

FCC Radio Test Report

FCC ID : FPJPD-ID100
Equipment : HHKB Studio
Brand Name : HHKB
Model Name : PD-ID100
Applicant : PFU LIMITED
Nu 98-2 Unoke, Kahoku-shi, Ishikawa 929-1192, Japan
Manufacturer : Dong Guan Ione Electronic Co.,Ltd.
Building 3 No.76,Huangjiang Yongjun 2nd
Road,Huangjiang Town,Dongguan City,Guangdong
Province, P.R.China
Standard : 47 CFR FCC Part 15.247

The product was received on Mar. 23, 2023, and testing was started from Apr. 07, 2023 and completed on Apr. 10, 2023. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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



Approved by: Jackson Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

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



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History of this test report

TEL : 886-3-3273456
FAX : 886-3-3270973
Report Template No.: HE1-C10 Ver4.3
FCC ID: FPJPD-ID100

Summary of Test Result

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

Declaration of Conformity:

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

Comments and explanations:

None

Reviewed by: Barry Hsiao

Report Producer: Ann Hou

1 General Description

1.1 Information

1.1.1 RF General Information

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

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

Note:

- ♦ Bluetooth LE uses a GFSK (1Mbps/2Mbps) modulation.
- ♦ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	JAE	GHT23-0134	SMT antenna	N/A	-0.3

Note 1: The EUT has one antenna.

For Bluetooth function:

For Bluetooth mode (1TX/1RX)

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

1.1.3 EUT Information

Operational Condition	
EUT Power Type	From Host system
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) $\geq 1/T$
BT-LE(1Mbps)	0.208	6.82	130.312u	10k
BT-LE(2Mbps)	0.122	9.14	76.875u	10k

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

1.2 Testing Applied Standards

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

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

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

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

1.3 Testing Location Information

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
☒ Hsinhua (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
	TEL: 886-3-327-3456		FAX: 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Nick Wu	21.5~22.8°C / 52~57%	10/Apr/2023
RF Conducted	TH07-HY	Yuna Lin	22.1~23.7°C / 48~58%	07/Apr/2023
☒ Wen 33rd.St. (TAF: 3785)	ADD: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)			
	TEL: 886-3-318-0787		FAX: 886-3-318-0287	
Test site Designation No. TW0008 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated	03CH09-HY	Nick Wu	21.2~22.6°C / 55~ 59%	07/Apr/2023~08/Apr/2023

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
AC Power-line Conducted Emissions	4.53 dB	Confidence levels of 95%
Bandwidth	3 MHz	Confidence levels of 95%
Maximum Conducted Output Power	2 dB	Confidence levels of 95%
Power Spectral Density	2 dB	Confidence levels of 95%
Emissions in Non-restricted Frequency Bands	0.14 dB	Confidence levels of 95%
Emissions in Restricted Frequency Bands	4.8 dB	Confidence levels of 95%
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	Mocha DTM Test V1.0.0.2
------------------------------	-------------------------

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	4
2440MHz	4
2480MHz	4
BT-LE(2Mbps)	-
2402MHz	4
2440MHz	4
2480MHz	4

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	USB mode

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

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

2.3 Accessories

Accessories				
USB Type C Cable	Brand Name	Yue-Yang Electronic Factory	Model Name	99136086A0
	Manufacturer	Yue-Yang Electronic Factory		
	Signal Line	1.8 meter, shielded cable, w/o ferrite core		

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

2.4 Support Equipment

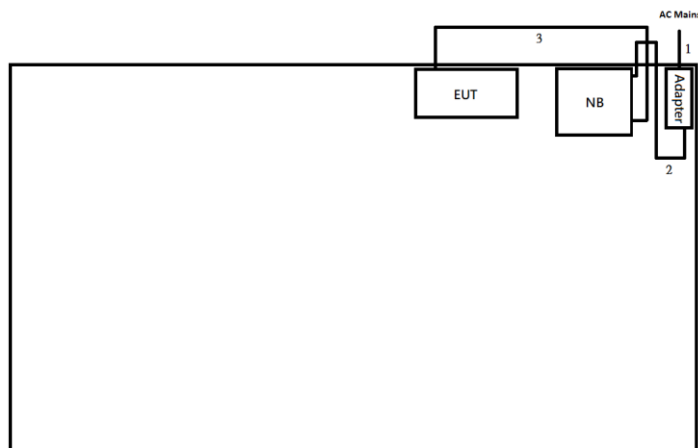
Support Equipment – AC Conduction					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	HP	HSTNN-142C	-	-
2	Adapter for NB	HP	HSTNN-CA40	-	-

Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	HP	HSTNN-142C	-	-
2	Adapter for NB	HP	HSTNN-CA40	-	-

Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	HP	HSTNN-142C	-	-
2	Adapter for NB	HP	HSTNN-CA40	-	-

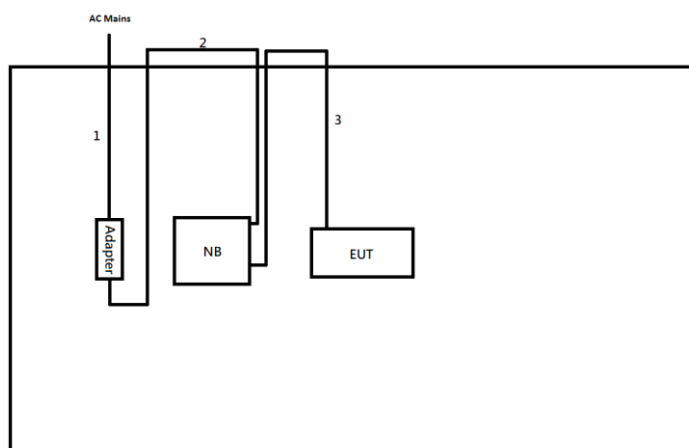
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length (m)
1	AC Power cable	No	1.8
2	DC Power cable	No	1.5
3	USB Type C cable	Yes	1.8

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length (m)
1	AC Power cable	No	1.8
2	DC Power cable	No	1.5
3	USB Type C cable	Yes	1.8

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

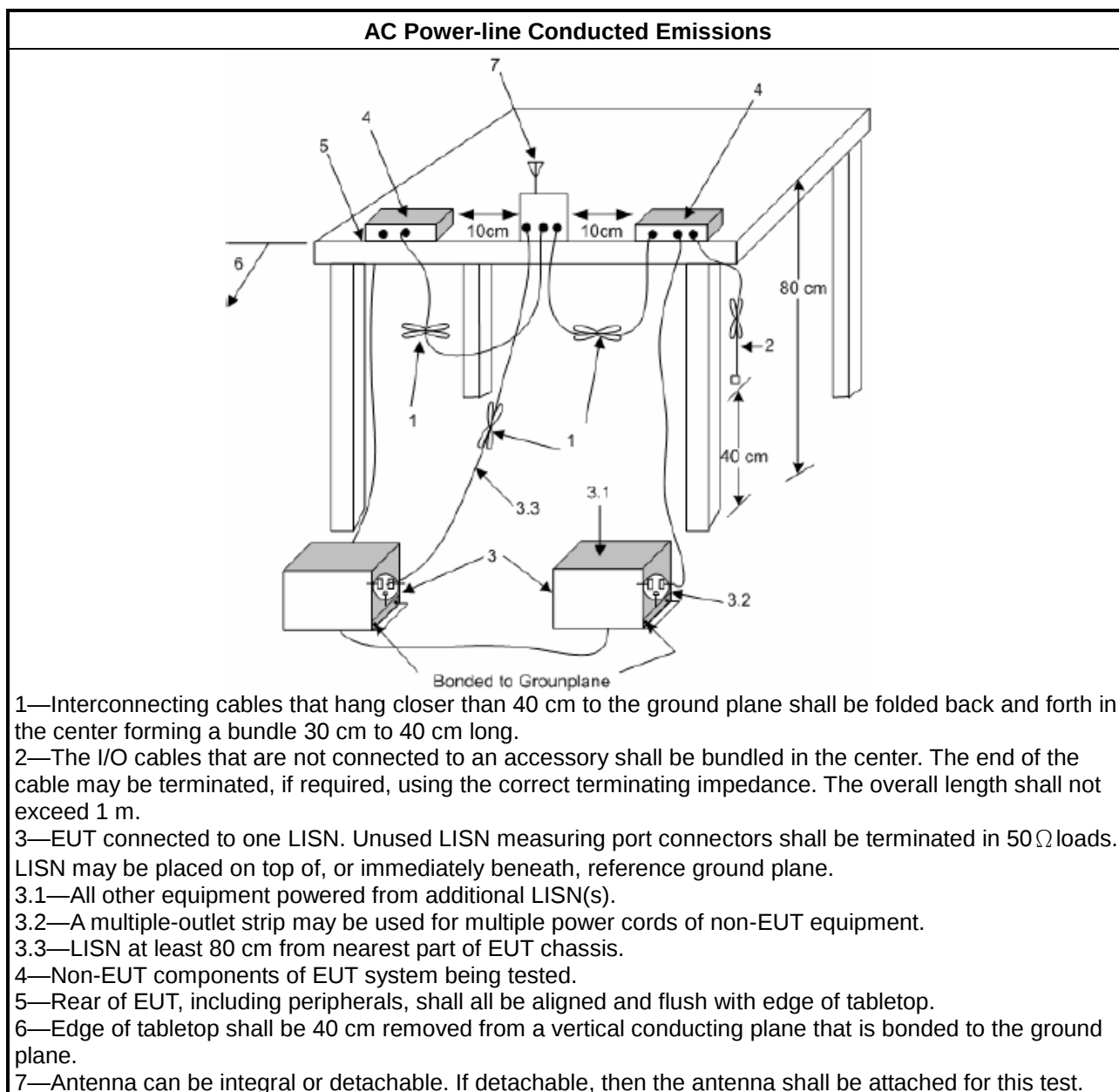
Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

3.1.4 Measurement Results Calculation

The measured Level is calculated using:

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

3.1.5 Test Setup



3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

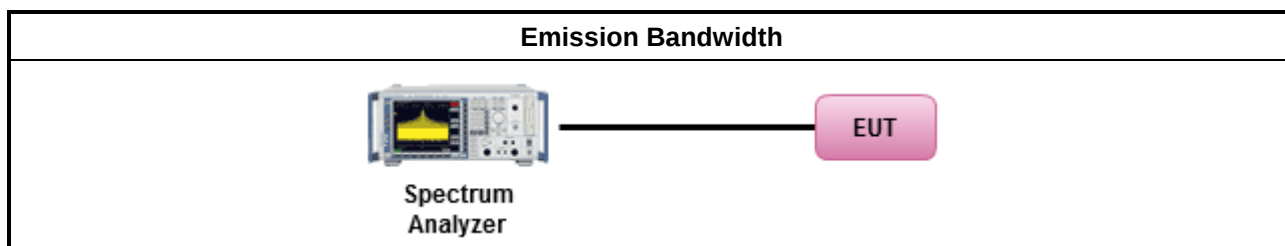
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

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

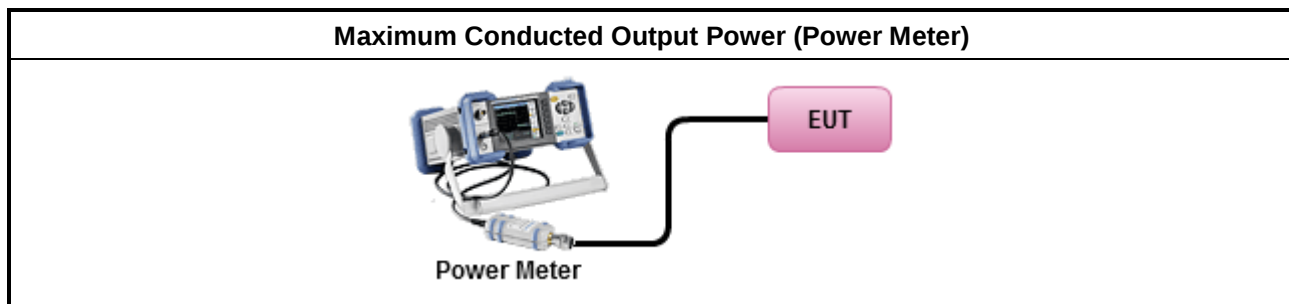
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

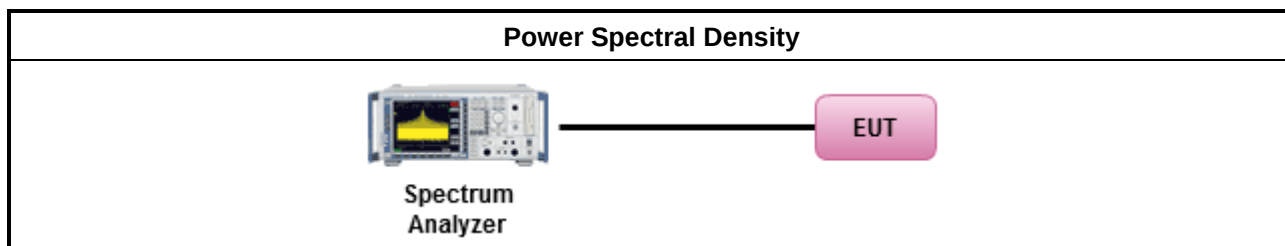
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

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

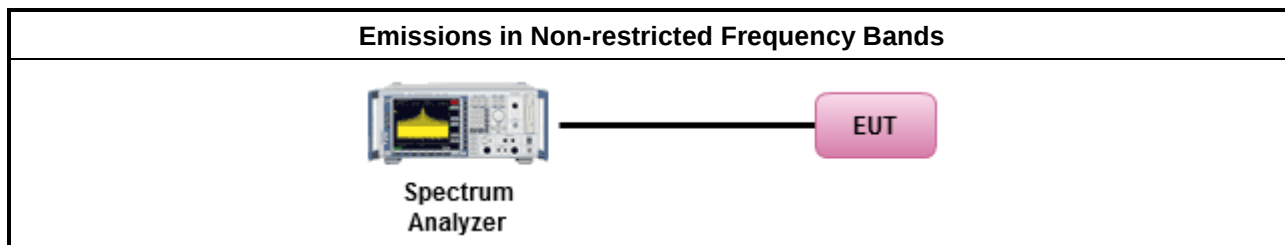
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

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

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

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

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

3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

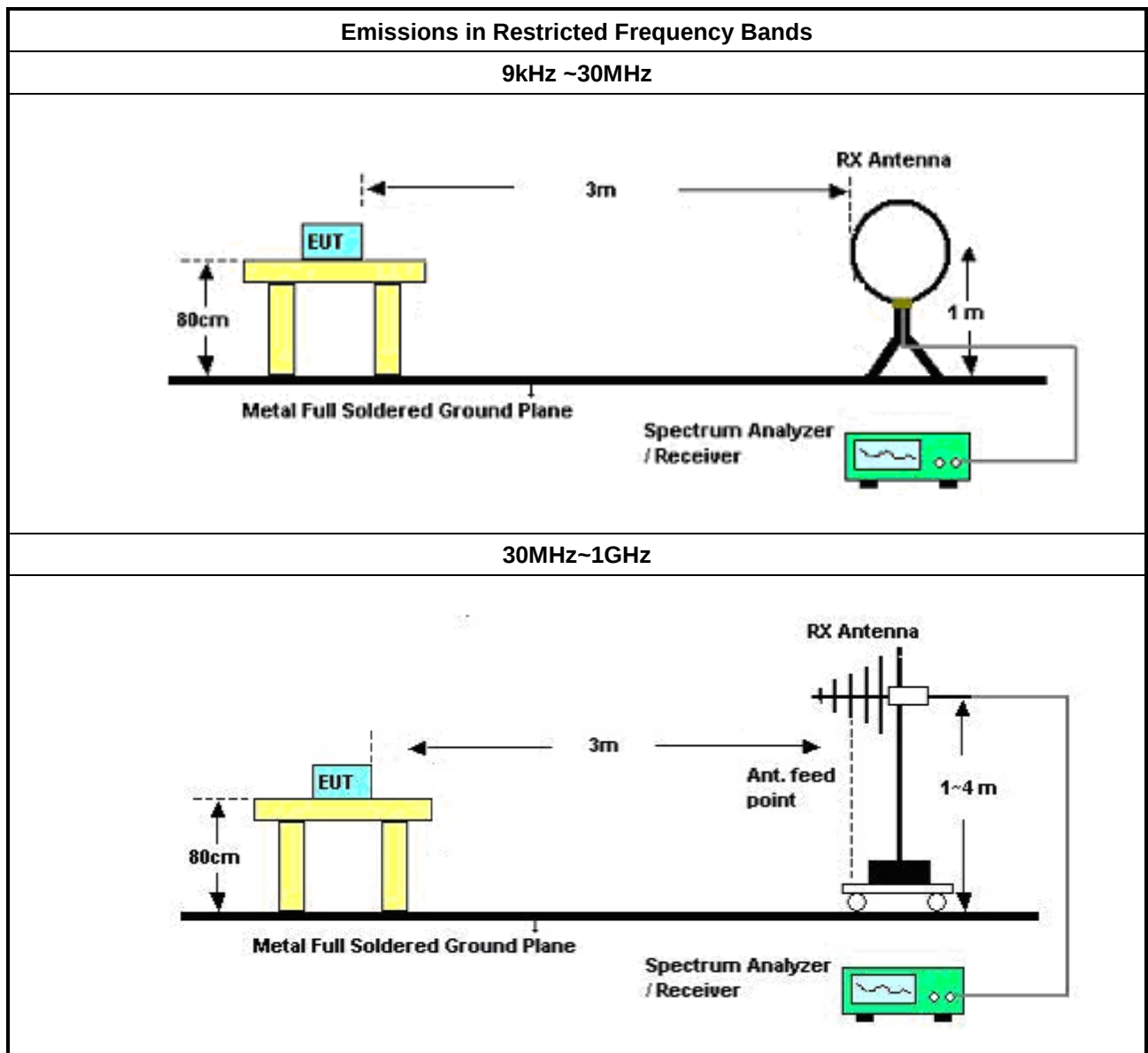
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted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

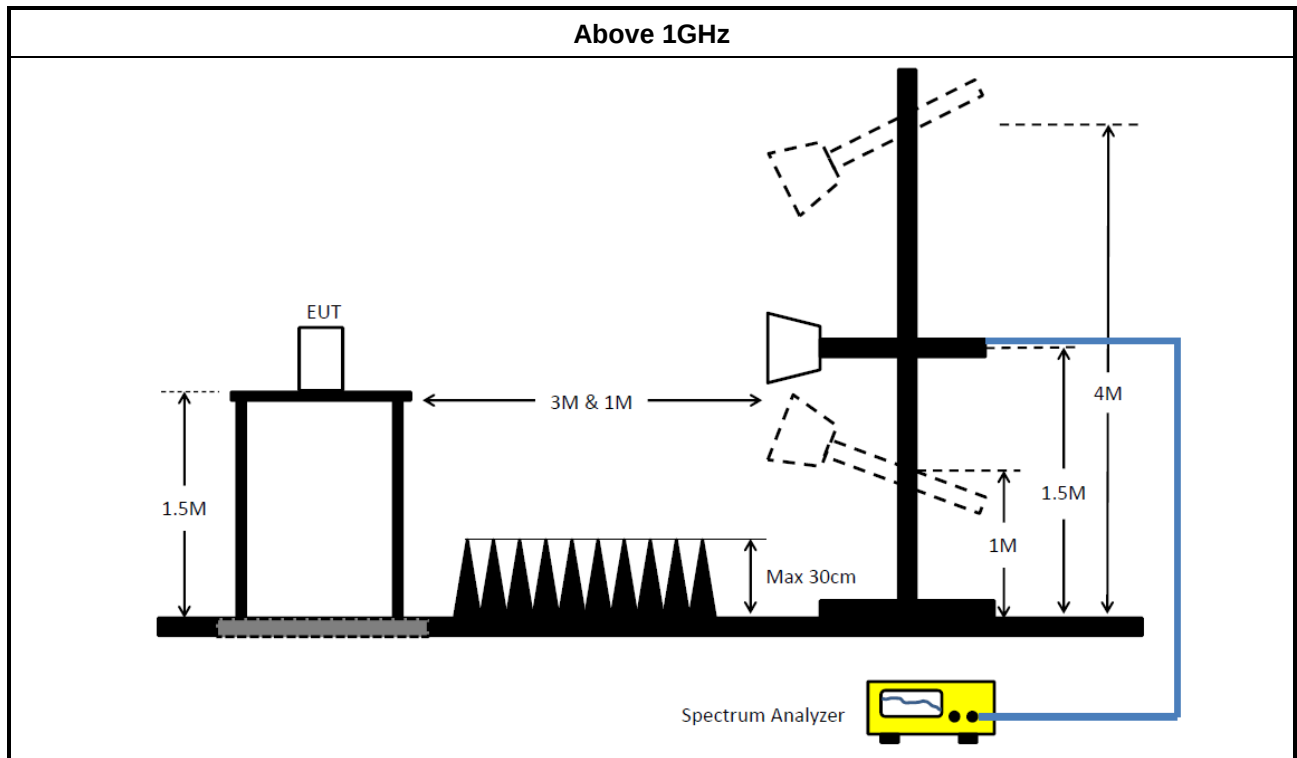
3.6.4 Measurement Results Calculation

The measured Level is calculated using:

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

3.6.5 Test Setup





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

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

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR	102051	9kHz ~ 3.6GHz	13/May/2022	12/May/2023
Two-Line V-Network	R&S	ENV 216	100003	9kHz ~ 30MHz	16/Feb/2023	15/Feb/2024
RF Cable 5m	TITAN	TITAN	CO04-cable-01	9 kHz~200MHz	28/Feb/2023	27/Feb/2024
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	25/Oct/2022	24/Oct/2023
Software	Sporton	SENSE-EMI	V5.10.8.7	-	NCR	NCR

NCR: No Calibration Required

Instrument for Conducted Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101515	10Hz~40GHz	14/Feb/2023	13/Feb/2024
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	21/Oct/2022	20/Oct/2023
Pulse Sensor	Anritsu	MA2411B	1339407	300MHz~40GHz	14/Dec/2022	13/Dec/2023
Power Meter	Anritsu	ML2495A	1517010	300MHz~40GHz	14/Dec/2022	13/Dec/2023
SENSE-15247_FS	Sporton	V5.11.1	N/A	N/A	N/A	N/A

Instrument for Radiated Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz~1GHz 3m	15/Mar/2023	14/Mar/2024
Site V.S.W.R	Riken	SAC-3M	03CH09-HY	1GHz~18GHz 3m	14/Mar/2023	13/Mar/2024
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	11/Aug/2022	10/Aug/2023
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	06/Apr/2023	05/Apr/2024
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz~26.5GHz	22/Jul/2022	21/Jul/2023
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D&MT J6102-05	35418 & 3	30MHz~1GHz	28/Aug/2022	27/Aug/2023
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz~18GHz	30/Dec/2022	29/Dec/2023
RF Cable-R03m	Jye Bao	RG142	03CH09-cable-01	9kHz~1GHz	21/Feb/2023	20/Feb/2024
RF CABLE 5m+3m+1m	HUBER+SUHNE R	SUCOFLEX104	03CH09-cable-02	1GHz~40GHz	21/Feb/2023	20/Feb/2024
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz~40GHz	14/May/2022	13/May/2023
Microwave Premplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz ~ 40GHz	25/Mar/2023	24/Mar/2024
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	23/Mar/2023	22/Mar/2024
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	23/Mar/2023	22/Mar/2024
SENSE_15407_FS	Sporton	Sporton	V5.10.8.9	NA	NA	NA



Conducted Emissions at Powerline

Appendix A

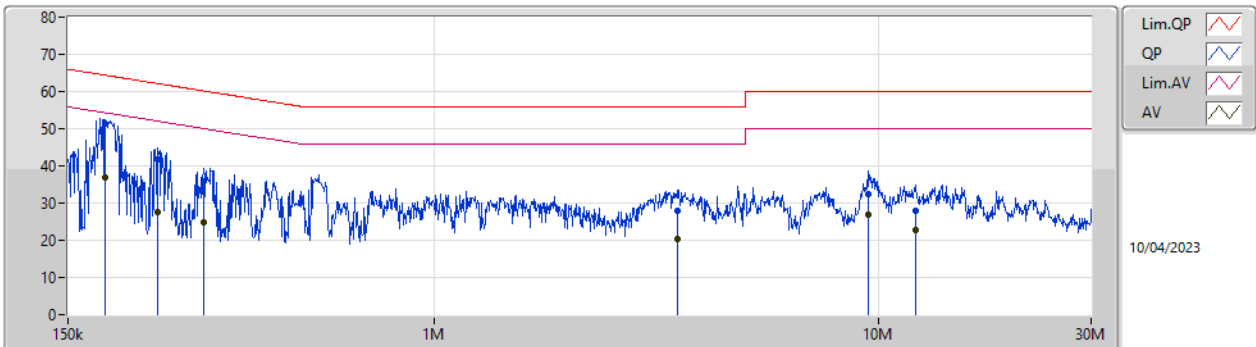
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	181.681k	51.21	64.41	-13.20	Line

Result

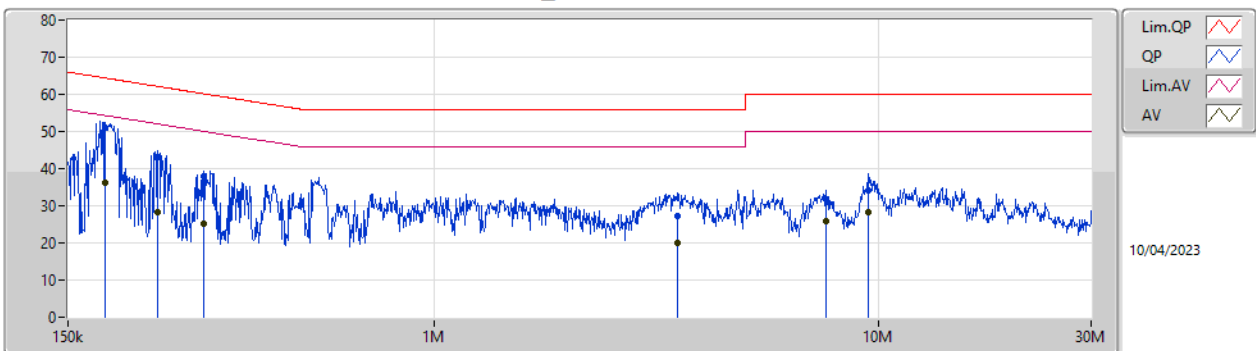
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	181.681k	51.21	64.41	-13.20	Line	-
Mode 1	Pass	AV	181.681k	36.90	54.41	-17.51	Line	-
Mode 1	Pass	QP	239.296k	41.81	62.12	-20.31	Line	-
Mode 1	Pass	AV	239.296k	27.42	52.12	-24.70	Line	-
Mode 1	Pass	QP	302.848k	36.03	60.17	-24.14	Line	-
Mode 1	Pass	AV	302.848k	24.89	50.17	-25.28	Line	-
Mode 1	Pass	QP	3.513M	27.85	56.00	-28.15	Line	-
Mode 1	Pass	AV	3.513M	20.43	46.00	-25.57	Line	-
Mode 1	Pass	QP	9.456M	32.48	60.00	-27.52	Line	-
Mode 1	Pass	AV	9.456M	26.82	50.00	-23.18	Line	-
Mode 1	Pass	QP	12.063M	27.99	60.00	-32.01	Line	-
Mode 1	Pass	AV	12.063M	22.63	50.00	-27.37	Line	-
Mode 1	Pass	QP	181.681k	51.14	64.41	-13.27	Neutral	-
Mode 1	Pass	AV	181.681k	36.15	54.41	-18.26	Neutral	-
Mode 1	Pass	QP	239.296k	43.09	62.12	-19.03	Neutral	-
Mode 1	Pass	AV	239.296k	28.23	52.12	-23.89	Neutral	-
Mode 1	Pass	QP	302.848k	37.79	60.17	-22.38	Neutral	-
Mode 1	Pass	AV	302.848k	25.25	50.17	-24.92	Neutral	-
Mode 1	Pass	QP	3.513M	27.30	56.00	-28.70	Neutral	-
Mode 1	Pass	AV	3.513M	20.17	46.00	-25.83	Neutral	-
Mode 1	Pass	QP	7.592M	31.60	60.00	-28.40	Neutral	-
Mode 1	Pass	AV	7.592M	25.88	50.00	-24.12	Neutral	-
Mode 1	Pass	QP	9.456M	33.98	60.00	-26.02	Neutral	-
Mode 1	Pass	AV	9.456M	28.24	50.00	-21.76	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	181.681k	51.21	64.41	-13.20	19.61	Line	-	31.60	9.65	0.03	9.93			
AV	181.681k	36.90	54.41	-17.51	19.61	Line	-	17.29	9.65	0.03	9.93			
QP	239.296k	41.81	62.12	-20.31	19.62	Line	-	22.19	9.65	0.03	9.94			
AV	239.296k	27.42	52.12	-24.70	19.62	Line	-	7.80	9.65	0.03	9.94			
QP	302.848k	36.03	60.17	-24.14	19.63	Line	-	16.40	9.64	0.04	9.95			
AV	302.848k	24.89	50.17	-25.28	19.63	Line	-	5.26	9.64	0.04	9.95			
QP	3.513M	27.85	56.00	-28.15	19.75	Line	-	8.10	9.70	0.12	9.93			
AV	3.513M	20.43	46.00	-25.57	19.75	Line	-	0.68	9.70	0.12	9.93			
QP	9.456M	32.48	60.00	-27.52	19.93	Line	-	12.55	9.79	0.18	9.96			
AV	9.456M	26.82	50.00	-23.18	19.93	Line	-	6.89	9.79	0.18	9.96			
QP	12.063M	27.99	60.00	-32.01	19.97	Line	-	8.02	9.80	0.21	9.96			
AV	12.063M	22.63	50.00	-27.37	19.97	Line	-	2.66	9.80	0.21	9.96			

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	181.681k	51.14	64.41	-13.27	19.58	Neutral	-	31.56	9.62	0.03	9.93			
AV	181.681k	36.15	54.41	-18.26	19.58	Neutral	-	16.57	9.62	0.03	9.93			
QP	239.296k	43.09	62.12	-19.03	19.59	Neutral	-	23.50	9.62	0.03	9.94			
AV	239.296k	28.23	52.12	-23.89	19.59	Neutral	-	8.64	9.62	0.03	9.94			
QP	302.848k	37.79	60.17	-22.38	19.62	Neutral	-	18.17	9.63	0.04	9.95			
AV	302.848k	25.25	50.17	-24.92	19.62	Neutral	-	5.63	9.63	0.04	9.95			
QP	3.513M	27.30	56.00	-28.70	19.73	Neutral	-	7.57	9.68	0.12	9.93			
AV	3.513M	20.17	46.00	-25.83	19.73	Neutral	-	0.44	9.68	0.12	9.93			
QP	7.592M	31.60	60.00	-28.40	19.88	Neutral	-	11.72	9.77	0.16	9.95			
AV	7.592M	25.88	50.00	-24.12	19.88	Neutral	-	6.00	9.77	0.16	9.95			
QP	9.456M	33.98	60.00	-26.02	19.94	Neutral	-	14.04	9.80	0.18	9.96			
AV	9.456M	28.24	50.00	-21.76	19.94	Neutral	-	8.30	9.80	0.18	9.96			



Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	700k	1.021M	1M02F1D	691.25k	1.019M
BT-LE(2Mbps)	1.188M	2.036M	2M02F1D	1.178M	1.022M

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

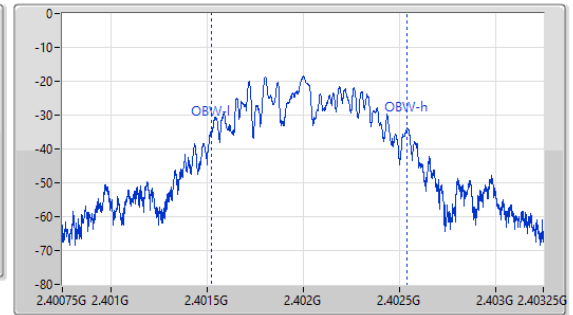
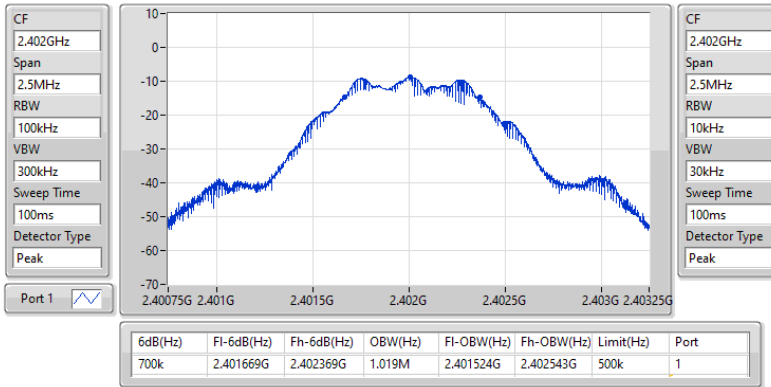
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	700k	1.019M
2440MHz	Pass	500k	691.25k	1.019M
2480MHz	Pass	500k	696.25k	1.021M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.178M	2.016M
2440MHz	Pass	500k	1.188M	2.021M
2480MHz	Pass	500k	1.185M	2.036M

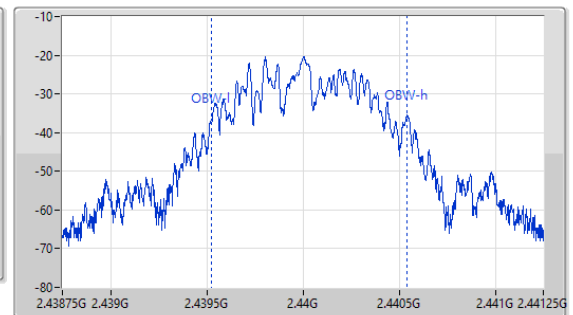
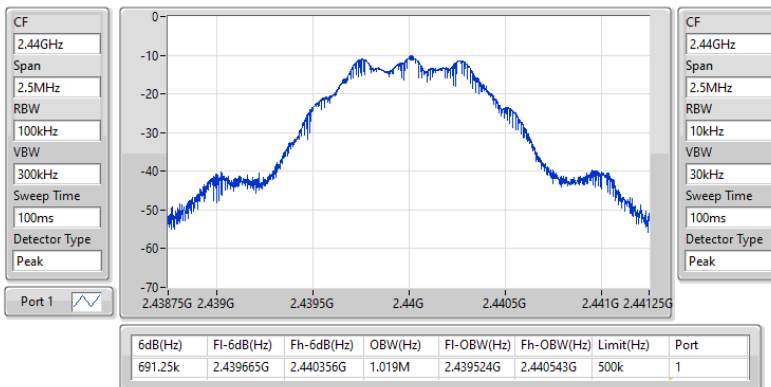
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

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

07/04/2023


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

07/04/2023

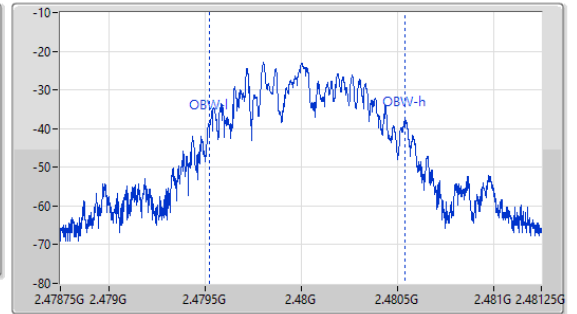
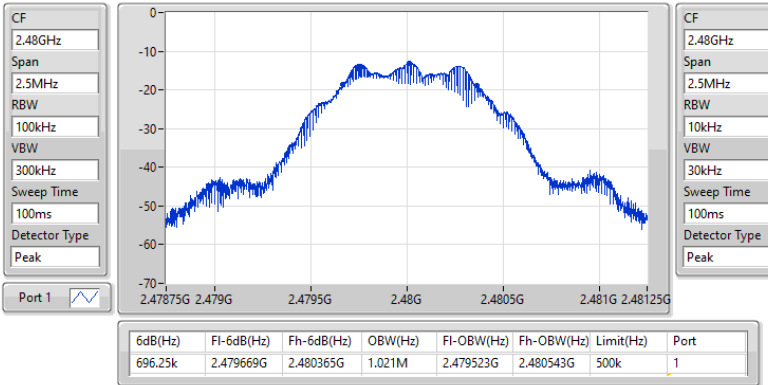


2.4-2.4835GHz_BT-LE(1Mbps)

EBW-DTS

2480MHz

07/04/2023

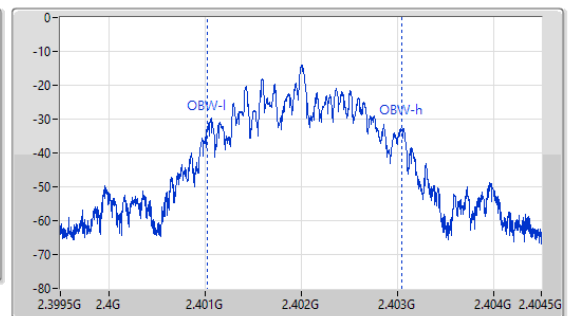
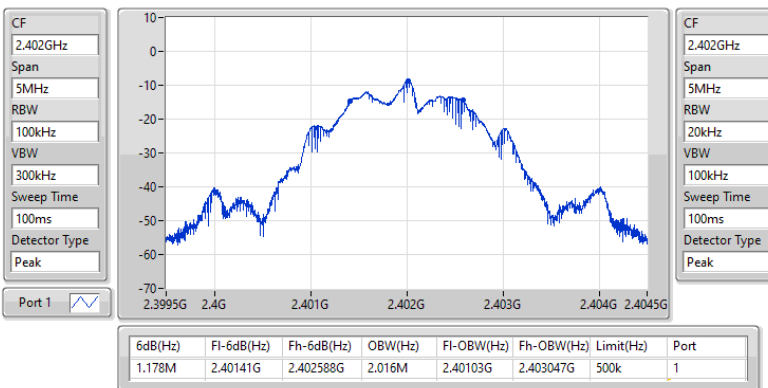


2.4-2.4835GHz_BT-LE(2Mbps)

EBW-DTS

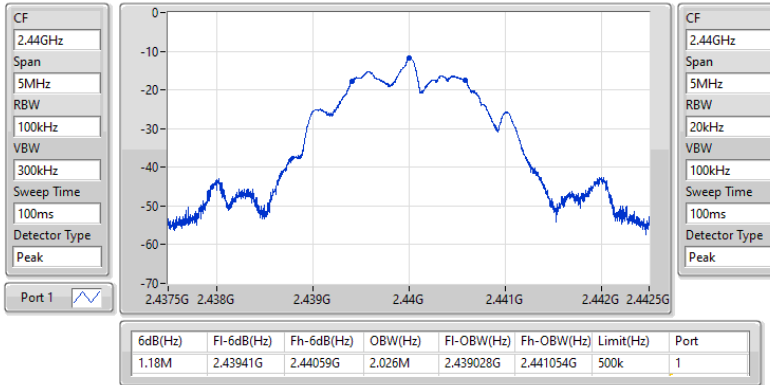
2402MHz

07/04/2023

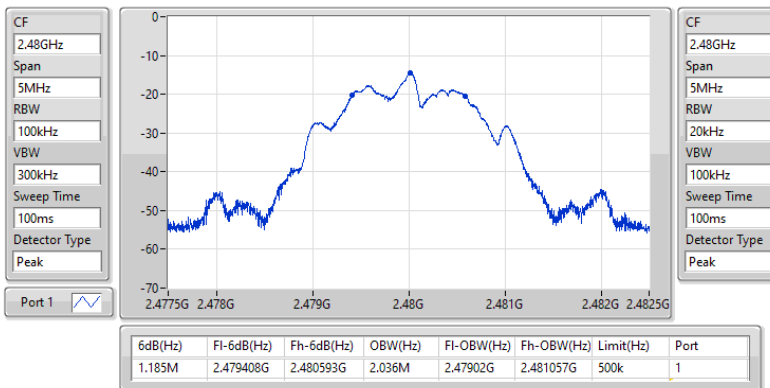


2.4-2.4835GHz_BT-LE(2Mbps)
EBW-DTS
2440MHz

07/04/2023


2.4-2.4835GHz_BT-LE(2Mbps)
EBW-DTS
2480MHz

07/04/2023





Summary

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	-9.28	0.00012
BT-LE(2Mbps)	-9.64	0.00011



Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	-0.30	-9.28	30.00
2440MHz	Pass	-0.30	-11.36	30.00
2480MHz	Pass	-0.30	-13.42	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	-0.30	-9.64	30.00
2440MHz	Pass	-0.30	-11.22	30.00
2480MHz	Pass	-0.30	-13.59	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-25.97
BT-LE(2Mbps)	-28.37

RBW = 3kHz;



Result

Mode	Result	DG (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	-0.30	-25.97	8.00
2440MHz	Pass	-0.30	-28.67	8.00
2480MHz	Pass	-0.30	-30.98	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	-0.30	-28.37	8.00
2440MHz	Pass	-0.30	-30.43	8.00
2480MHz	Pass	-0.30	-34.77	8.00

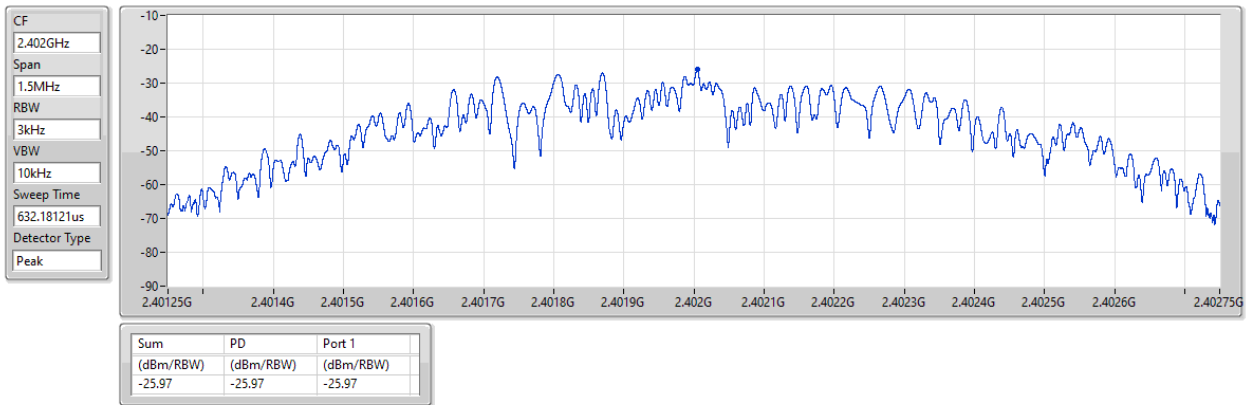
DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2402MHz

07/04/2023

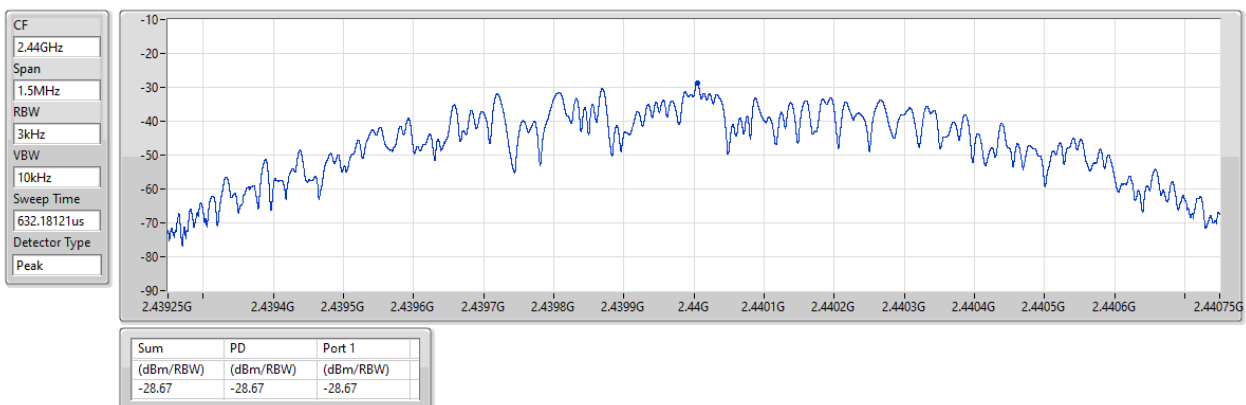


2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2440MHz

07/04/2023

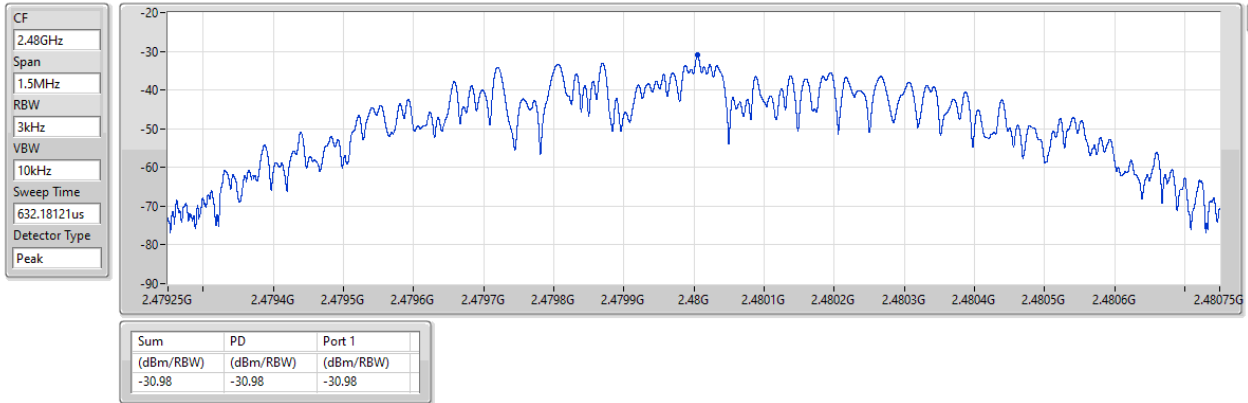


2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2480MHz

07/04/2023

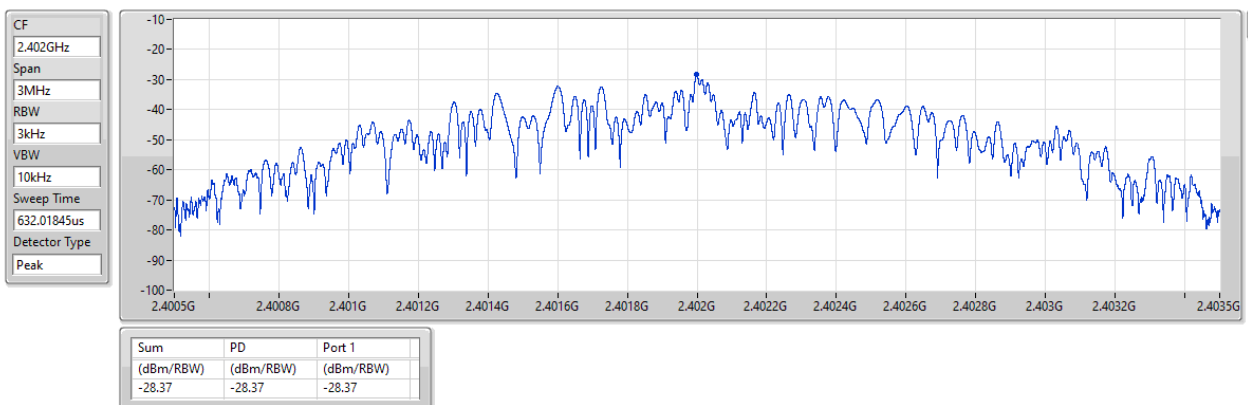


2.4-2.4835GHz_BT-LE(2Mbps)

PSD

2402MHz

07/04/2023

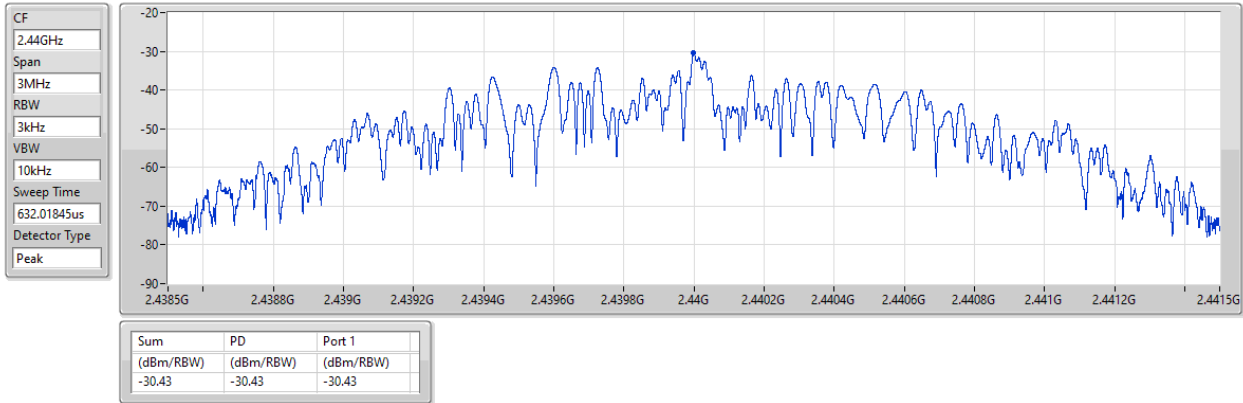


2.4-2.4835GHz_BT-LE(2Mbps)

PSD

2440MHz

07/04/2023

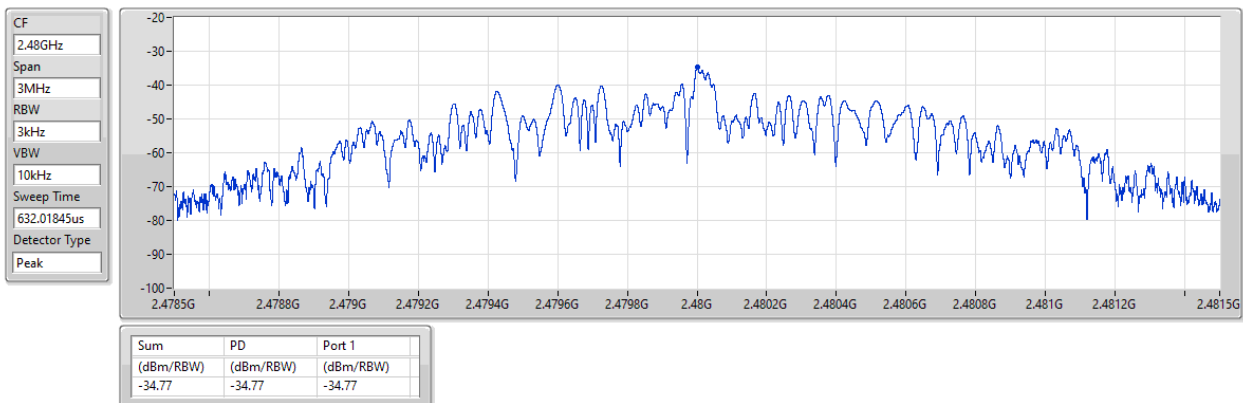


2.4-2.4835GHz_BT-LE(2Mbps)

PSD

2480MHz

07/04/2023



Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.402G	-8.88	-38.88	1.7455G	-40.37	2.39892G	-52.68	2.4G	-53.59	2.50174G	-52.42	24.73848G	-41.29	1
BT-LE(2Mbps)	Pass	2.40184G	-8.96	-38.96	2.11915G	-53.54	2.39948G	-53.15	2.4G	-55.33	2.50034G	-52.15	15.22527G	-39.86	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	-8.88	-38.88	2.30715G	-52.69	2.39552G	-52.93	2.4G	-55.01	2.50322G	-52.13	17.59584G	-41.92	1
2440MHz	Pass	2.402G	-8.88	-38.88	1.7455G	-40.37	2.39892G	-52.68	2.4G	-53.59	2.50174G	-52.42	24.73848G	-41.29	1
2480MHz	Pass	2.402G	-8.88	-38.88	886.58M	-53.77	2.39456G	-52.65	2.4G	-54.90	2.50074G	-52.07	15.21683G	-42.07	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40184G	-8.96	-38.96	2.11915G	-53.54	2.39948G	-53.15	2.4G	-55.33	2.50034G	-52.15	15.22527G	-39.86	1
2440MHz	Pass	2.40184G	-8.96	-38.96	2.04278G	-54.34	2.39664G	-53.44	2.4G	-54.33	2.50266G	-52.46	15.20277G	-41.73	1
2480MHz	Pass	2.40184G	-8.96	-38.96	2.11915G	-54.55	2.39336G	-53.11	2.4G	-55.67	2.50042G	-52.34	24.99438G	-42.15	1

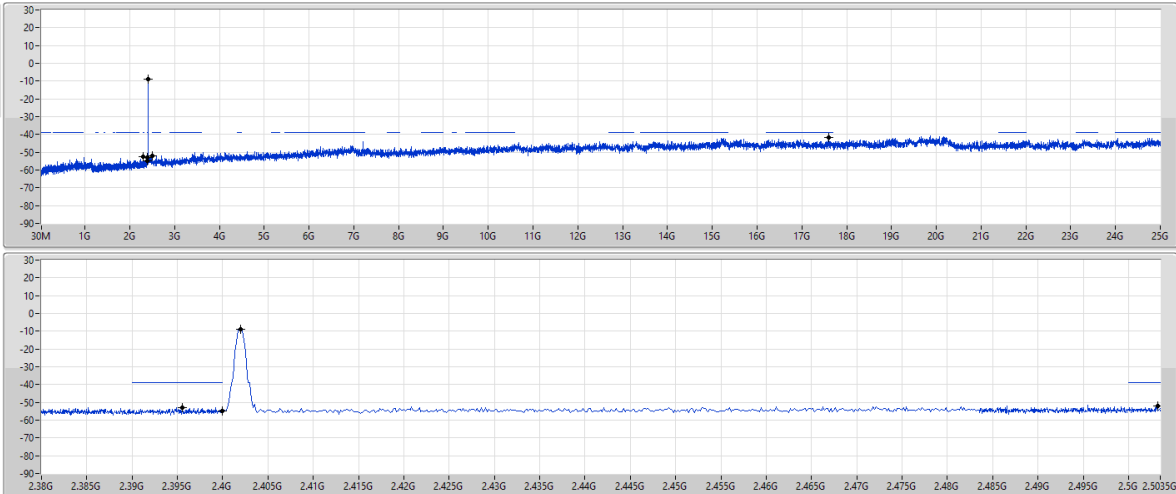
2.4-2.4835GHz_BT-LE(1Mbps)

CSEndB-DTS

2402MHz

07/04/2023

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



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402G	-8.88	-38.88	2.30715G	-52.69	2.39552G	-52.93	2.4G	-55.01	2.50322G	-52.13	2.50322G	-41.92	1

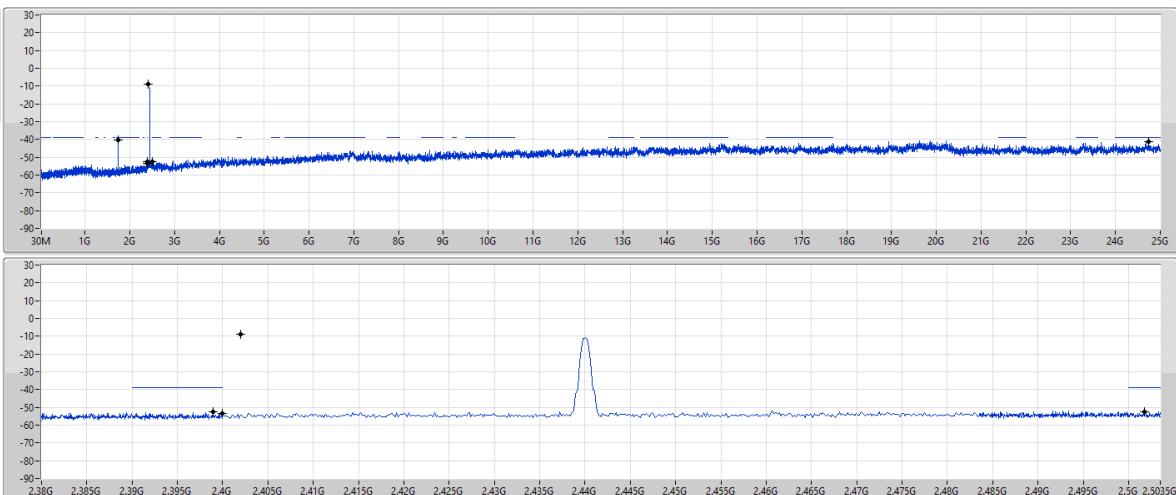
2.4-2.4835GHz_BT-LE(1Mbps)

CSEndB-DTS

2440MHz

07/04/2023

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



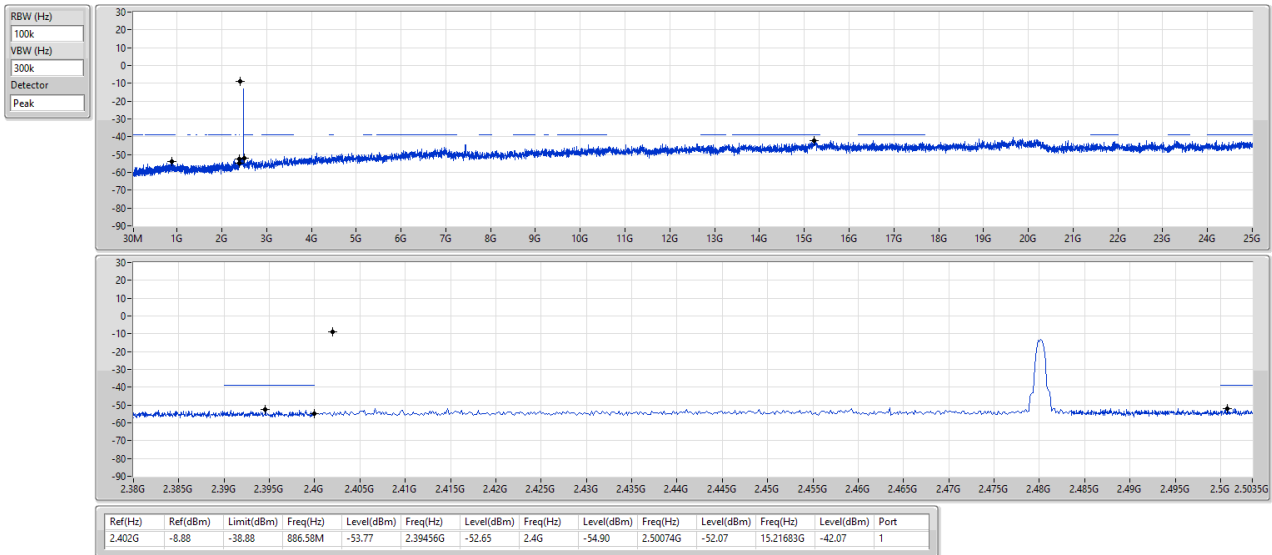
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402G	-8.88	-38.88	1.7455G	-40.37	2.39692G	-52.68	2.4G	-53.59	2.50174G	-52.42	2.50174G	-41.29	1

2.4-2.4835GHz_BT-LE(1Mbps)

CSEndB-DTS

2480MHz

07/04/2023

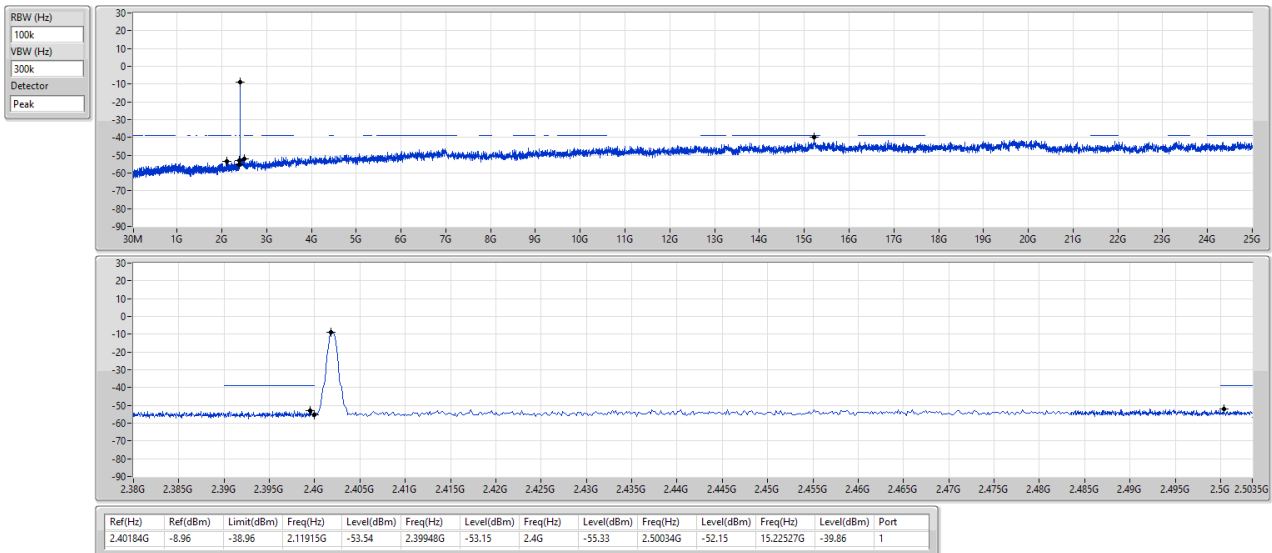


2.4-2.4835GHz_BT-LE(2Mbps)

CSEndB-DTS

2402MHz

07/04/2023

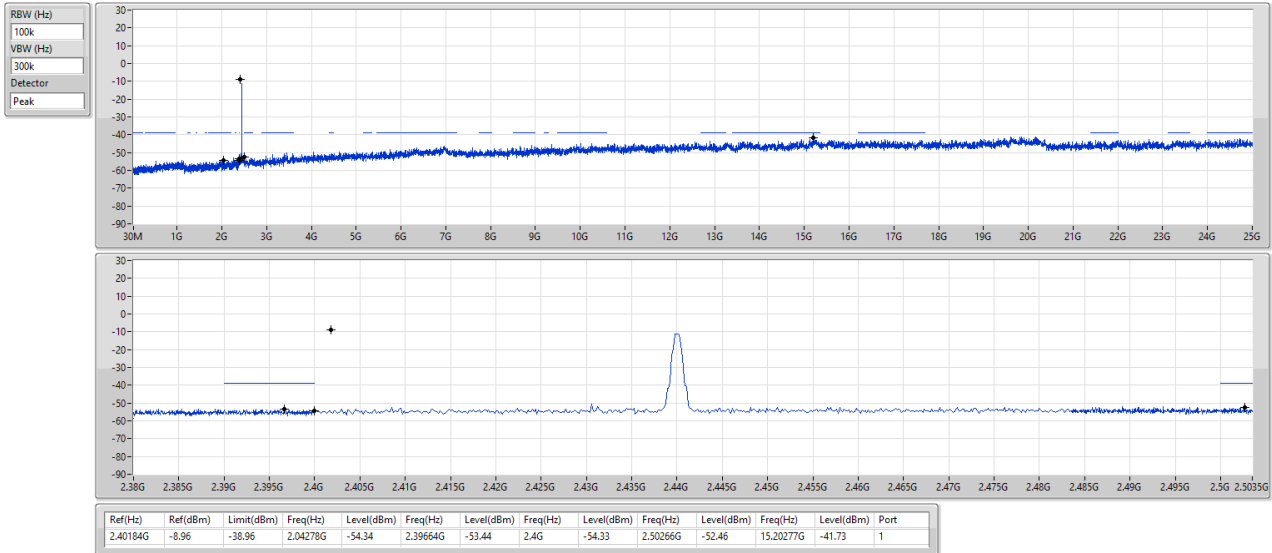


2.4-2.4835GHz_BT-LE(2Mbps)

CSEndB-DTS

2440MHz

07/04/2023

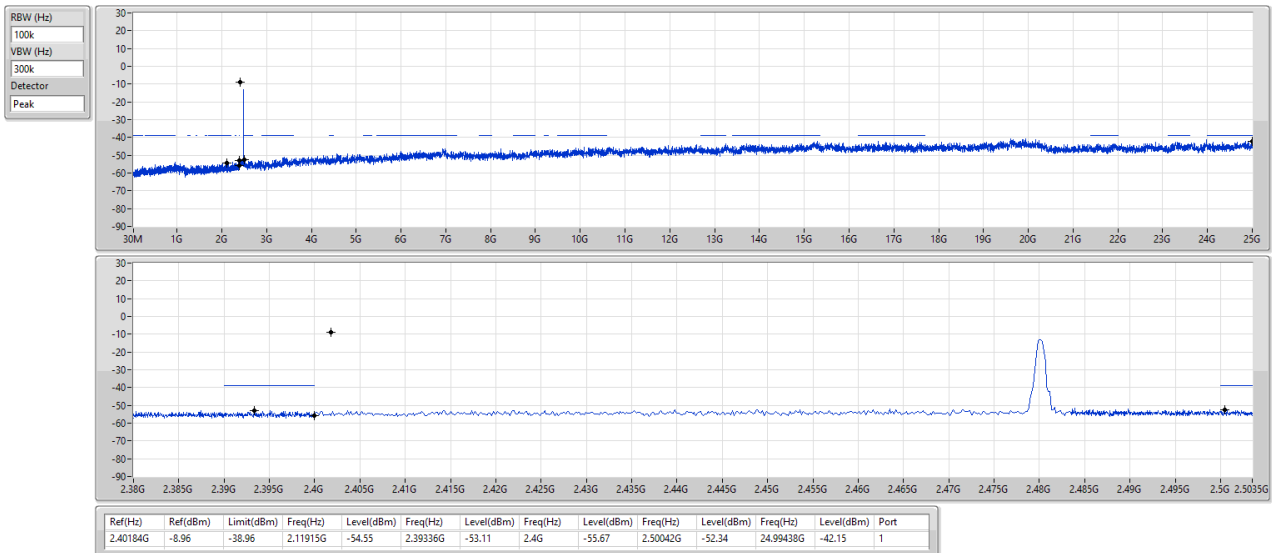


2.4-2.4835GHz_BT-LE(2Mbps)

CSEndB-DTS

2480MHz

07/04/2023





Summary

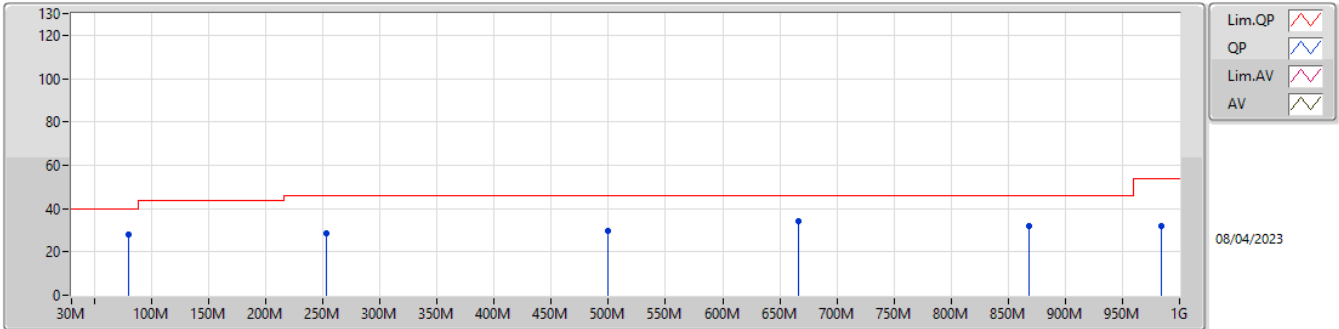
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-LE(2Mbps)	Pass	PK	95.96M	32.01	43.50	-11.49	3	Horizontal	360	1.00

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	PK	80.44M	28.21	40.00	-11.79	3	Vertical	0	1.00
2402MHz	Pass	PK	253.1M	28.59	46.00	-17.41	3	Vertical	0	1.00
2402MHz	Pass	PK	499.48M	29.75	46.00	-16.25	3	Vertical	0	1.00
2402MHz	Pass	PK	666.32M	33.95	46.00	-12.05	3	Vertical	0	1.00
2402MHz	Pass	PK	868.08M	32.09	46.00	-13.91	3	Vertical	0	1.00
2402MHz	Pass	PK	984.48M	31.68	54.00	-22.32	3	Vertical	0	1.00
2402MHz	Pass	PK	95.96M	32.01	43.50	-11.49	3	Horizontal	360	1.00
2402MHz	Pass	PK	200.72M	31.40	43.50	-12.10	3	Horizontal	360	1.00
2402MHz	Pass	PK	291.9M	32.24	46.00	-13.76	3	Horizontal	360	1.00
2402MHz	Pass	PK	392.78M	30.04	46.00	-15.96	3	Horizontal	360	1.00
2402MHz	Pass	PK	666.32M	31.57	46.00	-14.43	3	Horizontal	360	1.00
2402MHz	Pass	PK	870.02M	31.24	46.00	-14.76	3	Horizontal	360	1.00

2.4-2.4835GHz_BT-LE(2Mbps)

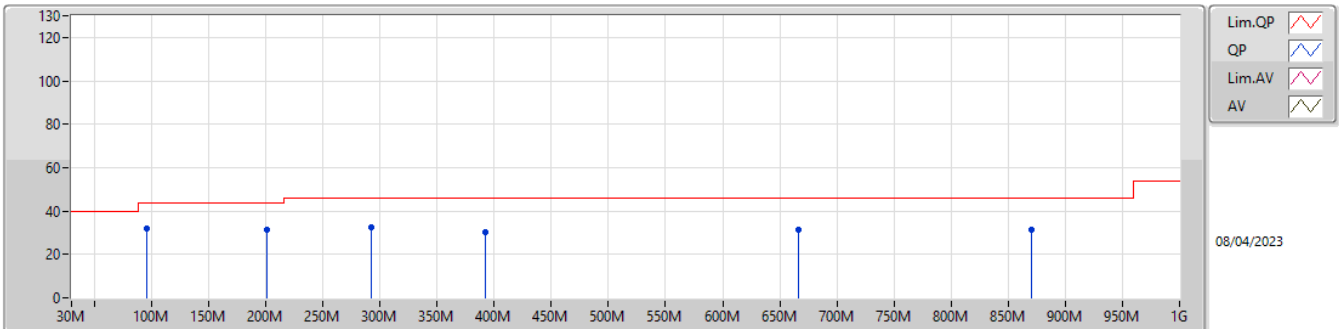
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	80.44M	28.21	40.00	-11.79	-23.22	3	Vertical	0	1.00	51.43	12.57	0.97	36.76
PK	253.11M	28.59	46.00	-17.41	-16.42	3	Vertical	0	1.00	45.01	18.15	1.85	36.42
PK	499.48M	29.75	46.00	-16.25	-11.10	3	Vertical	0	1.00	40.85	23.06	2.73	36.89
PK	666.32M	33.95	46.00	-12.05	-8.43	3	Vertical	0	1.00	42.38	25.50	3.22	37.15
PK	868.08M	32.09	46.00	-13.91	-5.49	3	Vertical	0	1.00	37.58	28.32	3.73	37.54
PK	984.48M	31.68	54.00	-22.32	-3.32	3	Vertical	0	1.00	35.00	29.87	4.01	37.20

2.4-2.4835GHz_BT-LE(2Mbps)

2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	95.96M	32.01	43.50	-11.49	-20.82	3	Horizontal	360	1.00	52.83	14.71	1.09	36.62
PK	200.72M	31.40	43.50	-12.10	-20.32	3	Horizontal	360	1.00	51.72	14.27	1.61	36.20
PK	291.9M	32.24	46.00	-13.76	-16.13	3	Horizontal	360	1.00	48.37	18.24	2.02	36.39
PK	392.78M	30.04	46.00	-15.96	-13.46	3	Horizontal	360	1.00	43.50	20.62	2.38	36.46
PK	666.32M	31.57	46.00	-14.43	-8.43	3	Horizontal	360	1.00	40.00	25.50	3.22	37.15
PK	870.02M	31.24	46.00	-14.76	-5.53	3	Horizontal	360	1.00	36.77	28.28	3.73	37.54



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	7.31927G	52.83	54.00	-1.17	3	Vertical	199	2.55
BT-LE(2Mbps)	Pass	AV	2.4922G	48.89	54.00	-5.11	3	Vertical	161	1.02

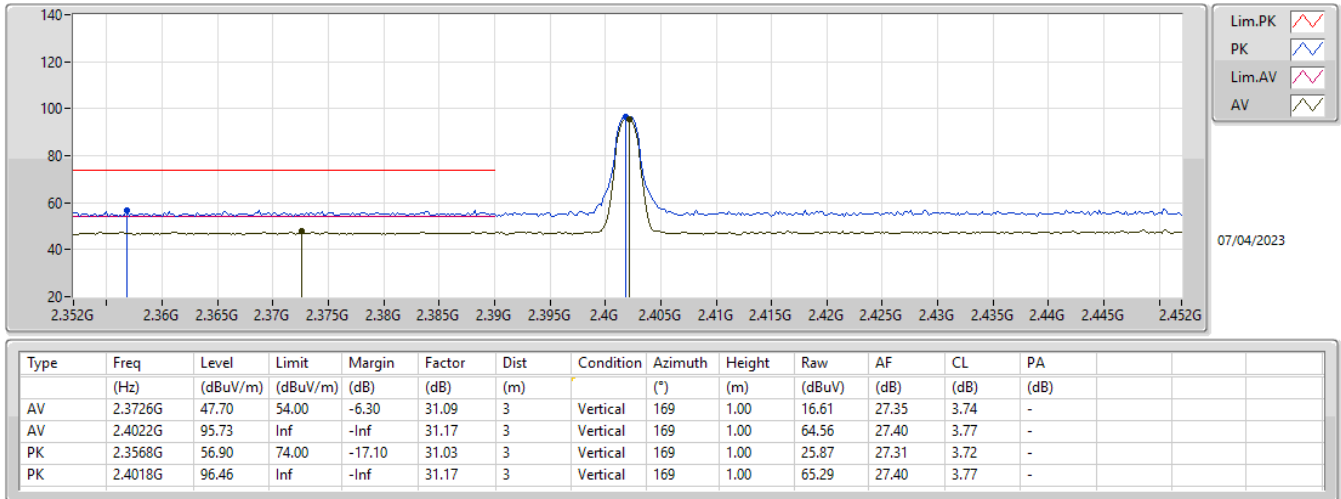
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3726G	47.70	54.00	-6.30	3	Vertical	169	1.00
2402MHz	Pass	AV	2.4022G	95.73	Inf	-Inf	3	Vertical	169	1.00
2402MHz	Pass	PK	2.3568G	56.90	74.00	-17.10	3	Vertical	169	1.00
2402MHz	Pass	PK	2.4018G	96.46	Inf	-Inf	3	Vertical	169	1.00
2402MHz	Pass	AV	2.3564G	47.84	54.00	-6.16	3	Horizontal	6	1.47
2402MHz	Pass	AV	2.402G	97.07	Inf	-Inf	3	Horizontal	6	1.47
2402MHz	Pass	PK	2.3548G	56.42	74.00	-17.58	3	Horizontal	6	1.47
2402MHz	Pass	PK	2.4018G	97.71	Inf	-Inf	3	Horizontal	6	1.47
2402MHz	Pass	AV	4.80355G	40.68	54.00	-13.32	3	Vertical	209	2.02
2402MHz	Pass	PK	4.80413G	49.06	74.00	-24.94	3	Vertical	209	2.02
2402MHz	Pass	AV	4.8036G	38.24	54.00	-15.76	3	Horizontal	329	1.07
2402MHz	Pass	PK	4.80364G	47.52	74.00	-26.48	3	Horizontal	329	1.07
2402MHz	Pass	AV	2.3872G	47.67	54.00	-6.33	3	Vertical	171	1.05
2440MHz	Pass	AV	2.44G	91.73	Inf	-Inf	3	Vertical	171	1.05
2440MHz	Pass	AV	2.4888G	48.33	54.00	-5.67	3	Vertical	171	1.05
2440MHz	Pass	PK	2.3644G	56.66	74.00	-17.34	3	Vertical	171	1.05
2440MHz	Pass	PK	2.4396G	92.47	Inf	-Inf	3	Vertical	171	1.05
2440MHz	Pass	PK	2.4976G	57.40	74.00	-16.60	3	Vertical	171	1.05
2440MHz	Pass	AV	2.376G	48.58	54.00	-5.42	3	Horizontal	7	1.05
2440MHz	Pass	AV	2.44G	93.47	Inf	-Inf	3	Horizontal	7	1.05
2440MHz	Pass	AV	2.486G	48.17	54.00	-5.83	3	Horizontal	7	1.05
2440MHz	Pass	PK	2.3536G	56.49	74.00	-17.51	3	Horizontal	7	1.05
2440MHz	Pass	PK	2.4396G	94.10	Inf	-Inf	3	Horizontal	7	1.05
2440MHz	Pass	PK	2.494G	57.56	74.00	-16.44	3	Horizontal	7	1.05
2440MHz	Pass	AV	4.8795G	40.71	54.00	-13.29	3	Vertical	198	1.35
2440MHz	Pass	AV	7.31927G	52.83	54.00	-1.17	3	Vertical	199	2.55
2440MHz	Pass	PK	4.87929G	48.44	74.00	-25.56	3	Vertical	198	1.35
2440MHz	Pass	PK	7.31919G	58.06	74.00	-15.94	3	Vertical	199	2.55
2440MHz	Pass	AV	4.87994G	37.21	54.00	-16.79	3	Horizontal	36	1.16
2440MHz	Pass	AV	7.31919G	49.90	54.00	-4.10	3	Horizontal	338	1.13
2440MHz	Pass	PK	4.87795G	46.19	74.00	-27.81	3	Horizontal	36	1.16
2440MHz	Pass	PK	7.31923G	55.71	74.00	-18.29	3	Horizontal	338	1.13
2480MHz	Pass	AV	2.4802G	84.56	Inf	-Inf	3	Vertical	159	1.02
2480MHz	Pass	AV	2.4942G	48.38	54.00	-5.62	3	Vertical	159	1.02
2480MHz	Pass	PK	2.4798G	85.34	Inf	-Inf	3	Vertical	159	1.02
2480MHz	Pass	PK	2.4972G	57.50	74.00	-16.50	3	Vertical	159	1.02
2480MHz	Pass	AV	2.4802G	86.41	Inf	-Inf	3	Horizontal	322	1.00
2480MHz	Pass	AV	2.4856G	48.94	54.00	-5.06	3	Horizontal	322	1.00
2480MHz	Pass	PK	2.4798G	87.19	Inf	-Inf	3	Horizontal	322	1.00
2480MHz	Pass	PK	2.484G	57.59	74.00	-16.41	3	Horizontal	322	1.00
2480MHz	Pass	AV	4.95974G	41.38	54.00	-12.62	3	Vertical	229	1.24
2480MHz	Pass	AV	7.43912G	51.30	54.00	-2.70	3	Vertical	197	2.01
2480MHz	Pass	PK	4.96057G	48.55	74.00	-25.45	3	Vertical	229	1.24
2480MHz	Pass	PK	7.43933G	56.31	74.00	-17.69	3	Vertical	197	2.01
2480MHz	Pass	AV	4.96003G	38.38	54.00	-15.62	3	Horizontal	292	1.76
2480MHz	Pass	AV	7.4393G	49.72	54.00	-4.28	3	Horizontal	356	2.28
2480MHz	Pass	PK	4.96021G	47.19	74.00	-26.81	3	Horizontal	292	1.76
2480MHz	Pass	PK	7.43927G	55.48	74.00	-18.52	3	Horizontal	356	2.28
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3638G	47.61	54.00	-6.39	3	Vertical	169	1.00
2402MHz	Pass	AV	2.402G	89.30	Inf	-Inf	3	Vertical	169	1.00
2402MHz	Pass	PK	2.3644G	56.33	74.00	-17.67	3	Vertical	169	1.00
2402MHz	Pass	PK	2.4014G	91.56	Inf	-Inf	3	Vertical	169	1.00
2402MHz	Pass	AV	2.3708G	47.36	54.00	-6.64	3	Horizontal	8	1.47
2402MHz	Pass	AV	2.402G	90.83	Inf	-Inf	3	Horizontal	8	1.47
2402MHz	Pass	PK	2.3628G	56.86	74.00	-17.14	3	Horizontal	8	1.47
2402MHz	Pass	PK	2.4016G	93.08	Inf	-Inf	3	Horizontal	8	1.47
2402MHz	Pass	AV	4.80389G	39.74	54.00	-14.26	3	Vertical	207	1.15
2402MHz	Pass	PK	4.80407G	48.35	74.00	-25.65	3	Vertical	207	1.15
2402MHz	Pass	AV	4.80285G	37.48	54.00	-16.52	3	Horizontal	302	1.03

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2402MHz	Pass	PK	4.80486G	46.72	74.00	-27.28	3	Horizontal	302	1.03
2440MHz	Pass	AV	2.3408G	47.52	54.00	-6.48	3	Vertical	172	1.07
2440MHz	Pass	AV	2.44G	84.85	Inf	-Inf	3	Vertical	172	1.07
2440MHz	Pass	AV	2.4928G	48.36	54.00	-5.64	3	Vertical	172	1.07
2440MHz	Pass	PK	2.3668G	56.86	74.00	-17.14	3	Vertical	172	1.07
2440MHz	Pass	PK	2.4396G	87.18	Inf	-Inf	3	Vertical	172	1.07
2440MHz	Pass	PK	2.4976G	56.87	74.00	-17.13	3	Vertical	172	1.07
2440MHz	Pass	AV	2.3828G	47.45	54.00	-6.55	3	Horizontal	321	1.01
2440MHz	Pass	AV	2.44G	86.90	Inf	-Inf	3	Horizontal	321	1.01
2440MHz	Pass	AV	2.4904G	48.76	54.00	-5.24	3	Horizontal	321	1.01
2440MHz	Pass	PK	2.3876G	56.77	74.00	-17.23	3	Horizontal	321	1.01
2440MHz	Pass	PK	2.44G	89.23	Inf	-Inf	3	Horizontal	321	1.01
2440MHz	Pass	PK	2.4852G	57.47	74.00	-16.53	3	Horizontal	321	1.01
2440MHz	Pass	AV	4.88008G	36.16	54.00	-17.84	3	Vertical	26	2.22
2440MHz	Pass	AV	7.32004G	43.54	54.00	-10.46	3	Vertical	198	2.80
2440MHz	Pass	PK	4.87971G	45.75	74.00	-28.25	3	Vertical	26	2.22
2440MHz	Pass	PK	7.32091G	51.62	74.00	-22.38	3	Vertical	198	2.80
2440MHz	Pass	AV	4.87779G	35.60	54.00	-18.40	3	Horizontal	114	1.50
2440MHz	Pass	AV	7.31993G	41.90	54.00	-12.10	3	Horizontal	1	1.35
2440MHz	Pass	PK	4.87774G	45.77	74.00	-28.23	3	Horizontal	114	1.50
2440MHz	Pass	PK	7.31877G	51.10	74.00	-22.90	3	Horizontal	1	1.35
2480MHz	Pass	AV	2.48G	82.87	Inf	-Inf	3	Vertical	161	1.02
2480MHz	Pass	AV	2.4922G	48.89	54.00	-5.11	3	Vertical	161	1.02
2480MHz	Pass	PK	2.4796G	85.23	Inf	-Inf	3	Vertical	161	1.02
2480MHz	Pass	PK	2.4848G	57.49	74.00	-16.51	3	Vertical	161	1.02
2480MHz	Pass	AV	2.48G	84.78	Inf	-Inf	3	Horizontal	322	1.00
2480MHz	Pass	AV	2.4916G	48.20	54.00	-5.80	3	Horizontal	322	1.00
2480MHz	Pass	PK	2.4794G	87.14	Inf	-Inf	3	Horizontal	322	1.00
2480MHz	Pass	PK	2.4952G	57.18	74.00	-16.82	3	Horizontal	322	1.00
2480MHz	Pass	AV	4.9601G	37.99	54.00	-16.01	3	Vertical	329	1.04
2480MHz	Pass	AV	7.44001G	42.79	54.00	-11.21	3	Vertical	198	2.74
2480MHz	Pass	PK	4.96012G	46.37	74.00	-27.63	3	Vertical	329	1.04
2480MHz	Pass	PK	7.44011G	51.56	74.00	-22.44	3	Vertical	198	2.74
2480MHz	Pass	AV	4.96215G	36.33	54.00	-17.67	3	Horizontal	298	1.50
2480MHz	Pass	AV	7.43993G	42.37	54.00	-11.63	3	Horizontal	357	1.50
2480MHz	Pass	PK	4.95972G	45.81	74.00	-28.19	3	Horizontal	298	1.50
2480MHz	Pass	PK	7.44011G	51.00	74.00	-23.00	3	Horizontal	357	1.50

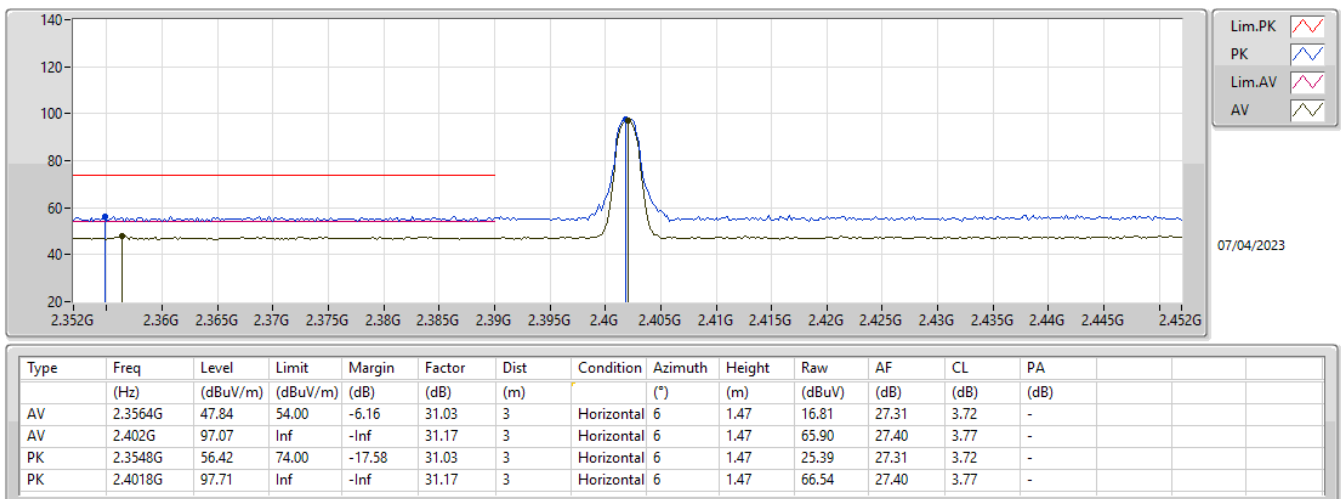
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2402MHz_TX



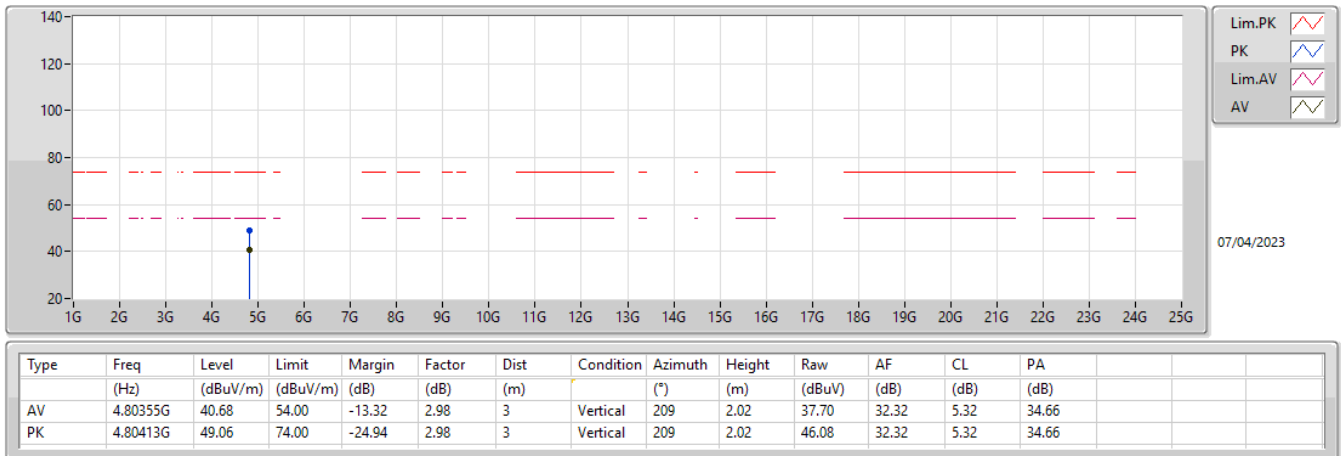
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2402MHz_TX



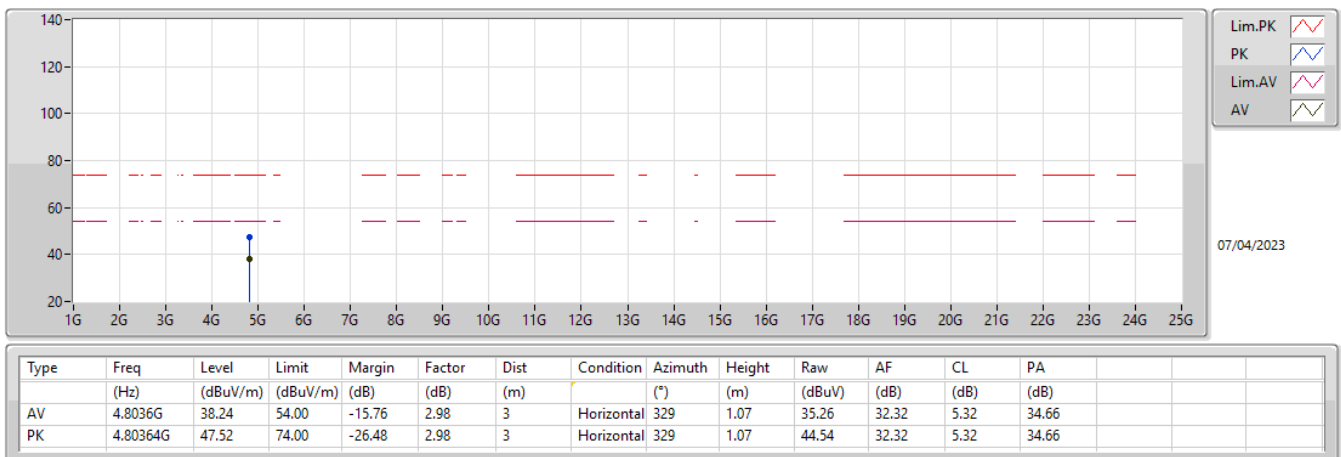
2.4-2.4835GHz_BT-LE(1Mbps)

2402MHz_TX



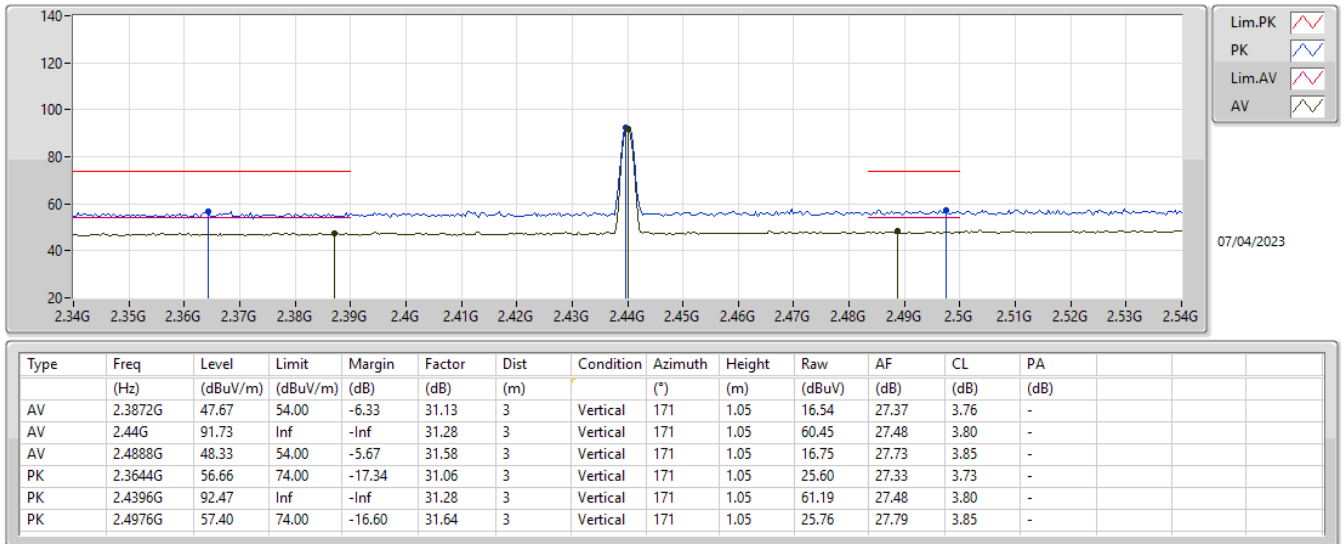
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2402MHz_TX



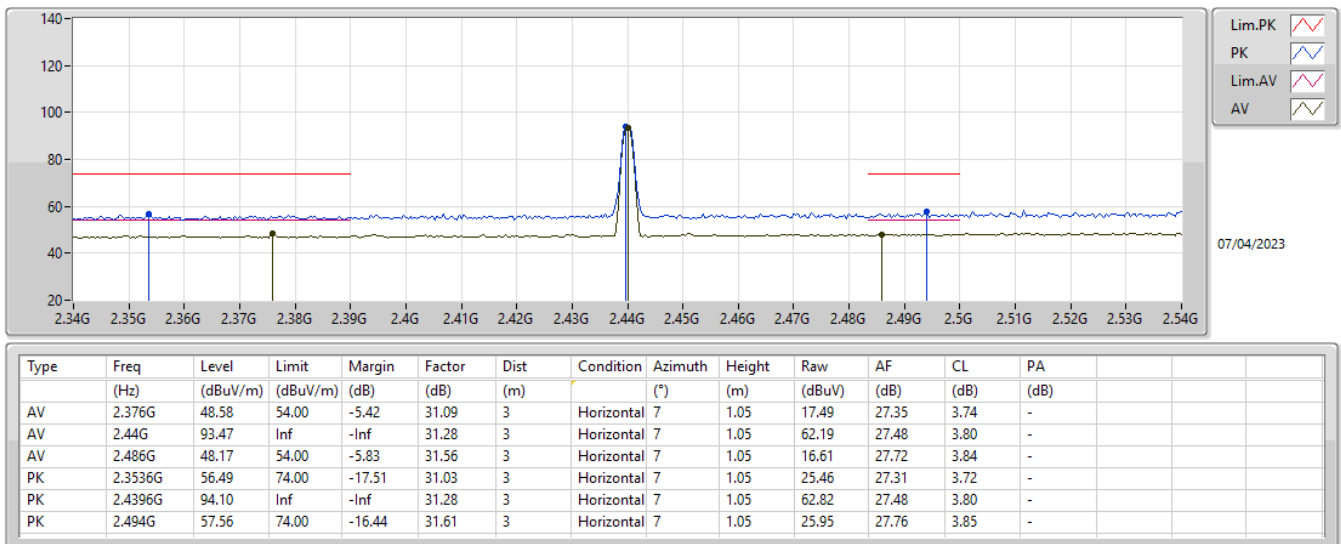
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2440MHz_TX



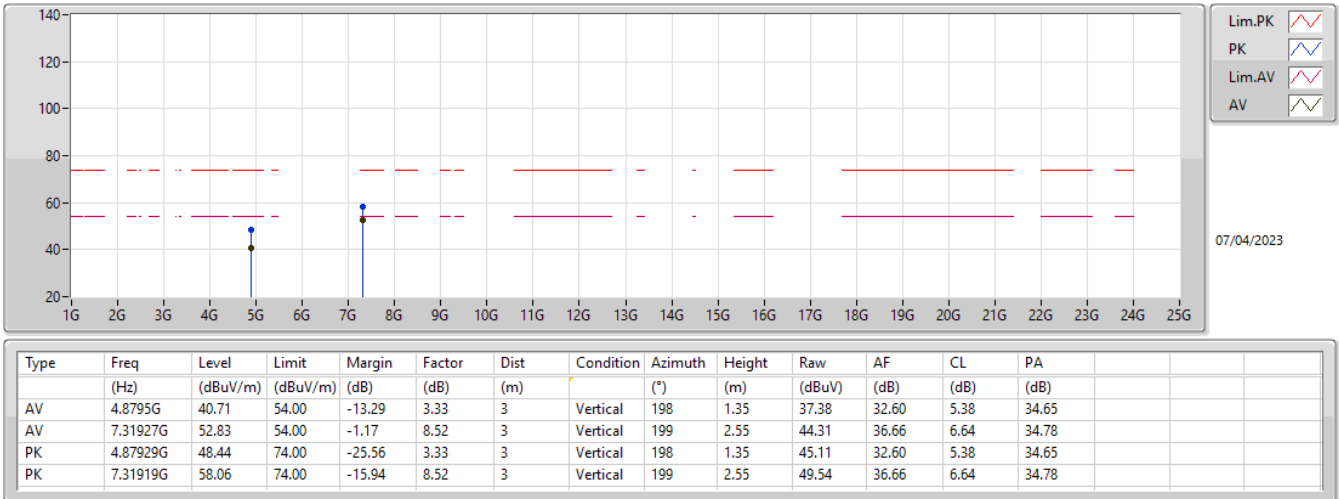
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2440MHz_TX



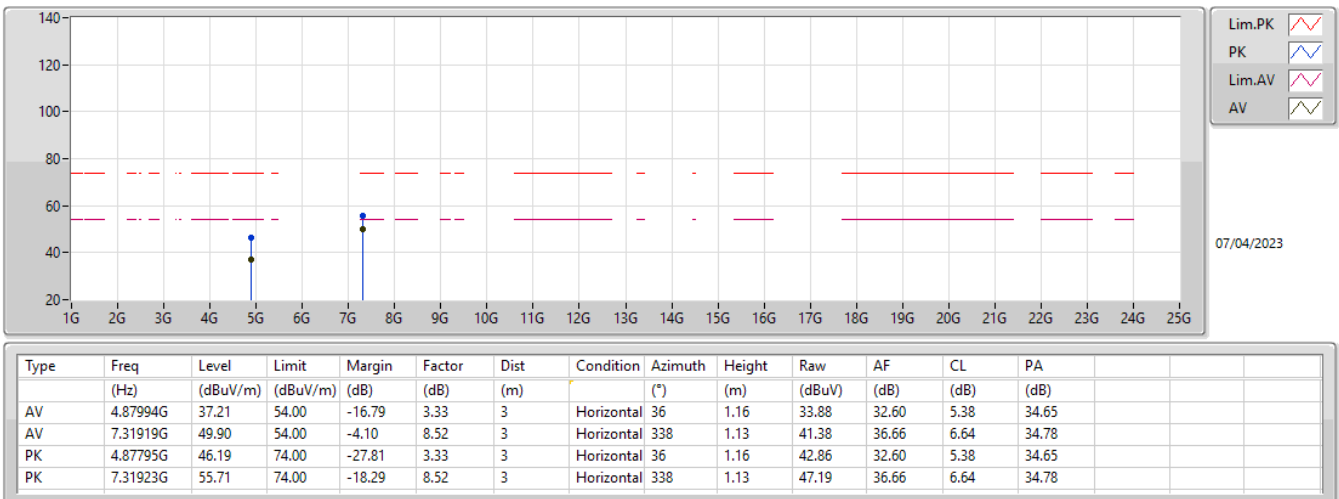
2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX



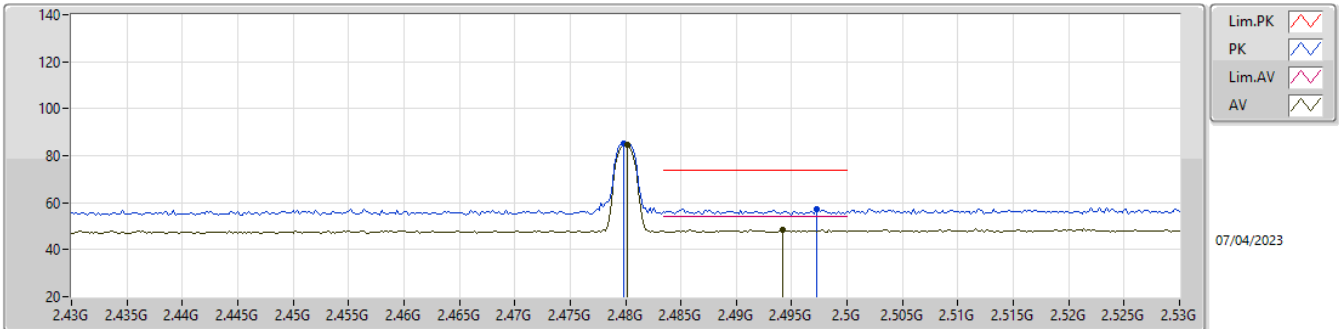
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2440MHz_TX



2.4-2.4835GHz_BT-LE(1Mbps)

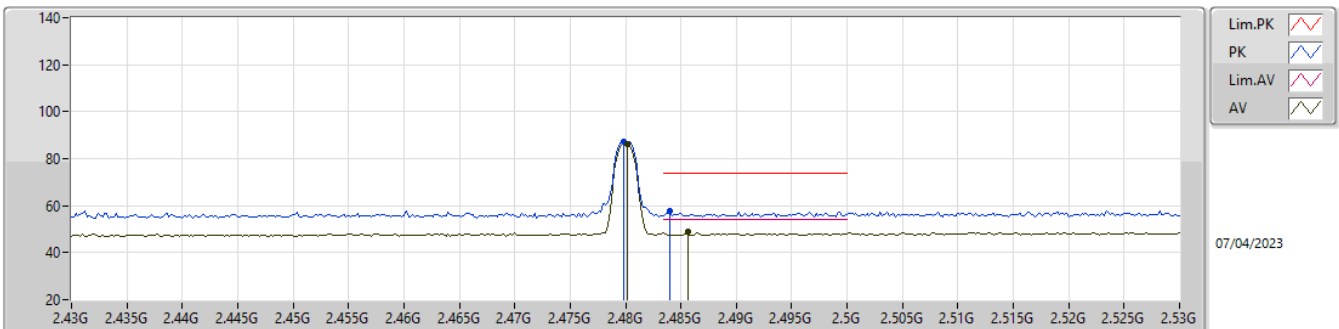
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.4802G	84.56	Inf	-Inf	31.52	3	Vertical	159	1.02	53.04	27.68	3.84	-
AV	2.4942G	48.38	54.00	-5.62	31.62	3	Vertical	159	1.02	16.76	27.77	3.85	-
PK	2.4798G	85.34	Inf	-Inf	31.52	3	Vertical	159	1.02	53.82	27.68	3.84	-
PK	2.4972G	57.50	74.00	-16.50	31.63	3	Vertical	159	1.02	25.87	27.78	3.85	-

2.4-2.4835GHz_BT-LE(1Mbps)

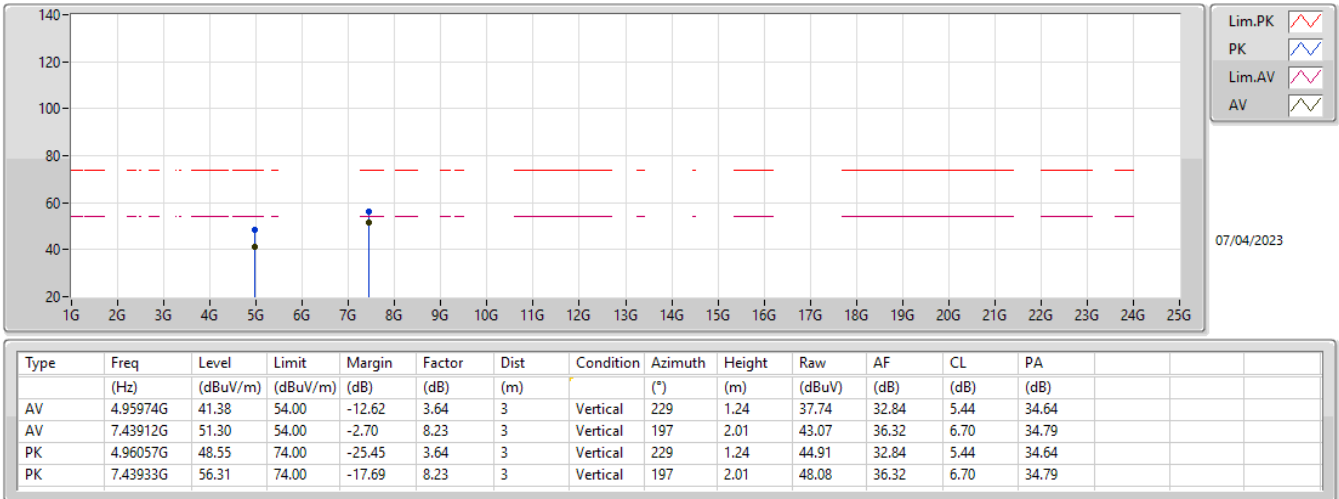
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.4802G	86.41	Inf	-Inf	31.52	3	Horizontal	322	1.00	54.89	27.68	3.84	-
AV	2.4856G	48.94	54.00	-5.06	31.55	3	Horizontal	322	1.00	17.39	27.71	3.84	-
PK	2.4798G	87.19	Inf	-Inf	31.52	3	Horizontal	322	1.00	55.67	27.68	3.84	-
PK	2.484G	57.59	74.00	-16.41	31.54	3	Horizontal	322	1.00	26.05	27.70	3.84	-

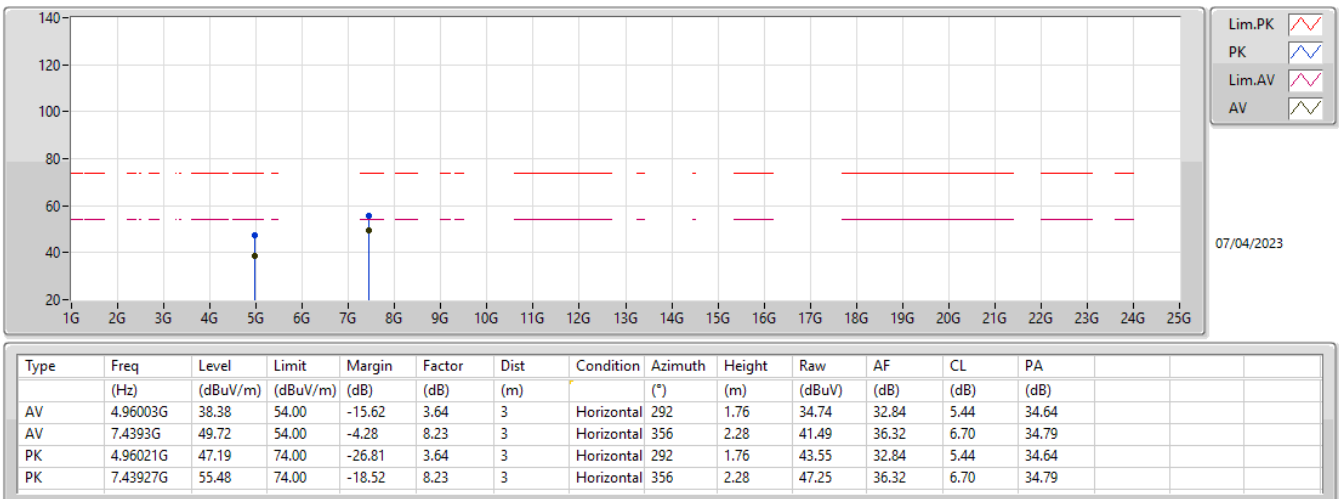
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2480MHz_TX



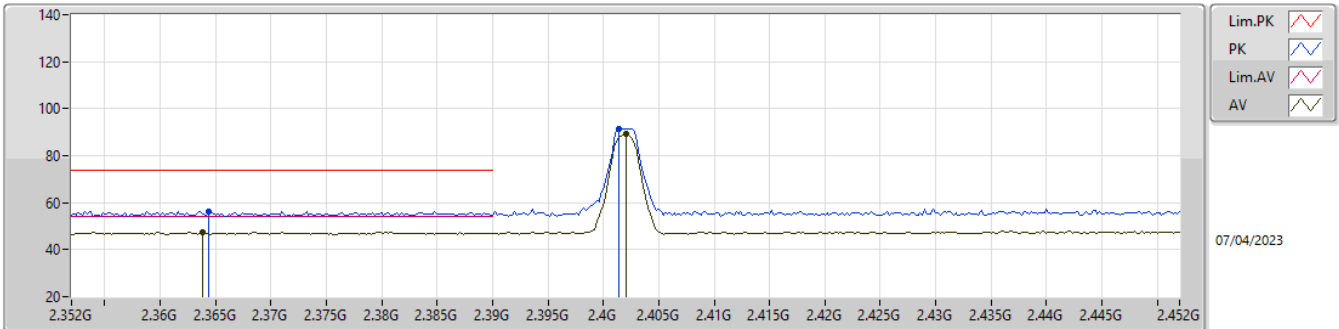
2.4-2.4835GHz_BT-LE(1Mbps)

2480MHz_TX



2.4-2.4835GHz_BT-LE(2Mbps)

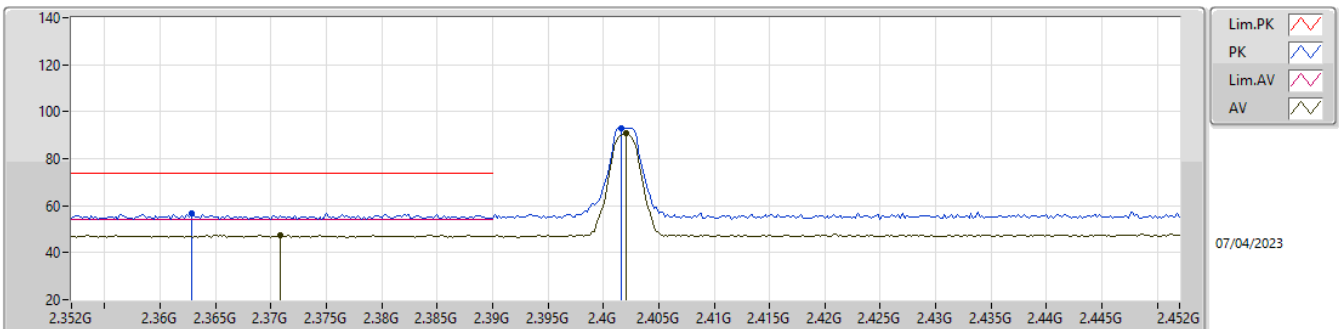
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3638G	47.61	54.00	-6.39	31.06	3	Vertical	169	1.00	16.55	27.33	3.73	-
AV	2.402G	89.30	Inf	-Inf	31.17	3	Vertical	169	1.00	58.13	27.40	3.77	-
PK	2.3644G	56.33	74.00	-17.67	31.06	3	Vertical	169	1.00	25.27	27.33	3.73	-
PK	2.4014G	91.56	Inf	-Inf	31.17	3	Vertical	169	1.00	60.39	27.40	3.77	-

2.4-2.4835GHz_BT-LE(2Mbps)

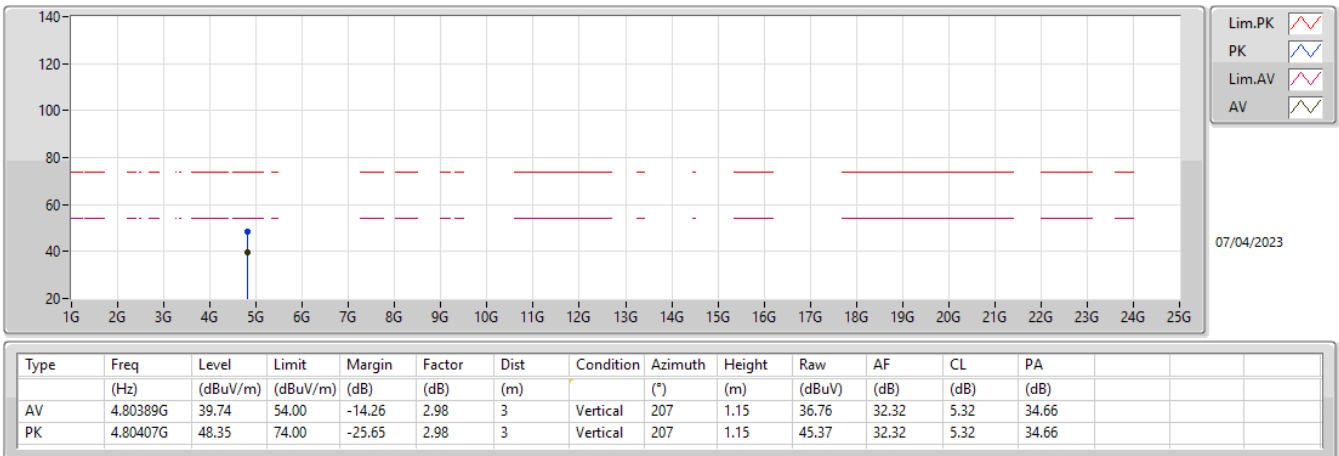
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3708G	47.36	54.00	-6.64	31.08	3	Horizontal	8	1.47	16.28	27.34	3.74	-
AV	2.402G	90.83	Inf	-Inf	31.17	3	Horizontal	8	1.47	59.66	27.40	3.77	-
PK	2.3628G	56.86	74.00	-17.14	31.06	3	Horizontal	8	1.47	25.80	27.33	3.73	-
PK	2.4016G	93.08	Inf	-Inf	31.17	3	Horizontal	8	1.47	61.91	27.40	3.77	-

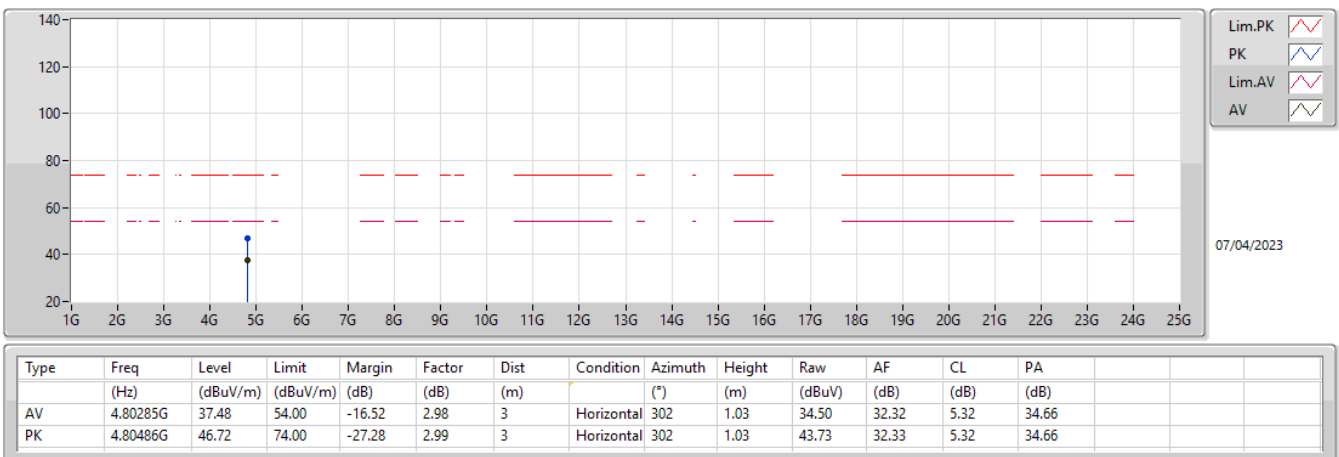
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2402MHz_TX



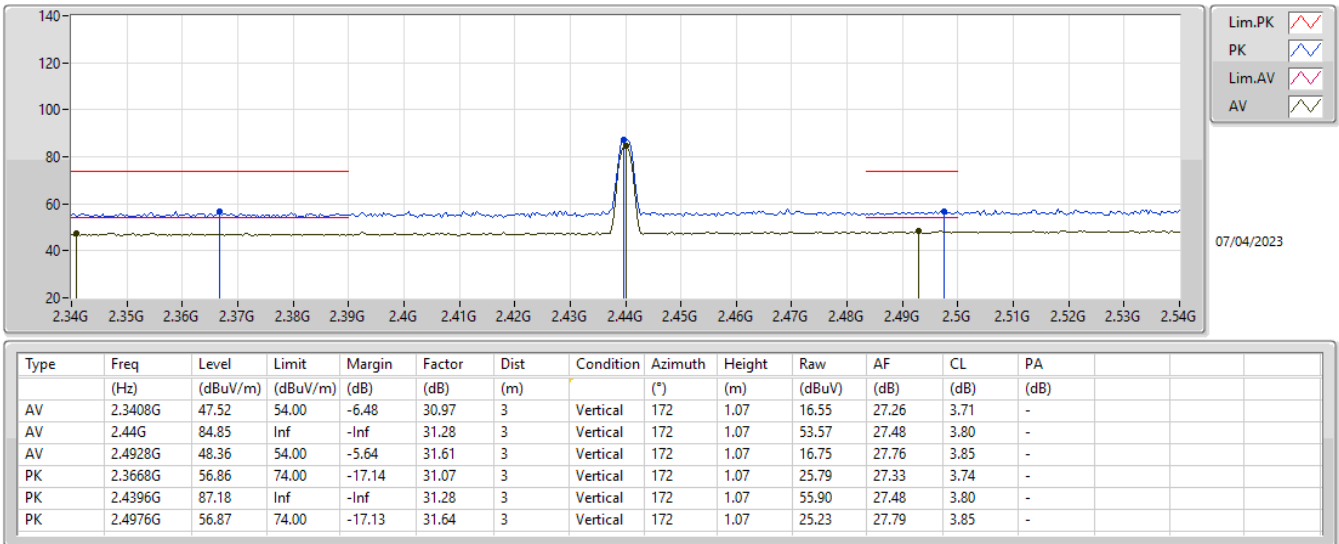
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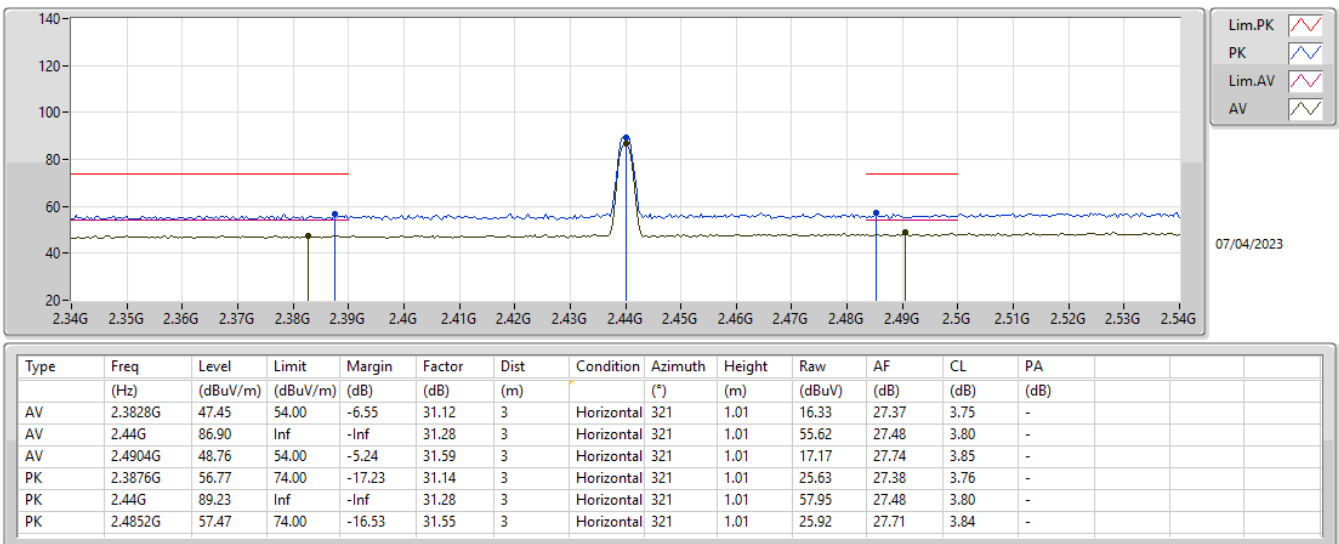
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2440MHz_TX



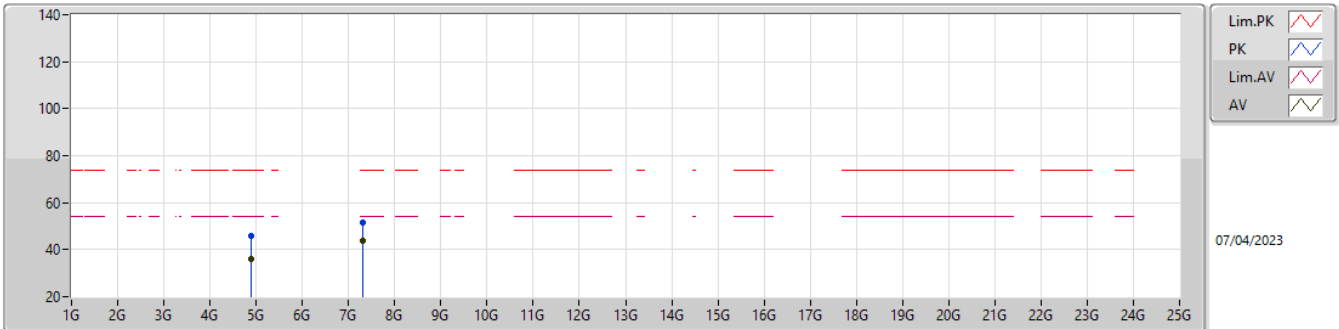
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2440MHz_TX



2.4-2.4835GHz_BT-LE(2Mbps)

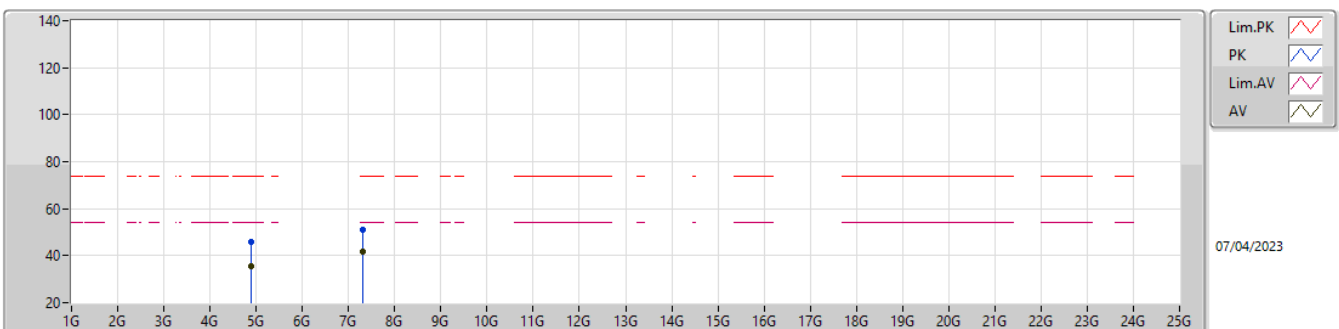
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88008G	36.16	54.00	-17.84	3.33	3	Vertical	26	2.22	32.83	32.60	5.38	34.65
AV	7.32004G	43.54	54.00	-10.46	8.52	3	Vertical	198	2.80	35.02	36.66	6.64	34.78
PK	4.87971G	45.75	74.00	-28.25	3.33	3	Vertical	26	2.22	42.42	32.60	5.38	34.65
PK	7.32091G	51.62	74.00	-22.38	8.52	3	Vertical	198	2.80	43.10	36.66	6.64	34.78

2.4-2.4835GHz_BT-LE(2Mbps)

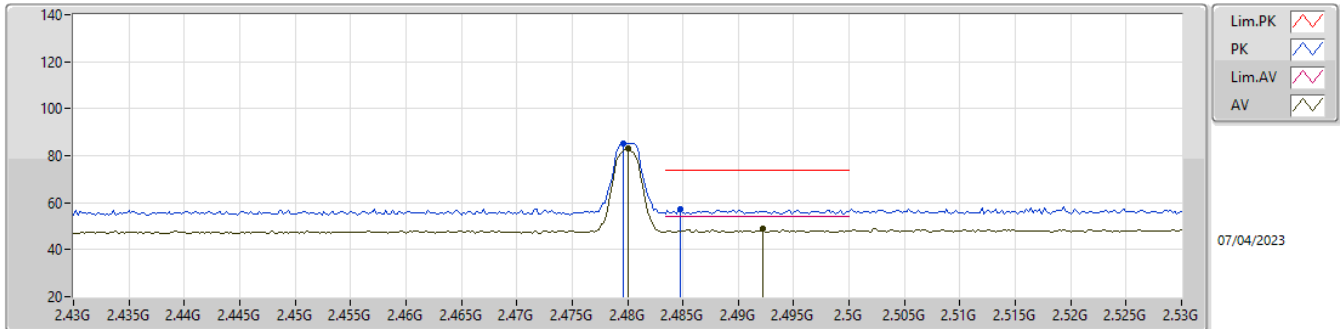
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.87779G	35.60	54.00	-18.40	3.33	3	Horizontal	114	1.50	32.27	32.60	5.38	34.65
AV	7.31993G	41.90	54.00	-12.10	8.52	3	Horizontal	1	1.35	33.38	36.66	6.64	34.78
PK	4.87774G	45.77	74.00	-28.23	3.33	3	Horizontal	114	1.50	42.44	32.60	5.38	34.65
PK	7.31877G	51.10	74.00	-22.90	8.52	3	Horizontal	1	1.35	42.58	36.66	6.64	34.78

2.4-2.4835GHz_BT-LE(2Mbps)

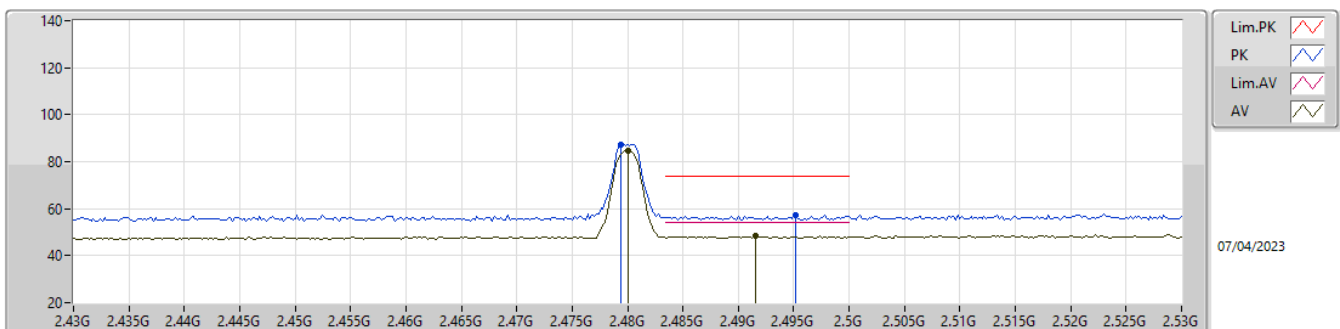
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	82.87	Inf	-Inf	31.52	3	Vertical	161	1.02	51.35	27.68	3.84	-
AV	2.4922G	48.89	54.00	-5.11	31.60	3	Vertical	161	1.02	17.29	27.75	3.85	-
PK	2.4796G	85.23	Inf	-Inf	31.52	3	Vertical	161	1.02	53.71	27.68	3.84	-
PK	2.4848G	57.49	74.00	-16.51	31.55	3	Vertical	161	1.02	25.94	27.71	3.84	-

2.4-2.4835GHz_BT-LE(2Mbps)

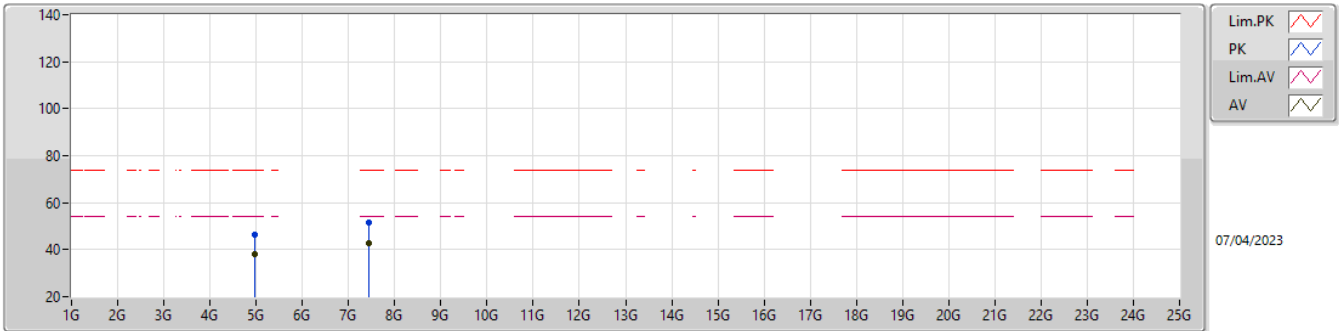
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	84.78	Inf	-Inf	31.52	3	Horizontal	322	1.00	53.26	27.68	3.84	-
AV	2.4916G	48.20	54.00	-5.80	31.60	3	Horizontal	322	1.00	16.60	27.75	3.85	-
PK	2.4794G	87.14	Inf	-Inf	31.52	3	Horizontal	322	1.00	55.62	27.68	3.84	-
PK	2.4952G	57.18	74.00	-16.82	31.62	3	Horizontal	322	1.00	25.56	27.77	3.85	-

2.4-2.4835GHz_BT-LE(2Mbps)

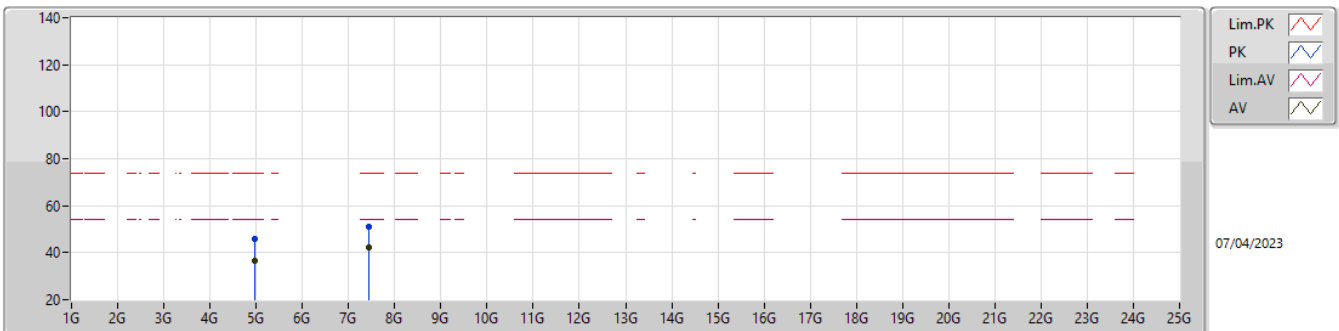
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.9601G	37.99	54.00	-16.01	3.64	3	Vertical	329	1.04	34.35	32.84	5.44	34.64
AV	7.44001G	42.79	54.00	-11.21	8.23	3	Vertical	198	2.74	34.56	36.32	6.70	34.79
PK	4.96012G	46.37	74.00	-27.63	3.64	3	Vertical	329	1.04	42.73	32.84	5.44	34.64
PK	7.44011G	51.56	74.00	-22.44	8.23	3	Vertical	198	2.74	43.33	36.32	6.70	34.79

2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96215G	36.33	54.00	-17.67	3.65	3	Horizontal	298	1.50	32.68	32.85	5.44	34.64
AV	7.43993G	42.37	54.00	-11.63	8.23	3	Horizontal	357	1.50	34.14	36.32	6.70	34.79
PK	4.95972G	45.81	74.00	-28.19	3.64	3	Horizontal	298	1.50	42.17	32.84	5.44	34.64
PK	7.44011G	51.00	74.00	-23.00	8.23	3	Horizontal	357	1.50	42.77	36.32	6.70	34.79