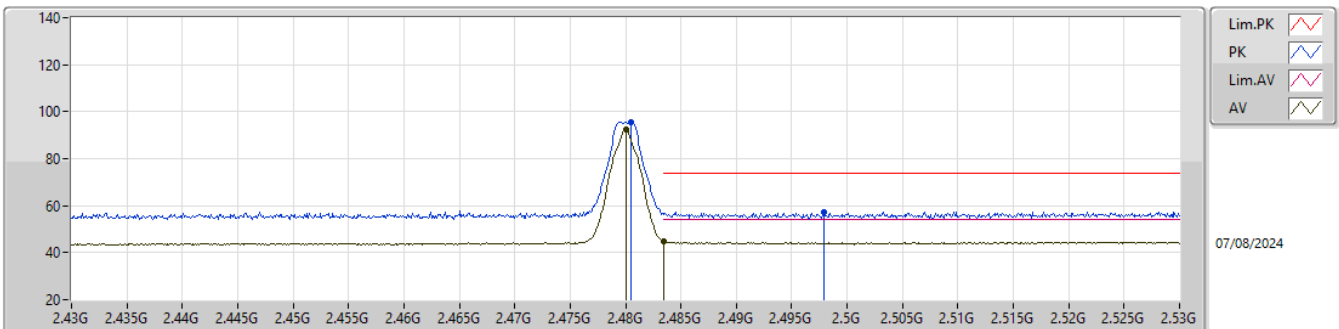
2480MHz_TX



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	2.4795G	96.66	Inf	-Inf	31.09	3	Vertical	196	2.43	65.57	27.89	3.20	-
AV	2.48G	93.52	Inf	-Inf	31.10	3	Vertical	196	2.43	62.42	27.90	3.20	-
PK	2.4964G	57.02	74.00	-16.98	31.15	3	Vertical	196	2.43	25.87	27.94	3.21	-
AV	2.4835G	45.03	54.00	-8.97	31.15	3	Vertical	196	2.43	13.88	27.94	3.21	-

2.4-2.4835GHz_BT-LE(2Mbps)

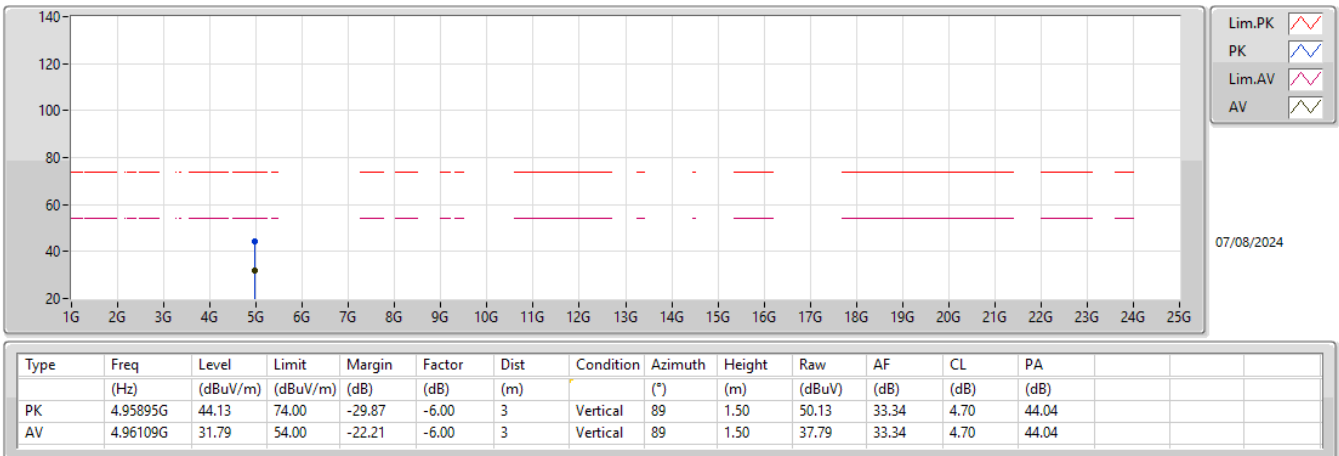
2480MHz_TX



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	2.4805G	95.73	Inf	-Inf	31.11	3	Horizontal	49	1.08	64.62	27.91	3.20	-
AV	2.48G	92.58	Inf	-Inf	31.10	3	Horizontal	49	1.08	61.48	27.90	3.20	-
PK	2.4979G	57.07	74.00	-16.93	31.13	3	Horizontal	49	1.08	25.94	27.92	3.21	-
AV	2.4835G	44.90	54.00	-9.10	31.15	3	Horizontal	49	1.08	13.75	27.94	3.21	-

2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX



2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX

