

FCC Radio Test Report

FCC ID : 2ASJ3-ATS
Equipment : Console module (ATS)
Brand Name : AVIRON
Model Name : ATS
Applicant : Aviron Interactive
265 Bartley Drive, North York, Ontario, M4A 2N7, Canada
Manufacturer : Qisda Corporation
157 , Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan
Standard : 47 CFR FCC Part 15.247

The product was received on Oct. 24, 2024, and testing was started from Nov. 29, 2024 and completed on Dec. 17, 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.)



Table of Contents

HISTORY OF THIS TEST REPORT	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Information.....	5
1.2 Testing Applied Standards	7
1.3 Testing Location Information	7
1.4 Measurement Uncertainty	7
2 TEST CONFIGURATION OF EUT.....	8
2.1 Test Channel Mode	8
2.2 The Worst Case Measurement Configuration.....	9
2.3 Support Equipment.....	10
2.4 Test Setup Diagram	11
3 TRANSMITTER TEST RESULT	13
3.1 AC Power-line Conducted Emissions	13
3.2 20dB Bandwidth and Carrier Frequency Separation.....	15
3.3 Maximum Conducted Output Power	16
3.4 Number of Hopping Frequencies and Hopping Bandedge	17
3.5 Time of Occupancy (Dwell Time)	18
3.6 Emissions in Non-restricted Frequency Bands	19
3.7 Emissions in Restricted Frequency Bands.....	20
4 TEST EQUIPMENT AND CALIBRATION DATA.....	24
APPENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS	
APPENDIX B. TEST RESULTS OF 20DB BANDWIDTH AND CARRIER FREQUENCY SEPARATION	
APPENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	
APPENDIX D. TEST RESULTS OF NUMBER OF HOPPING FREQUENCIES AND HOPPING BANDEDGE	
APPENDIX E. TEST RESULTS OF TIME OF OCCUPANCY (DWELL TIME)	
APPENDIX F. TEST RESULTS OF EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS	
APPENDIX G. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS	
APPENDIX H. TEST RESULTS OF RADIATED EMISSION CO-LOCATION	
APPENDIX I. TEST PHOTOS	
PHOTOGRAPHS OF EUT V01	

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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)	20dB Bandwidth	PASS	-
3.2	15.247(a)	Carrier Frequency Separation	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(a)	Number of Hopping Frequencies and Hopping Bandedge	PASS	-
3.5	15.247(a)	Time of Occupancy (Dwell Time)	PASS	-
3.6	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.7	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: Amber Chiu

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Version	Ch. Frequency (MHz)	Channel Number
2400-2483.5	BR / EDR	2402-2480	0-78 [79]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-BR(1Mbps)	1	1TX
2.4-2.4835GHz	BT-EDR(2Mbps)	1	1TX
2.4-2.4835GHz	BT-EDR(3Mbps)	1	1TX

Note:

- Bluetooth BR uses a GFSK (1Mbps).
- Bluetooth EDR uses a combination of $\pi/4$ -DQPSK (2Mbps) and 8DPSK (3Mbps).
- Bluetooth BR/EDR uses as a system using FHSS modulation.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Support
1	INPAQ	WA-P-LB-02-1095	PCB	I-Pex	2.4G+5G+BT
2	INPAQ	WA-P-LB-01-335	PCB	N-type	2.4G+5G

Ant.	Port	Gain (dBi)			
		2.4G	5G		BT
			U-NII-1	U-NII-3	
1	1	2.92	3.21	3.20	2.92
2	2	2.90	3.14	3.12	2.90

Note 1: The EUT has two antennas.

For 2.4GHz function:

For IEEE 802.11 b/g/n mode (2TX/2RX)

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

For 5GHz function:

For IEEE 802.11 a/n/ac mode (2TX/2RX)

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

For BT function:

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

Only Ant. 1 (port 1) can be used as transmitting/receiving antenna.

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-BR(1Mbps)	0.77	1.14	2.887m	1k
BT-EDR(2Mbps)	0.771	1.13	2.891m	1k
BT-EDR(3Mbps)	0.771	1.13	2.893m	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	Daniel Lin	21.1~22.5°C / 51~54%	17/Dec/2024
RF Conducted	TH01-HY	Jin Jing	22.2~23.8°C / 53~58%	03/Dec/2024~04/Dec/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. TW0036 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated	03CH25-HY	Rian Chung	20.6~21.7°C / 52~55%	29/Nov/2024~01/Dec/2024
Radiated (Co-location)	03CH25-HY	Billy Wang	20.1~20.5°C / 54~55%	17/Dec/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%
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	Dos 6.1
Mode	Power Setting
BT-BR(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default
BT-EDR(2Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default
BT-EDR(3Mbps)	-
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	20dB Bandwidth Carrier Frequency Separation Maximum Conducted Output Power Number of Hopping Frequencies Hopping Bandedge Time of Occupancy (Dwell Time) Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains ☒ Non-adaptive frequency hopping systems (Non-AFH) ☐ adaptive frequency hopping systems (AFH)

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
Refer to Sporton Test Report No.: FA4O2313 for Co-location RF Exposure Evaluation and Appendix H for Radiated Emission Co-location.	

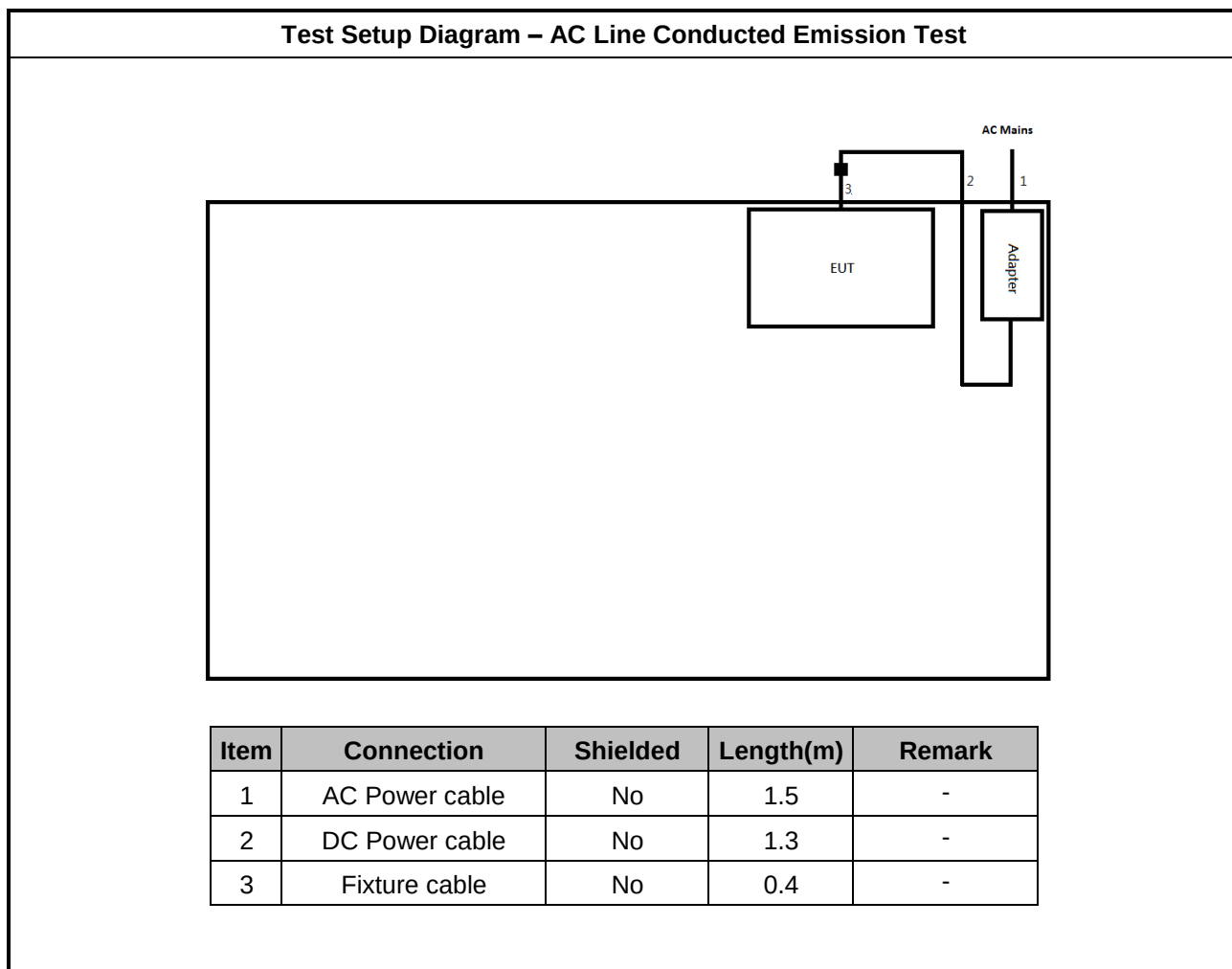
2.3 Support Equipment

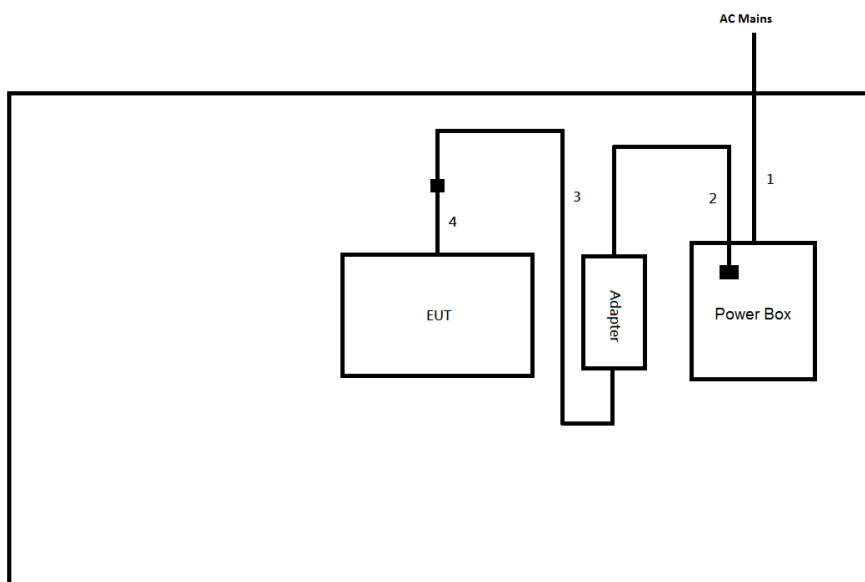
Support Equipment – AC Conduction					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Adapter	GVE	GM60-120500-F	-	-
2	Fixture	N/A	N/A	-	Provided by Customer
3	Power Cord	N/A	N/A	-	Provided by Customer

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

Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Adapter	GVE	GM60-120500-F	-	-
2	Fixture	N/A	N/A	-	Provided by Customer
3	Power Cord	N/A	N/A	-	Provided by Customer

2.4 Test Setup Diagram



Test Setup Diagram - Radiated Test


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	AC Power cable	No	1.5	-
3	DC Power cable	No	1.3	-
4	Fixture cable	No	0.4	-

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

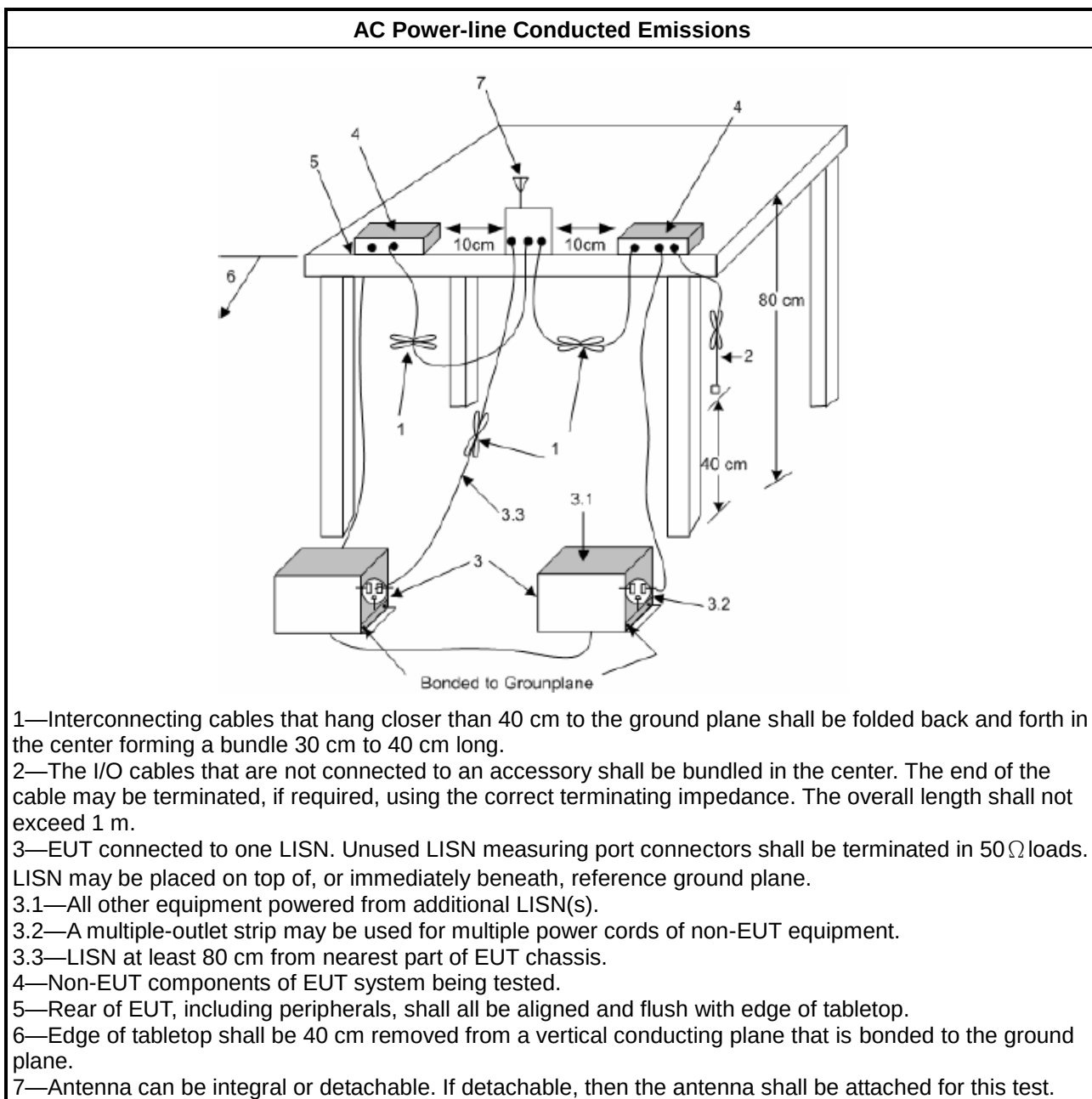
Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

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 20dB Bandwidth and Carrier Frequency Separation

3.2.1 20dB Bandwidth and Carrier Frequency Separation Limit

20dB Bandwidth and Carrier Frequency Separation Limit for Frequency Hopping Systems	
▪	2400-2483.5 MHz Band:
	▪ $N \geq 75$ and $ChS \geq MAX$ (20 dB bandwidth, 25 kHz).
	▪ $75 > N \geq 15$ and $ChS \geq MAX$ (20 dB bandwidth 2/3, 25 kHz).
N: Number of Hopping Frequencies; ChS: Hopping Channel Separation	

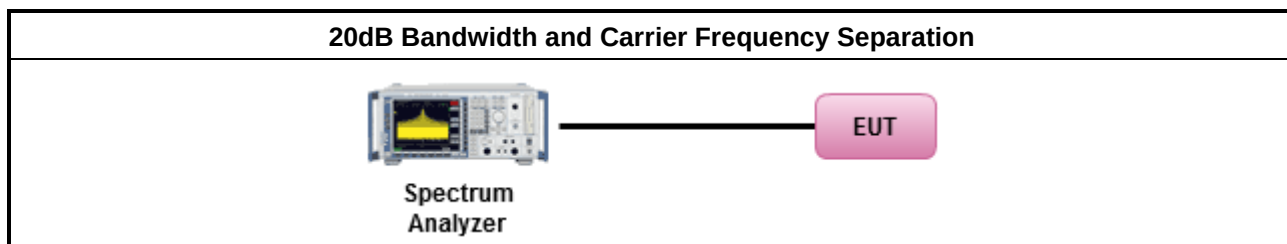
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method
▪ Refer as ANSI C63.10-2013, clause 6.9.2 for 20 dB bandwidth measurement.
▪ Refer as ANSI C63.10-2013, clause 7.8.2 for carrier frequency separation measurement.

3.2.4 Test Setup



3.2.5 Test Result of 20dB Bandwidth

Refer as Appendix B

3.2.6 Test Result of Carrier Frequency Separation

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
2400-2483.5 MHz Band:	
	$N \geq 75$; Power 30dBm; EIRP 36dBm
	$75 > N \geq 15$; Power 21dBm; EIRP 27dBm
N: Number of Hopping Frequencies	

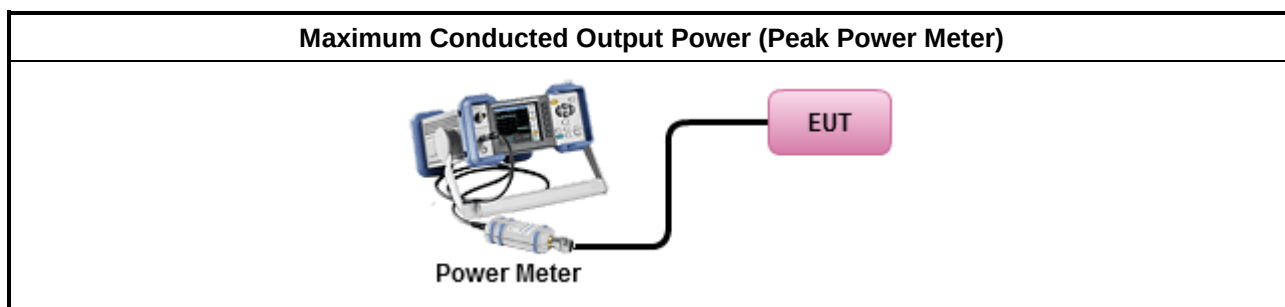
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method
Refer as ANSI C63.10-2013, clause 7.8.5 for output power measurement.

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Number of Hopping Frequencies and Hopping Bandedge

3.4.1 Number of Hopping Frequencies Limit

Number of Hopping Frequencies Limit	
2400-2483.5 MHz Band:	
	$N \geq 75$ and $ChS \geq MAX$ (20 dB bandwidth, 25 kHz).
	$75 > N \geq 15$ and $ChS \geq MAX$ (20 dB bandwidth 2/3, 25 kHz).
N: Number of Hopping Frequencies; ChS : Hopping Channel Separation	

3.4.2 Hopping Bandedge Limit

Refer clause 3.6.1 and clause 3.7.1

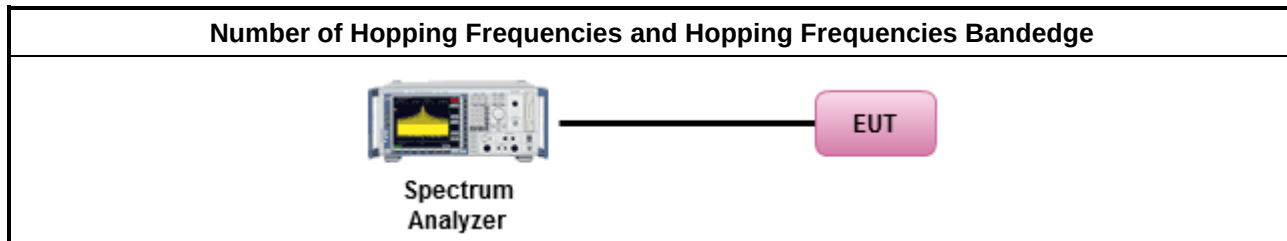
3.4.3 Measuring Instruments

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

3.4.4 Test Procedures

Test Method
Refer as ANSI C63.10-2013, clause 7.8.3 for number of hopping frequencies measurement.
Refer as ANSI C63.10-2013, clause 7.8.6 for hopping frequencies Bandedge measurement.

3.4.5 Test Setup



3.4.6 Test Result of Number of Hopping Frequencies

Refer as Appendix D

3.4.7 Test Result of Number of Hopping Frequencies Bandedge

Refer as Appendix D

3.5 Time of Occupancy (Dwell Time)

3.5.1 Time of Occupancy (Dwell Time) Limit

Time of Occupancy (Dwell Time) Limit for Frequency Hopping Systems	
2400-2483.5 MHz Band:	
	$N \geq 75$; 0.4s in $N \times 0.4$ period
	$75 > N \geq 15$; 0.4s in $N \times 0.4$ period
N: Number of Hopping Frequencies	

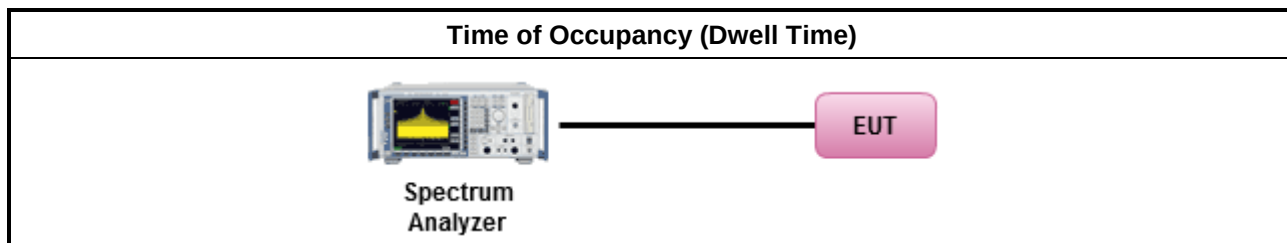
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method	
Refer as ANSI C63.10-2013, clause 7.8.4 for dwell time measurement.	
Bluetooth ACL packets can be 1, 3, or 5 time slots. Following as dwell time. Operate DH5 at maximum dwell time and maximum duty cycle.	
	The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum dwell time and maximum duty cycle. A maximum length packet has duration of 5 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is $5/1600$ seconds, or 3.125ms. DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel.

3.5.4 Test Setup



3.5.5 Test Result of Time of Occupancy (Dwell Time)

Refer as Appendix E

3.6 Emissions in Non-restricted Frequency Bands

3.6.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
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 PSD level.	

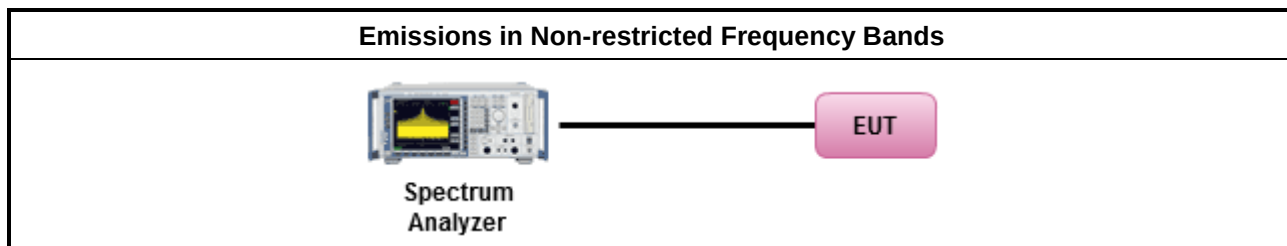
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

Test Method
Refer as ANSI C63.10-2013, clause 7.8.8 for unwanted emissions into non-restricted bands.

3.6.4 Test Setup



3.6.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix F

3.7 Emissions in Restricted Frequency Bands

3.7.1 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.

3.7.2 Measuring Instruments

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

3.7.3 Test Procedures

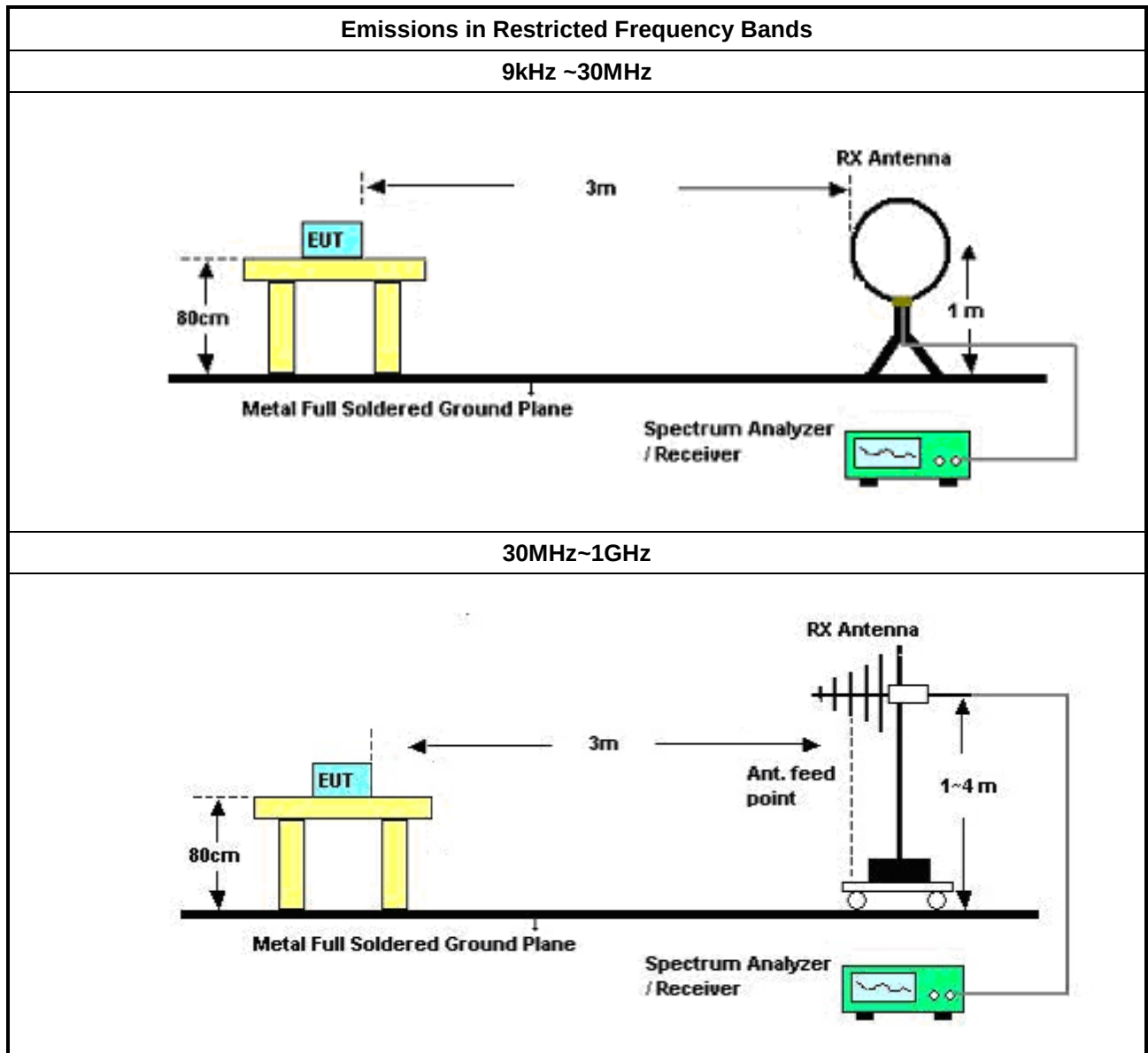
Test Method	
▪	The average emission levels shall be measured in [hopping duty factor].
	Refer as ANSI C63.10; clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
▪	For the transmitter unwanted emissions shall be measured using following options below:
	Refer as ANSI C63.10, clause 4.1.4.2.1 QP value.
	Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak.
	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of hopping pulsed emissions.
▪	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.

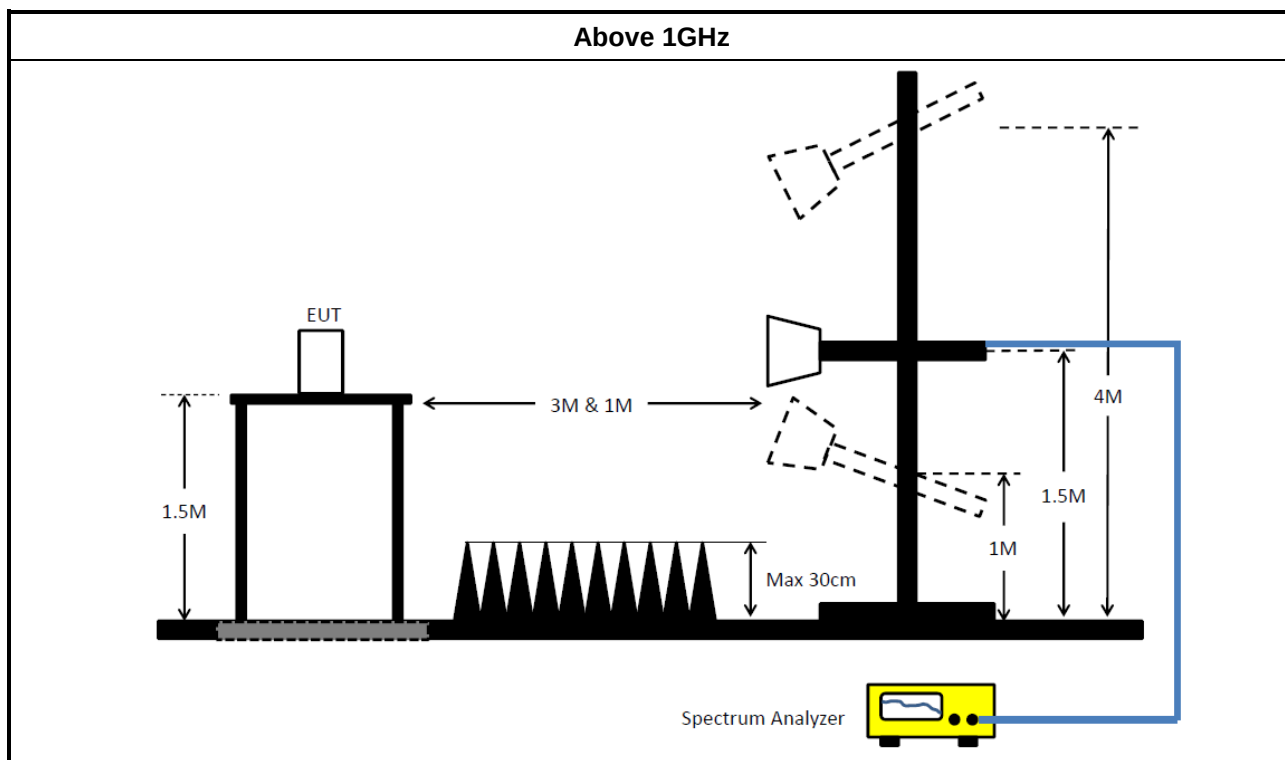
3.7.4 Measurement Results Calculation

The measured Level is calculated using:

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

3.7.5 Test Setup





3.7.6 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.

3.7.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix G

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	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	17/Oct/2024	16/Oct/2025
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	101013	10Hz~40GHz	09/Apr/2024	08/Apr/2025
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	16/Oct/2024	15/Oct/2025
Power Meter	Anritsu	ML2495A	0949003	300MHz~40GHz	17/Feb/2024	16/Feb/2025
Pulse Sensor	Anritsu	MA2411B	0917017	300MHz~40GHz	17/Feb/2024	16/Feb/2025
SENSE-15247_FS	Sporton	V5.11.18	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	30MHz~1GHz 3m	20/Jul/2024	19/Jul/2025
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH25-HY	1GHz~18GHz 3m	08/Aug/2024	07/Aug/2025
ESR7 EMI Test Receiver	ROHDE & SCHWARZ	ESR7	102956	9kHz~3.6GHz	27/Aug/2024	26/Aug/2025
Signal Analyzer	ROHDE & SCHWARZ	FSV3044	101410	10Hz~44GHz	18/Nov/2024	17/Nov/2025
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	19/Mar/2024	18/Mar/2025
Bilog Antenna & 6dB Attenuator	TESEQ & VGT	CBL 6111D & VFA 04002-06	63537/001	30MHz~1GHz	30/May/2024	29/May/2025
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02876	1GHz~18GHz	11/Jul/2024	10/Jul/2025
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	01248	18GHz~40GHz	04/Oct/2024	03/Oct/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB007	9kHz~1GHz	24/Apr/2024	23/Apr/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB007	1GHz~40GHz	23/Apr/2024	22/Apr/2025
Preamplifier	SGH	PRAMP 903	20230515-1	25MHz~3GHz	24/May/2024	23/May/2025
Preamplifier	SGH	PRAMP 118-H	20230515-3	1GHz~18GHz	24/May/2024	23/May/2025
Amplifier	EM	EM18G40GA	060874	18GHz ~ 40GHz	15/Apr/2024	14/Apr/2025
SENSE-15247-FS	Sporton	V5.11.20	N/A	N/A	N/A	N/A

Instrument for Radiated Test (Co-location)

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	08/Aug/2024	07/Aug/2025
Signal Analyzer	ROHDE & SCHWARZ	FSV3044	101410	10Hz~44GHz	18/Nov/2024	17/Nov/2025
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
Amplifier	EM	EM18G40GA	060874	18GHz ~ 40GHz	21/Sep/2024	22/Sep/2025
SENSE-EMI	Sporton	V5.11.6	N/A	N/A	N/A	N/A



Conducted Emissions at Powerline

Appendix A

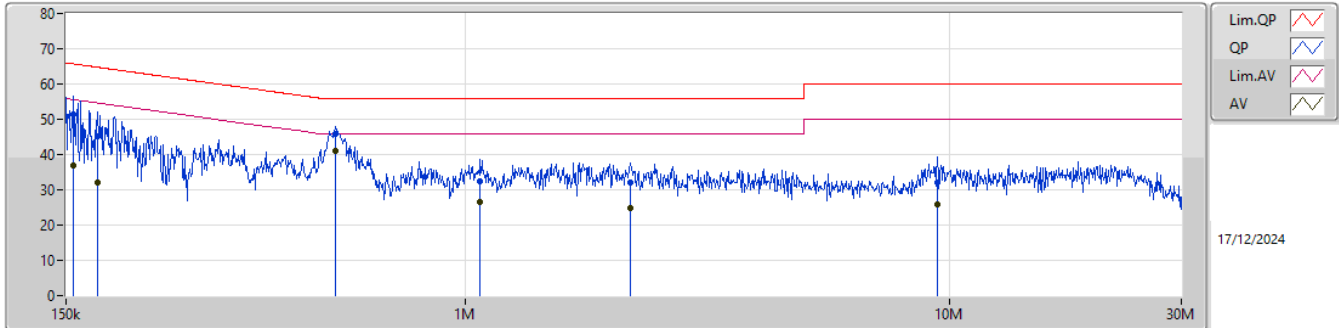
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	540.273k	40.98	46.00	-5.02	Line

Result

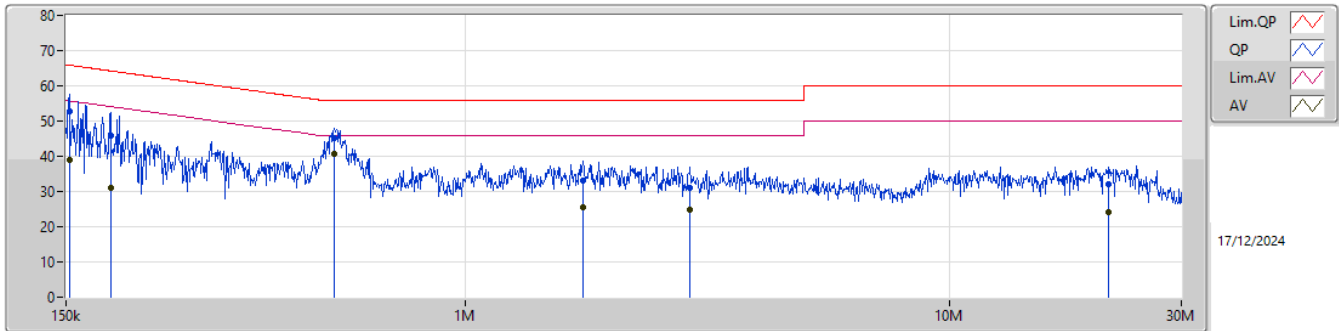
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	155.487k	51.27	65.69	-14.42	Line
Mode 1	Pass	AV	155.487k	37.01	55.69	-18.68	Line
Mode 1	Pass	QP	174.571k	45.22	64.74	-19.52	Line
Mode 1	Pass	AV	174.571k	32.14	54.74	-22.60	Line
Mode 1	Pass	QP	540.273k	45.88	56.00	-10.12	Line
Mode 1	Pass	AV	540.273k	40.98	46.00	-5.02	Line
Mode 1	Pass	QP	1.074M	32.56	56.00	-23.44	Line
Mode 1	Pass	AV	1.074M	26.69	46.00	-19.31	Line
Mode 1	Pass	QP	2.185M	31.99	56.00	-24.01	Line
Mode 1	Pass	AV	2.185M	24.96	46.00	-21.04	Line
Mode 1	Pass	QP	9.418M	31.91	60.00	-28.09	Line
Mode 1	Pass	AV	9.418M	25.95	50.00	-24.05	Line
Mode 1	Pass	QP	152.414k	52.76	65.87	-13.11	Neutral
Mode 1	Pass	AV	152.414k	39.10	55.87	-16.77	Neutral
Mode 1	Pass	QP	185.344k	45.75	64.24	-18.49	Neutral
Mode 1	Pass	AV	185.344k	31.19	54.24	-23.05	Neutral
Mode 1	Pass	QP	535.976k	45.34	56.00	-10.66	Neutral
Mode 1	Pass	AV	535.976k	40.60	46.00	-5.40	Neutral
Mode 1	Pass	QP	1.747M	32.95	56.00	-23.05	Neutral
Mode 1	Pass	AV	1.747M	25.56	46.00	-20.44	Neutral
Mode 1	Pass	QP	2.912M	30.95	56.00	-25.05	Neutral
Mode 1	Pass	AV	2.912M	24.95	46.00	-21.05	Neutral
Mode 1	Pass	QP	21.178M	32.05	60.00	-27.95	Neutral
Mode 1	Pass	AV	21.178M	24.11	50.00	-25.89	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	155.487k	51.27	65.69	-14.42	19.70	Line	-	31.57	9.66	0.07	9.97						
AV	155.487k	37.01	55.69	-18.68	19.70	Line	-	17.31	9.66	0.07	9.97						
QP	174.571k	45.22	64.74	-19.52	19.70	Line	-	25.52	9.65	0.08	9.97						
AV	174.571k	32.14	54.74	-22.60	19.70	Line	-	12.44	9.65	0.08	9.97						
QP	540.273k	45.88	56.00	-10.12	19.74	Line	-	26.14	9.65	0.11	9.98						
AV	540.273k	40.98	46.00	-5.02	19.74	Line	-	21.24	9.65	0.11	9.98						
QP	1.074M	32.56	56.00	-23.44	19.73	Line	-	12.83	9.66	0.09	9.98						
AV	1.074M	26.69	46.00	-19.31	19.73	Line	-	6.96	9.66	0.09	9.98						
QP	2.185M	31.99	56.00	-24.01	19.74	Line	-	12.25	9.67	0.10	9.97						
AV	2.185M	24.96	46.00	-21.04	19.74	Line	-	5.22	9.67	0.10	9.97						
QP	9.418M	31.91	60.00	-28.09	19.74	Line	-	12.17	9.71	0.05	9.98						
AV	9.418M	25.95	50.00	-24.05	19.74	Line	-	6.21	9.71	0.05	9.98						

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	152.414k	52.76	65.87	-13.11	19.64	Neutral	-	33.12	9.60	0.07	9.97						
AV	152.414k	39.10	55.87	-16.77	19.64	Neutral	-	19.46	9.60	0.07	9.97						
QP	185.344k	45.75	64.24	-18.49	19.65	Neutral	-	26.10	9.60	0.08	9.97						
AV	185.344k	31.19	54.24	-23.05	19.65	Neutral	-	11.54	9.60	0.08	9.97						
QP	535.976k	45.34	56.00	-10.66	19.69	Neutral	-	25.65	9.60	0.11	9.98						
AV	535.976k	40.60	46.00	-5.40	19.69	Neutral	-	20.91	9.60	0.11	9.98						
QP	1.747M	32.95	56.00	-23.05	19.69	Neutral	-	13.26	9.61	0.11	9.97						
AV	1.747M	25.56	46.00	-20.44	19.69	Neutral	-	5.87	9.61	0.11	9.97						
QP	2.912M	30.95	56.00	-25.05	19.69	Neutral	-	11.26	9.62	0.09	9.98						
AV	2.912M	24.95	46.00	-21.05	19.69	Neutral	-	5.26	9.62	0.09	9.98						
QP	21.178M	32.05	60.00	-27.95	19.77	Neutral	-	12.28	9.67	0.12	9.98						
AV	21.178M	24.11	50.00	-25.89	19.77	Neutral	-	4.34	9.67	0.12	9.98						

**Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-BR(1Mbps)	951.5k	893.303k	893KF1D	918.5k	884.558k
BT-EDR(2Mbps)	1.381M	1.227M	1M23G1D	1.375M	1.214M
BT-EDR(3Mbps)	1.37M	1.232M	1M23G1D	1.37M	1.217M

Max-N dB = Maximum 20dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 20dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	Inf	951.5k	887.056k
2440MHz	Pass	Inf	918.5k	884.558k
2480MHz	Pass	Inf	921.25k	893.303k
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.381M	1.214M
2440MHz	Pass	Inf	1.381M	1.227M
2480MHz	Pass	Inf	1.375M	1.222M
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.37M	1.232M
2440MHz	Pass	Inf	1.37M	1.232M
2480MHz	Pass	Inf	1.37M	1.217M

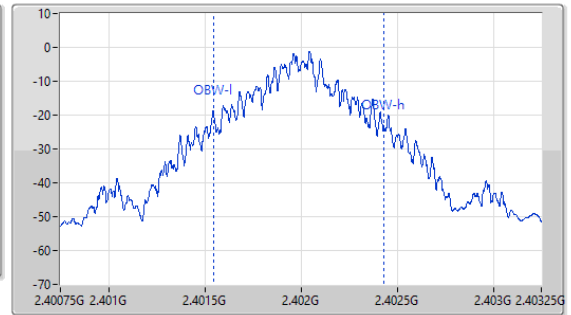
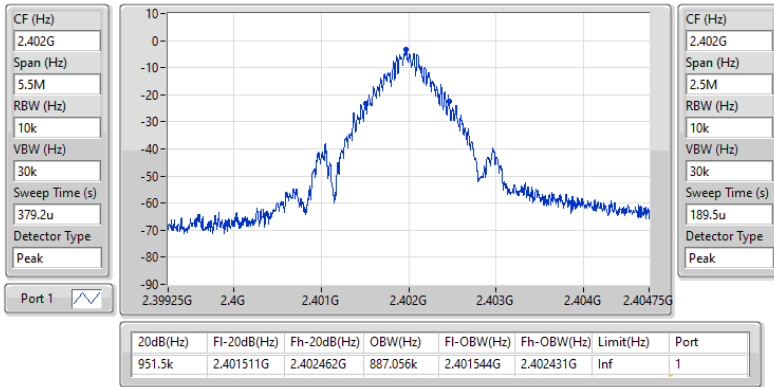
Port X-N dB = Port X 20dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

2.4-2.4835GHz_BT-BR(1Mbps)

EBW-FS

2402MHz

03/12/2024

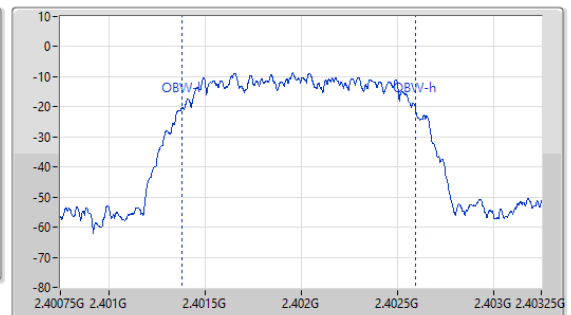
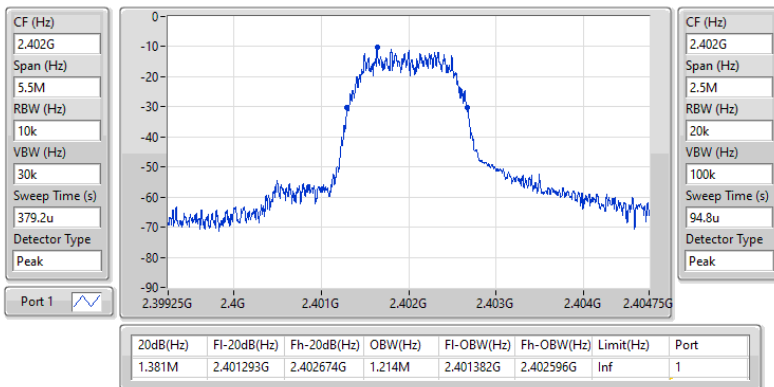


2.4-2.4835GHz_BT-EDR(2Mbps)

EBW-FS

2402MHz

03/12/2024

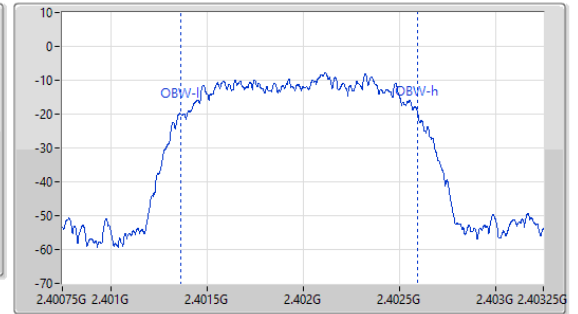
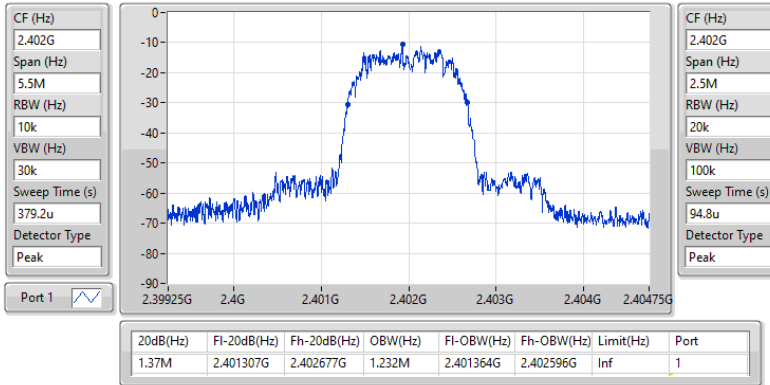


2.4-2.4835GHz_BT-EDR(3Mbps)

EBW-FS

2402MHz

04/12/2024





Summary

Mode	Max-Space (Hz)	Min-Space (Hz)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	999k	919.5k
BT-EDR(2Mbps)	1.002M	999k
BT-EDR(3Mbps)	1.0005M	999k

Result

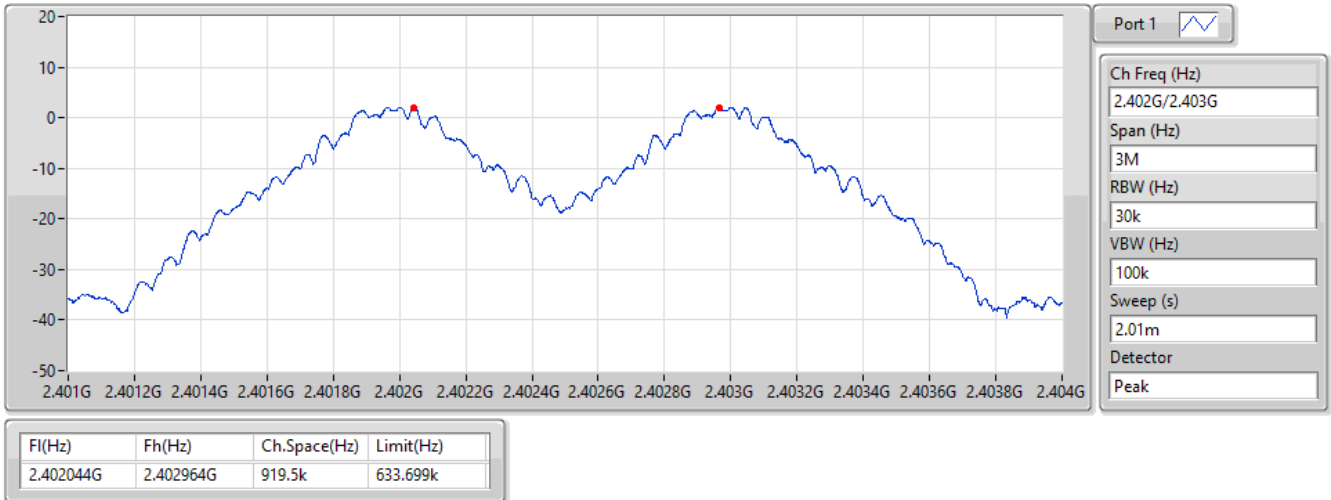
Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
BT-BR(1Mbps)	-	-	-	-	-
2402MHz	Pass	2.402044G	2.402964G	919.5k	633.699k
2440MHz	Pass	2.440047G	2.441004G	957k	611.721k
2480MHz	Pass	2.478974G	2.479973G	999k	613.5525k
BT-EDR(2Mbps)	-	-	-	-	-
2402MHz	Pass	2.401806G	2.402808G	1.002M	919.746k
2440MHz	Pass	2.439809G	2.440808G	999k	919.746k
2480MHz	Pass	2.478815G	2.479815G	1.0005M	915.75k
BT-EDR(3Mbps)	-	-	-	-	-
2402MHz	Pass	2.402115G	2.403114G	999k	912.42k
2440MHz	Pass	2.439938G	2.440938G	1.0005M	912.42k
2480MHz	Pass	2.478942G	2.479943G	1.0005M	912.42k

2.4-2.4835GHz_BT-BR(1Mbps)

Channel Separation-FS

2.402G/2.403GHz

03/12/2024

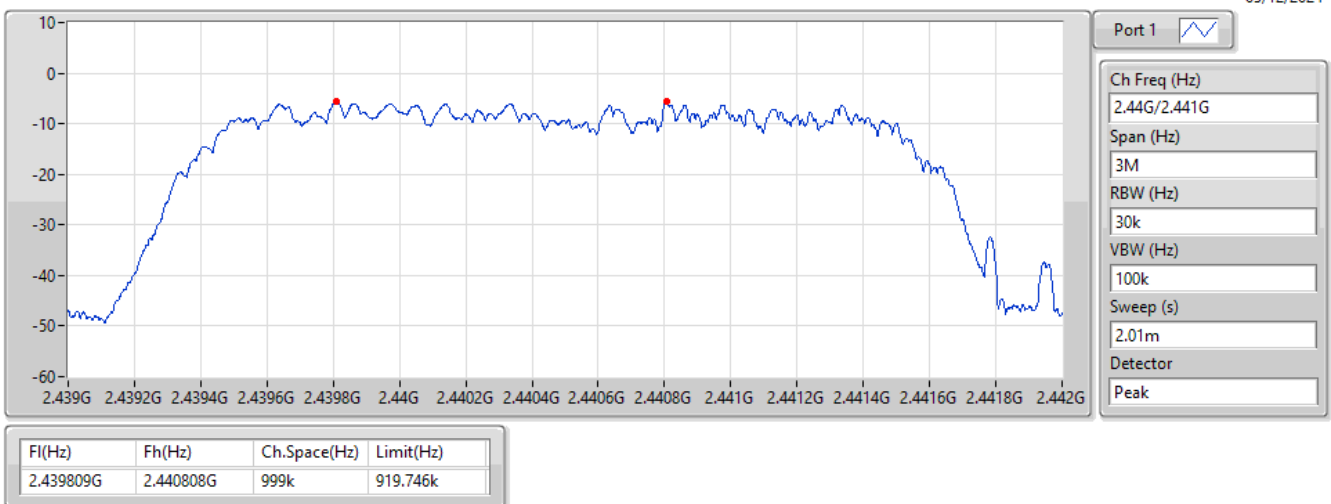


2.4-2.4835GHz_BT-EDR(2Mbps)

Channel Separation-FS

2.44G/2.441GHz

03/12/2024

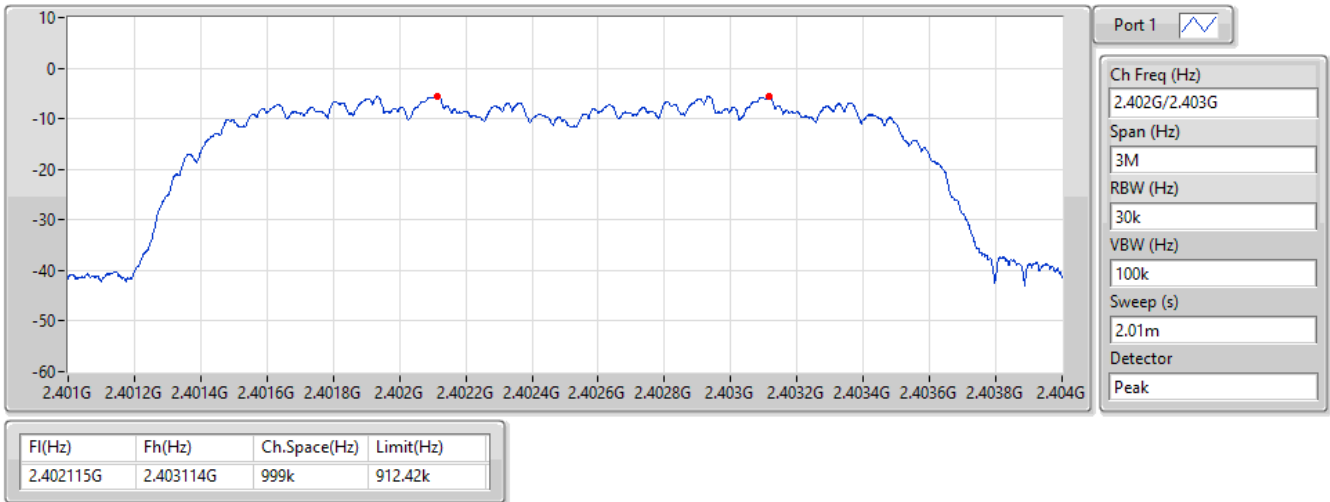


2.4-2.4835GHz_BT-EDR(3Mbps)

Channel Separation-FS

2.402G/2.403GHz

04/12/2024





Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	5.32	0.00340
BT-EDR(2Mbps)	3.39	0.00218
BT-EDR(3Mbps)	3.54	0.00226

Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	2.92	5.19	21.00
2440MHz	Pass	2.92	5.32	21.00
2480MHz	Pass	2.92	4.87	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	2.92	3.35	21.00
2440MHz	Pass	2.92	3.39	21.00
2480MHz	Pass	2.92	2.70	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	2.92	3.43	21.00
2440MHz	Pass	2.92	3.54	21.00
2480MHz	Pass	2.92	2.96	21.00

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



Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	4.92	0.00310
BT-EDR(2Mbps)	0.58	0.00114
BT-EDR(3Mbps)	0.59	0.00115



Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	2.92	4.79	21.00
2440MHz	Pass	2.92	4.92	21.00
2480MHz	Pass	2.92	4.41	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	2.92	0.43	21.00
2440MHz	Pass	2.92	0.58	21.00
2480MHz	Pass	2.92	0.01	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	2.92	0.38	21.00
2440MHz	Pass	2.92	0.59	21.00
2480MHz	Pass	2.92	-0.04	21.00

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



Summary

Mode	Max-Hop No
2.4-2.4835GHz	-
BT-BR(1Mbps)	79
BT-EDR(2Mbps)	79
BT-EDR(3Mbps)	79



Result

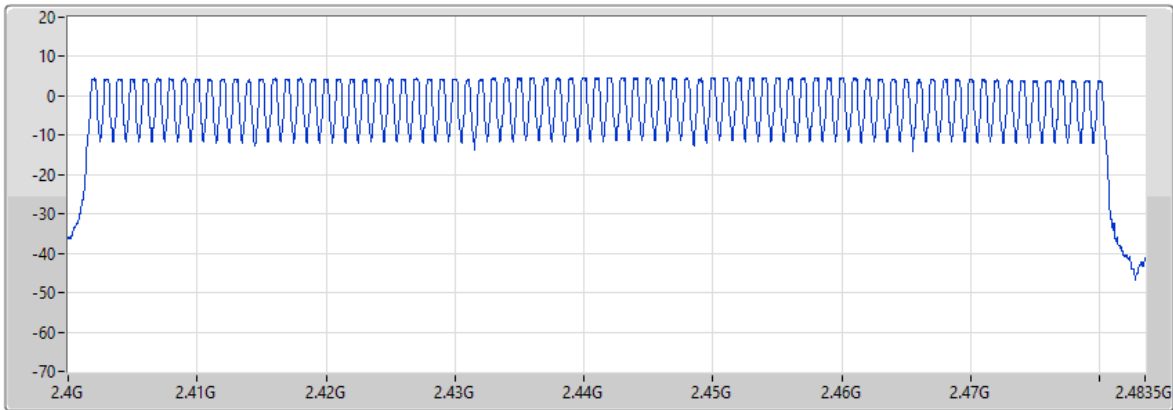
Mode	Result	Hopping No	Limit
BT-BR(1Mbps)	-	-	-
2440MHz	Pass	79	15
BT-EDR(2Mbps)	-	-	-
2440MHz	Pass	79	15
BT-EDR(3Mbps)	-	-	-
2440MHz	Pass	79	15

2.4-2.4835GHz_BT-BR(1Mbps)

Hopping-FS

2440MHz

03/12/2024



Port 1 

Hopping No
79

Span (Hz)
83.5M

RBW (Hz)
100k

VBW (Hz)
300kHz

Sweep (s)
132.6us

Detector
Peak

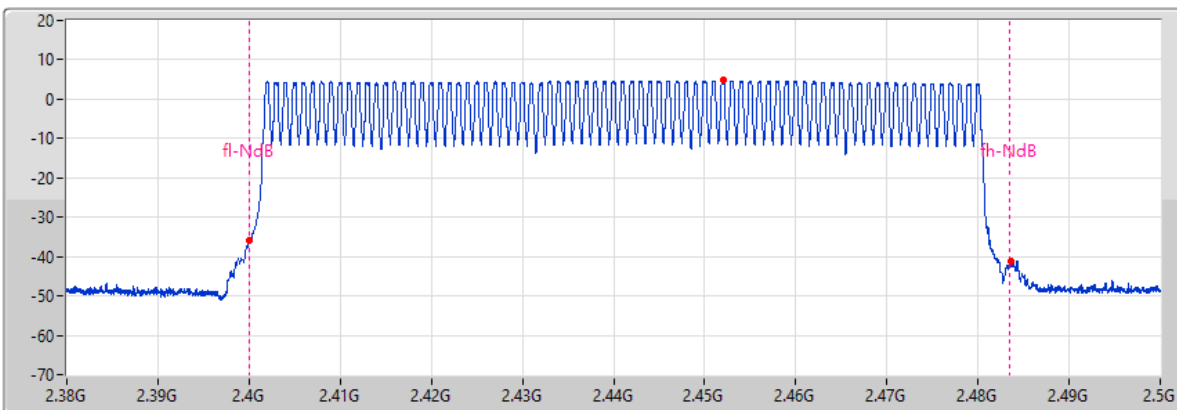
Hopping No	Limit
79	15

2.4-2.4835GHz_BT-BR(1Mbps)

2440MHz

Hopping Ch Bandedge (Non-restricted Band)

03/12/2024



Port 1 

Span (Hz)
120M

RBW (Hz)
100k

VBW (Hz)
300k

Sweep (s)
132.6u

Detector
Peak

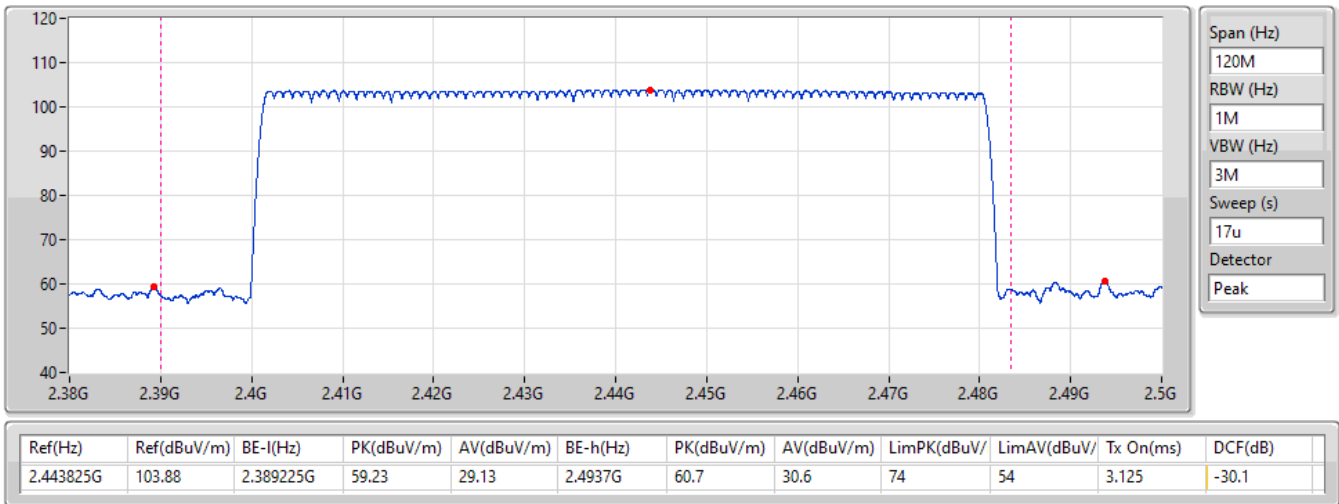
Limit(dBm)	Ref(Hz)	Ref(dBm)	BE-l(Hz)	BE-l(dBm)	BE-h(Hz)	BE-h(dBm)
-15.26	2.452G	4.74	2.399995G	-36.03	2.483575G	-41.11

2.4-2.4835GHz_BT-BR(1Mbps)

2440MHz

Hopping Ch Bandedge (Restricted Band)

03/12/2024

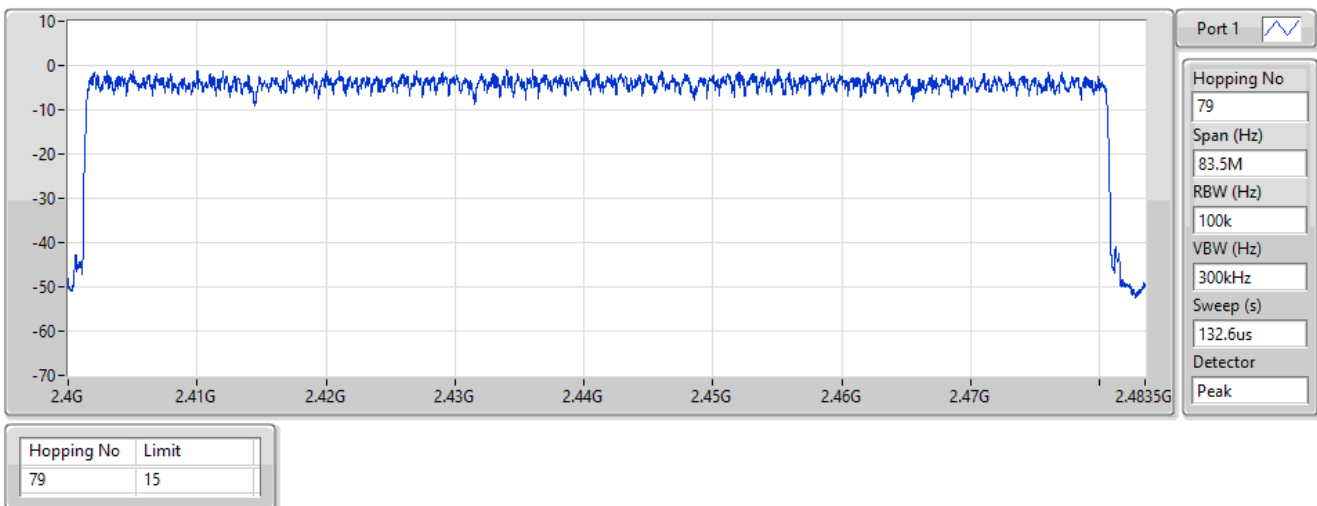


2.4-2.4835GHz_BT-EDR(2Mbps)

2440MHz

Hopping-FS

04/12/2024

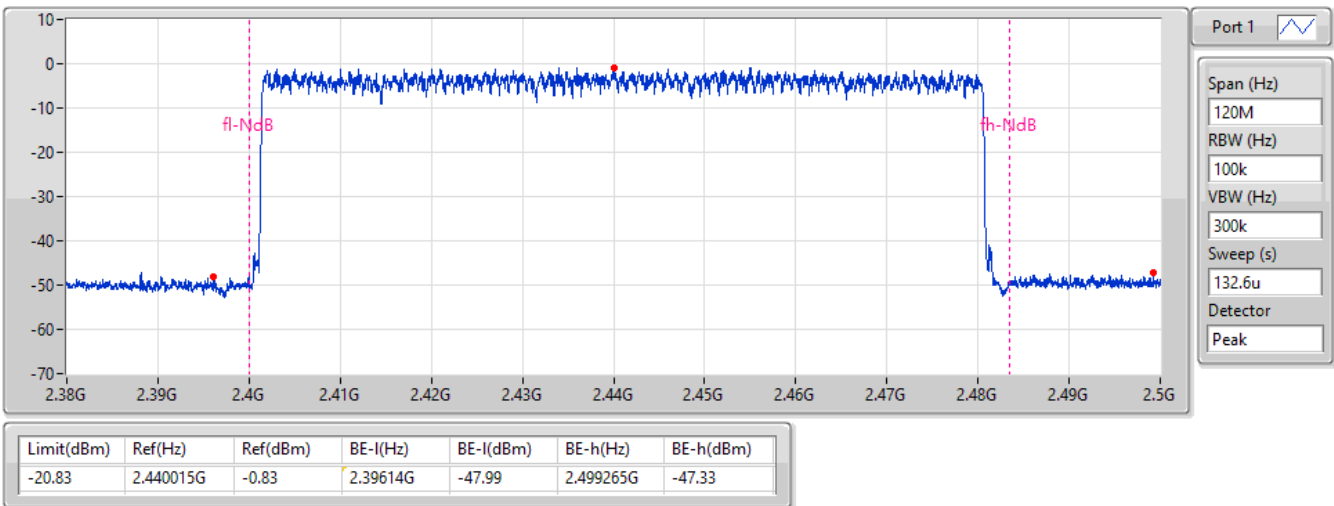


2.4-2.4835GHz_BT-EDR(2Mbps)

2440MHz

Hopping Ch Bandedge (Non-restricted Band)

04/12/2024

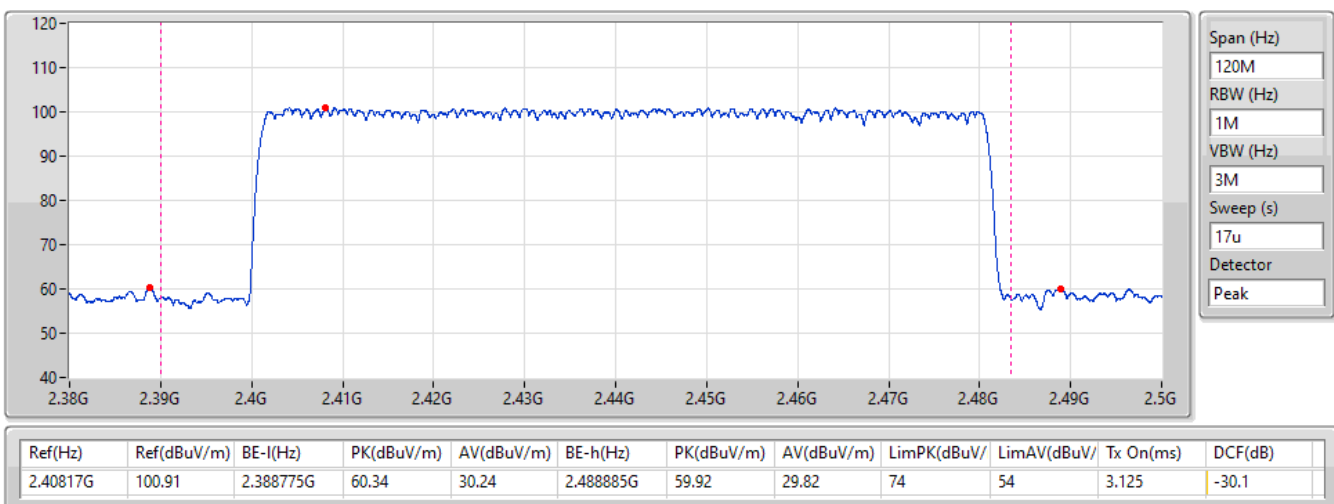


2.4-2.4835GHz_BT-EDR(2Mbps)

2440MHz

Hopping Ch Bandedge (Restricted Band)

04/12/2024

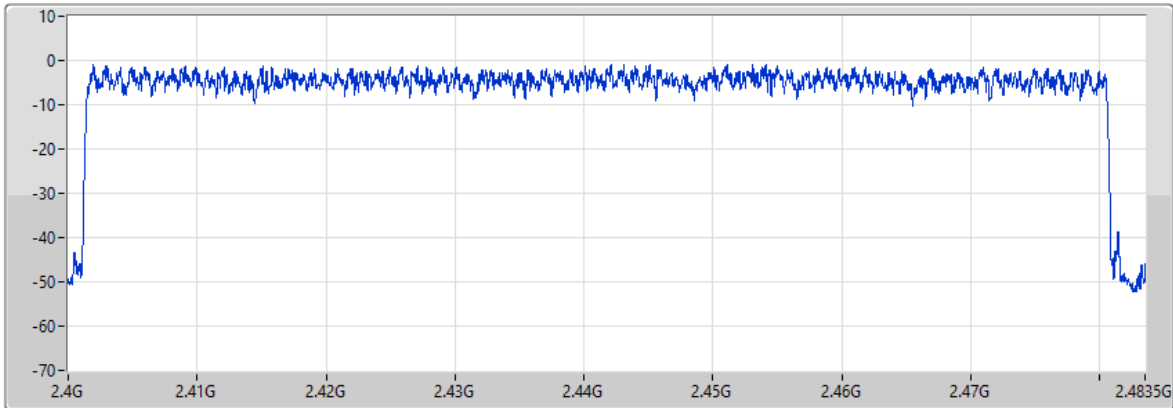


2.4-2.4835GHz_BT-EDR(3Mbps)

Hopping-FS

2440MHz

04/12/2024



Port 1 

Hopping No
79

Span (Hz)
83.5M

RBW (Hz)
100k

VBW (Hz)
300kHz

Sweep (s)
132.6us

Detector
Peak

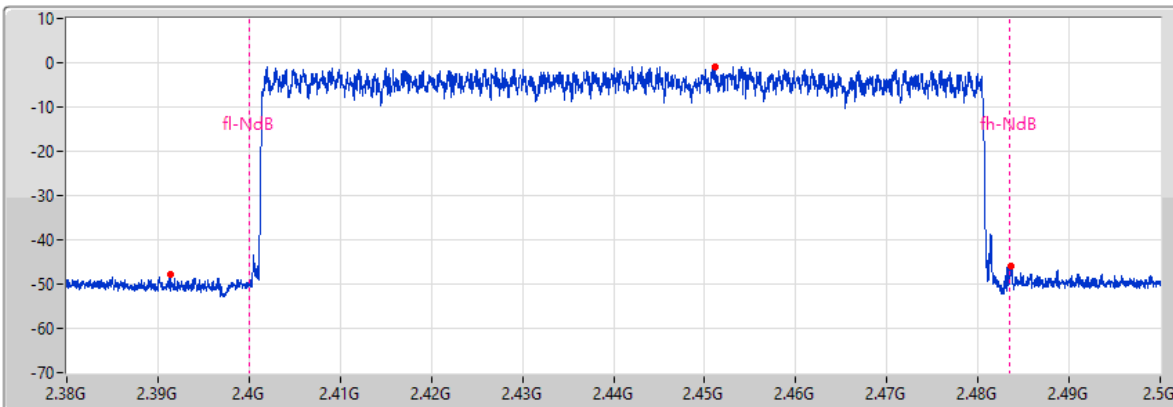
Hopping No	Limit
79	15

2.4-2.4835GHz_BT-EDR(3Mbps)

2440MHz

Hopping Ch Bandedge (Non-restricted Band)

04/12/2024



Port 1 

Span (Hz)
120M

RBW (Hz)
100k

VBW (Hz)
300k

Sweep (s)
132.6u

Detector
Peak

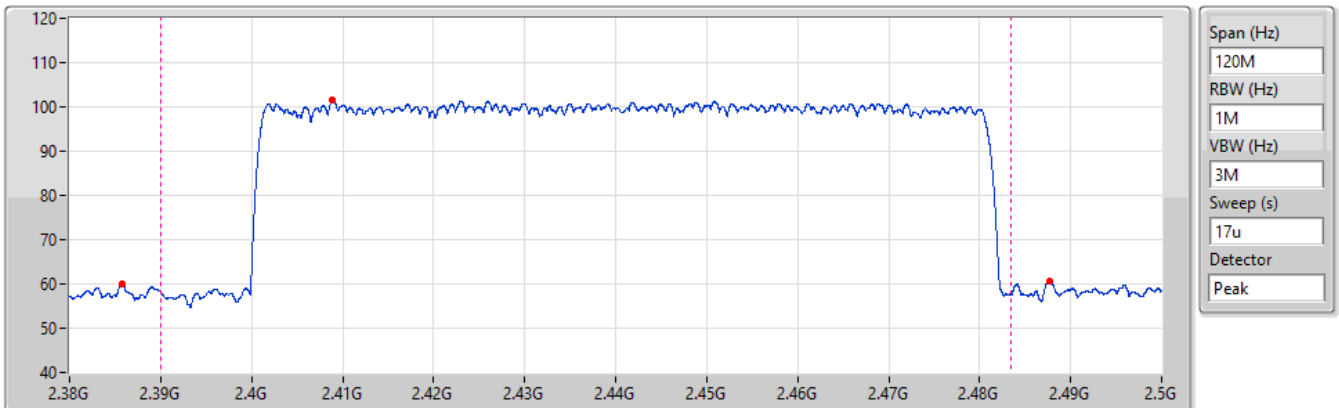
Limit(dBm)	Ref(Hz)	Ref(dBm)	BE-l(Hz)	BE-l(dBm)	BE-h(Hz)	BE-h(dBm)
-20.97	2.451085G	-0.97	2.39131G	-47.88	2.48356G	-46.01

2.4-2.4835GHz_BT-EDR(3Mbps)

2440MHz

Hopping Ch Bandedge (Restricted Band)

04/12/2024



Span (Hz)
120M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep (s)
17u

Detector
Peak

Ref(Hz)	Ref(dBuV/m)	BE-l(Hz)	PK(dBuV/m)	AV(dBuV/m)	BE-h(Hz)	PK(dBuV/m)	AV(dBuV/m)	LimPK(dBuV/	LimAV(dBuV/	Tx On(ms)	DCF(dB)
2.408935G	101.56	2.38573G	60.04	29.94	2.48764G	60.67	30.57	74	54	3.125	-30.1



Summary

2.4-2.4835GHz	-
BT-BR(1Mbps)	308.47375m_DH5
BT-EDR(2Mbps)	288.6728m_DH5
BT-EDR(3Mbps)	285.7946m_DH5

Result

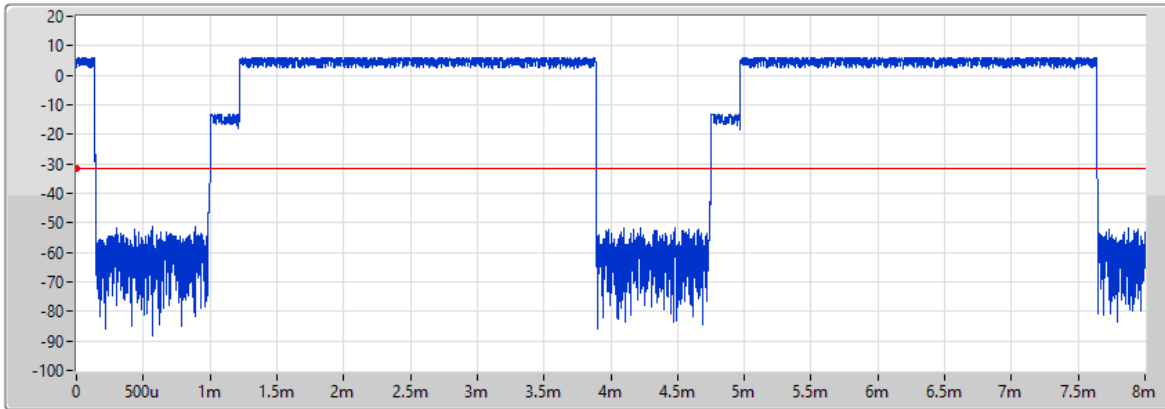
Mode	Result	Period (s)	Dwell (s)	Limit (s)	Tx On (s)
BT-BR(1Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	308.47375m_DH5	400m	2.89375m
BT-EDR(2Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	288.6728m_DH5	400m	2.708m
BT-EDR(3Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	285.7946m_DH5	400m	2.681m

2.4-2.4835GHz_BT-BR(1Mbps)

Dwell-FS

2440MHz

03/12/2024



Port 1 

Ch Freq (Hz)
2.44G

RBW (Hz)
300k

VBW (Hz)
1M

Sweep Time (s)
8m

TX Time (s)
2.89375m

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
31.6	308.47375m_DH5	400m	2.89375m

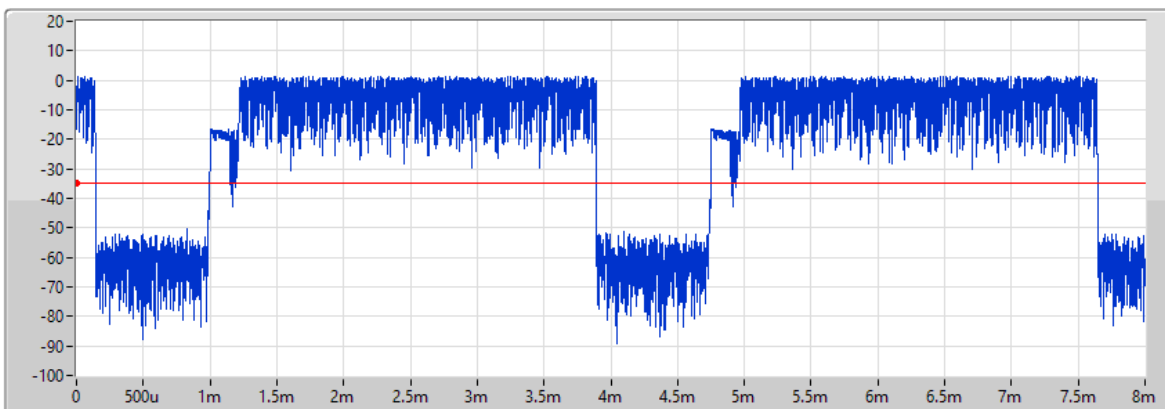
DH5

2.4-2.4835GHz_BT-EDR(2Mbps)

Dwell-FS

2440MHz

04/12/2024



Port 1 

Ch Freq (Hz)
2.44G

RBW (Hz)
300k

VBW (Hz)
1M

Sweep Time (s)
8m

TX Time (s)
2.708m

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
31.6	288.6728m_DH5	400m	2.708m

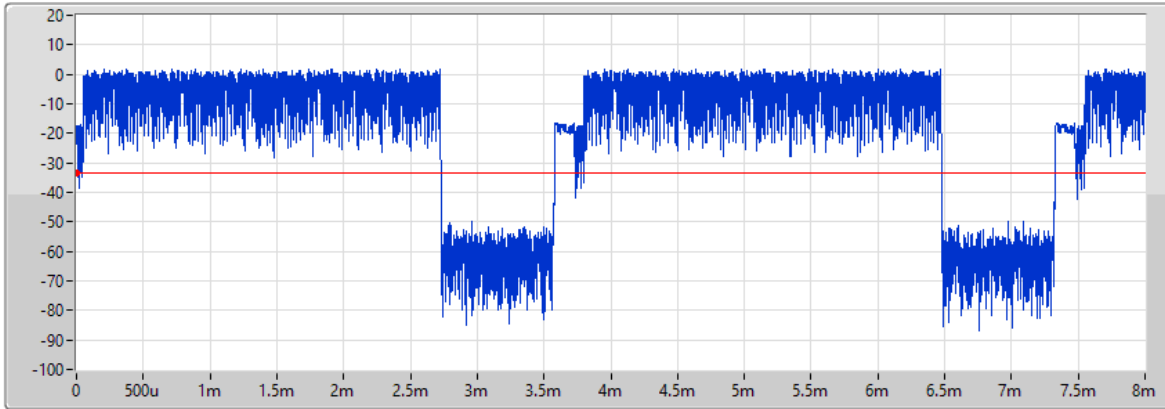
DH5

2.4-2.4835GHz_BT-EDR(3Mbps)

Dwell-FS

2440MHz

04/12/2024



Port 1 

Ch Freq (Hz)
2.44G

RBW (Hz)
300k

VBW (Hz)
1M

Sweep Time (s)
8m

TX Time (s)
2.681m

DH5

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
31.6	285.7946m_DH5	400m	2.681m

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-BR(1Mbps)	Pass	2.43991G	4.49	-15.51	1.93938G	-55.42	2.4G	-37.17	2.4G	-35.48	2.50146G	-53.75	24.61194G	-41.69	1
BT-EDR(2Mbps)	Pass	2.44008G	-0.90	-20.90	1.94525G	-54.18	2.39988G	-46.30	2.4G	-46.16	2.50078G	-53.94	24.4882G	-41.89	1
BT-EDR(3Mbps)	Pass	2.44008G	-1.20	-21.20	2.13678G	-54.55	2.39996G	-38.73	2.4G	-38.07	2.50234G	-53.90	24.19013G	-41.66	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-BR(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.43991G	4.49	-15.51	1.93938G	-55.42	2.4G	-37.17	2.4G	-35.48	2.50146G	-53.75	24.61194G	-41.69	1
2440MHz	Pass	2.43991G	4.49	-15.51	2.1403G	-56.15	2.39748G	-54.97	2.4G	-56.07	2.50278G	-54.08	24.53039G	-41.06	1
2480MHz	Pass	2.43991G	4.49	-15.51	2.15675G	-54.37	2.39996G	-53.63	2.4G	-56.29	2.50034G	-54.22	24.53039G	-42.31	1
BT-EDR(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.44008G	-0.90	-20.90	1.94525G	-54.18	2.39988G	-46.30	2.4G	-46.16	2.50078G	-53.94	24.4882G	-41.89	1
2440MHz	Pass	2.44008G	-0.90	-20.90	2.30128G	-55.20	2.39256G	-54.23	2.4G	-56.00	2.50106G	-52.92	16.20106G	-41.62	1
2480MHz	Pass	2.44008G	-0.90	-20.90	2.18848G	-55.44	2.39768G	-53.57	2.4G	-56.38	2.50226G	-54.28	16.20668G	-41.89	1
BT-EDR(3Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.44008G	-1.20	-21.20	2.13678G	-54.55	2.39996G	-38.73	2.4G	-38.07	2.50234G	-53.90	24.19013G	-41.66	1
2440MHz	Pass	2.44008G	-1.20	-21.20	1.88298G	-54.73	2.39392G	-53.64	2.4G	-55.75	2.50254G	-54.10	24.4629G	-41.93	1
2480MHz	Pass	2.44008G	-1.20	-21.20	1.98403G	-54.97	2.39676G	-54.19	2.4G	-56.76	2.50318G	-54.01	24.51351G	-41.50	1

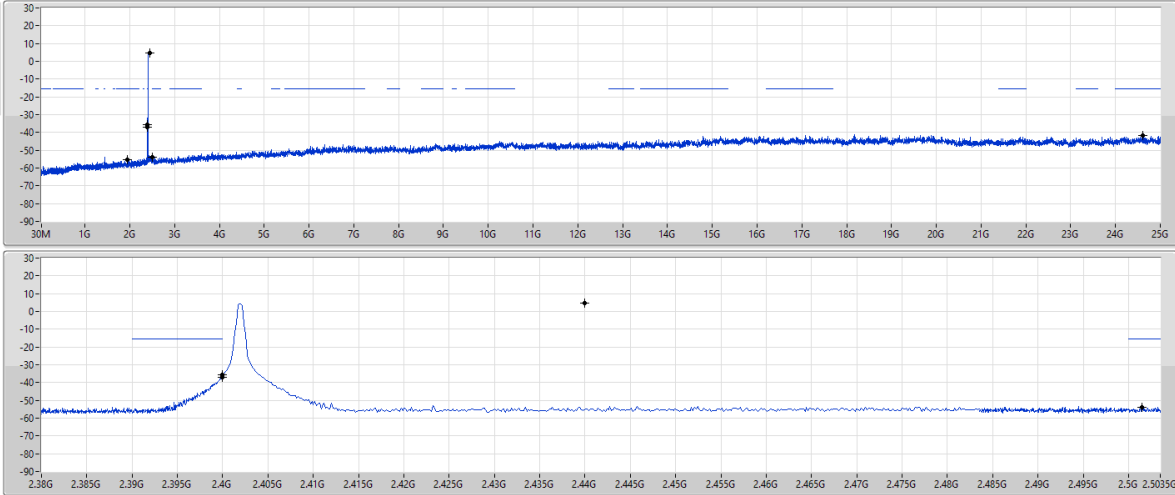
2.4-2.4835GHz_BT-BR(1Mbps)

CSEndB-FS

2402MHz

03/12/2024

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
2.43991G	4.49	-15.51	1.93938G	-55.42	2.4G	-37.17	2.4G	-35.48	2.50146G	-53.75	2.461194G	-41.69	1

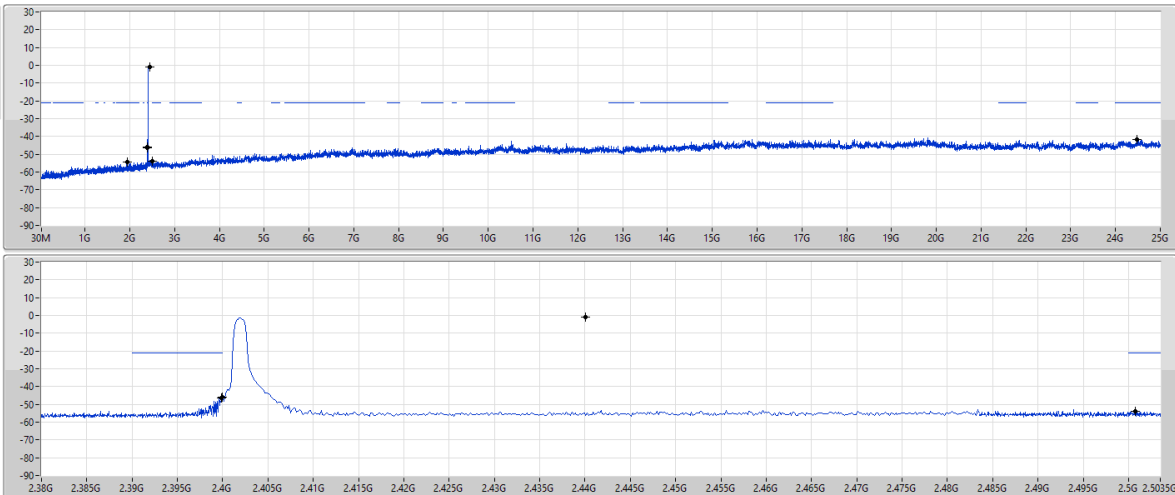
2.4-2.4835GHz_BT-EDR(2Mbps)

CSEndB-FS

2402MHz

04/12/2024

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
2.44008G	-0.90	-20.90	1.94525G	-54.18	2.39988G	-46.30	2.4G	-46.16	2.50078G	-53.94	2.44882G	-41.89	1

2.4-2.4835GHz_BT-EDR(3Mbps)

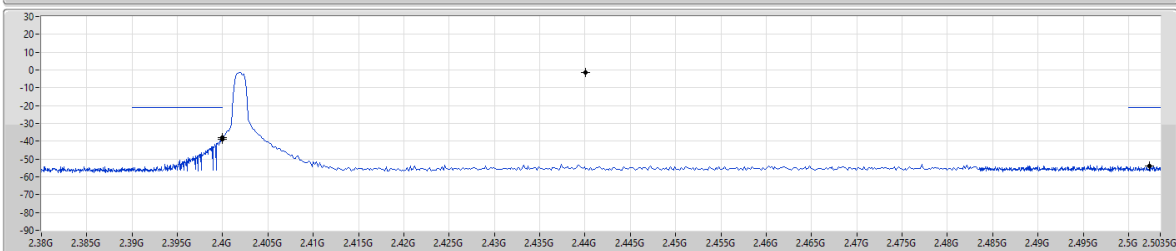
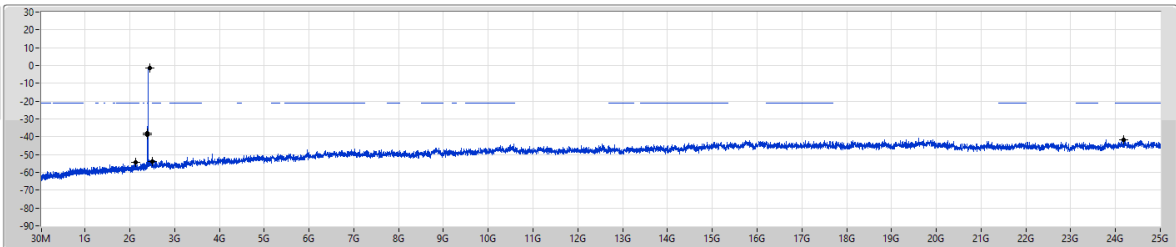
CSEndB-FS

2402MHz

04/12/2024

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

Port 1



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
2.44008G	-1.20	-21.20	2.13678G	-54.55	2.39996G	-38.73	2.4G	-38.07	2.50234G	-53.90	2.419013G	-41.66	1



Summary

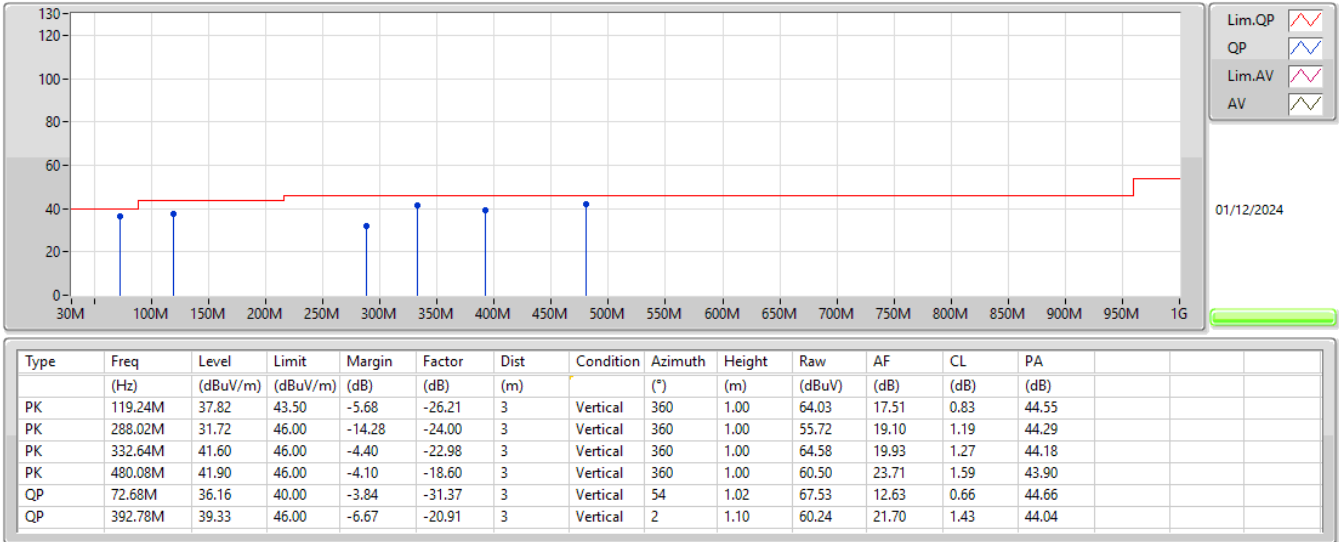
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-EDR(3Mbps)	Pass	QP	72.68M	36.16	40.00	-3.84	3	Vertical	54	1.02

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-EDR(3Mbps)	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	119.24M	37.82	43.50	-5.68	3	Vertical	360	1.00
2440MHz	Pass	PK	288.02M	31.72	46.00	-14.28	3	Vertical	360	1.00
2440MHz	Pass	PK	332.64M	41.60	46.00	-4.40	3	Vertical	360	1.00
2440MHz	Pass	PK	480.08M	41.90	46.00	-4.10	3	Vertical	360	1.00
2440MHz	Pass	QP	72.68M	36.16	40.00	-3.84	3	Vertical	54	1.02
2440MHz	Pass	QP	392.78M	39.33	46.00	-6.67	3	Vertical	2	1.10
2440MHz	Pass	PK	72.68M	34.47	40.00	-5.53	3	Horizontal	0	1.00
2440MHz	Pass	PK	119.24M	35.65	43.50	-7.85	3	Horizontal	0	1.00
2440MHz	Pass	PK	330.7M	38.94	46.00	-7.06	3	Horizontal	0	1.00
2440MHz	Pass	PK	592.6M	36.31	46.00	-9.69	3	Horizontal	0	1.00
2440MHz	Pass	PK	714.82M	34.55	46.00	-11.45	3	Horizontal	0	1.00
2440MHz	Pass	QP	400.54M	40.86	46.00	-5.14	3	Horizontal	155	2.17

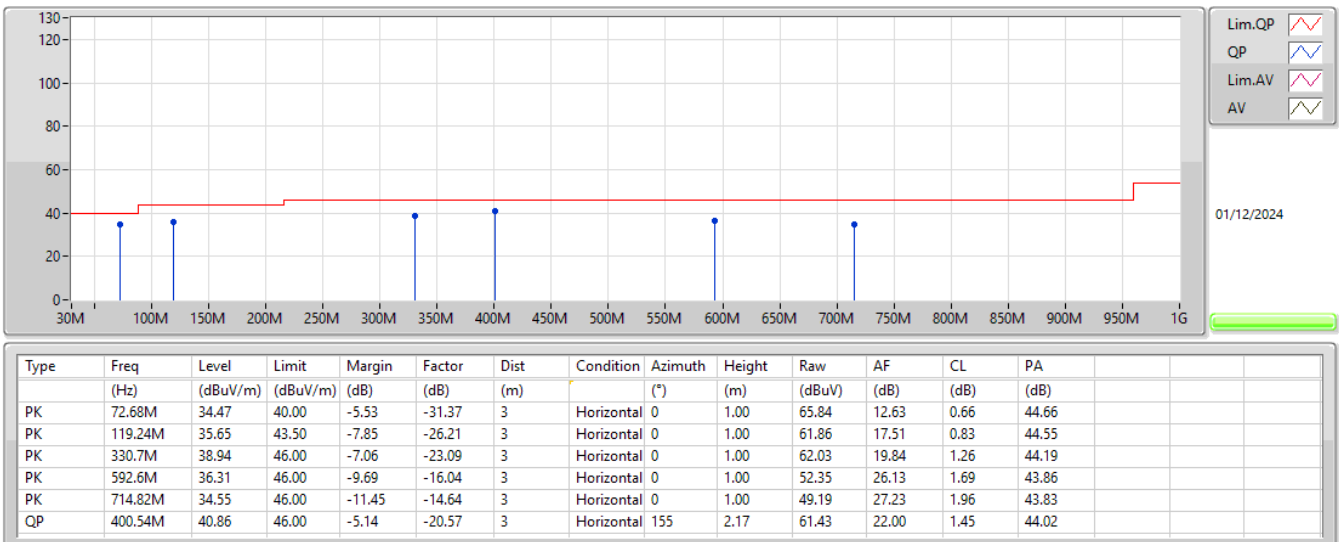
2.4-2.4835GHz_BT-EDR(3Mbps)

2440MHz_TX



2.4-2.4835GHz_BT-EDR(3Mbps)

2440MHz_TX





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-BR(1Mbps)	Pass	PK	2.49831G	58.16	74.00	-15.84	3	Vertical	200	1.61
BT-EDR(3Mbps)	Pass	PK	2.48893G	58.20	74.00	-15.80	3	Vertical	202	1.61

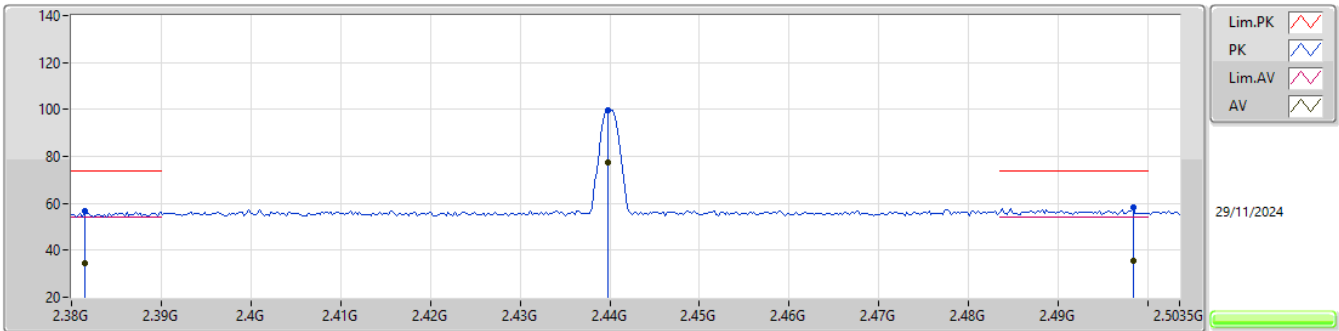
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-BR(1Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.38092G	34.14	54.00	-19.86	3	Vertical	198	1.77
2402MHz	Pass	AV	2.40218G	78.09	Inf	-Inf	3	Vertical	198	1.77
2402MHz	Pass	PK	2.38092G	56.64	74.00	-17.36	3	Vertical	198	1.77
2402MHz	Pass	PK	2.40218G	100.59	Inf	-Inf	3	Vertical	198	1.77
2402MHz	Pass	AV	2.38386G	34.56	54.00	-19.44	3	Horizontal	229	1.75
2402MHz	Pass	AV	2.40209G	75.35	Inf	-Inf	3	Horizontal	229	1.75
2402MHz	Pass	PK	2.38386G	57.06	74.00	-16.94	3	Horizontal	229	1.75
2402MHz	Pass	PK	2.40209G	97.85	Inf	-Inf	3	Horizontal	229	1.75
2402MHz	Pass	AV	4.80374G	19.27	54.00	-34.73	3	Vertical	241	1.34
2402MHz	Pass	PK	4.80374G	41.77	74.00	-32.23	3	Vertical	241	1.34
2402MHz	Pass	AV	4.80335G	18.60	54.00	-35.40	3	Horizontal	136	1.50
2402MHz	Pass	PK	4.80335G	41.10	74.00	-32.90	3	Horizontal	136	1.50
2440MHz	Pass	AV	2.38148G	34.23	54.00	-19.77	3	Vertical	200	1.61
2440MHz	Pass	AV	2.43977G	77.41	Inf	-Inf	3	Vertical	200	1.61
2440MHz	Pass	AV	2.49831G	35.66	54.00	-18.34	3	Vertical	200	1.61
2440MHz	Pass	PK	2.38148G	56.73	74.00	-17.27	3	Vertical	200	1.61
2440MHz	Pass	PK	2.43977G	99.91	Inf	-Inf	3	Vertical	200	1.61
2440MHz	Pass	PK	2.49831G	58.16	74.00	-15.84	3	Vertical	200	1.61
2440MHz	Pass	AV	2.38025G	33.77	54.00	-20.23	3	Horizontal	275	1.67
2440MHz	Pass	AV	2.43977G	74.62	Inf	-Inf	3	Horizontal	275	1.67
2440MHz	Pass	AV	2.49658G	35.25	54.00	-18.75	3	Horizontal	275	1.67
2440MHz	Pass	PK	2.38025G	56.27	74.00	-17.73	3	Horizontal	275	1.67
2440MHz	Pass	PK	2.43977G	97.12	Inf	-Inf	3	Horizontal	275	1.67
2440MHz	Pass	PK	2.49658G	57.75	74.00	-16.25	3	Horizontal	275	1.67
2440MHz	Pass	AV	4.88182G	19.00	54.00	-35.00	3	Vertical	15	1.50
2440MHz	Pass	PK	4.88182G	41.50	74.00	-32.50	3	Vertical	15	1.50
2440MHz	Pass	AV	4.88478G	18.43	54.00	-35.57	3	Horizontal	236	1.25
2440MHz	Pass	PK	4.88478G	40.93	74.00	-33.07	3	Horizontal	236	1.25
2480MHz	Pass	AV	2.48018G	78.52	Inf	-Inf	3	Vertical	187	1.69
2480MHz	Pass	AV	2.49306G	35.53	54.00	-18.47	3	Vertical	187	1.69
2480MHz	Pass	PK	2.48018G	101.02	Inf	-Inf	3	Vertical	187	1.69
2480MHz	Pass	PK	2.49306G	58.03	74.00	-15.97	3	Vertical	187	1.69
2480MHz	Pass	AV	2.48018G	77.45	Inf	-Inf	3	Horizontal	275	1.62
2480MHz	Pass	AV	2.4901G	35.22	54.00	-18.78	3	Horizontal	275	1.62
2480MHz	Pass	PK	2.48018G	99.95	Inf	-Inf	3	Horizontal	275	1.62
2480MHz	Pass	PK	2.4901G	57.72	74.00	-16.28	3	Horizontal	275	1.62
2480MHz	Pass	AV	4.96086G	19.31	54.00	-34.69	3	Vertical	252	2.40
2480MHz	Pass	PK	4.96086G	41.81	74.00	-32.19	3	Vertical	252	2.40
2480MHz	Pass	AV	4.9633G	19.51	54.00	-34.49	3	Horizontal	196	1.65
2480MHz	Pass	PK	4.9633G	42.01	74.00	-31.99	3	Horizontal	196	1.65
BT-EDR(3Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.38571G	34.69	54.00	-19.31	3	Vertical	198	1.78
2402MHz	Pass	AV	2.40201G	75.17	Inf	-Inf	3	Vertical	198	1.78
2402MHz	Pass	PK	2.38571G	57.19	74.00	-16.81	3	Vertical	198	1.78
2402MHz	Pass	PK	2.40201G	97.67	Inf	-Inf	3	Vertical	198	1.78
2402MHz	Pass	AV	2.38286G	34.16	54.00	-19.84	3	Horizontal	274	1.71
2402MHz	Pass	AV	2.40201G	70.96	Inf	-Inf	3	Horizontal	274	1.71
2402MHz	Pass	PK	2.38286G	56.66	74.00	-17.34	3	Horizontal	274	1.71
2402MHz	Pass	PK	2.40201G	93.46	Inf	-Inf	3	Horizontal	274	1.71
2402MHz	Pass	AV	4.79988G	25.51	54.00	-28.49	3	Vertical	184	1.50
2402MHz	Pass	PK	4.79988G	48.01	74.00	-25.99	3	Vertical	184	1.50
2402MHz	Pass	AV	4.79926G	22.61	54.00	-31.39	3	Horizontal	206	1.53
2402MHz	Pass	PK	4.79926G	45.11	74.00	-28.89	3	Horizontal	206	1.53
2440MHz	Pass	AV	2.38321G	33.64	54.00	-20.36	3	Vertical	202	1.61
2440MHz	Pass	AV	2.44002G	74.48	Inf	-Inf	3	Vertical	202	1.61
2440MHz	Pass	AV	2.48893G	35.70	54.00	-18.30	3	Vertical	202	1.61
2440MHz	Pass	PK	2.38321G	56.14	74.00	-17.86	3	Vertical	202	1.61
2440MHz	Pass	PK	2.44002G	96.98	Inf	-Inf	3	Vertical	202	1.61
2440MHz	Pass	PK	2.48893G	58.20	74.00	-15.80	3	Vertical	202	1.61
2440MHz	Pass	AV	2.38445G	33.30	54.00	-20.70	3	Horizontal	275	1.69

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2440MHz	Pass	AV	2.44002G	71.58	Inf	-Inf	3	Horizontal	275	1.69
2440MHz	Pass	AV	2.48992G	35.33	54.00	-18.67	3	Horizontal	275	1.69
2440MHz	Pass	PK	2.38445G	55.80	74.00	-18.20	3	Horizontal	275	1.69
2440MHz	Pass	PK	2.44002G	94.08	Inf	-Inf	3	Horizontal	275	1.69
2440MHz	Pass	PK	2.48992G	57.83	74.00	-16.17	3	Horizontal	275	1.69
2440MHz	Pass	AV	4.87808G	18.65	54.00	-35.35	3	Vertical	166	2.53
2440MHz	Pass	PK	4.87808G	41.15	74.00	-32.85	3	Vertical	166	2.53
2440MHz	Pass	AV	4.87826G	18.72	54.00	-35.28	3	Horizontal	39	2.30
2440MHz	Pass	PK	4.87826G	41.22	74.00	-32.78	3	Horizontal	39	2.30
2480MHz	Pass	AV	2.48001G	75.28	Inf	-Inf	3	Vertical	186	1.69
2480MHz	Pass	AV	2.49906G	35.34	54.00	-18.66	3	Vertical	186	1.69
2480MHz	Pass	PK	2.48001G	97.78	Inf	-Inf	3	Vertical	186	1.69
2480MHz	Pass	PK	2.49906G	57.84	74.00	-16.16	3	Vertical	186	1.69
2480MHz	Pass	AV	2.48001G	74.16	Inf	-Inf	3	Horizontal	275	1.62
2480MHz	Pass	AV	2.48854G	35.36	54.00	-18.64	3	Horizontal	275	1.62
2480MHz	Pass	PK	2.48001G	96.66	Inf	-Inf	3	Horizontal	275	1.62
2480MHz	Pass	PK	2.48854G	57.86	74.00	-16.14	3	Horizontal	275	1.62
2480MHz	Pass	AV	4.96108G	19.63	54.00	-34.37	3	Vertical	316	2.56
2480MHz	Pass	PK	4.96108G	42.13	74.00	-31.87	3	Vertical	316	2.56
2480MHz	Pass	AV	4.9589G	19.51	54.00	-34.49	3	Horizontal	259	1.50
2480MHz	Pass	PK	4.9589G	42.01	74.00	-31.99	3	Horizontal	259	1.50

2.4-2.4835GHz_BT-BR(1Mbps)

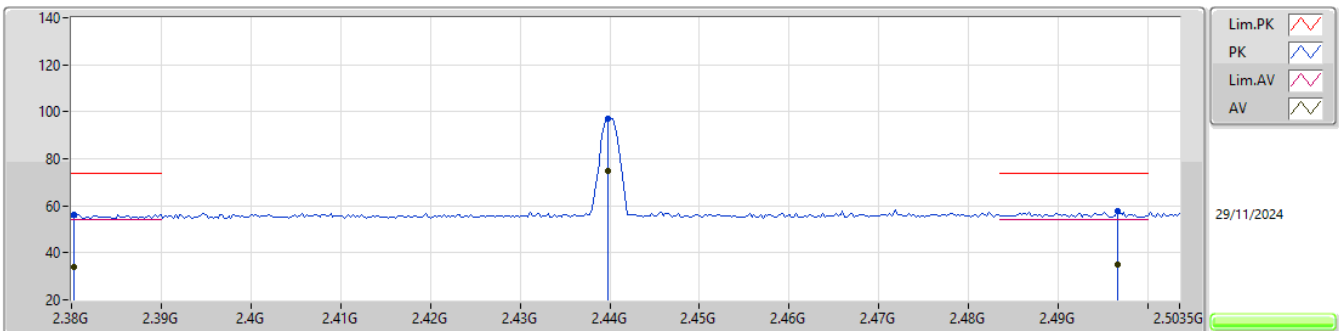
2440MHz_TX



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	2.38148G	34.23	54.00	-19.77	30.46	3	Vertical	200	1.61	3.77	27.31	3.15	-				
AV	2.43977G	77.41	Inf	-Inf	30.88	3	Vertical	200	1.61	46.53	27.70	3.18	-				
AV	2.49831G	35.66	54.00	-18.34	31.13	3	Vertical	200	1.61	4.53	27.92	3.21	-				
PK	2.38148G	56.73	74.00	-17.27	30.46	3	Vertical	200	1.61	26.27	27.31	3.15	-				
PK	2.43977G	99.91	Inf	-Inf	30.88	3	Vertical	200	1.61	69.03	27.70	3.18	-				
PK	2.49831G	58.16	74.00	-15.84	31.13	3	Vertical	200	1.61	27.03	27.92	3.21	-				

2.4-2.4835GHz_BT-BR(1Mbps)

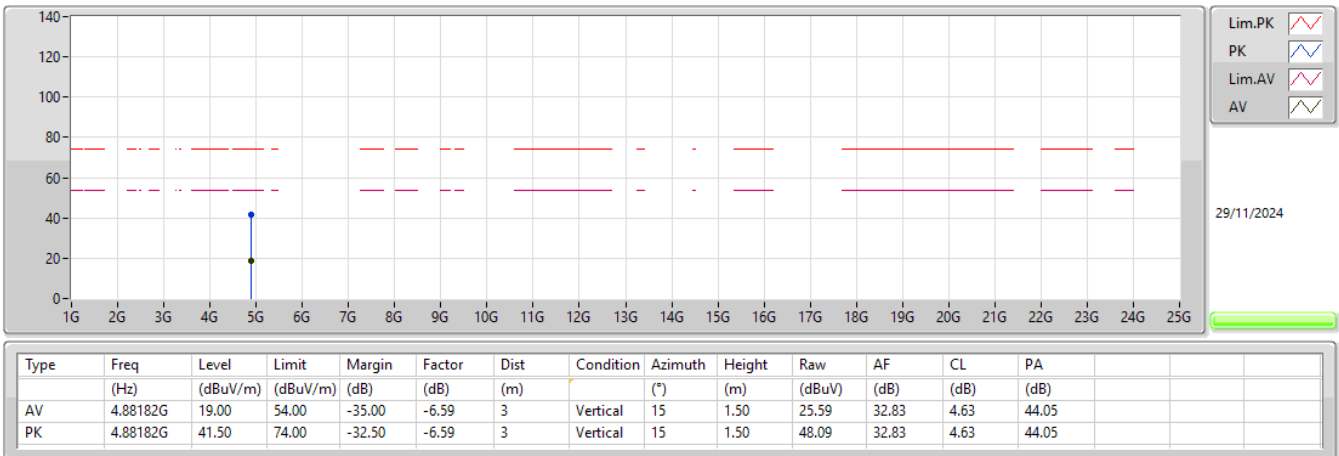
2440MHz_TX



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	2.38025G	33.77	54.00	-20.23	30.45	3	Horizontal	275	1.67	3.32	27.30	3.15	-				
AV	2.43977G	74.62	Inf	-Inf	30.88	3	Horizontal	275	1.67	43.74	27.70	3.18	-				
AV	2.49658G	35.25	54.00	-18.75	31.14	3	Horizontal	275	1.67	4.11	27.93	3.21	-				
PK	2.38025G	56.27	74.00	-17.73	30.45	3	Horizontal	275	1.67	25.82	27.30	3.15	-				
PK	2.43977G	97.12	Inf	-Inf	30.88	3	Horizontal	275	1.67	66.24	27.70	3.18	-				
PK	2.49658G	57.75	74.00	-16.25	31.14	3	Horizontal	275	1.67	26.61	27.93	3.21	-				

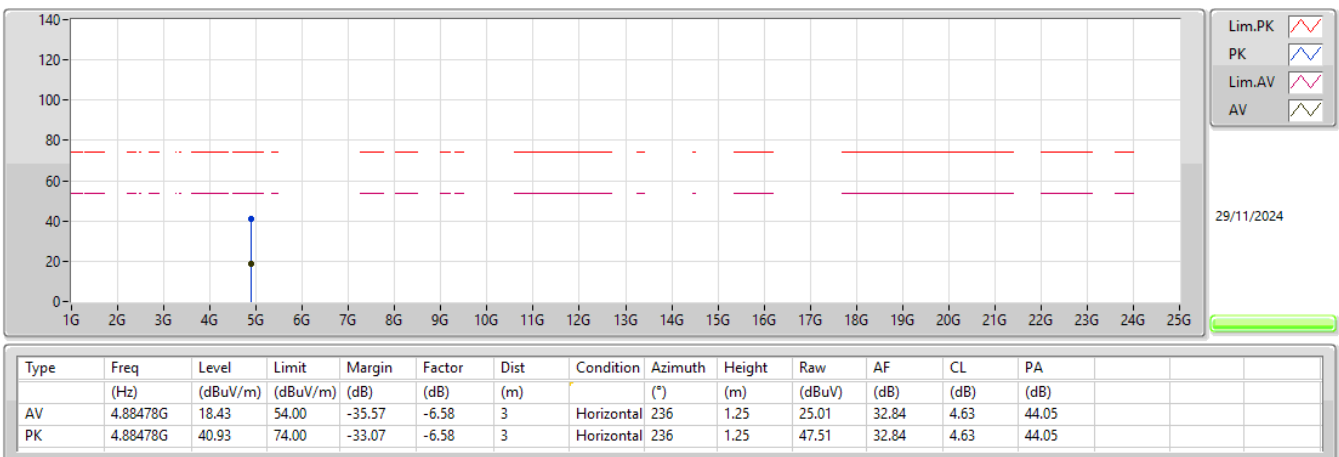
2.4-2.4835GHz_BT-BR(1Mbps)

2440MHz_TX



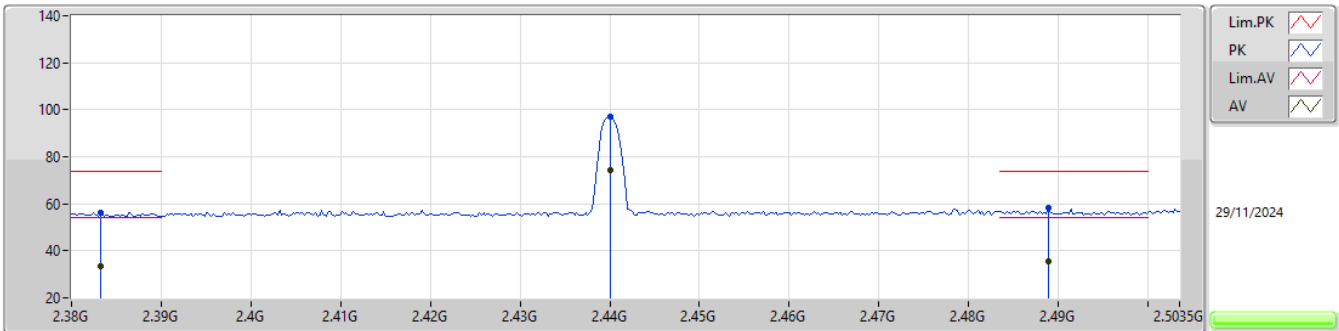
2.4-2.4835GHz_BT-BR(1Mbps)

2440MHz_TX



2.4-2.4835GHz_BT-EDR(3Mbps)

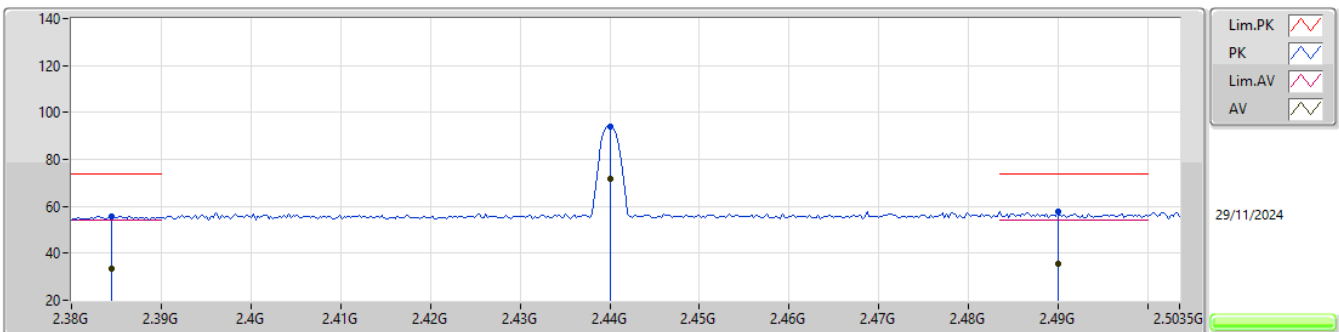
2440MHz_TX



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	2.38321G	33.64	54.00	-20.36	30.48	3	Vertical	202	1.61	3.16	27.33	3.15	-
AV	2.44002G	74.48	Inf	-Inf	30.88	3	Vertical	202	1.61	43.60	27.70	3.18	-
AV	2.48893G	35.70	54.00	-18.30	31.20	3	Vertical	202	1.61	4.50	27.99	3.21	-
PK	2.38321G	56.14	74.00	-17.86	30.48	3	Vertical	202	1.61	25.66	27.33	3.15	-
PK	2.44002G	96.98	Inf	-Inf	30.88	3	Vertical	202	1.61	66.10	27.70	3.18	-
PK	2.48893G	58.20	74.00	-15.80	31.20	3	Vertical	202	1.61	27.00	27.99	3.21	-

2.4-2.4835GHz_BT-EDR(3Mbps)

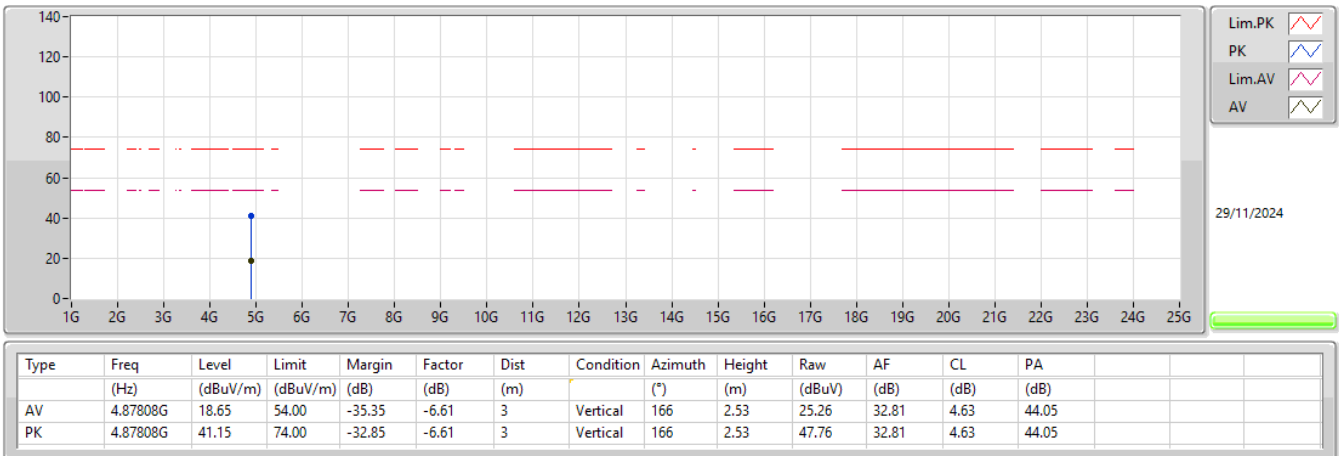
2440MHz_TX



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	2.38445G	33.30	54.00	-20.70	30.49	3	Horizontal	275	1.69	2.81	27.34	3.15	-
AV	2.44002G	71.58	Inf	-Inf	30.88	3	Horizontal	275	1.69	40.70	27.70	3.18	-
AV	2.48992G	35.33	54.00	-18.67	31.21	3	Horizontal	275	1.69	4.12	28.00	3.21	-
PK	2.38445G	55.80	74.00	-18.20	30.49	3	Horizontal	275	1.69	25.31	27.34	3.15	-
PK	2.44002G	94.08	Inf	-Inf	30.88	3	Horizontal	275	1.69	63.20	27.70	3.18	-
PK	2.48992G	57.83	74.00	-16.17	31.21	3	Horizontal	275	1.69	26.62	28.00	3.21	-

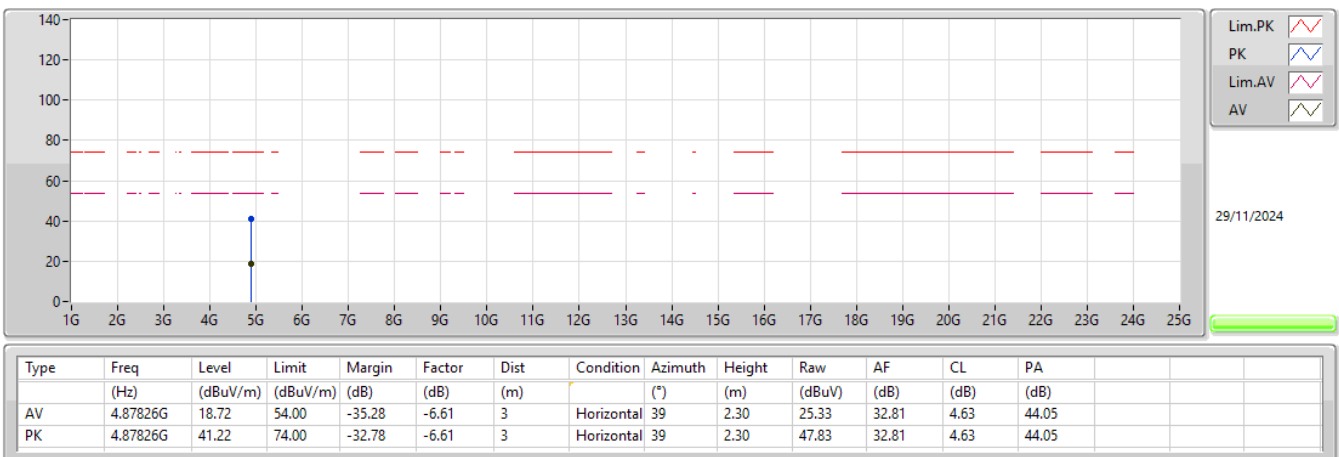
2.4-2.4835GHz_BT-EDR(3Mbps)

2440MHz_TX



2.4-2.4835GHz_BT-EDR(3Mbps)

2440MHz_TX





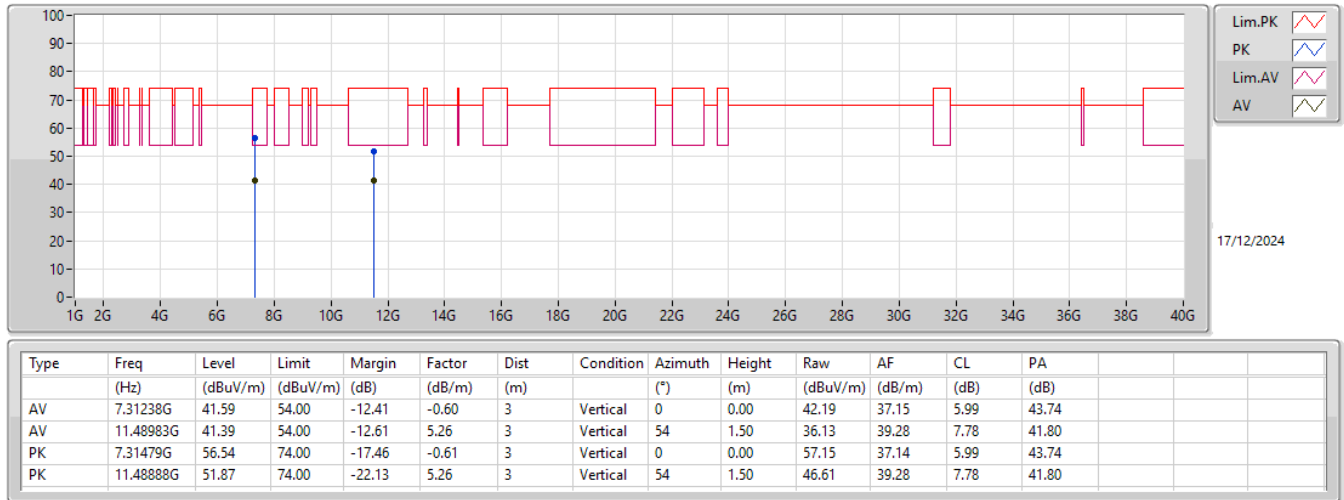
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	AV	7.31264G	43.57	54.00	-10.43	Horizontal

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
Mode 1	Pass	AV	7.31238G	41.59	54.00	-12.41	3	Vertical	0	0.00	-
Mode 1	Pass	AV	11.48983G	41.39	54.00	-12.61	3	Vertical	54	1.50	-
Mode 1	Pass	PK	7.31479G	56.54	74.00	-17.46	3	Vertical	0	0.00	-
Mode 1	Pass	PK	11.48888G	51.87	74.00	-22.13	3	Vertical	54	1.50	-
Mode 1	Pass	AV	7.31264G	43.57	54.00	-10.43	3	Horizontal	162	1.12	-
Mode 1	Pass	AV	11.48974G	40.85	54.00	-13.15	3	Horizontal	156	1.54	-
Mode 1	Pass	PK	7.31396G	58.24	74.00	-15.76	3	Horizontal	162	1.12	-
Mode 1	Pass	PK	11.49025G	50.62	74.00	-23.38	3	Horizontal	156	1.54	-

Radiated Emissions above 1GHz_Mode 1



Radiated Emissions above 1GHz_Mode 1

