



RADIO TEST REPORT

FCC ID : ZQ6-AP6611S
Equipment : Wi-Fi/Bluetooth Module
Brand Name : AMPAK Technology Inc
Model Name : AP6611S, AP12611_M2, WNFS-163AXI(BT)
Applicant : AMPAK Technology Inc.
3F, No. 1, Jen Ai Road, Hsinchu Industrial
Park, Hsinchu City 30352, Taiwan (R.O.C.)
Manufacturer : BILLIONTON SYSTEMS INC.
No. 21, Sui-Lih Rd., Hsin-Chu City 300, Taiwan (R.O.C.)
Standard : 47 CFR FCC Part 15.247

The product was received on Feb. 27, 2024, and testing was started from Mar. 01, 2024 and completed on Apr. 15, 2024. We, Sporton International Inc. Hsinchu 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. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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Photographs of EUT v01



History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A10_5 Ver1.3

Page Number : 4 of 27
Issued Date : May 02, 2024
Report Version : 01



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 Band edge	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	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sam Chen

Report Producer: Sophia Shiung



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.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	PULSE ELECTRONICS PTE LTD	TZ2412W	Dipole	Reversed-SMA	Note 1

Note 1:

Ant.	Gain (dBi)			
	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	Bluetooth
1	3.68	4.65	4.62	3.68

Note 2: The above antenna gain doesn't include cable loss.

Cable Loss of Antenna:

Ant.	Cable Loss (dB)			
	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	Bluetooth
1	0.4	0.7	0.8	0.4

Note 3: For conducted measurement, the measurement port is from the reversed-SMA connector.

Note 4: The above information was declared by manufacturer.

Note 5: **For 2.4GHz function:****For IEEE 802.11 b/g/n/VHT/ax (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

For 5GHz function:**For IEEE 802.11a/n/ac/ax (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

For 6GHz function:**For IEEE 802.11ax (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving antenna.

For Bluetooth function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

**1.1.3 Mode Test Duty Cycle**

Mode	DC	DCF (dB)	T (s)	VBW (Hz)_1/T
BT-BR(1Mbps)	0.742	1.3	2.889m	1k
BT-EDR(2Mbps)	0.742	1.3	2.889m	1k
BT-EDR(3Mbps)	0.742	1.3	2.889m	1k

Note:

- ♦ DC is Duty Cycle.
- ♦ DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

EUT Power Type	From host system
Test Software Version	For Emissions in Restricted Frequency Bands < 1GHz: DOS [ver 6.1.7601] For other test items: BlueTool (ver 1.9.7.4)

1.1.5 Table for Multiple Listing

Model Name	Description
AP6611S	All the models are identical, the different model names serve as marketing strategy.
AP12611_M2	
WNFS-163AXI(BT)	

Note 1: From the above models, model: AP6611S was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.



1.2 Applicable Standards

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

- ♦ 47 CFR FCC Part 15.247

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

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

1.3 Testing Location Information

Testing Location Information				
Test Lab. : Sporton International Inc. Hsinchu Laboratory				
Hsinchu ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)				
(TAF: 3787) TEL: 886-3-656-9065 FAX: 886-3-656-9085				
Test site Designation No. TW3787 with FCC.				
Conformity Assessment Body Identifier (CABID) TW3787 with ISCED.				

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH01-CB	Mason Chan	21.9~23.5 / 64~67	Mar. 01, 2024~ Mar. 15, 2024
Radiated < 1GHz	03CH05-CB	Roy Mai	21.9~22.4 / 55~58	Mar. 02, 2024~ Apr. 12, 2024
Radiated > 1GHz	03CH04-CB	Roy Mai	22.7~23.8 / 56~59	Mar. 02, 2024~ Apr. 12, 2024
AC Conduction	CO01-CB	Allen Chung	22~23 / 52~53	Apr. 15, 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
Conducted Emission (150kHz ~ 30MHz)	3.4 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.1 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.1 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.2 dB	Confidence levels of 95%
Conducted Emission	3.1 dB	Confidence levels of 95%
Output Power Measurement	0.8 dB	Confidence levels of 95%
Power Density Measurement	3.1 dB	Confidence levels of 95%
Bandwidth Measurement	2.2%	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Channel Mode

Mode
BT-BR(1Mbps)
2402MHz
2440MHz
2480MHz
BT-EDR(2Mbps)
2402MHz
2440MHz
2480MHz
BT-EDR(3Mbps)
2402MHz
2440MHz
2480MHz

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	EUT_Bluetooth
2	EUT_WLAN 2.4GHz
3	EUT_WLAN 5GHz
4	EUT_WLAN 6GHz
For operating, mode 1 is the worst case and it was recorded in this test report.	

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



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
	The EUT was performed at X axis, Y axis and Z axis positions with each function at Radiated measurement > 1GH, and the worst cases were found at Z axis for WLAN 2.4GHz, 6GHz and Bluetooth, and X axis for WLAN 5GHz. Thus, the measurement will follow these same test configurations.
1	EUT in Z axis_Bluetooth
2	EUT in Z axis_WLAN 2.4GHz
3	EUT in X axis_WLAN 5GHz
4	EUT in Z axis_WLAN 6GHz
For operating, mode 2 is the worst case and it was recorded in this test report.	
Operating Mode > 1GHz	CTX
	The EUT was performed at X axis, Y axis and Z axis positions, and the worst case was found at Z axis. Thus, the measurement will follow this same test configuration.
1	EUT in Z axis

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

N/A



2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	EUT Fixture 1	AMPAK Technology Inc	AP12281_M2_V01	N/A
B	BT Fixture	AMPAK Technology Inc	UART_V07	N/A
C	NB	ASUS	PU401L	N/A
D	Power Supply	MOTECH	LPS-305	N/A
E	Earphone	e-Power	GT-02	N/A
F	Mouse	Logitech	M-UAE96	N/A
G	EUT Fixture 2	AMPAK Technology Inc	AP12611_M2	N/A

For Radiated < 1GHz:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	EUT Fixture 1	AMPAK Technology Inc	AP12281_M2_V01	N/A
B	WIFI Fixture	AMPAK Technology Inc	A113D_EVB_V01	N/A
C	Power Supply	MOTECH	LPS-305	N/A
D	EUT Fixture 2	AMPAK Technology Inc	AP12611_M2	N/A

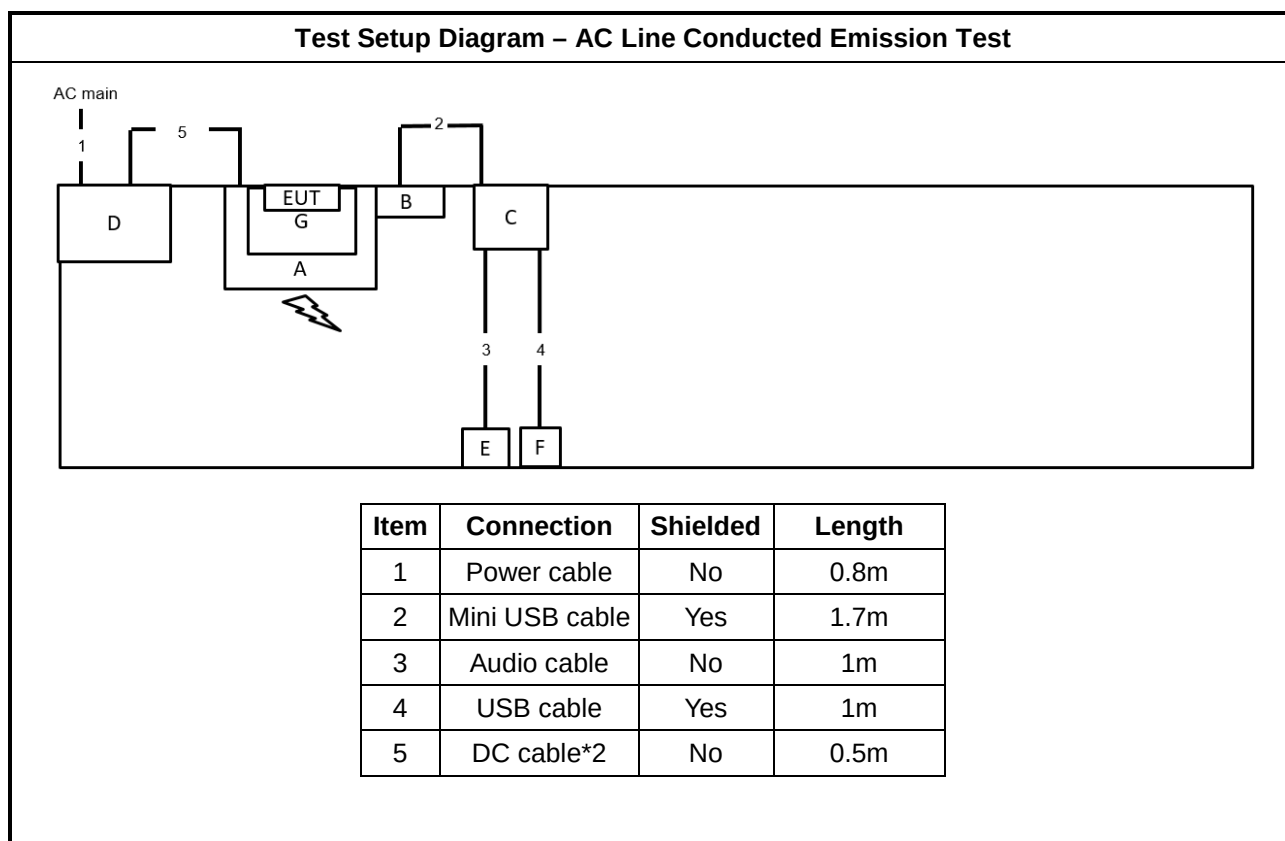
For Radiated > 1GHz:

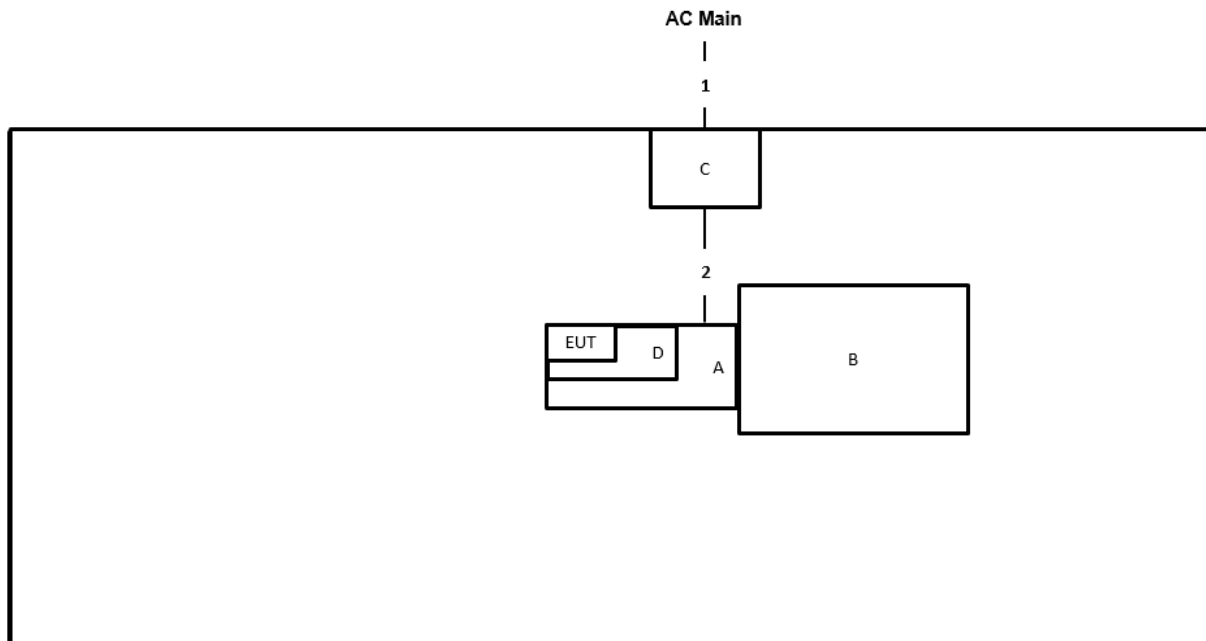
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	EUT Fixture 1	AMPAK Technology Inc	AP12281_M2_V01	N/A
B	BT Fixture	AMPAK Technology Inc	UART_V07	N/A
C	Power Supply	MOTECH	LPS-305	N/A
D	EUT Fixture 2	AMPAK Technology Inc	AP12611_M2	N/A
E	PC	DELL	T3400	N/A

For RF Conducted:

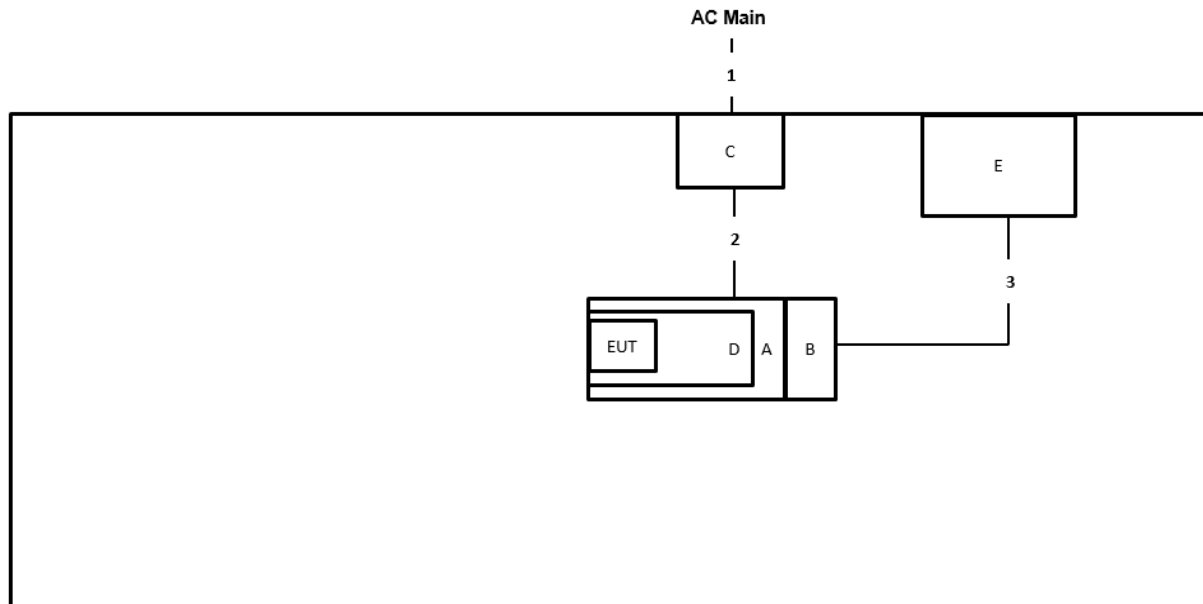
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	PC	AMPAK Technology Inc	H81-PLUS	N/A
B	EUT Fixture 1	AMPAK Technology Inc	AP12281_M2_V01	N/A
C	BT Fixture	AMPAK Technology Inc	UART_V07	N/A
D	EUT Fixture 2	AMPAK Technology Inc	AP12611_M2	N/A

2.6 Test Setup Diagram



Test Setup Diagram - Radiated Test < 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	Crocodile clip cable*2	No	0.3m

Test Setup Diagram - Radiated Test > 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	Crocodile clip cable*2	No	0.3m
3	Mini USB Cable	Yes	1.8m



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.		

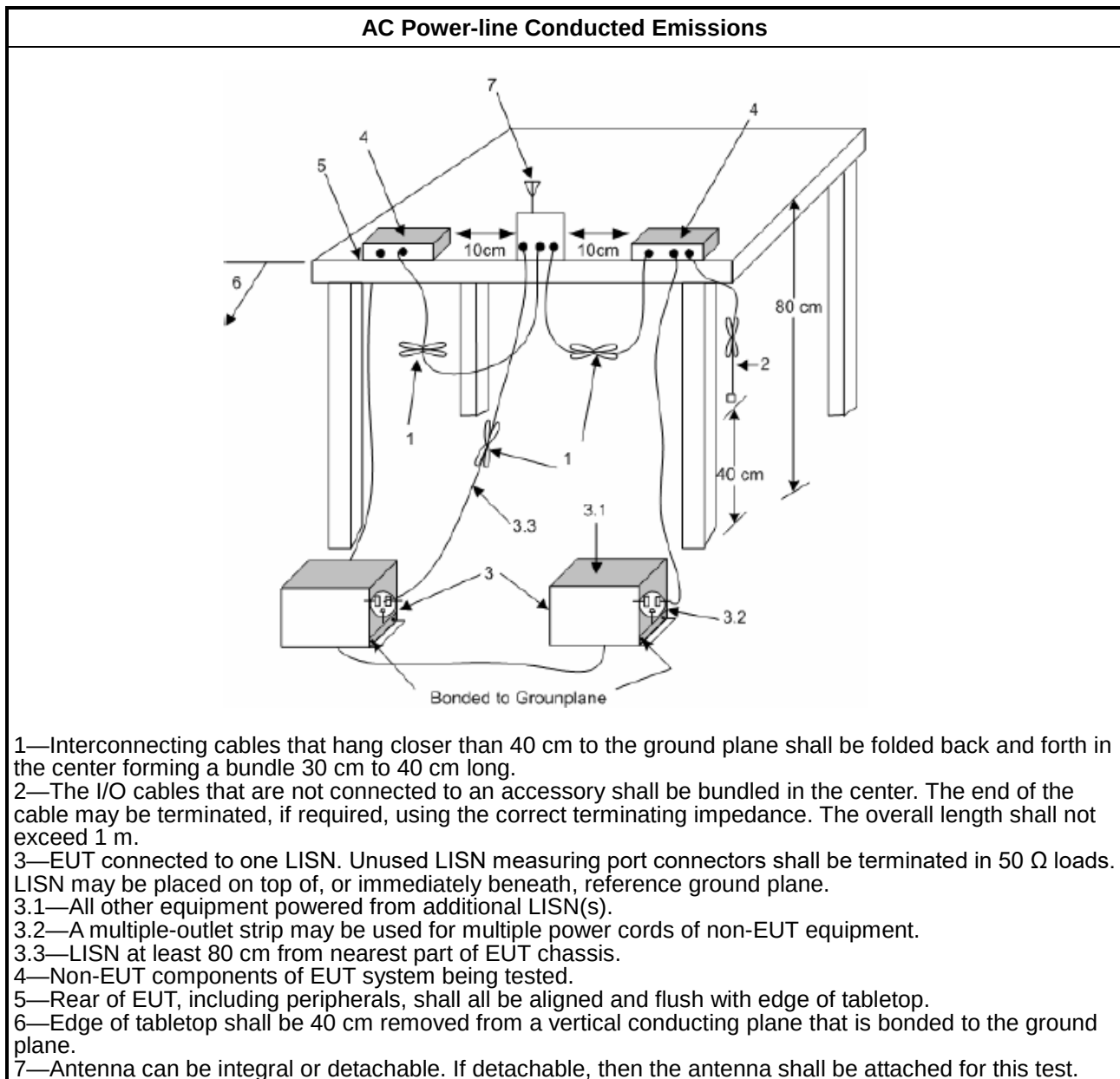
3.1.2 Measuring Instruments

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 Test Setup



1.1.1. Measurement Results Calculation

The measured Level is calculated using:

- a. Corrected Reading: LISN Factor (LISN) + Attenuator (AT/AUX) + Cable Loss (CL) + Read Level (Raw) = Level
- b. Margin = -Limit + Level

3.1.5 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	
▪ 902-928 MHz Band:	
	▪ $N \geq 50$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 250 kHz.
	▪ $50 > N \geq 25$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $>$ 250 kHz.
▪ 2400-2483.5 MHz Band:	
	▪ $N \geq 75$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz).
	▪ $75 > N \geq 15$ and $ChS \geq \text{MAX}$ (20 dB bandwidth 2/3, 25 kHz).
▪ 5725-5850 MHz Band:	
	▪ $N \geq 75$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 1 MHz.
N: Number of Hopping Frequencies; ChS: Hopping Channel Separation	

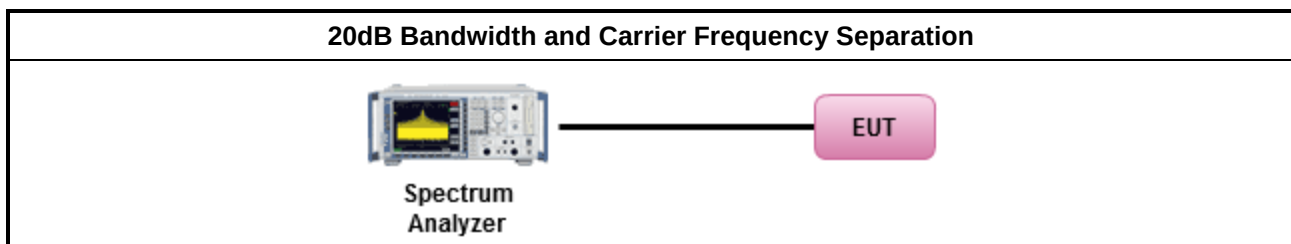
3.2.2 Measuring Instruments

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 6.9.1 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	
▪ 902-928 MHz Band:	
▪ N ≥ 50; Power 30dBm; EIRP 36dBm	
▪ 50 > N ≥ 25; Power 23.98dBm; EIRP 29.98dBm	
▪ 2400-2483.5 MHz Band:	
▪ N ≥ 75; Power 30dBm; EIRP 36dBm	
▪ 75 > N ≥ 15; Power 21dBm; EIRP 27dBm	
▪ 5725-5850 MHz Band:	
▪ N ≥ 75; Power 30dBm; EIRP 36dBm	
N: Number of Hopping Frequencies	

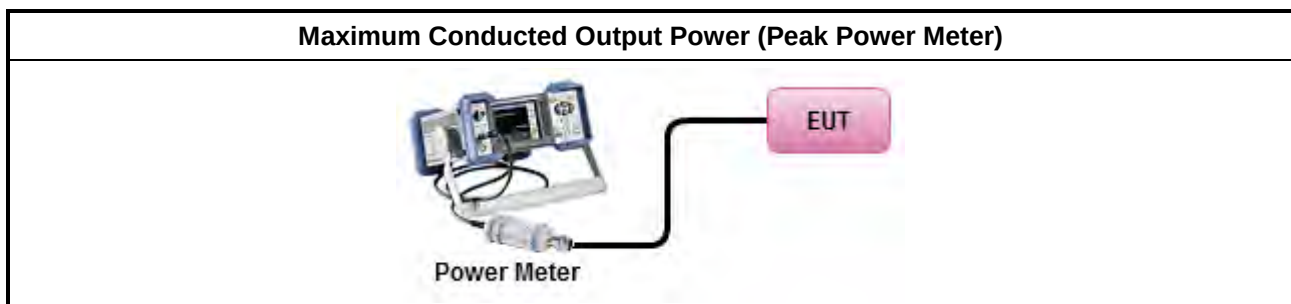
3.3.2 Measuring Instruments

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	
▪ 902-928 MHz Band:	
	▪ $N \geq 50$ and $ChS \geq MAX$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 250 kHz.
	▪ $50 > N \geq 25$ and $ChS \geq MAX$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $>$ 250 kHz.
▪ 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).
▪ 5725-5850 MHz Band:	
	▪ $N \geq 75$ and $ChS \geq MAX$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 1 MHz.
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

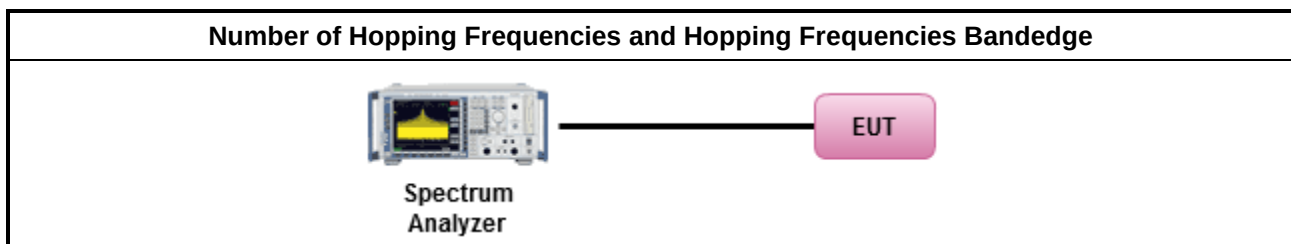
3.4.3 Measuring Instruments

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

20dB Bandwidth and Carrier Frequency Separation Limit for Frequency Hopping Systems	
▪ 902-928 MHz Band:	
	▪ $N \geq 50$; 0.4s in 20s period
	▪ $50 > N \geq 25$; 0.4s in 10s period
▪ 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
▪ 5725-5850 MHz Band:	
	▪ $N \geq 75$; 0.4s in 30s period
N: Number of Hopping Frequencies	

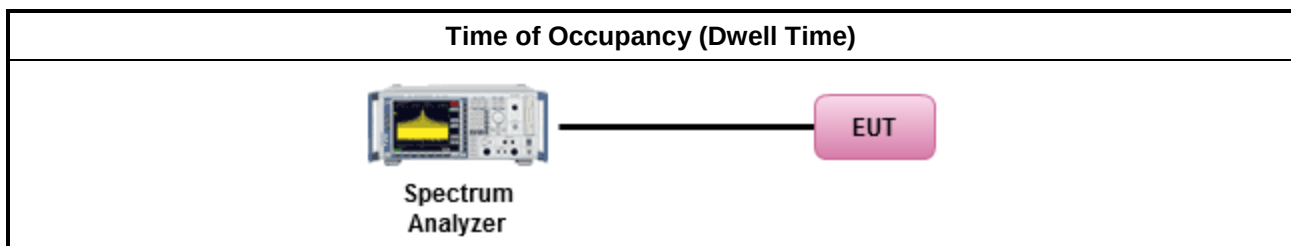
3.5.2 Measuring Instruments

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 (dBc)
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.	

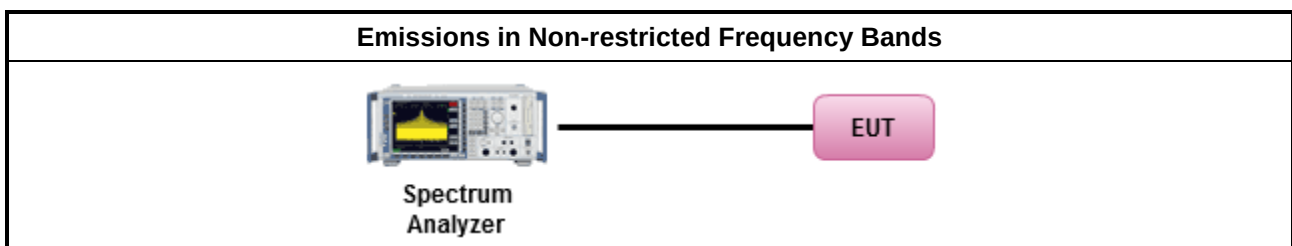
3.6.2 Measuring Instruments

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.

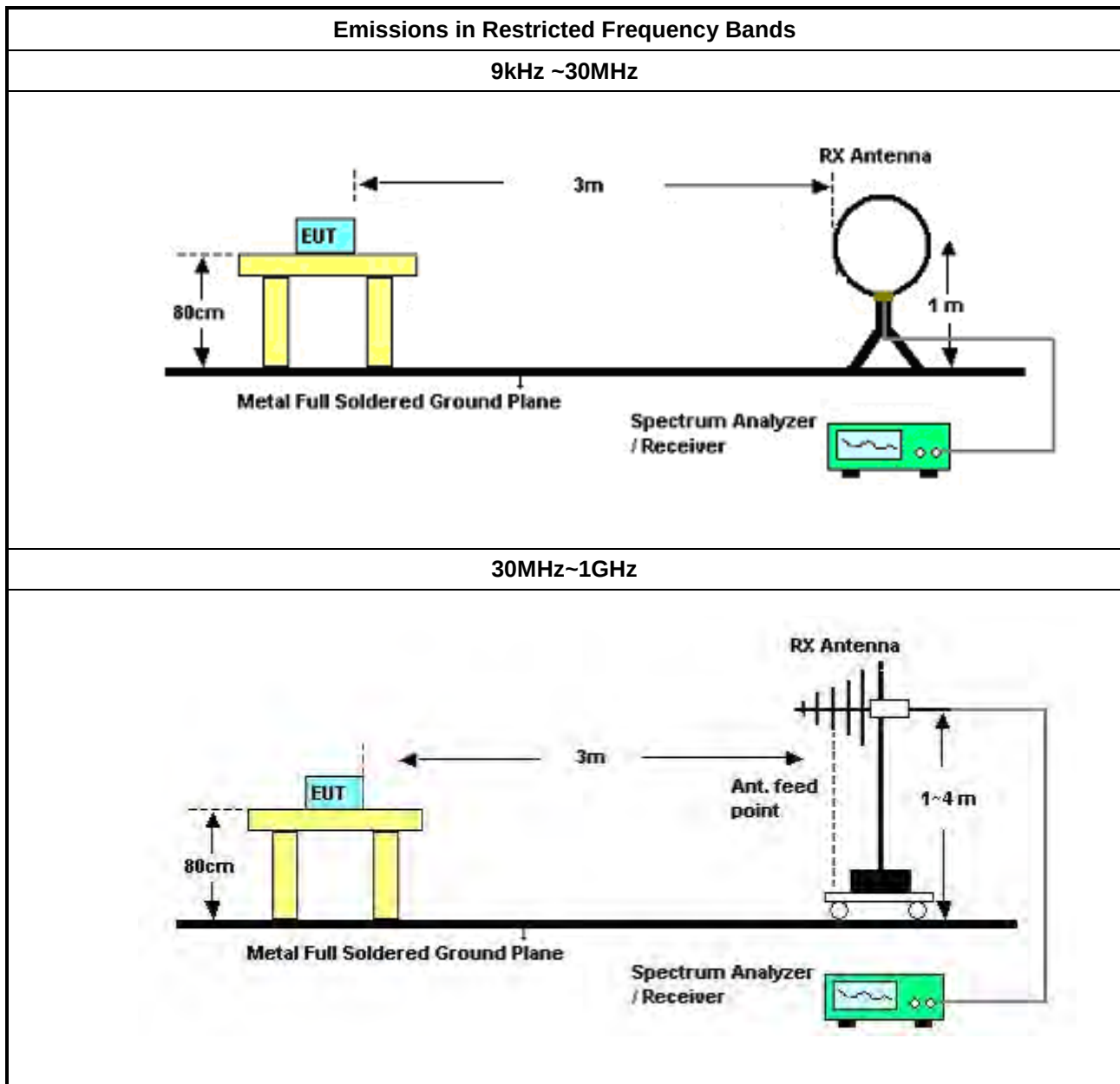
3.7.2 Measuring Instruments

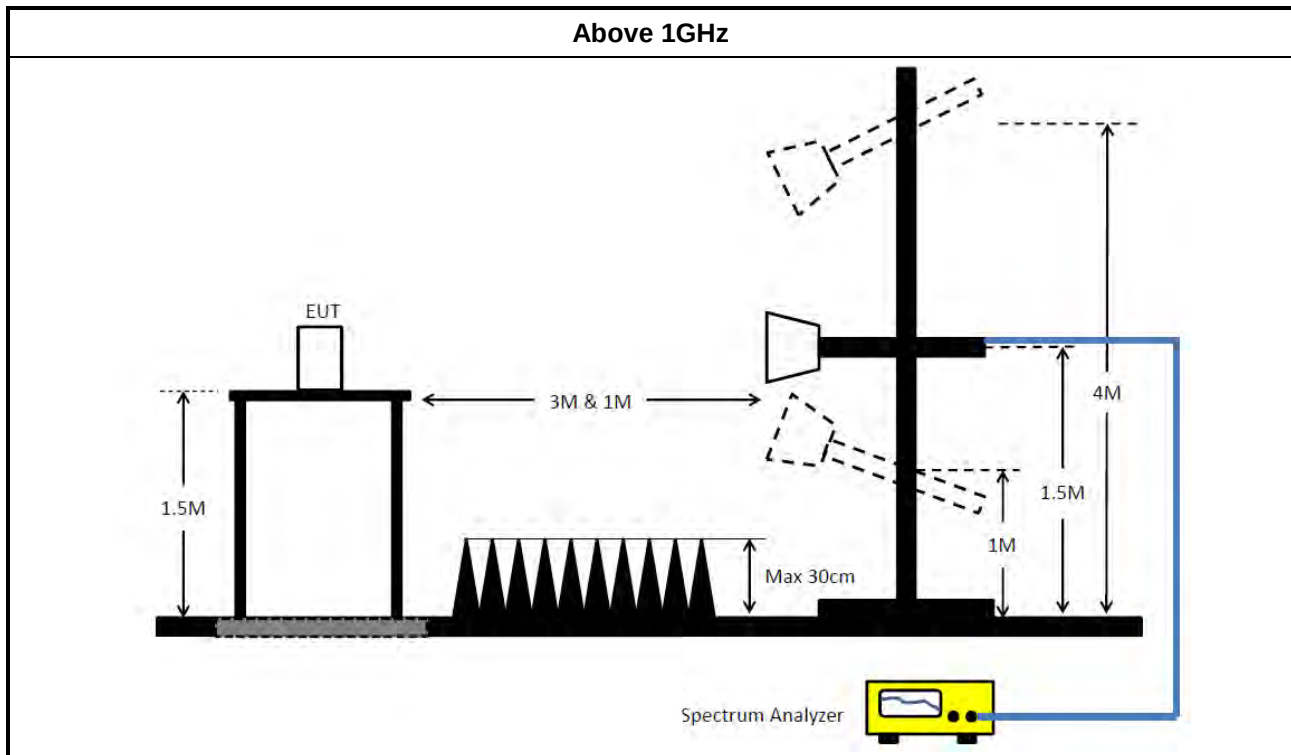
Refer a test equipment and calibration data table in this test report.

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.

3.7.4 Test Setup





3.7.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

3.7.6 Emissions in Restricted Frequency Bands (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

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

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10th harmonic or 40 GHz, whichever is appropriate.

3.7.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix G



4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.4GHz	Mar. 01, 2024	Feb. 28, 2025	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Feb. 19, 2024	Feb. 18, 2025	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Apr. 27, 2023	Apr. 26, 2024	Conduction (CO01-CB)
Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Feb. 08, 2024	Feb. 07, 2025	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	Oct. 17, 2023	Oct. 16, 2024	Conduction (CO01-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6121	65417	9kHz ~ 30MHz	Oct. 13, 2023	Oct. 12, 2024	Radiation (03CH05-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30MHz ~ 1GHz	Aug. 02, 2023	Aug. 01, 2024	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCi	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 24, 2023	Mar. 23, 2024	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCi	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 23, 2024	Mar. 22, 2025	Radiation (03CH05-CB)
Amplifier	EMCi	EMC330N	980331	20MHz ~ 3GHz	May 03, 2023	May 02, 2024	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Apr. 18, 2023	Apr. 17, 2024	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Dec. 06, 2023	Dec. 05, 2024	Radiation (03CH05-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH05-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH04-CB	1GHz ~18GHz 3m	Feb. 22, 2024	Feb. 21, 2025	Radiation (03CH04-CB)
Horn Antenna	ETS-Lindgren	3115	00143147	750MHz~18GHz	Oct. 04, 2023	Oct. 03, 2024	Radiation (03CH04-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Sep. 04, 2023	Sep. 03, 2024	Radiation (03CH04-CB)
Pre-Amplifier	Agilent	83017A	MY53270063	0.5GHz ~ 26.5GHz	Jun. 30, 2023	Jun. 29, 2024	Radiation (03CH04-CB)
Pre-Amplifier	SGH	SGH184	20221107-3	18GHz ~ 40GHz	Nov. 24, 2023	Nov. 23, 2024	Radiation (03CH04-CB)



Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Mar. 21, 2023	Mar. 20, 2024	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Mar. 19, 2024	Mar. 18, 2025	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21	1GHz - 18GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH04-CB)
RF Cable-high	Woken	RG402	High Cable-21+67	1GHz - 18GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH04-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40GHz	Jan. 11, 2024	Jan. 10, 2025	Radiation (03CH04-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH04-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	May 29, 2023	May 28, 2024	Conducted (TH01-CB)
Switch	SPTCB	SP-SWI	SWI-01	1~26.5GHz	Oct. 03, 2023	Oct. 02, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-30	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1339408	300MHz~40GHz	Sep. 12, 2023	Sep. 11, 2024	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1517009	300MHz~40GHz	Sep. 12, 2023	Sep. 11, 2024	Conducted (TH01-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

NCR means Non-Calibration required.



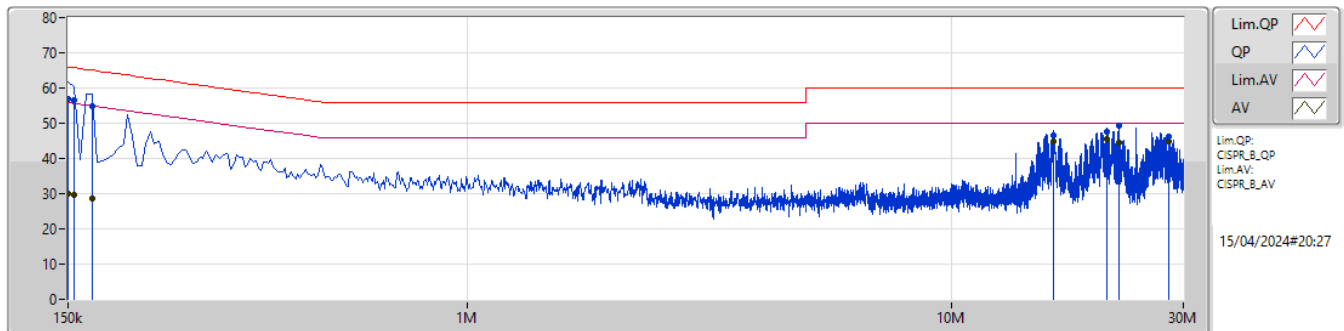
Conducted Emissions at Powerline

Appendix A

Summary

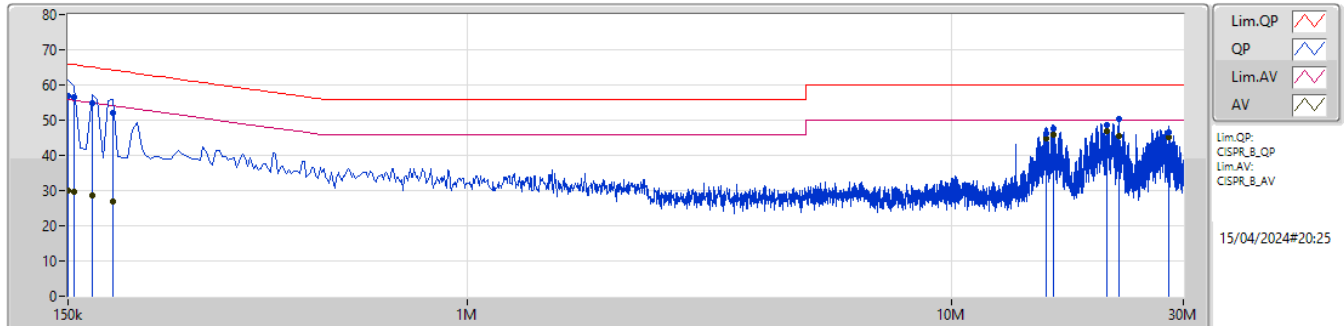
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	20.922M	46.89	50.00	-3.11	Neutral

Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)						
QP	150k	57.06	66.00	-8.94	9.98	Line	-	47.08	0.09	0.02	9.87						
AV	150k	29.92	56.00	-26.08	9.98	Line	-	19.94	0.09	0.02	9.87						
QP	154.5k	56.55	65.75	-9.20	9.97	Line	-	46.58	0.09	0.02	9.86						
AV	154.5k	29.56	55.75	-26.19	9.97	Line	-	19.59	0.09	0.02	9.86						
QP	168k	54.89	65.06	-10.17	9.97	Line	-	44.92	0.09	0.02	9.86						
AV	168k	28.67	55.06	-26.39	9.97	Line	-	18.70	0.09	0.02	9.86						
QP	16.161M	46.65	60.00	-13.35	10.44	Line	-	36.21	0.28	0.19	9.97						
AV	16.161M	44.72	50.00	-5.28	10.44	Line	-	34.28	0.28	0.19	9.97						
QP	20.882M	47.54	60.00	-12.46	10.56	Line	-	36.98	0.30	0.23	10.03						
AV	20.882M	45.68	50.00	-4.32	10.56	Line	"Worst"	35.12	0.30	0.23	10.03						
QP	22.119M	49.45	60.00	-10.55	10.57	Line	-	38.88	0.31	0.23	10.03						
AV	22.119M	44.62	50.00	-5.38	10.57	Line	-	34.05	0.31	0.23	10.03						
QP	28.041M	46.22	60.00	-13.78	10.71	Line	-	35.51	0.33	0.32	10.06						
AV	28.041M	44.85	50.00	-5.15	10.71	Line	-	34.14	0.33	0.32	10.06						

Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)						
QP	150k	57.05	66.00	-8.95	9.96	Neutral	-	47.09	0.07	0.02	9.87						
AV	150k	29.96	56.00	-26.04	9.96	Neutral	-	20.00	0.07	0.02	9.87						
QP	154.5k	56.49	65.75	-9.26	9.95	Neutral	-	46.54	0.07	0.02	9.86						
AV	154.5k	29.53	55.75	-26.22	9.95	Neutral	-	19.58	0.07	0.02	9.86						
QP	168k	54.87	65.06	-10.19	9.95	Neutral	-	44.92	0.07	0.02	9.86						
AV	168k	28.65	55.06	-26.41	9.95	Neutral	-	18.70	0.07	0.02	9.86						
QP	186k	51.92	64.20	-12.28	9.94	Neutral	-	41.98	0.07	0.02	9.85						
AV	186k	26.98	54.20	-27.22	9.94	Neutral	-	17.04	0.07	0.02	9.85						
QP	15.603M	46.18	60.00	-13.82	10.41	Neutral	-	35.77	0.26	0.19	9.96						
AV	15.603M	44.69	50.00	-5.31	10.41	Neutral	-	34.28	0.26	0.19	9.96						
QP	16.161M	47.66	60.00	-12.34	10.42	Neutral	-	37.24	0.26	0.19	9.97						
AV	16.161M	45.86	50.00	-4.14	10.42	Neutral	-	35.44	0.26	0.19	9.97						
QP	20.922M	48.56	60.00	-11.44	10.55	Neutral	-	38.01	0.29	0.23	10.03						
AV	20.922M	46.89	50.00	-3.11	10.55	Neutral	"Worst"	36.34	0.29	0.23	10.03						
QP	22.119M	50.34	60.00	-9.66	10.57	Neutral	-	39.77	0.31	0.23	10.03						
AV	22.119M	45.43	50.00	-4.57	10.57	Neutral	-	34.86	0.31	0.23	10.03						
QP	28.041M	46.67	60.00	-13.33	10.77	Neutral	-	35.90	0.39	0.32	10.06						
AV	28.041M	45.28	50.00	-4.72	10.77	Neutral	-	34.51	0.39	0.32	10.06						

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)	926.75k	877.061k	877KF1D	918.5k	862.069k
BT-EDR(2Mbps)	1.383M	1.211M	1M21G1D	1.326M	1.203M
BT-EDR(3Mbps)	1.37M	1.213M	1M21G1D	1.337M	1.207M

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

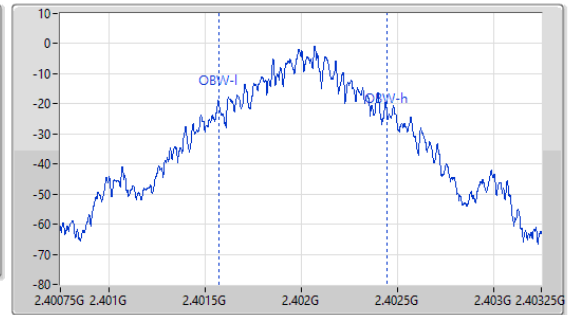
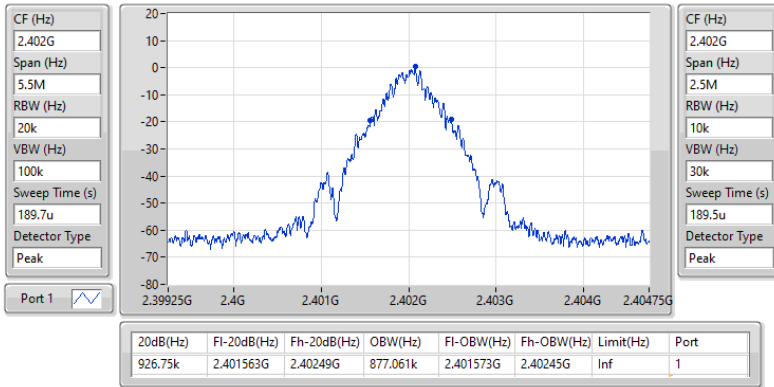
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	Inf	926.75k	877.061k
2440MHz	Pass	Inf	918.5k	874.563k
2480MHz	Pass	Inf	921.25k	862.069k
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.383M	1.203M
2440MHz	Pass	Inf	1.326M	1.211M
2480MHz	Pass	Inf	1.356M	1.203M
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.37M	1.209M
2440MHz	Pass	Inf	1.337M	1.213M
2480MHz	Pass	Inf	1.337M	1.207M

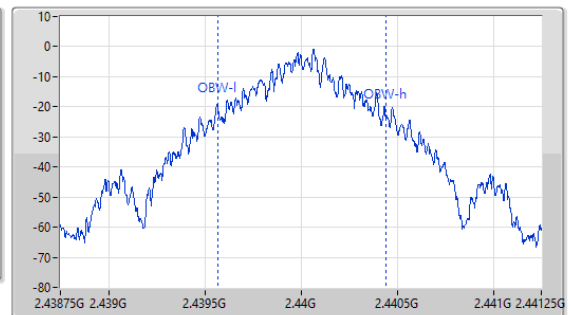
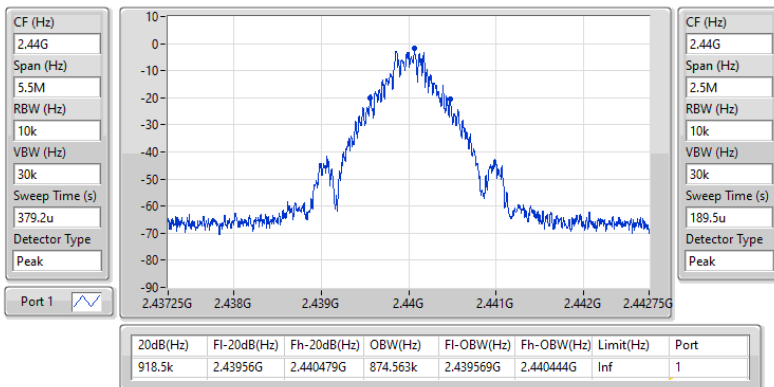
Port X-N dB = Port X 20dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

2.4-2.4835GHz_BT-BR(1Mbps)
EBW-FS
2402MHz

11/03/2024

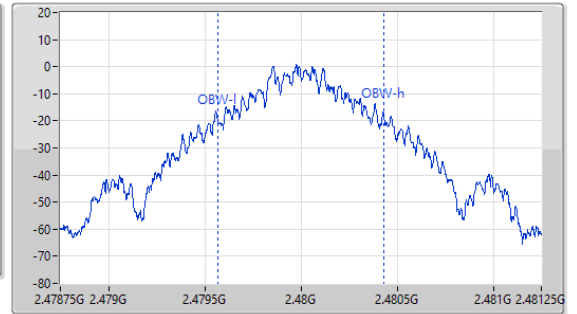
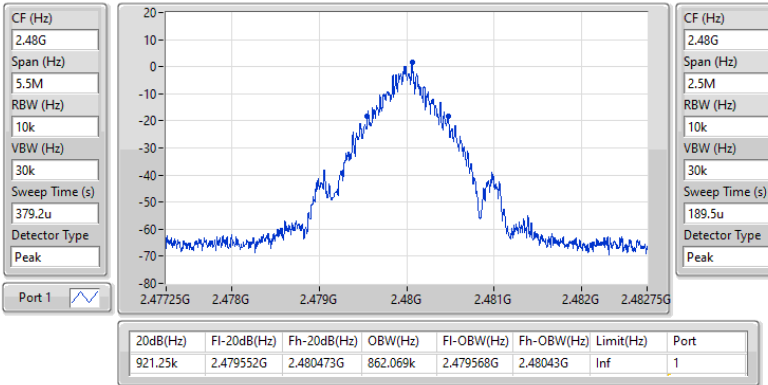

2.4-2.4835GHz_BT-BR(1Mbps)
EBW-FS
2440MHz

11/03/2024

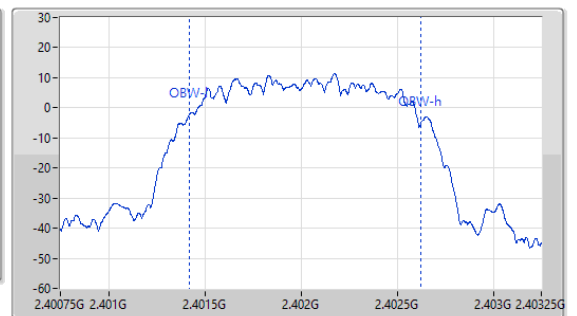
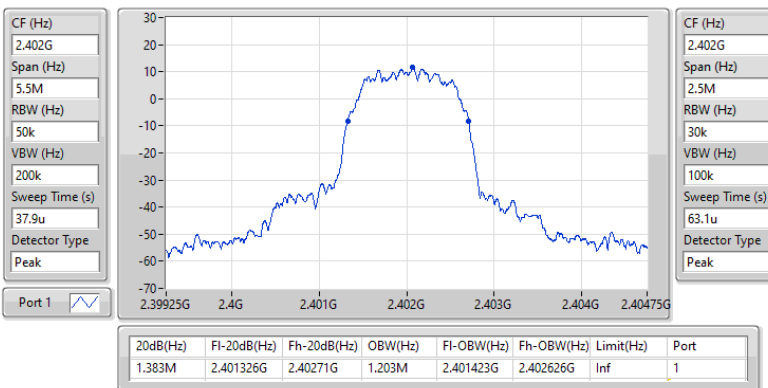


2.4-2.4835GHz_BT-BR(1Mbps)
EBW-FS
2480MHz

11/03/2024

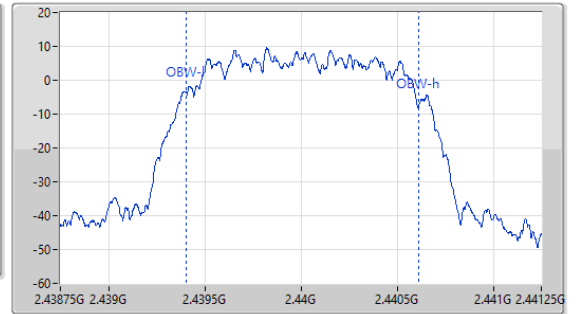
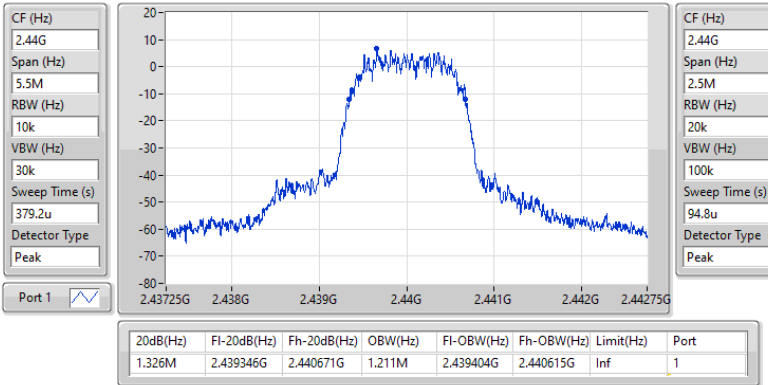

2.4-2.4835GHz_BT-EDR(2Mbps)
EBW-FS
2402MHz

11/03/2024

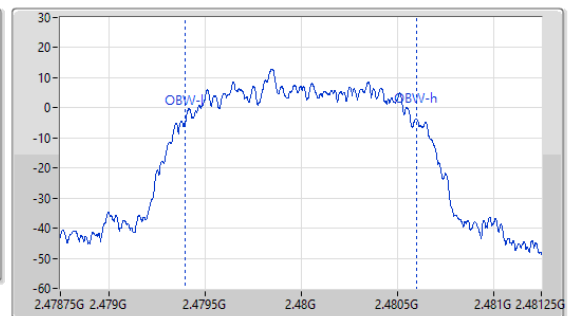
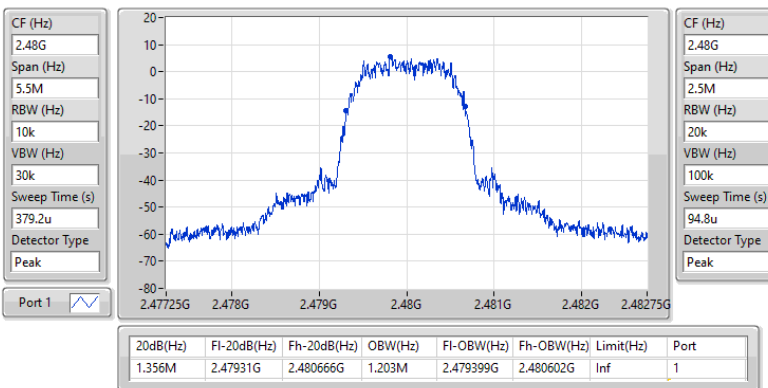


2.4-2.4835GHz_BT-EDR(2Mbps)
EBW-FS
2440MHz

11/03/2024

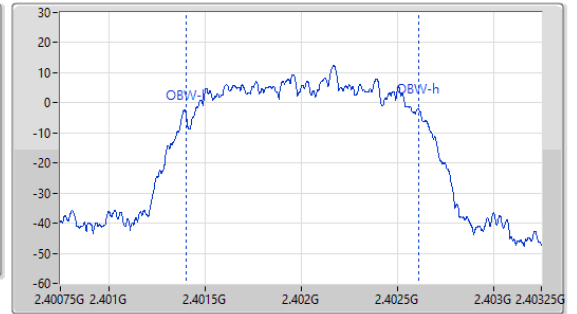
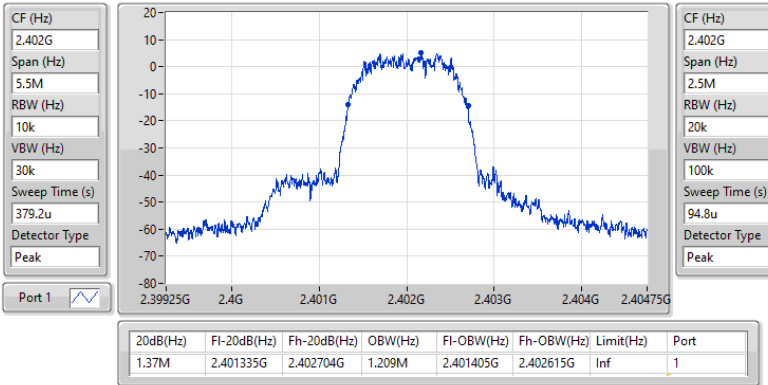

2.4-2.4835GHz_BT-EDR(2Mbps)
EBW-FS
2480MHz

11/03/2024

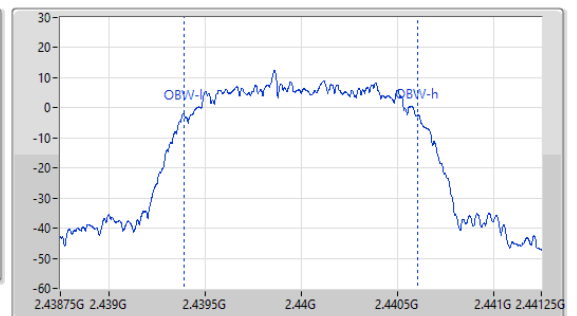
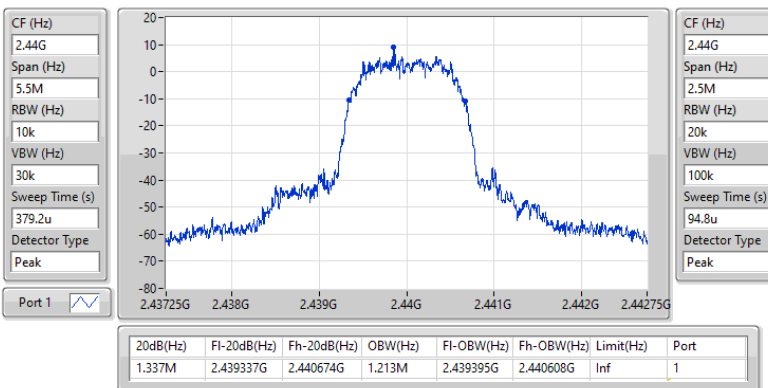


2.4-2.4835GHz_BT-EDR(3Mbps)
EBW-FS
2402MHz

11/03/2024


2.4-2.4835GHz_BT-EDR(3Mbps)
EBW-FS
2440MHz

11/03/2024

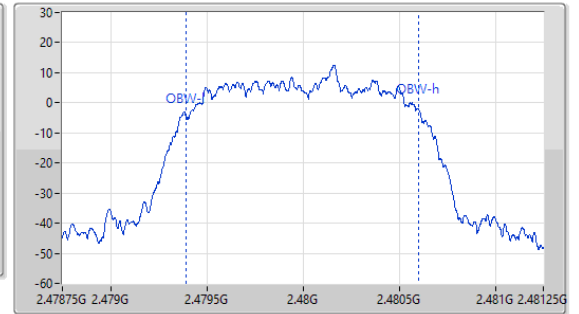
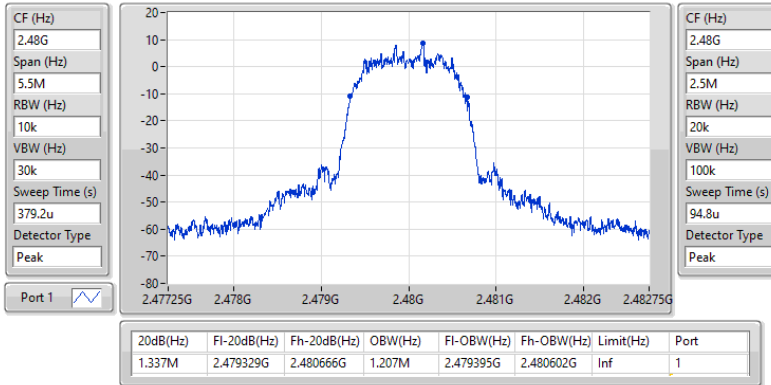


2.4-2.4835GHz_BT-EDR(3Mbps)

EBW-FS

2480MHz

11/03/2024



Summary

Mode	Max-Space (Hz)	Min-Space (Hz)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	1.308M	1.0005M
BT-EDR(2Mbps)	1.314M	1.0065M
BT-EDR(3Mbps)	1.0035M	997.5k

Result

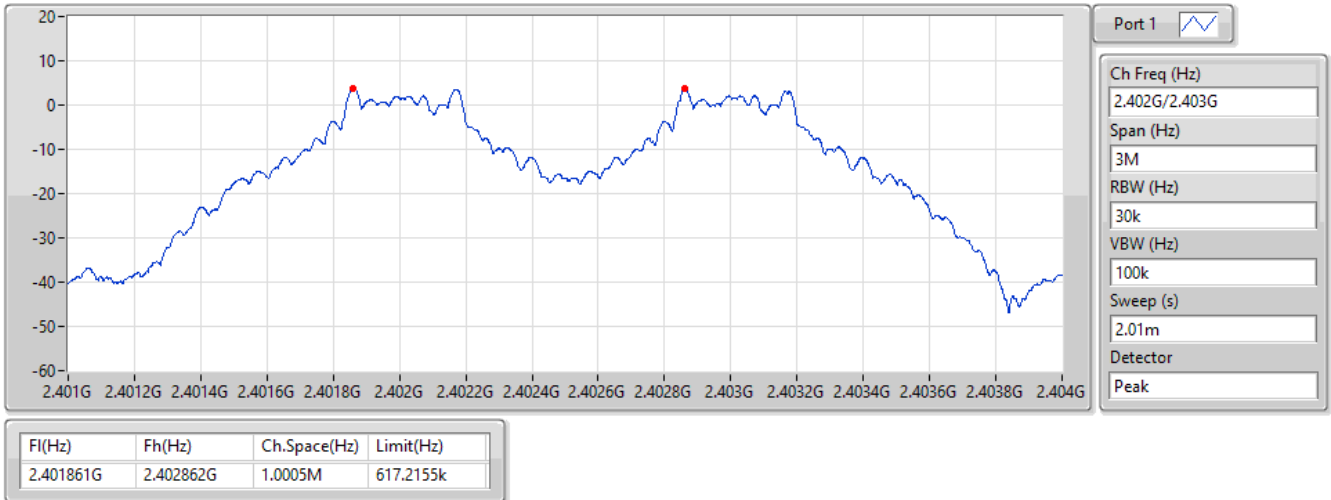
Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
BT-BR(1Mbps)	-	-	-	-	-
2402MHz	Pass	2.401861G	2.402862G	1.0005M	617.2155k
2440MHz	Pass	2.439855G	2.441163G	1.308M	611.721k
2480MHz	Pass	2.478848G	2.47985G	1.002M	613.5525k
BT-EDR(2Mbps)	-	-	-	-	-
2402MHz	Pass	2.401861G	2.403175G	1.314M	921.078k
2440MHz	Pass	2.439852G	2.440863G	1.011M	883.116k
2480MHz	Pass	2.478842G	2.479848G	1.0065M	903.096k
BT-EDR(3Mbps)	-	-	-	-	-
2402MHz	Pass	2.401861G	2.402859G	997.5k	912.42k
2440MHz	Pass	2.439855G	2.440856G	1.0005M	890.442k
2480MHz	Pass	2.478846G	2.47985G	1.0035M	890.442k

2.4-2.4835GHz_BT-BR(1Mbps)

Channel Separation-FS

2.402G/2.403GHz

11/03/2024

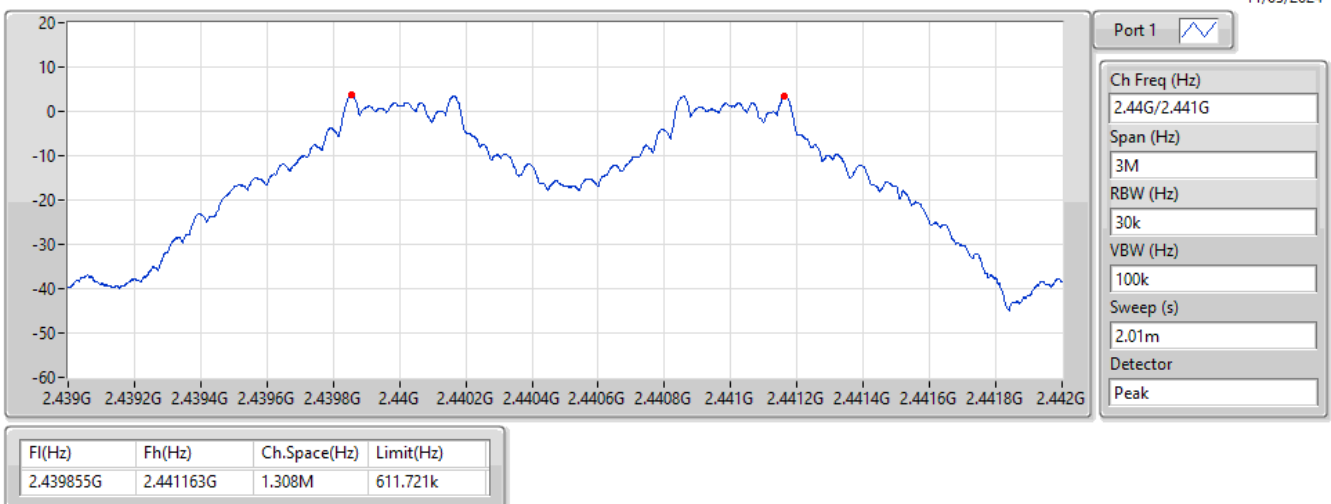


2.4-2.4835GHz_BT-BR(1Mbps)

Channel Separation-FS

2.44G/2.441GHz

11/03/2024



2.4-2.4835GHz_BT-BR(1Mbps)

Channel Separation-FS

2.48G/2.479GHz

11/03/2024

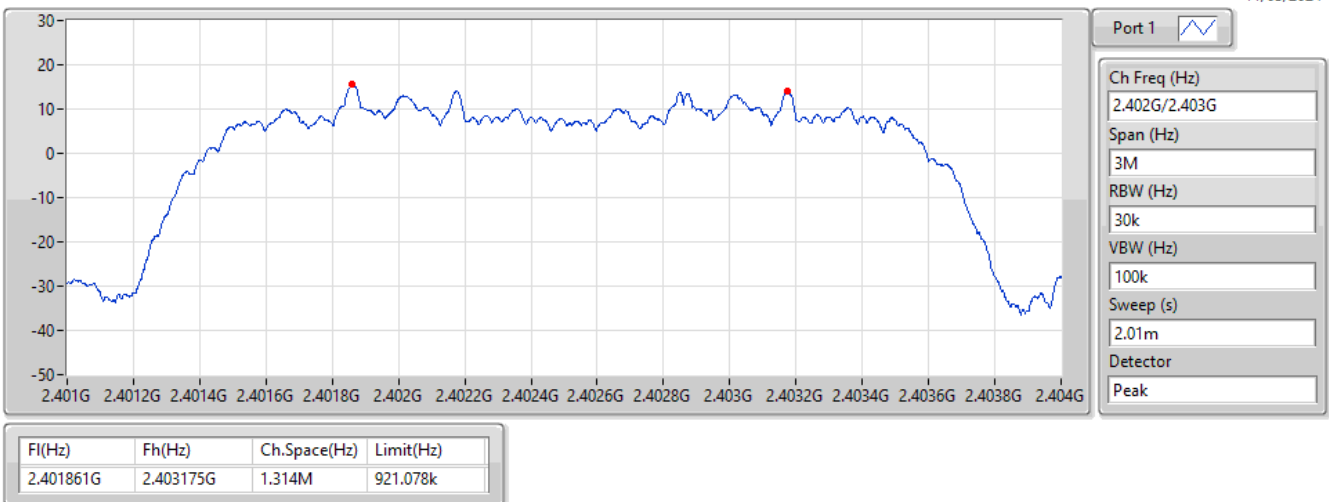


2.4-2.4835GHz_BT-EDR(2Mbps)

Channel Separation-FS

2.402G/2.403GHz

11/03/2024

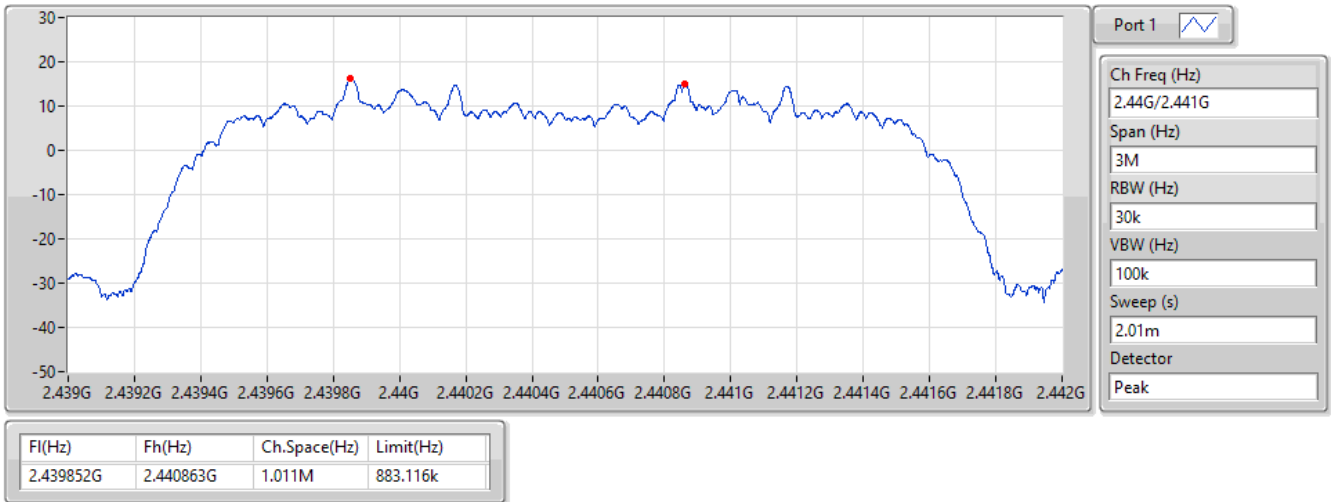


2.4-2.4835GHz_BT-EDR(2Mbps)

Channel Separation-FS

2.44G/2.441GHz

11/03/2024

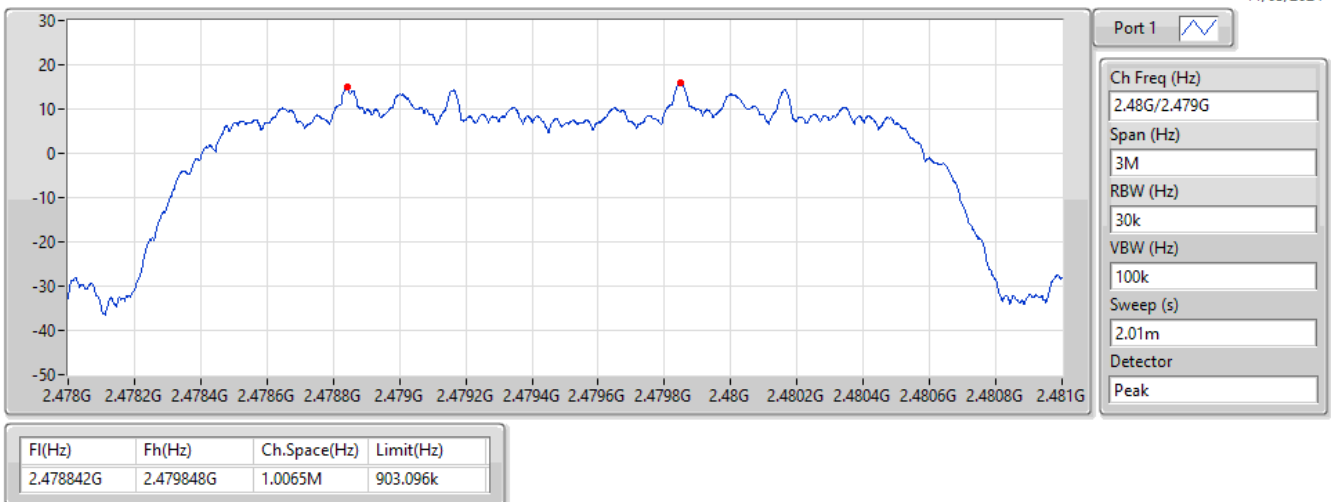


2.4-2.4835GHz_BT-EDR(2Mbps)

Channel Separation-FS

2.48G/2.479GHz

11/03/2024

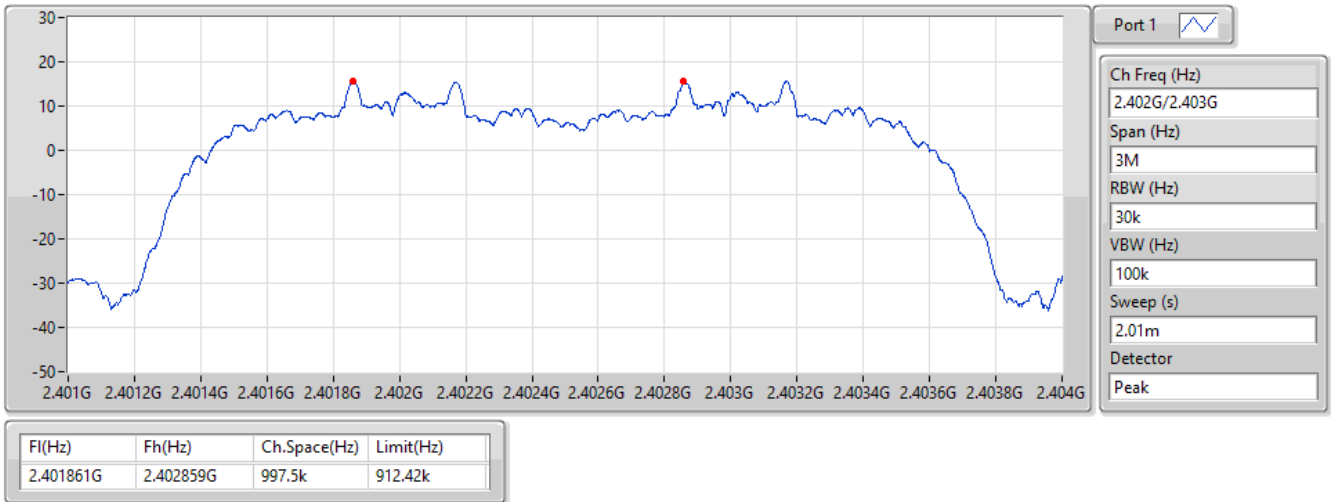


2.4-2.4835GHz_BT-EDR(3Mbps)

Channel Separation-FS

2.402G/2.403GHz

11/03/2024

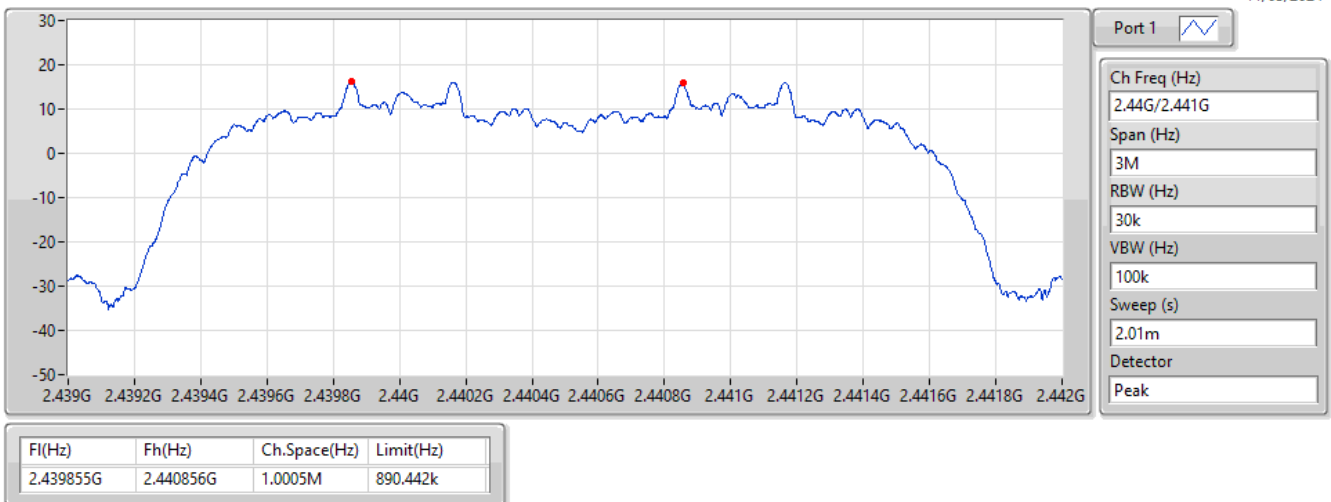


2.4-2.4835GHz_BT-EDR(3Mbps)

Channel Separation-FS

2.44G/2.441GHz

11/03/2024

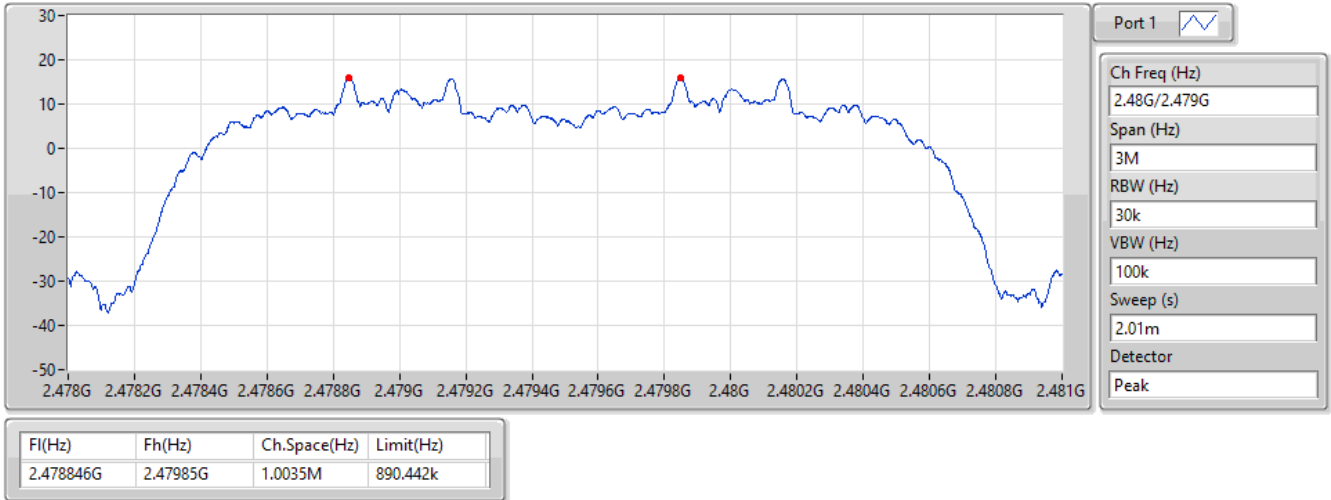


2.4-2.4835GHz_BT-EDR(3Mbps)

Channel Separation-FS

2.48G/2.479GHz

11/03/2024





Average Power-FHSS

Appendix C.1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	7.63	0.00579
BT-EDR(2Mbps)	7.66	0.00583
BT-EDR(3Mbps)	7.61	0.00577



Average Power-FHSS

Appendix C.1

Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	3.68	7.63	21.00
2440MHz	Pass	3.68	7.52	21.00
2480MHz	Pass	3.68	7.21	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	3.68	7.47	21.00
2440MHz	Pass	3.68	7.66	21.00
2480MHz	Pass	3.68	6.82	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	3.68	7.50	21.00
2440MHz	Pass	3.68	7.61	21.00
2480MHz	Pass	3.68	7.35	21.00

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

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	7.93	0.00621
BT-EDR(2Mbps)	9.25	0.00841
BT-EDR(3Mbps)	9.70	0.00933

Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	3.68	7.93	21.00
2440MHz	Pass	3.68	7.67	21.00
2480MHz	Pass	3.68	7.34	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	3.68	8.99	21.00
2440MHz	Pass	3.68	9.25	21.00
2480MHz	Pass	3.68	8.94	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	3.68	9.47	21.00
2440MHz	Pass	3.68	9.70	21.00
2480MHz	Pass	3.68	9.36	21.00

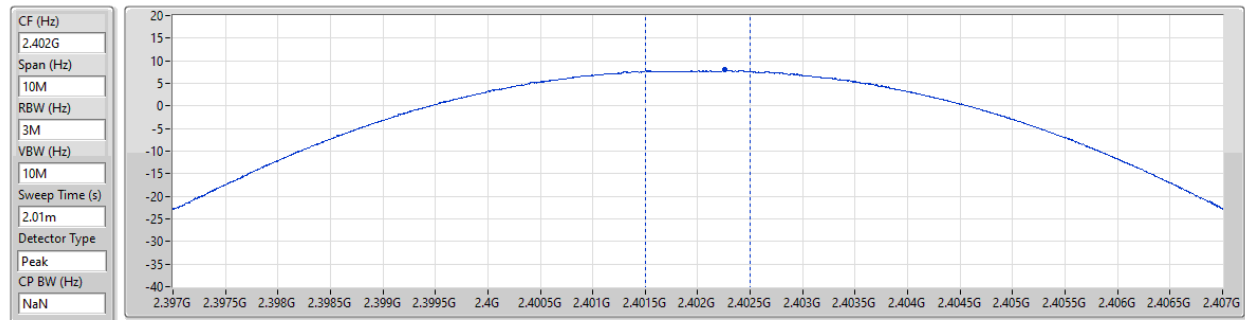
DG = Directional Gain; Port X = Port X output power

2.4-2.4835GHz_BT-BR(1Mbps)

PK Power-FS

2402MHz

11/03/2024

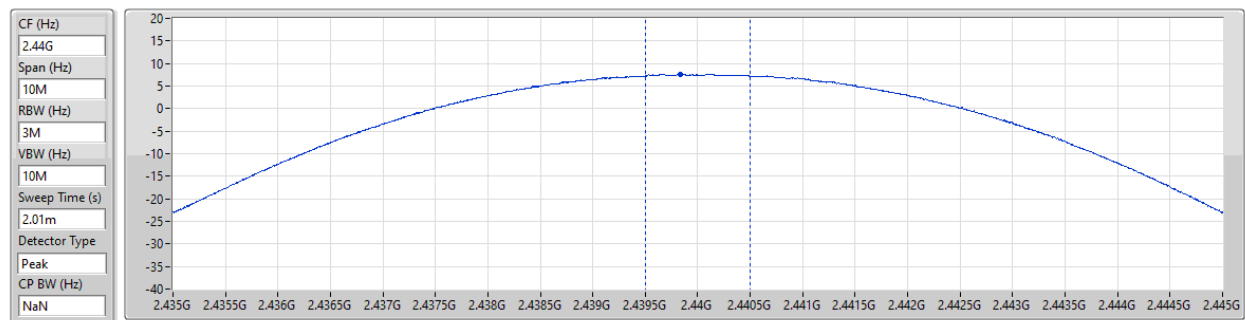


2.4-2.4835GHz_BT-BR(1Mbps)

PK Power-FS

2440MHz

11/03/2024

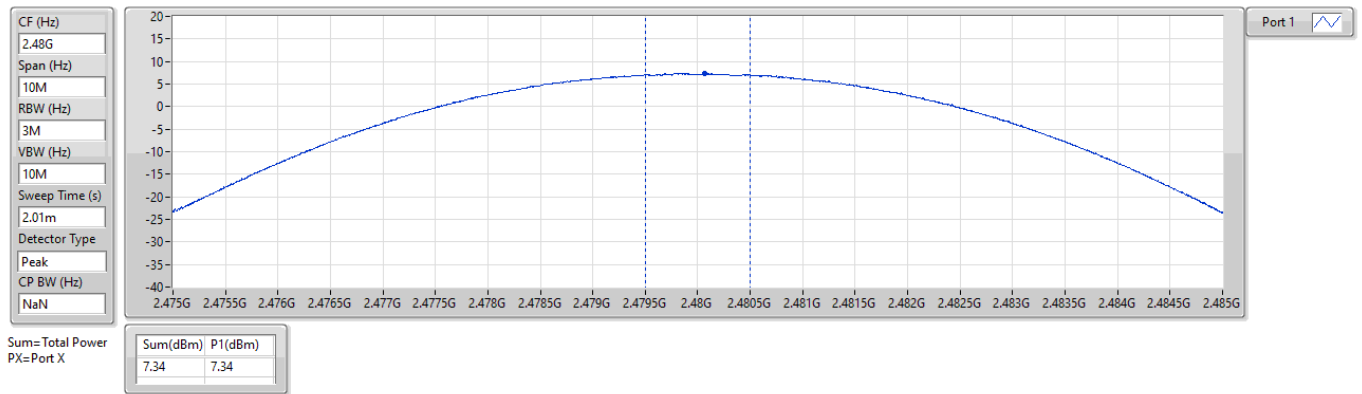


2.4-2.4835GHz_BT-BR(1Mbps)

PK Power-FS

2480MHz

11/03/2024

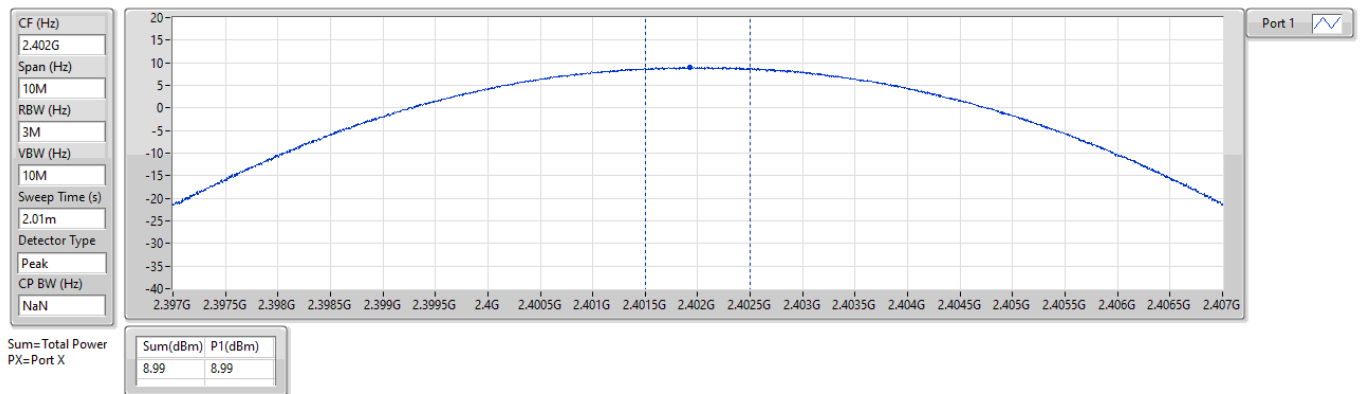


2.4-2.4835GHz_BT-EDR(2Mbps)

PK Power-FS

2402MHz

11/03/2024

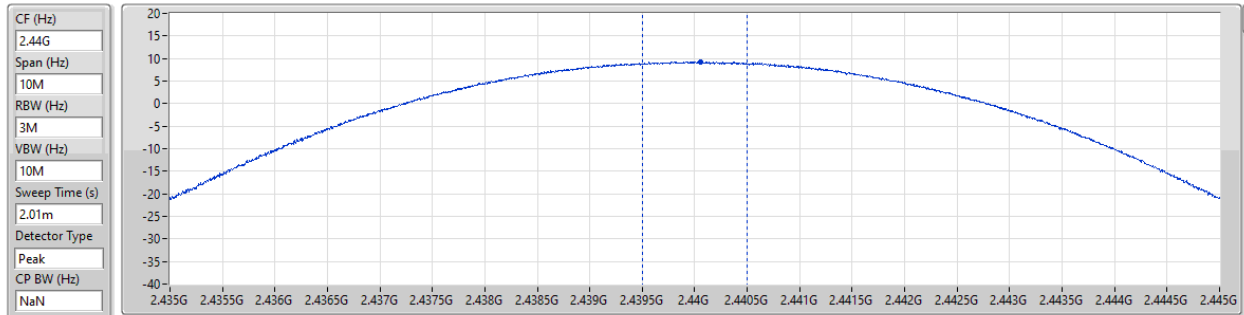


2.4-2.4835GHz_BT-EDR(2Mbps)

PK Power-FS

2440MHz

11/03/2024



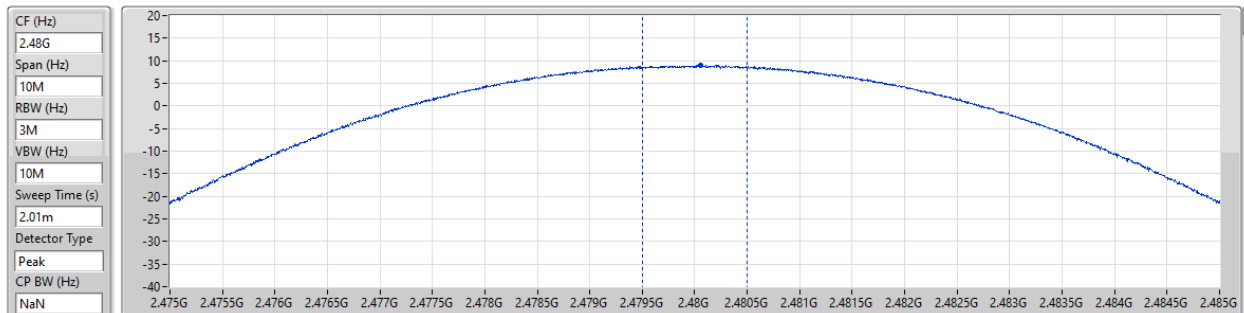
Sum= Total Power
PX=Port X

2.4-2.4835GHz_BT-EDR(2Mbps)

PK Power-FS

2480MHz

11/03/2024



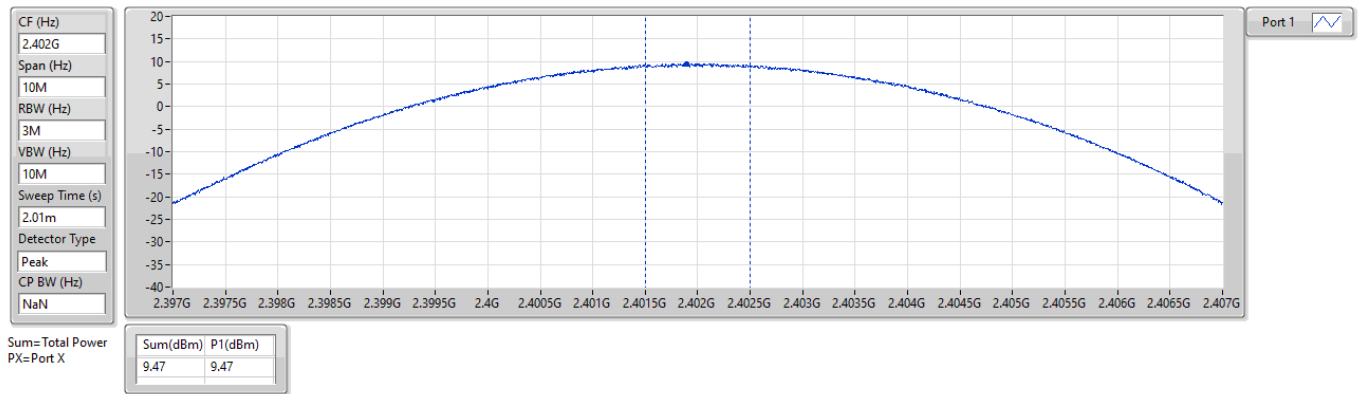
Sum= Total Power
PX=Port X

2.4-2.4835GHz_BT-EDR(3Mbps)

PK Power-FS

2402MHz

11/03/2024

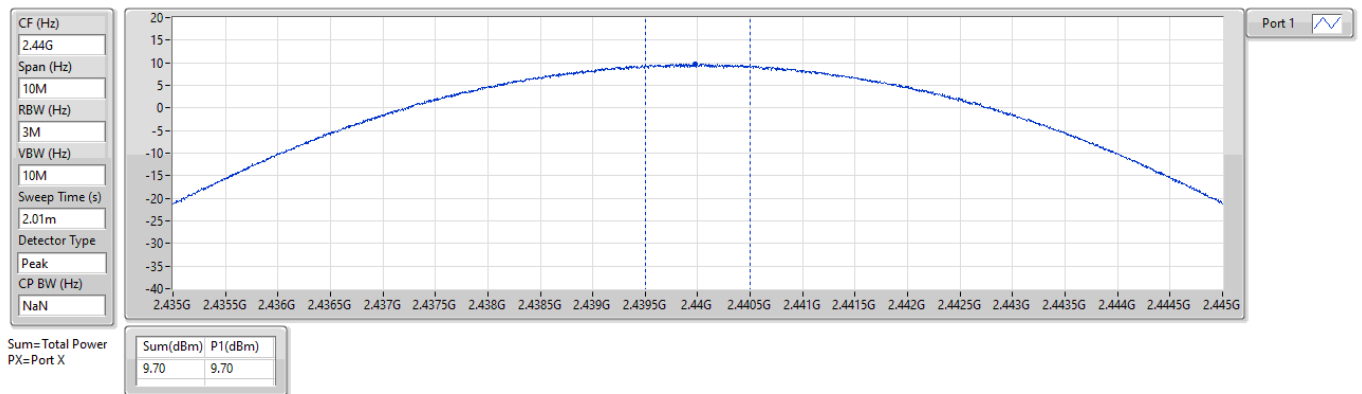


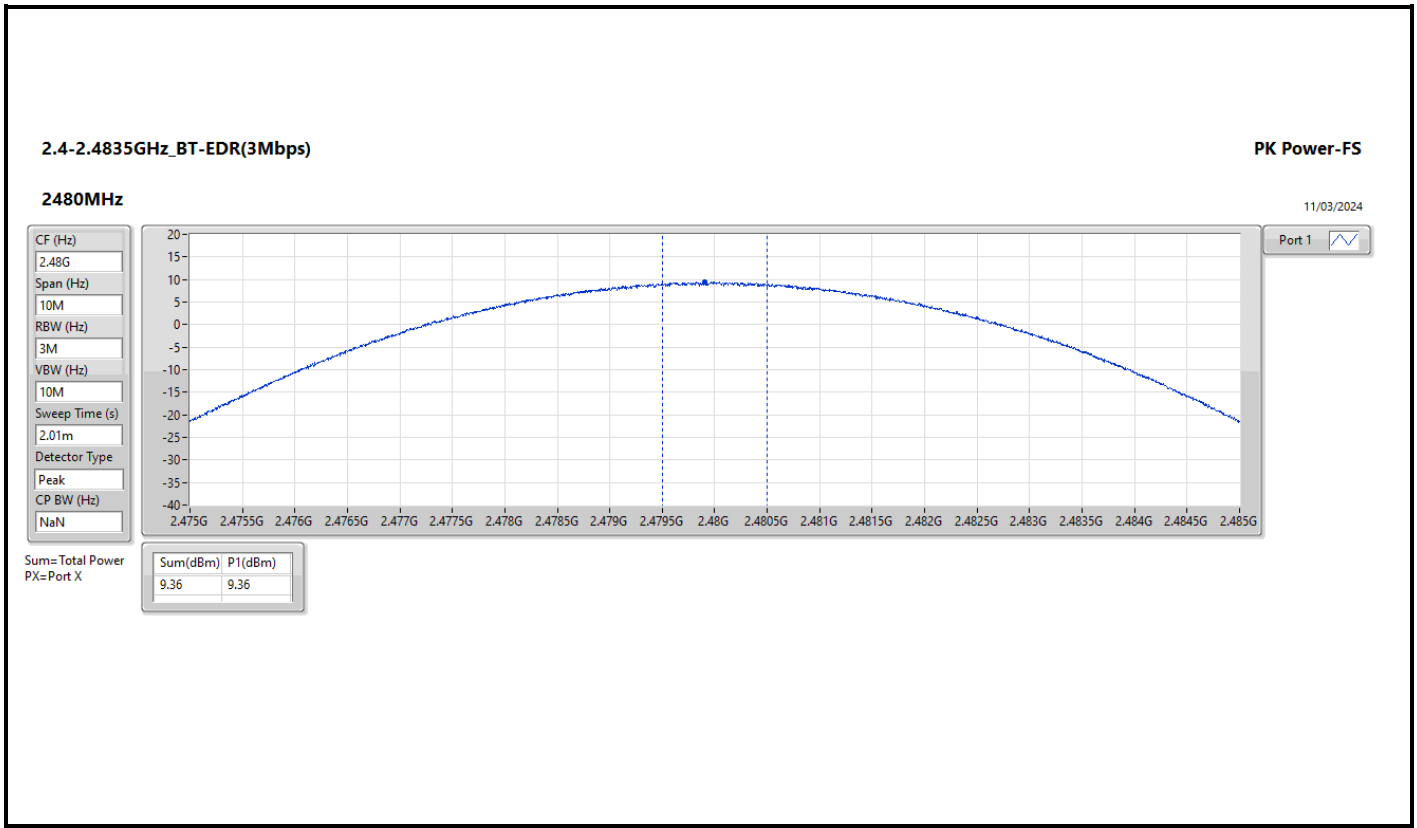
2.4-2.4835GHz_BT-EDR(3Mbps)

PK Power-FS

2440MHz

11/03/2024







Summary

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

Result

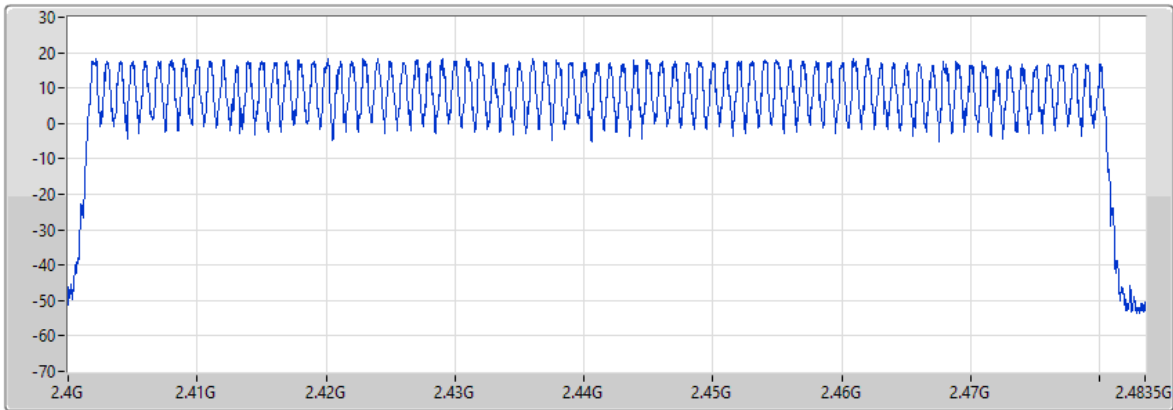
Mode	Result	Hopping No	Limit
BT-BR(1Mbps)	-	-	-
2440MHz	Pass	79	15
BT-EDR(2Mbps)	-	-	-
2440MHz	Pass	79	15
BT-EDR(3Mbps)	-	-	-
2440MHz	Pass	79	15

2.4-2.4835GHz_BT-BR(1Mbps)

Hopping-FS

2440MHz

11/03/2024



Port 1 

Hopping No
79

Span (Hz)
83.5M

RBW (Hz)
100k

VBW (Hz)
300kHz

Sweep (s)
8.01ms

Detector
Peak

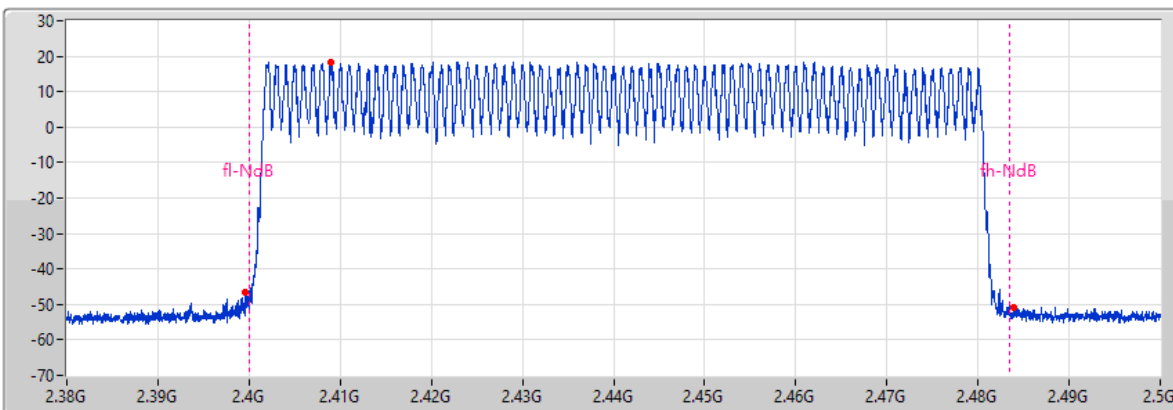
Hopping No	Limit
79	15

2.4-2.4835GHz_BT-BR(1Mbps)

2440MHz

Hopping Ch Bandedge (Non-restricted Band)

11/03/2024



Port 1 

Span (Hz)
120M

RBW (Hz)
100k

VBW (Hz)
300k

Sweep (s)
8.01m

Detector
Peak

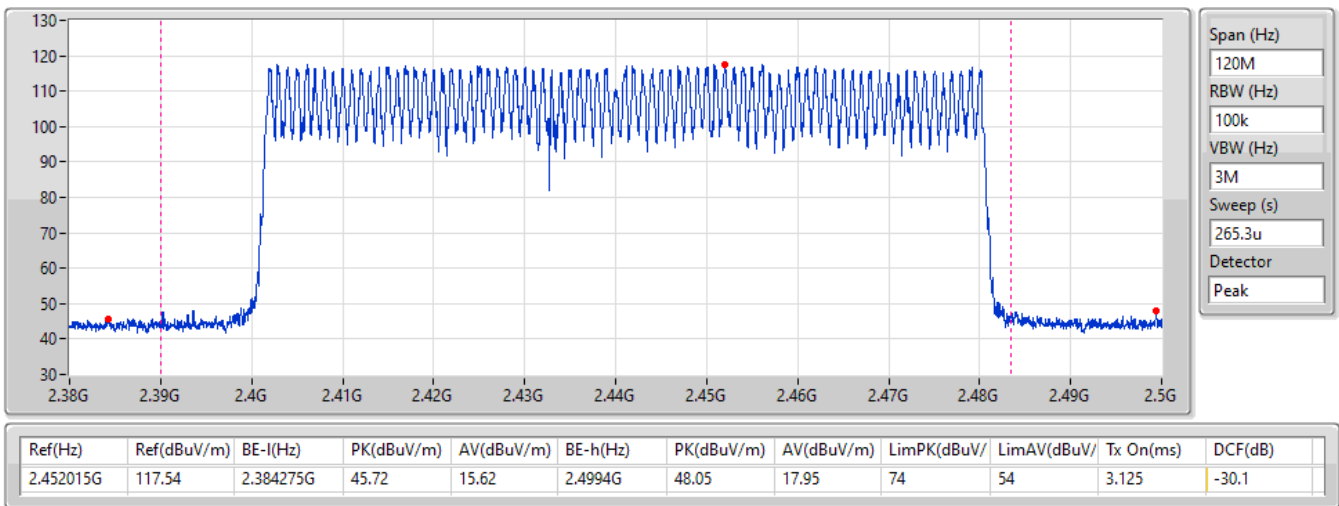
Limit(dBm)	Ref(Hz)	Ref(dBm)	BE-l(Hz)	BE-l(dBm)	BE-h(Hz)	BE-h(dBm)
-1.55	2.40901G	18.45	2.399635G	-46.66	2.48398G	-50.79

2.4-2.4835GHz_BT-BR(1Mbps)

2440MHz

Hopping Ch Bandedge (Restricted Band)

11/03/2024

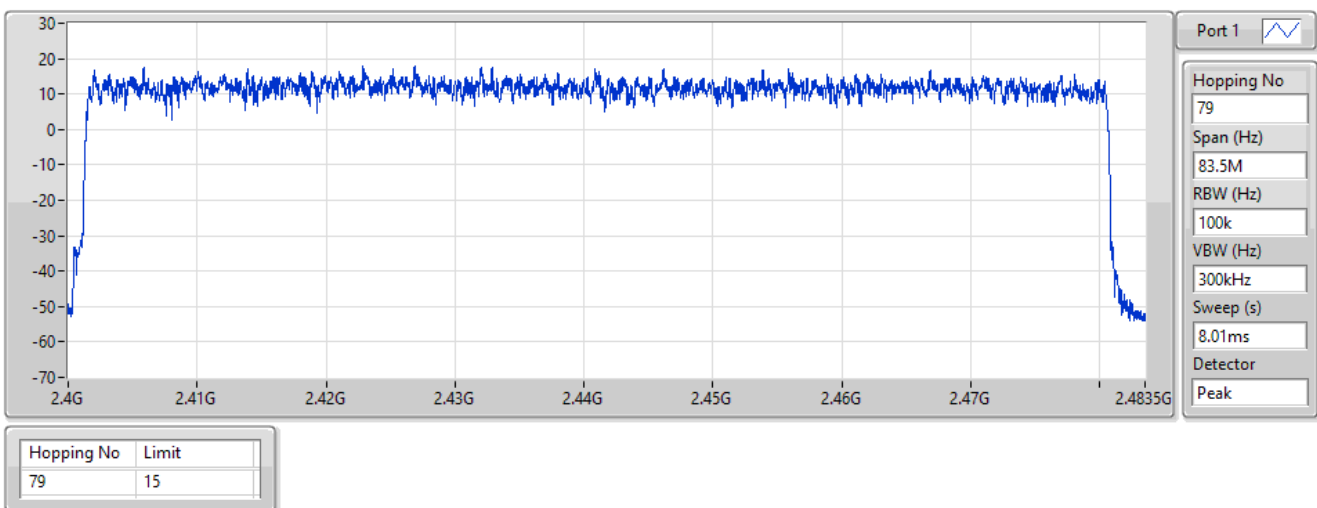


2.4-2.4835GHz_BT-EDR(2Mbps)

2440MHz

Hopping-FS

11/03/2024

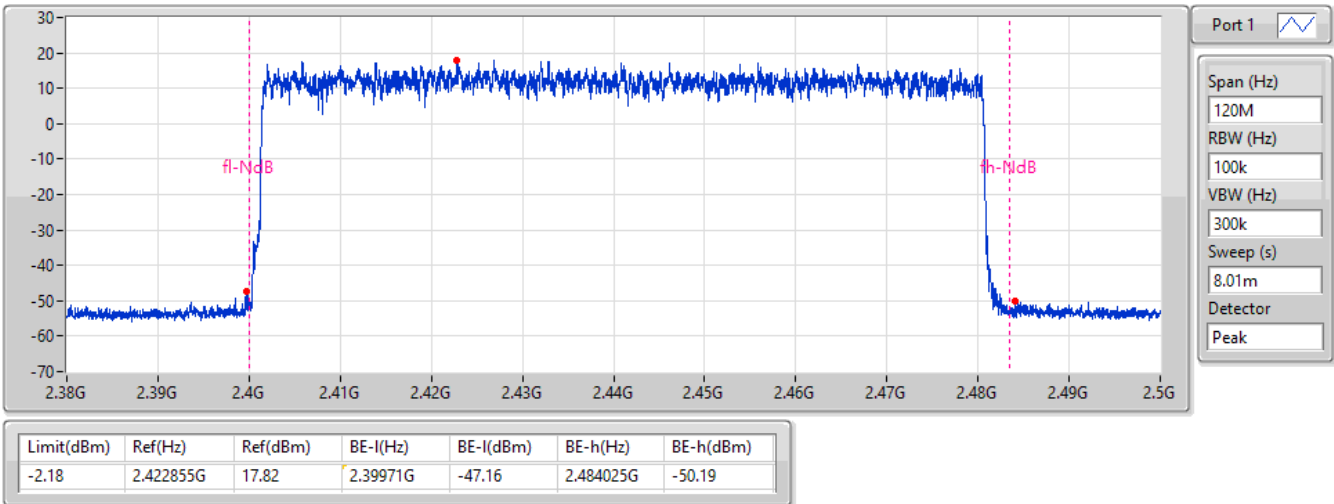


2.4-2.4835GHz_BT-EDR(2Mbps)

2440MHz

Hopping Ch Bandedge (Non-restricted Band)

11/03/2024

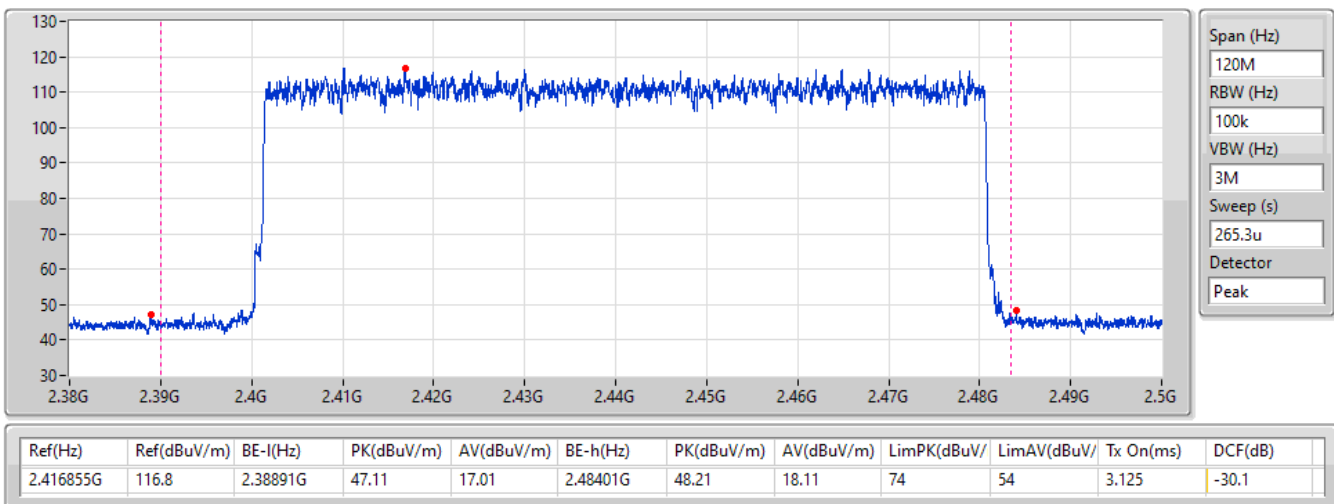


2.4-2.4835GHz_BT-EDR(2Mbps)

2440MHz

Hopping Ch Bandedge (Restricted Band)

11/03/2024

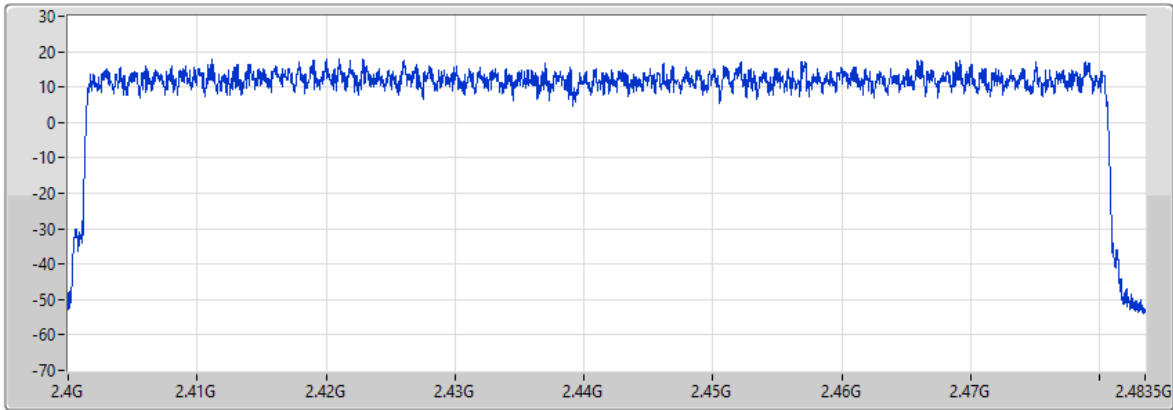


2.4-2.4835GHz_BT-EDR(3Mbps)

Hopping-FS

2440MHz

11/03/2024



Port 1 

Hopping No
79

Span (Hz)
83.5M

RBW (Hz)
100k

VBW (Hz)
300kHz

Sweep (s)
8.01ms

Detector
Peak

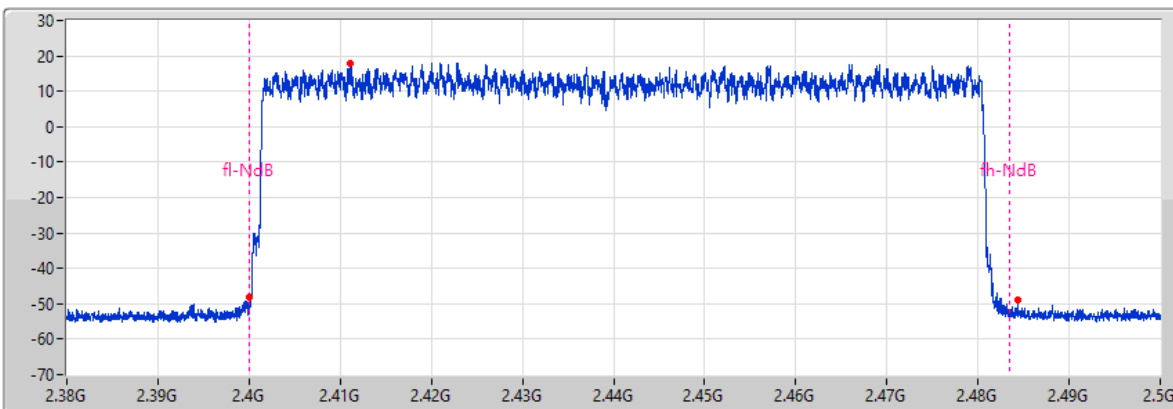
Hopping No	Limit
79	15

2.4-2.4835GHz_BT-EDR(3Mbps)

2440MHz

Hopping Ch Bandedge (Non-restricted Band)

11/03/2024



Port 1 

Span (Hz)
120M

RBW (Hz)
100k

VBW (Hz)
300k

Sweep (s)
8.01m

Detector
Peak

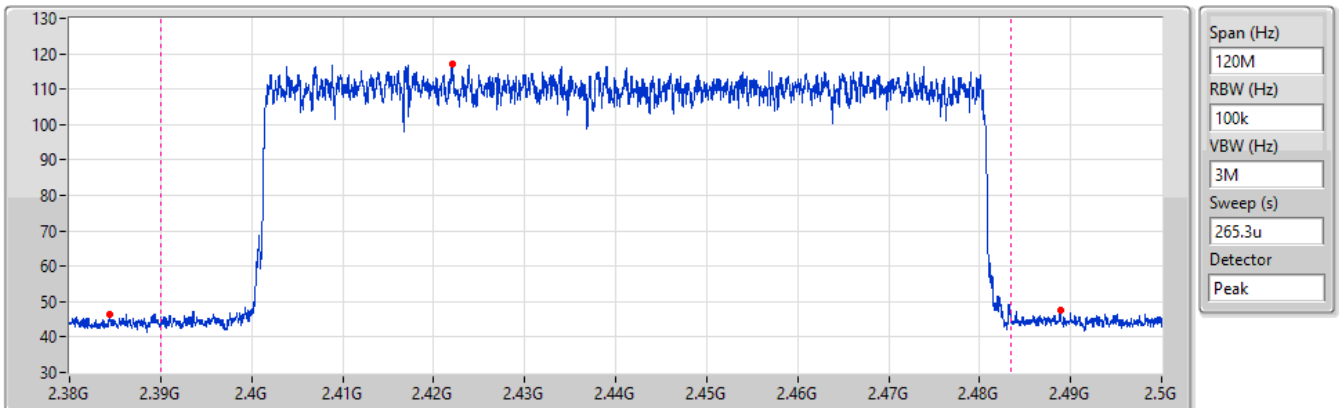
Limit(dBm)	Ref(Hz)	Ref(dBm)	BE-l(Hz)	BE-l(dBm)	BE-h(Hz)	BE-h(dBm)
-2.02	2.41117G	17.98	2.39998G	-47.97	2.484355G	-48.93

2.4-2.4835GHz_BT-EDR(3Mbps)

2440MHz

Hopping Ch Bandedge (Restricted Band)

11/03/2024



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)
2.422015G	116.93	2.38438G	46.34	16.24	2.4889G	47.41	17.31	74	54	3.125	-30.1

Summary

Mode	Max-Dwell (s)
2.4-2.4835GHz	-
BT-BR(1Mbps)	308.074m
BT-EDR(2Mbps)	308.6603m
BT-EDR(3Mbps)	308.5004m

Result

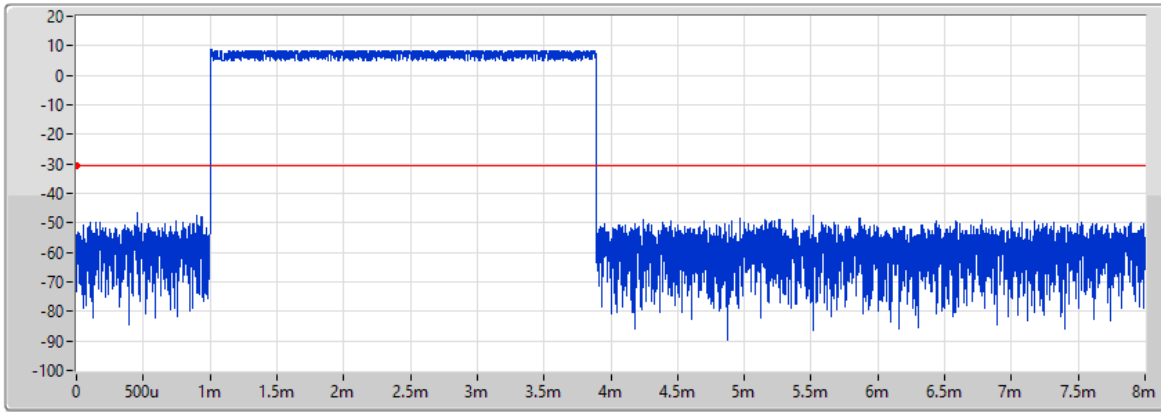
Mode	Result	Period (s)	Dwell (s)	Limit (s)	Tx On (s)
BT-BR(1Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	308.074m_DH5	400m	2.89m
2440MHz	Pass	8	154.037m_DH5-AFH	400m	2.89m
BT-EDR(2Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	308.6603m_DH5	400m	2.8955m
2440MHz	Pass	8	154.33015m_DH5-AFH	400m	2.8955m
BT-EDR(3Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	308.5004m_DH5	400m	2.894m
2440MHz	Pass	8	100.723675m_DH5-AFH	400m	1.88975m

2.4-2.4835GHz_BT-BR(1Mbps)

Dwell-FS

2440MHz

15/03/2024



Port 1 

Ch Freq (Hz)
2.44G

RBW (Hz)
300k

VBW (Hz)
1M

Sweep Time (s)
8m

TX Time (s)
2.89m

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
31.6	308.074m_DH5	400m	2.89m

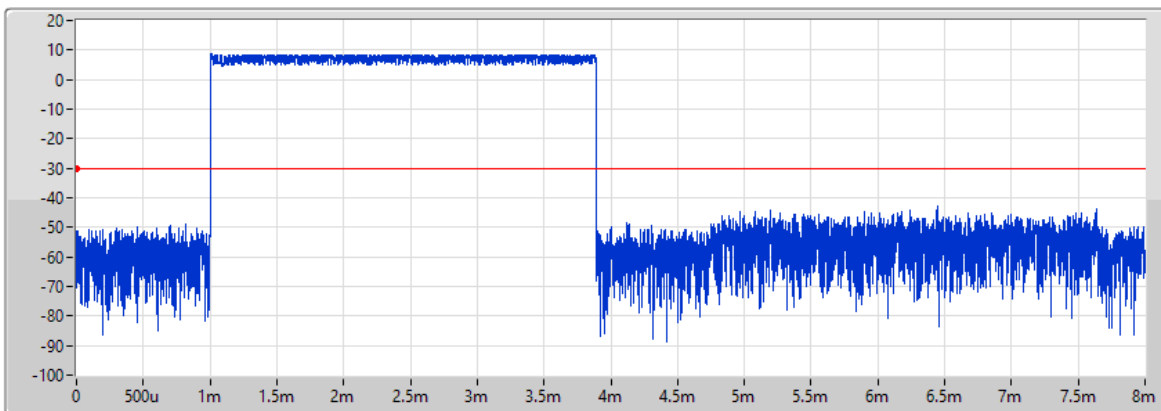
DH5

2.4-2.4835GHz_BT-BR(1Mbps)

Dwell-FS

2440MHz

15/03/2024



Port 1 

Ch Freq (Hz)
2.44G

RBW (Hz)
300k

VBW (Hz)
1M

Sweep Time (s)
8m

TX Time (s)
2.89m

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
8	154.037m_DH5-AFH	400m	2.89m

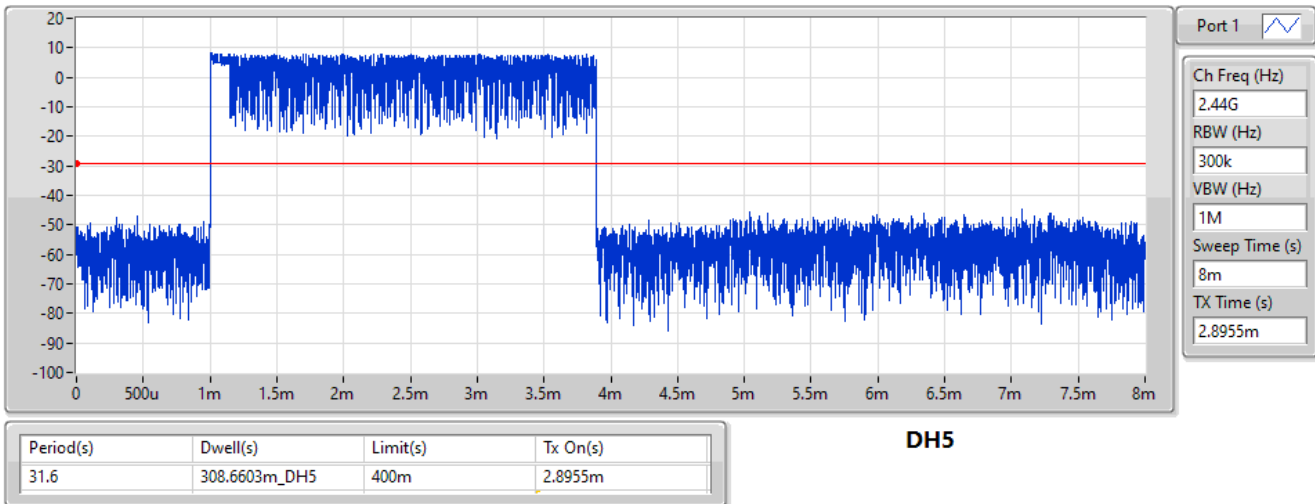
DH5-AFH

2.4-2.4835GHz_BT-EDR(2Mbps)

Dwell-FS

2440MHz

15/03/2024

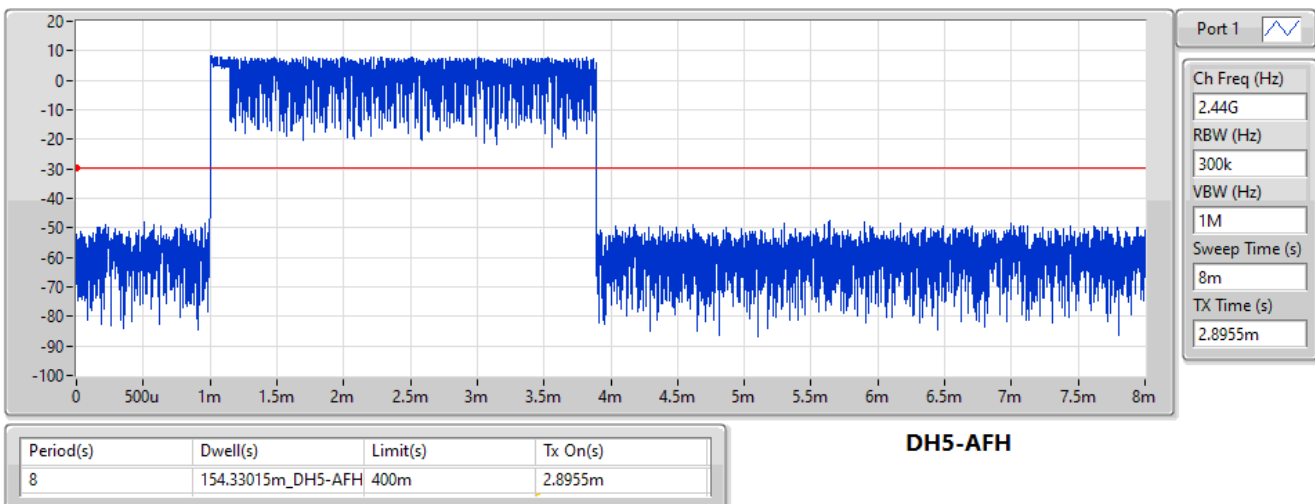


2.4-2.4835GHz_BT-EDR(2Mbps)

Dwell-FS

2440MHz

15/03/2024

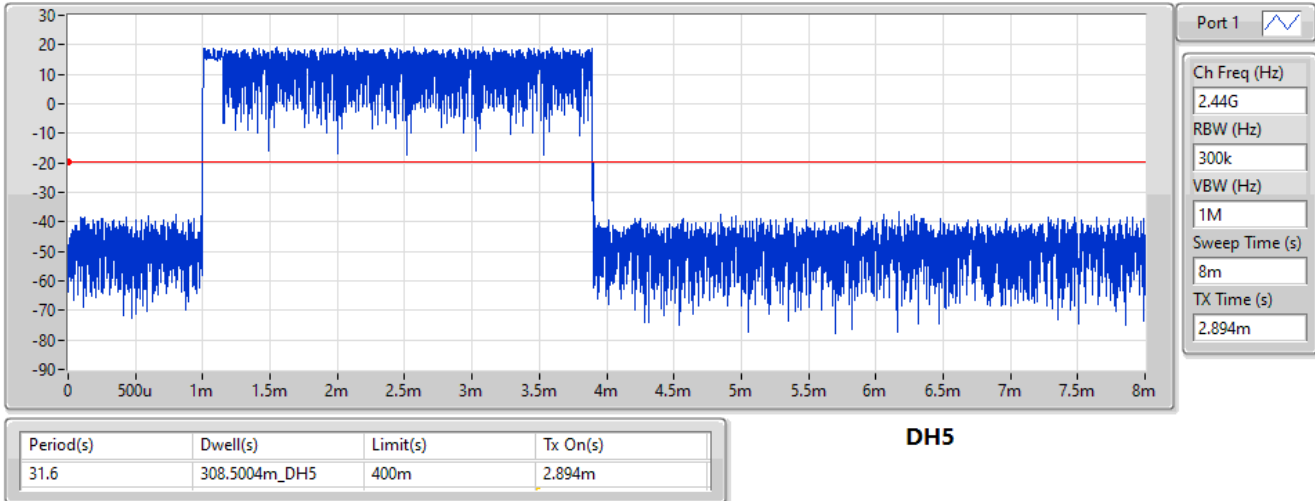


2.4-2.4835GHz_BT-EDR(3Mbps)

Dwell-FS

2440MHz

11/03/2024

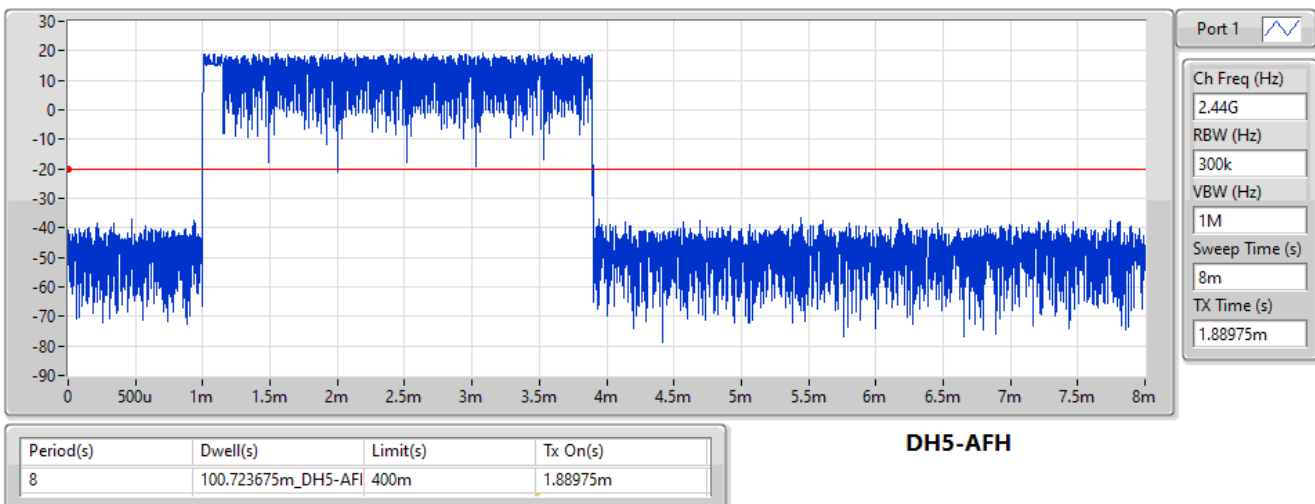


2.4-2.4835GHz_BT-EDR(3Mbps)

Dwell-FS

2440MHz

11/03/2024



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-BR(1Mbps)	Pass	2.43991G	4.43	-15.57	806.68M	-42.14	2.3964G	-41.28	2.4G	-43.62	2.50062G	-41.81	24.85096G	-33.98	1
BT-EDR(2Mbps)	Pass	2.48016G	16.92	-3.08	2.06745G	-40.17	2.3936G	-41.05	2.4G	-44.81	2.50082G	-41.56	3.30494G	-32.57	1
BT-EDR(3Mbps)	Pass	2.40217G	16.73	-3.27	890.1M	-41.71	2.39988G	-40.86	2.4G	-41.38	2.50242G	-41.17	3.20089G	-30.81	1

Result

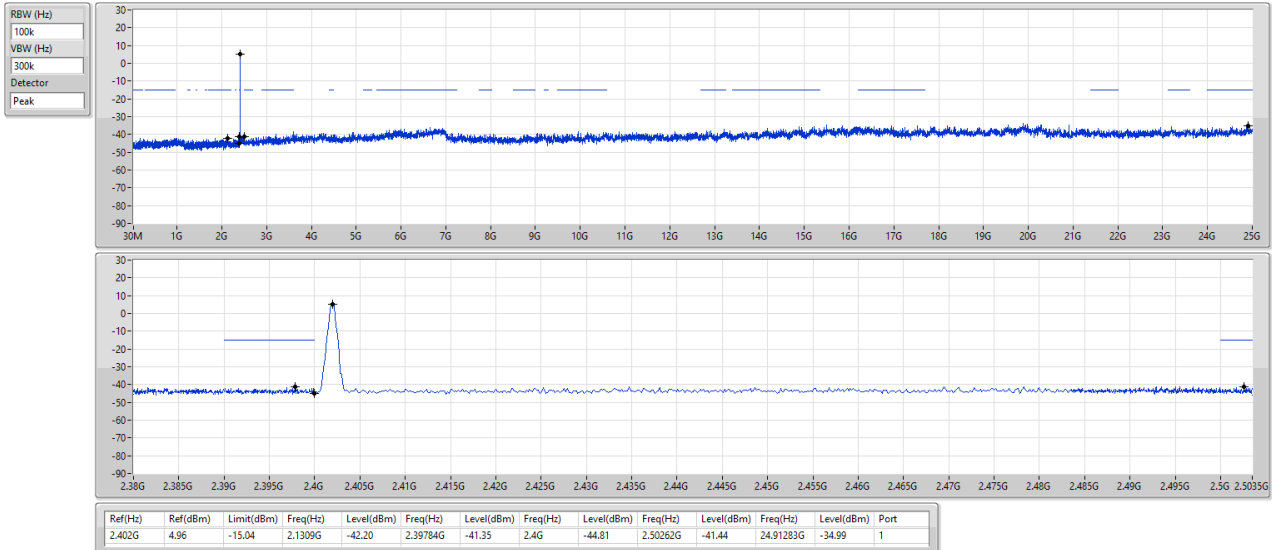
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-BR(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	4.96	-15.04	2.1309G	-42.20	2.39784G	-41.35	2.4G	-44.81	2.50262G	-41.44	24.91283G	-34.99	1
2440MHz	Pass	2.43991G	4.43	-15.57	806.68M	-42.14	2.3964G	-41.28	2.4G	-43.62	2.50062G	-41.81	24.85096G	-33.98	1
2480MHz	Pass	2.48016G	7.46	-12.54	2.0933G	-42.40	2.39668G	-41.91	2.4G	-43.51	2.50278G	-41.56	16.38384G	-34.79	1
BT-EDR(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	16.79	-3.21	509.4M	-41.24	2.39824G	-41.10	2.4G	-42.57	2.50022G	-41.65	3.20089G	-31.00	1
2440MHz	Pass	2.43991G	16.33	-3.67	811.38M	-41.76	2.39708G	-41.59	2.4G	-44.32	2.50274G	-41.69	3.25151G	-32.06	1
2480MHz	Pass	2.48016G	16.92	-3.08	2.06745G	-40.17	2.3936G	-41.05	2.4G	-44.81	2.50082G	-41.56	3.30494G	-32.57	1
BT-EDR(3Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40217G	16.73	-3.27	890.1M	-41.71	2.39988G	-40.86	2.4G	-41.38	2.50242G	-41.17	3.20089G	-30.81	1
2440MHz	Pass	2.44025G	17.34	-2.66	947.68M	-41.33	2.39488G	-41.02	2.4G	-42.54	2.50022G	-41.57	3.25151G	-31.17	1
2480MHz	Pass	2.48016G	16.31	-3.69	2.06745G	-41.62	2.39452G	-41.29	2.4G	-44.33	2.50002G	-41.28	3.30494G	-32.78	1

2.4-2.4835GHz_BT-BR(1Mbps)

CSENdb-FS

2402MHz

11/03/2024

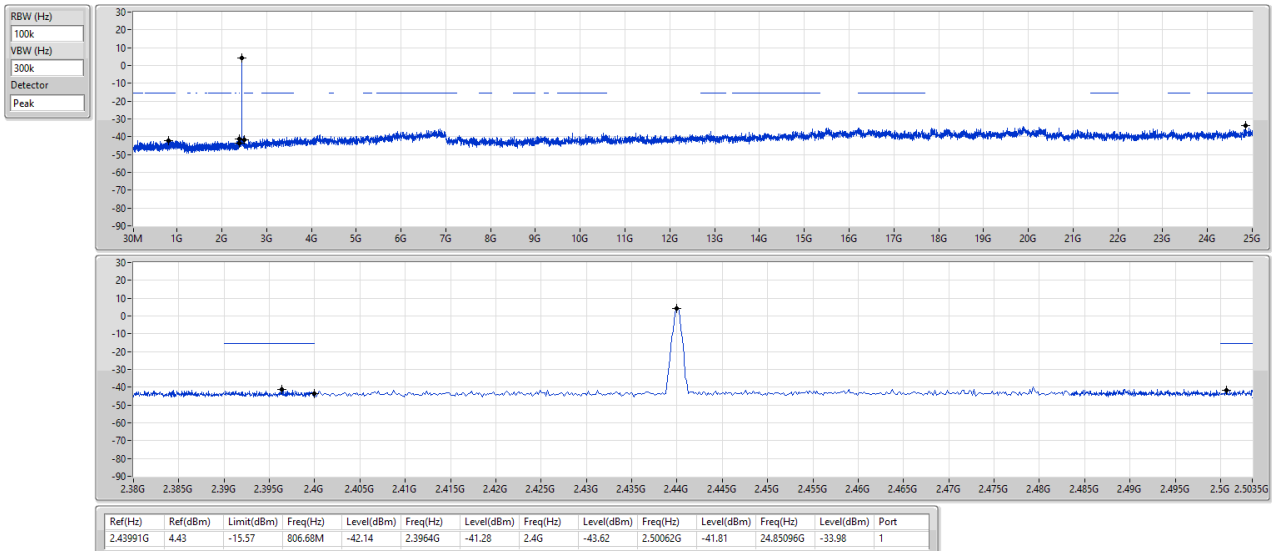


2.4-2.4835GHz_BT-BR(1Mbps)

CSENdb-FS

2440MHz

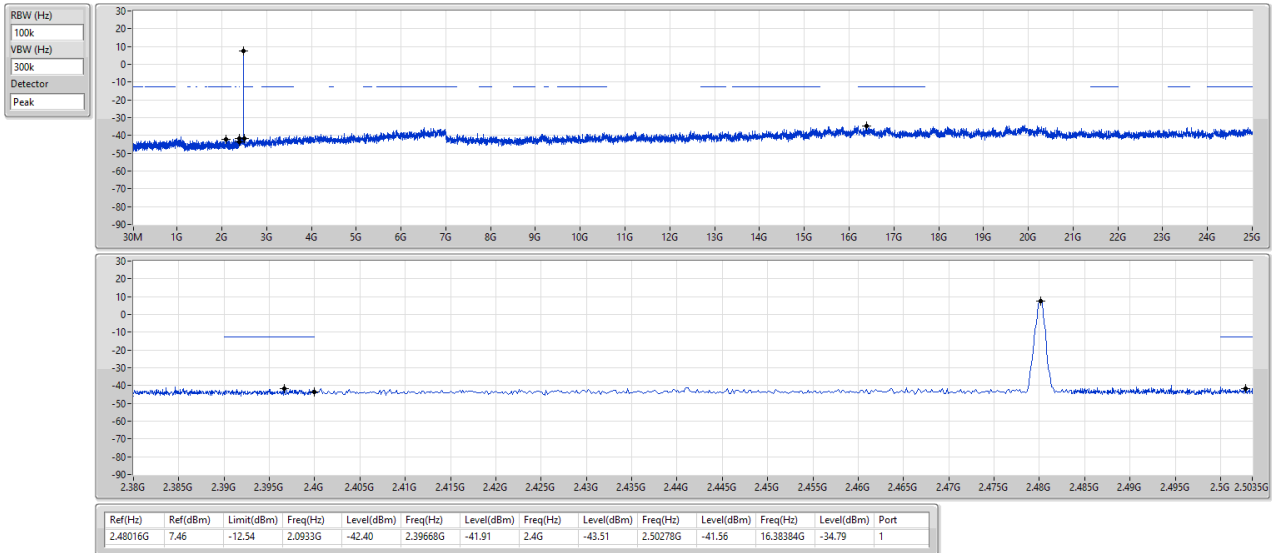
11/03/2024



2.4-2.4835GHz_BT-BR(1Mbps)

CSEndB-FS

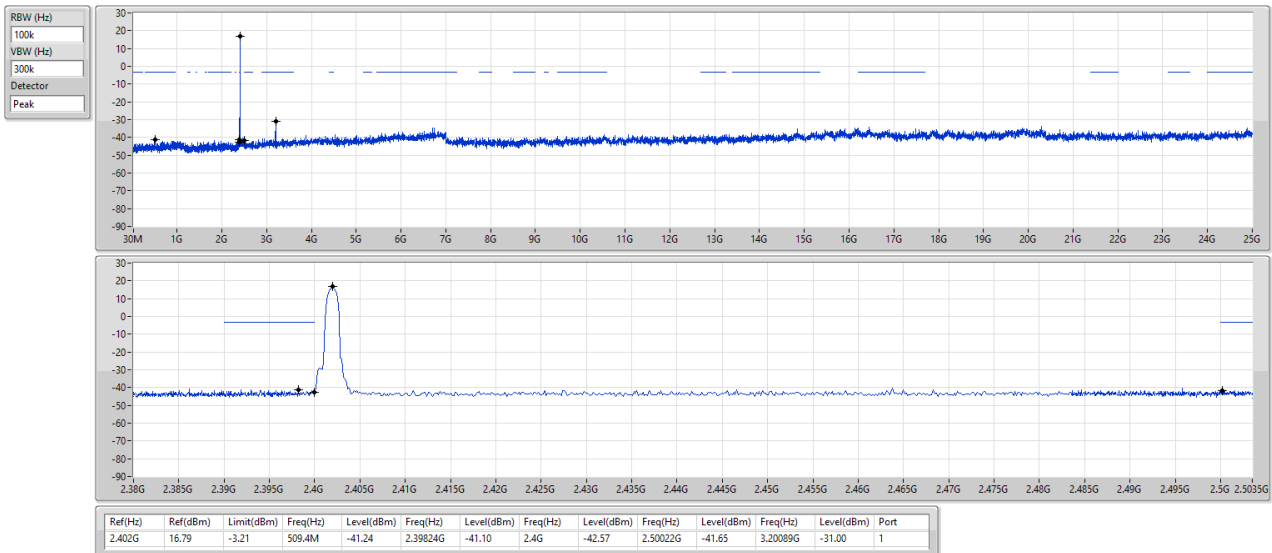
2480MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

CSEndB-FS

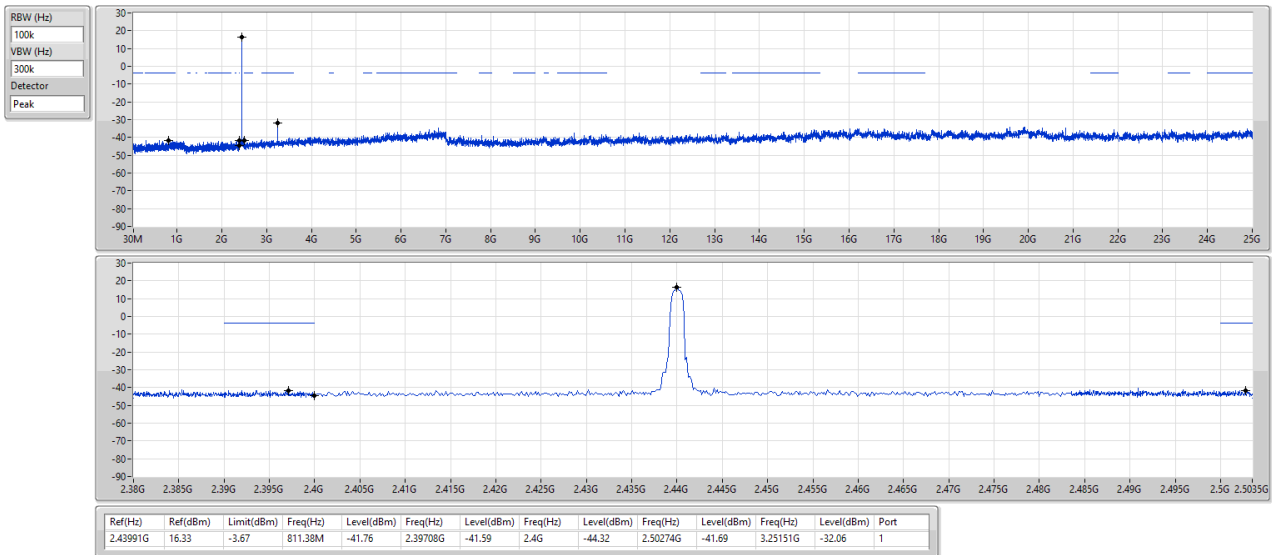
2402MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

CSENdB-FS

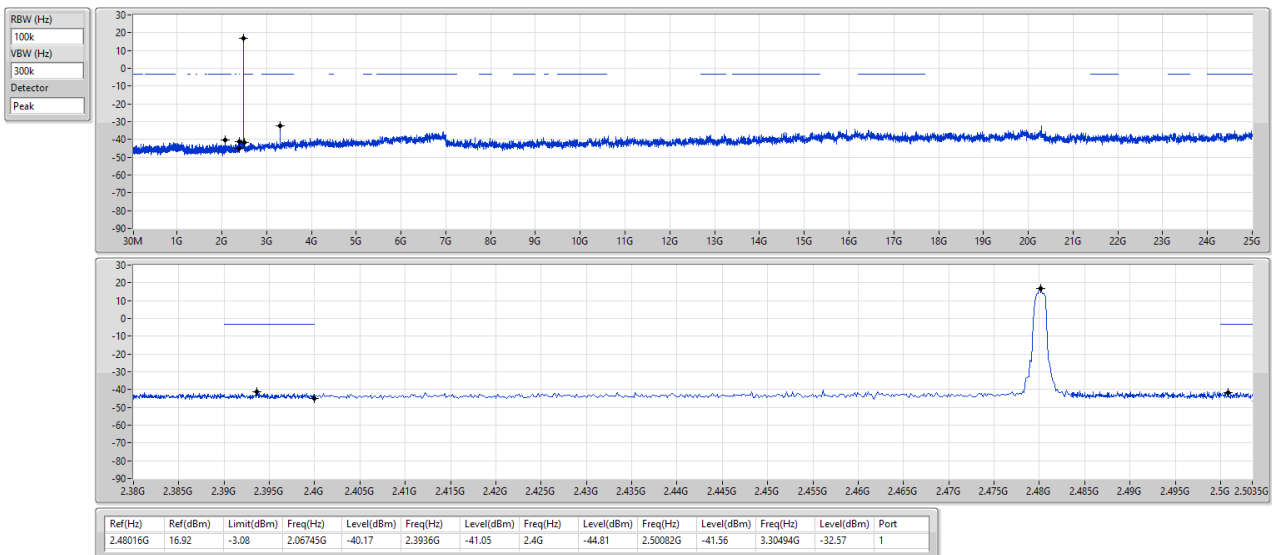
2440MHz



2.4-2.4835GHz_BT-EDR(2Mbps)

CSENdB-FS

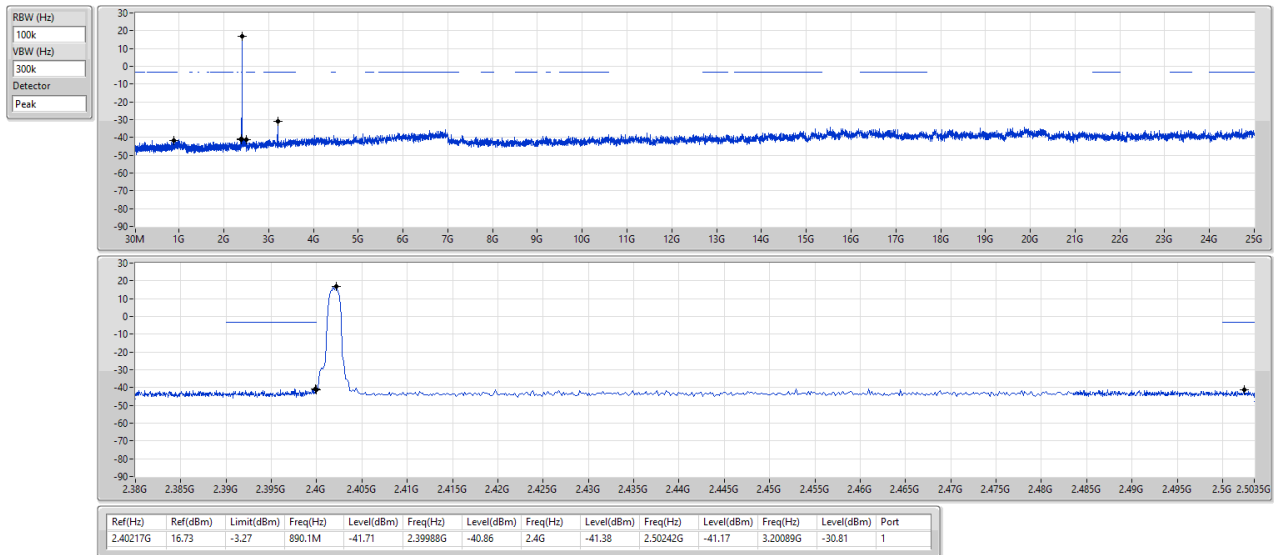
2480MHz



2.4-2.4835GHz_BT-EDR(3Mbps)

CSEndB-FS

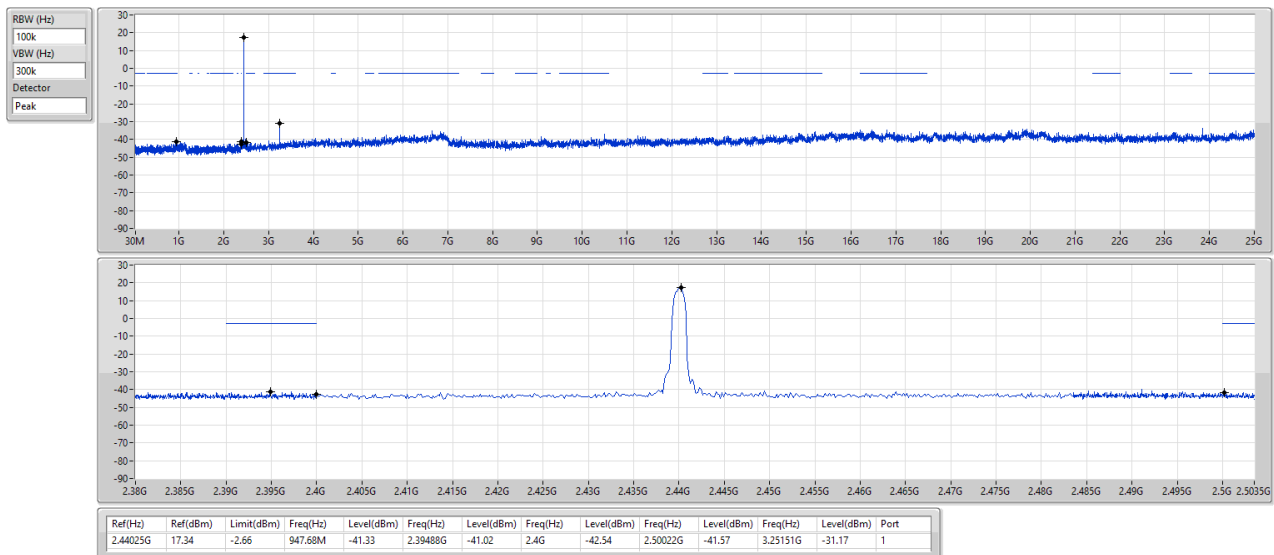
2402MHz



2.4-2.4835GHz_BT-EDR(3Mbps)

CSEndB-FS

2440MHz



2.4-2.4835GHz_BT-EDR(3Mbps)

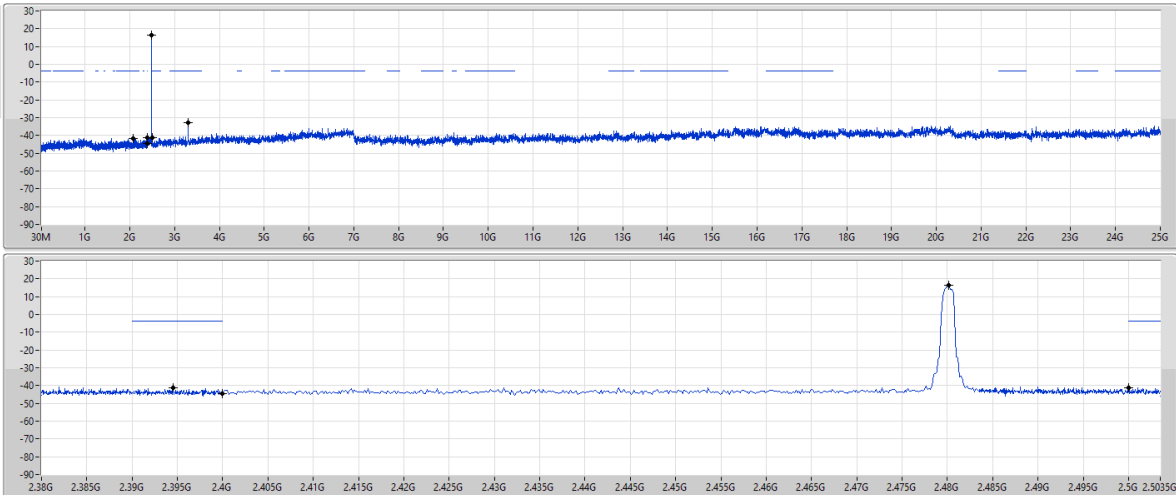
CSEndB-FS

2480MHz

11/03/2024

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
2.48016G	16.31	-3.69	2.06745G	-41.62	2.39452G	-41.29	2.4G	-44.33	2.50002G	-41.28	3.30494G	-32.78	1



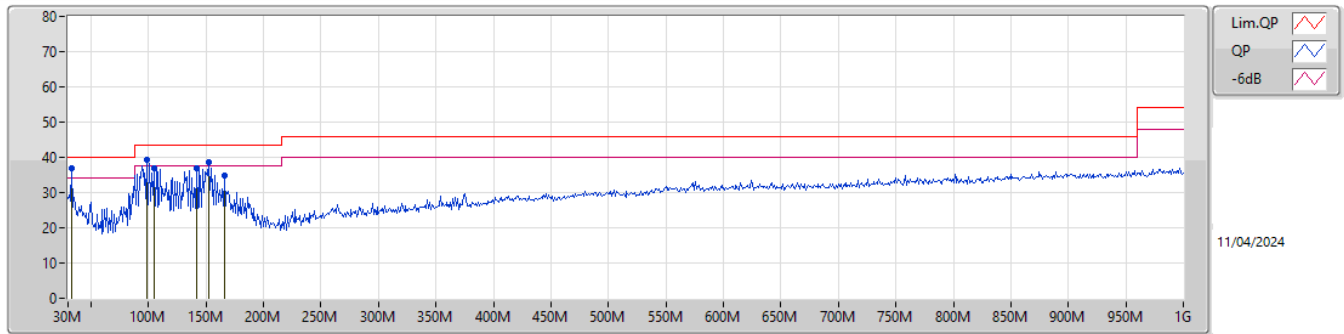
Radiated Emissions below 1GHz

Appendix G.1

Summary

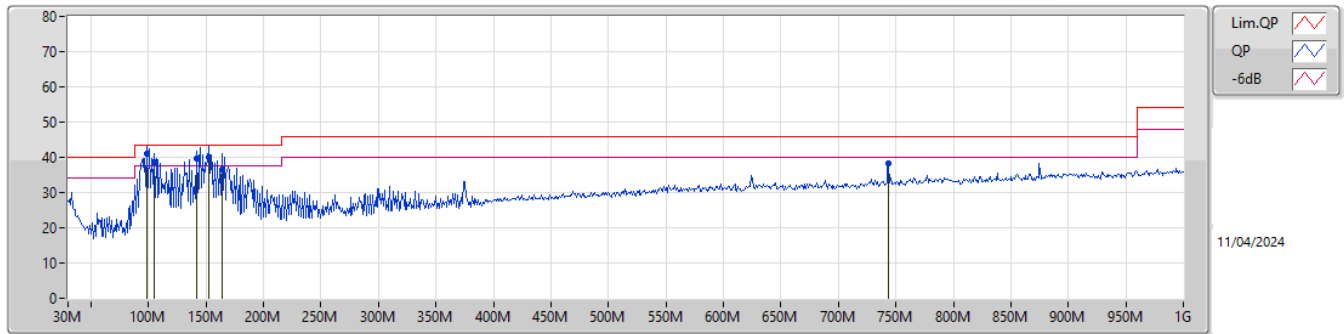
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 2	Pass	QP	98.87M	41.07	43.50	-2.43	Horizontal

Mode 2



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)		
PK	32.91M	36.89	40.00	-3.11	-7.75	3	Vertical	255	1.25	"Worst"	44.64	22.92	0.95	31.62		
PK	98.87M	39.17	43.50	-4.33	-13.58	3	Vertical	294	1.00	-	52.75	16.63	1.74	31.95		
PK	104.69M	37.01	43.50	-6.49	-12.90	3	Vertical	294	1.00	-	49.91	17.26	1.79	31.95		
PK	141.55M	36.99	43.50	-6.51	-12.84	3	Vertical	131	1.25	-	49.83	17.06	2.08	31.98		
PK	152.22M	38.63	43.50	-4.87	-13.58	3	Vertical	262	2.00	-	52.21	16.28	2.16	32.02		
PK	165.8M	34.80	43.50	-8.70	-13.93	3	Vertical	236	2.00	-	48.73	15.85	2.26	32.04		

Mode 2



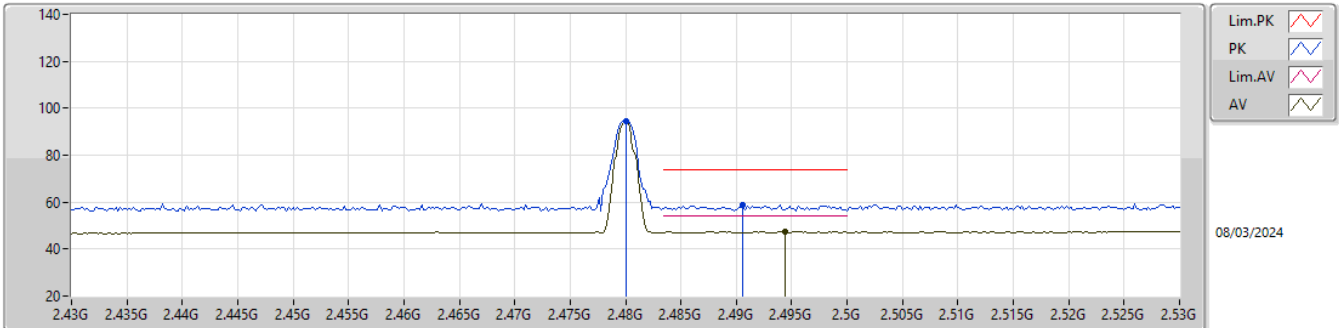
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)		
QP	98.87M	41.07	43.50	-2.43	-13.58	3	Horizontal	324	3.00	"Worst"	54.65	16.63	1.74	31.95		
QP	104.69M	38.70	43.50	-4.80	-12.90	3	Horizontal	342	3.00	-	51.60	17.26	1.79	31.95		
QP	141.55M	39.82	43.50	-3.68	-12.84	3	Horizontal	267	2.00	-	52.66	17.06	2.08	31.98		
QP	152.22M	40.09	43.50	-3.41	-13.58	3	Horizontal	340	2.00	-	53.67	16.28	2.16	32.02		
QP	163.86M	36.63	43.50	-6.87	-13.96	3	Horizontal	340	2.00	-	50.59	15.83	2.25	32.04		
PK	743.92M	38.32	46.00	-7.68	-1.95	3	Horizontal	0	1.00	-	40.27	25.49	5.20	32.64		

Summary

Mode	Result	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
2.4-2.4835GHz	-	-	-	-	-	-
BT-EDR(3Mbps)	Pass	2.4835G	48.34	54.00	-5.66	Vertical

2.4-2.4835GHz_BT-BR(1Mbps)

2480MHz_TX

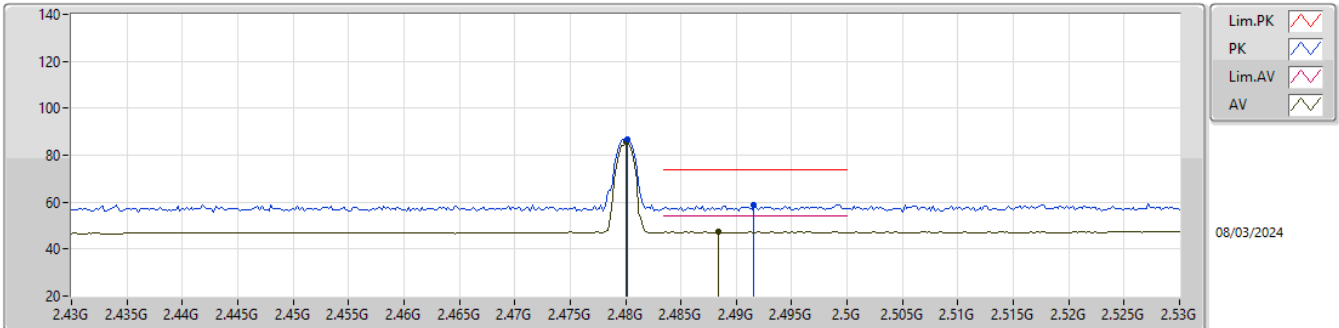


EUT_Z_1TX
Setting 0
04-P-G-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)				
PK	2.48G	94.70	Inf	-Inf	63.71	3	Vertical	48	2.60	-	27.60	3.39	-				
AV	2.48G	94.23	Inf	-Inf	63.24	3	Vertical	48	2.60	-	27.60	3.39	-				
PK	2.4906G	58.92	74.00	-15.08	27.82	3	Vertical	48	2.60	-	27.70	3.40	-				
AV	2.4944G	47.60	54.00	-6.40	16.50	3	Vertical	48	2.60	-	27.70	3.40	-				

2.4-2.4835GHz_BT-BR(1Mbps)

2480MHz_TX

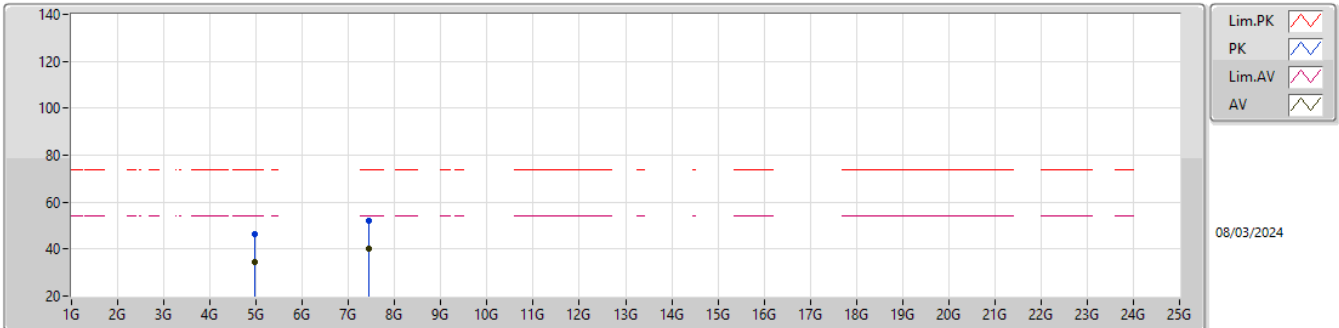


EUT_Z_1TX
Setting 0
04-P-G-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)			
PK	2.4802G	86.61	Inf	-Inf	55.62	3	Horizontal	123	1.07	-	27.60	3.39	-			
AV	2.48G	85.76	Inf	-Inf	54.77	3	Horizontal	123	1.07	-	27.60	3.39	-			
PK	2.4916G	58.60	74.00	-15.40	27.50	3	Horizontal	123	1.07	-	27.70	3.40	-			
AV	2.4884G	47.57	54.00	-6.43	16.49	3	Horizontal	123	1.07	-	27.68	3.40	-			

2.4-2.4835GHz_BT-BR(1Mbps)

2480MHz_TX

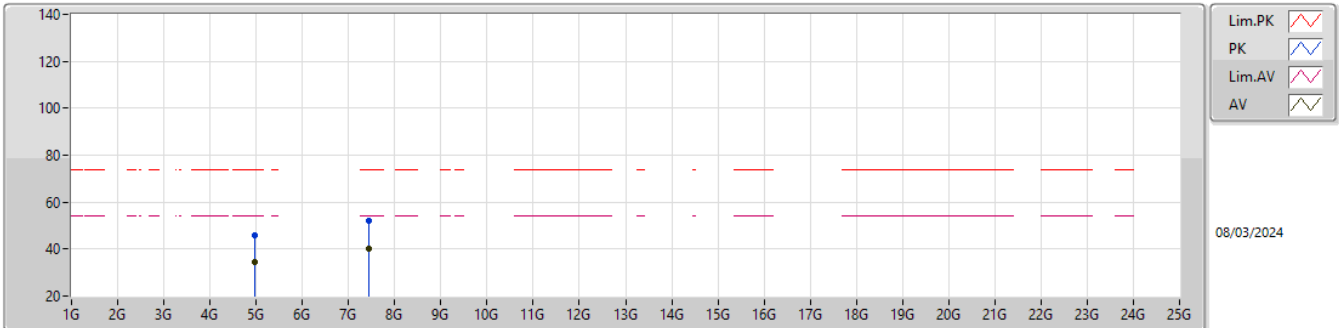


EUT_Z_1TX
Setting 0
04-P-G-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)			
PK	4.95704G	46.63	74.00	-27.37	41.37	3	Vertical	105	2.62	-	32.70	5.79	33.23			
AV	4.96162G	34.48	54.00	-19.52	29.20	3	Vertical	105	2.62	-	32.70	5.80	33.22			
PK	7.43754G	51.82	74.00	-22.18	41.56	3	Vertical	351	2.84	-	37.20	7.21	34.15			
AV	7.43514G	40.12	54.00	-13.88	29.85	3	Vertical	351	2.84	-	37.20	7.21	34.14			

2.4-2.4835GHz_BT-BR(1Mbps)

2480MHz_TX

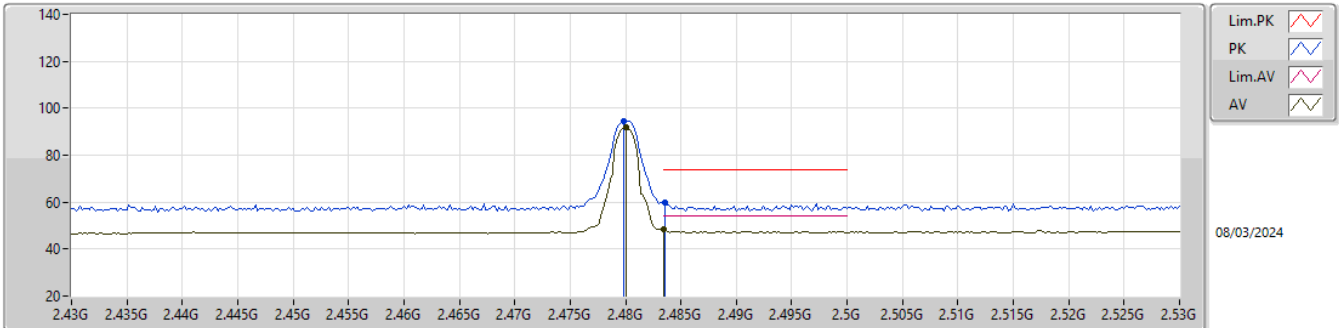


EUT_Z_1TX
Setting 0
04-P-G-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)			
PK	4.96168G	45.96	74.00	-28.04	40.68	3	Horizontal	264	2.74	-	32.70	5.80	33.22			
AV	4.96112G	34.47	54.00	-19.53	29.19	3	Horizontal	264	2.74	-	32.70	5.80	33.22			
PK	7.44114G	51.92	74.00	-22.08	41.66	3	Horizontal	177	1.35	-	37.20	7.21	34.15			
AV	7.43976G	39.98	54.00	-14.02	29.72	3	Horizontal	177	1.35	-	37.20	7.21	34.15			

2.4-2.4835GHz_BT-EDR(3Mbps)

2480MHz_TX

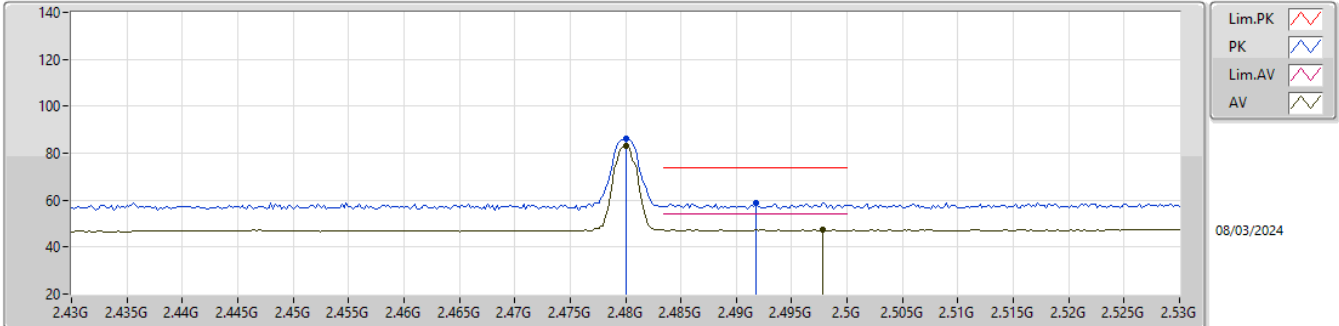


EUT_Z_1TX
Setting 0
04-P-G-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)			
PK	2.4798G	94.48	Inf	-Inf	63.49	3	Vertical	49	2.61	-	27.60	3.39	-			
AV	2.48G	91.80	Inf	-Inf	60.81	3	Vertical	49	2.61	-	27.60	3.39	-			
PK	2.4836G	60.01	74.00	-13.99	28.97	3	Vertical	49	2.61	-	27.64	3.40	-			
AV	2.4835G	48.34	54.00	-5.66	17.30	3	Vertical	49	2.61	-	27.64	3.40	-			

2.4-2.4835GHz_BT-EDR(3Mbps)

2480MHz_TX

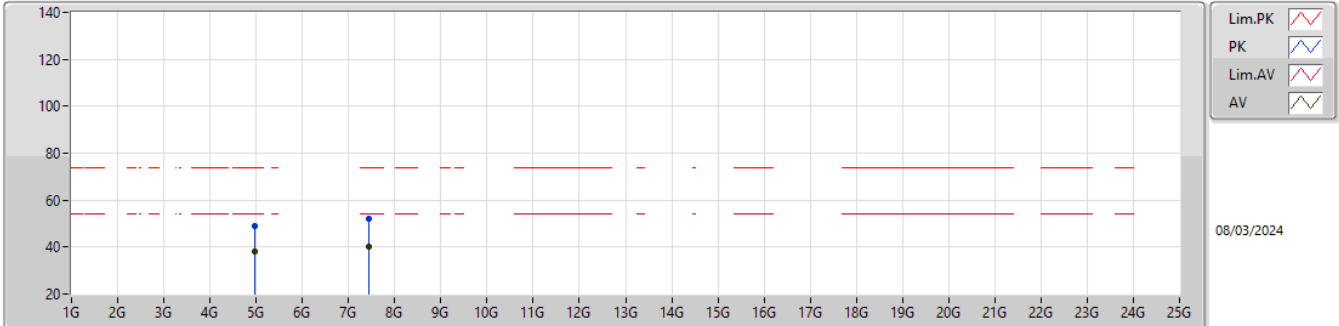


EUT_Z_1TX
Setting 0
04-P-G-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)			
PK	2.48G	85.97	Inf	-Inf	54.98	3	Horizontal	124	1.07	-	27.60	3.39	-			
AV	2.48G	83.24	Inf	-Inf	52.25	3	Horizontal	124	1.07	-	27.60	3.39	-			
PK	2.4918G	58.84	74.00	-15.16	27.74	3	Horizontal	124	1.07	-	27.70	3.40	-			
AV	2.4978G	47.32	54.00	-6.68	16.22	3	Horizontal	124	1.07	-	27.70	3.40	-			

2.4-2.4835GHz_BT-EDR(3Mbps)

2480MHz_TX

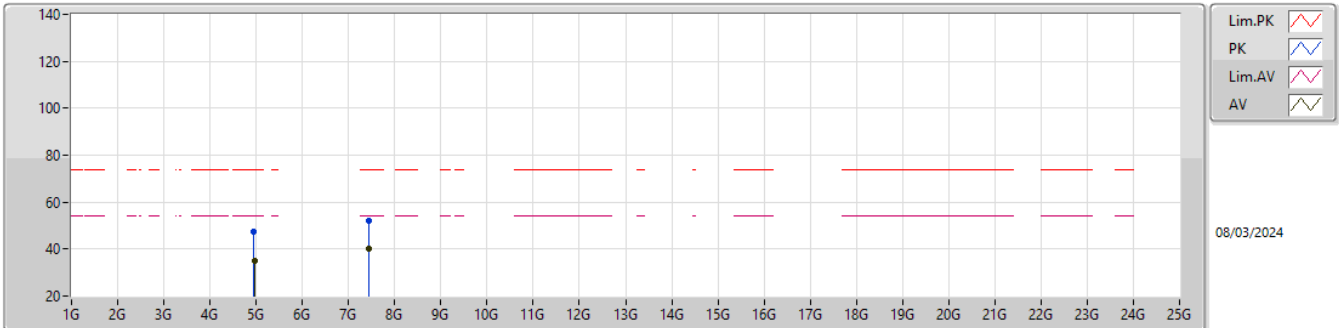


EUT_Z_1TX
Setting 0
04-P-G-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)			
PK	4.96026G	48.81	74.00	-25.19	43.54	3	Vertical	69	2.59	-	32.70	5.79	33.22			
AV	4.96G	38.23	54.00	-15.77	32.96	3	Vertical	69	2.59	-	32.70	5.79	33.22			
PK	7.44232G	52.13	74.00	-21.87	41.87	3	Vertical	329	1.80	-	37.20	7.21	34.15			
AV	7.43826G	40.33	54.00	-13.67	30.07	3	Vertical	329	1.80	-	37.20	7.21	34.15			

2.4-2.4835GHz_BT-EDR(3Mbps)

2480MHz_TX



EUT_Z_1TX
Setting 0
04-P-G-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)			
PK	4.95538G	47.20	74.00	-26.80	41.94	3	Horizontal	70	1.58	-	32.70	5.79	33.23			
AV	4.96152G	34.97	54.00	-19.03	29.69	3	Horizontal	70	1.58	-	32.70	5.80	33.22			
PK	7.4387G	52.00	74.00	-22.00	41.74	3	Horizontal	207	2.12	-	37.20	7.21	34.15			
AV	7.43626G	40.31	54.00	-13.69	30.04	3	Horizontal	207	2.12	-	37.20	7.21	34.14			