

FCC Radio Test Report

FCC ID : 2AG9J-EVGA-X20-MS01
Equipment : Gaming Mouse
Brand Name : EVGA
Model Name : X20
Applicant : EVGA Corporation
18F., No. 176, Jian 1st Rd., Zhonghe Dist., New Taipei
City 235, Taiwan
Manufacturer : EVGA Corporation
18F., No. 176, Jian 1st Rd., Zhonghe Dist., New Taipei
City 235, Taiwan
Standard : 47 CFR FCC Part 15.247

The product was received on Jan. 14, 2021, and testing was started from Feb. 23, 2021 and completed on Mar. 11, 2021. 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: Allen Lin

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

[illegible]

Summary of Test Result

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

Declaration of Conformity:

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

Comments and explanations:

None

Reviewed by: Ben Tseng

Report Producer: Debby Hung

1 General Description

1.1 Information

1.1.1 RF General Information

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

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

Note:

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

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ACX	AT8010-E2R9HAA	Chip Antenna	N/A	0.5

For SRD function:

For SRD mode (1TX/1RX)

Ant. 1 could transmit/receive.

For BT function:

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

Ant. 1 could transmit/receive.

1.1.3 EUT Information

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

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.799	0.97	473.75u	3k
BT-LE(2Mbps)	0.598	2.23	178.125u	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. TW1190 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Daniel Lin	21.7~23.7°C / 51~56%	03/Mar/2021
RF Conducted	TH06-HY	Johnny Yu	20.1~26.9°C / 50~60%	23/Feb/2021~11/Mar/2021
Radiated	03CH03-HY	Edward Wang	20.8~22.7°C / 54~58%	24/Feb/2021~06/Mar/2021
☐ 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.				

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)	0.9 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.0 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 Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	120V

2.2 Test Channel Mode

Test Software Version	RF Tester V1.0.0.0
-----------------------	--------------------

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	0
2440MHz	-4
2480MHz	-4
BT-LE(2Mbps)	-
2402MHz	0
2440MHz	-4
2480MHz	0

2.3 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
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
	
Worst Planes of EUT	V

2.4 Accessories

Accessories				
Battery	Brand Name	Pow-Tech	Model Name	PT803040
	Manufacturer	Guangdong Pow-Tech New Power Co.Ltd	SN	PT-0001
	Power Rating	3.7Vdc, 900mAh	Type	Li-ion, Yes
USB Cable	Brand Name	Acrox	Model Name	1CCBLW35A4200004
	Manufacturer	Shenzhen Duo Ji Xin Technolgy Co.,Ltd	SN	X20-0001
	Signal Line	1.96meter, shielded cable, w/o ferrite core		
USB Receiver	Brand Name	EVGA	Model Name	X20RX
Extension Adapter	Brand Name	EVGA	Model Name	X20Adapter

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

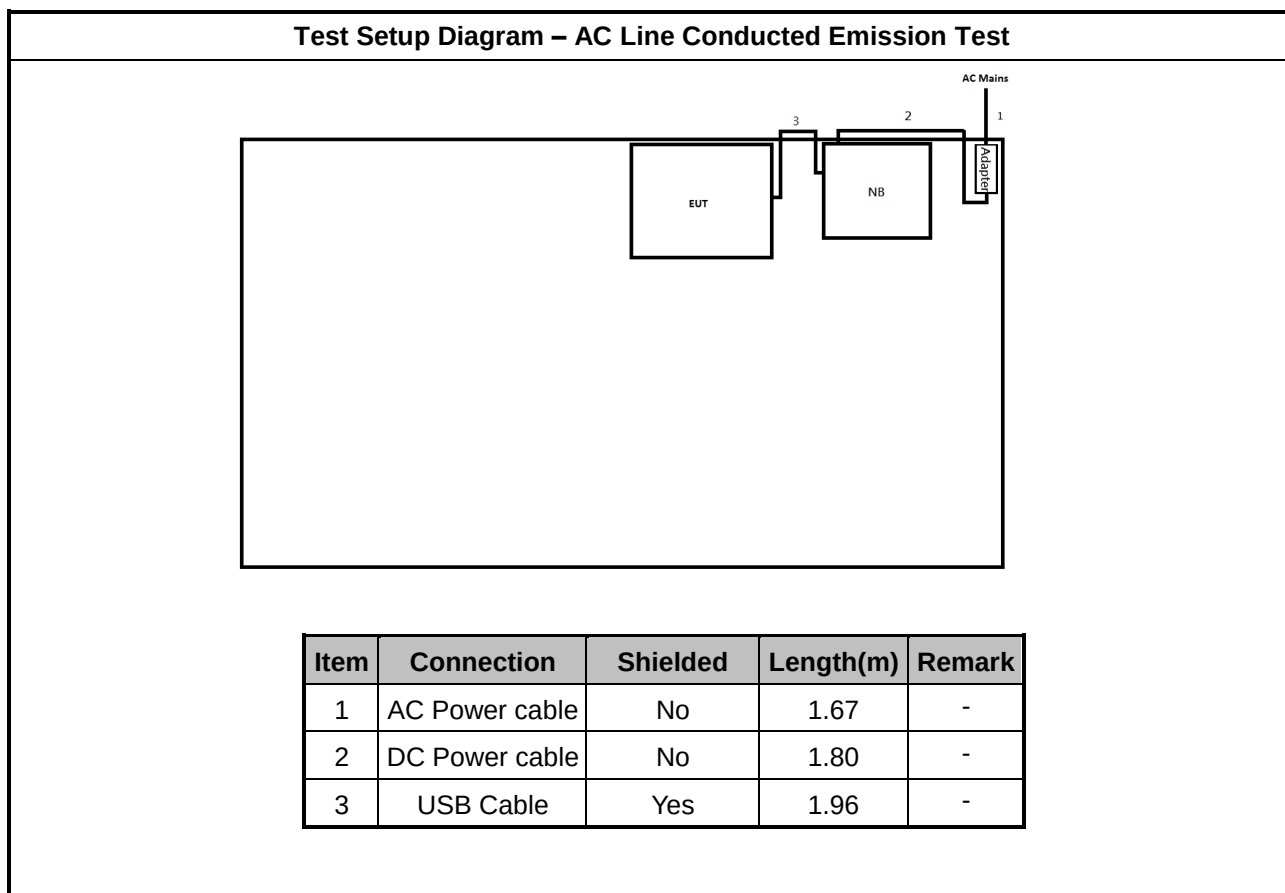
2.5 Support Equipment

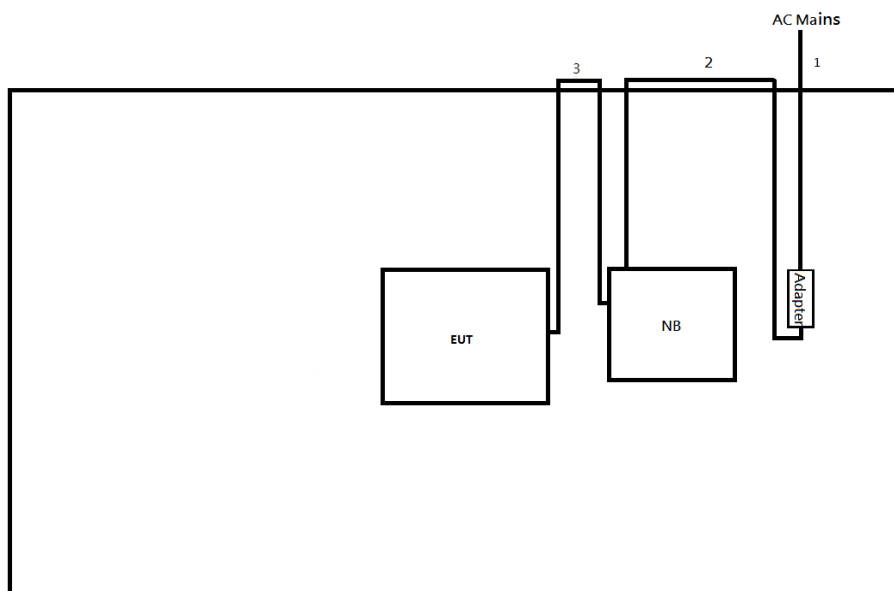
Support Equipment – AC Conduction					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	AC Power cable	Power sync	AC Power Cable	-	-
2	Notebook	HP	5220m	-	-
3	AC Adapter (for NB)	HP	PPP012H-S	-	-

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

Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	AC Power cable	Power sync	AC Power Cable	-	-
2	Notebook	HP	5220m	-	-
3	AC Adapter (for NB)	HP	PPP012H-S	-	-

2.6 Test Setup Diagram



Test Setup Diagram - Radiated Test


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.67	-
2	DC Power cable	No	1.80	-
3	USB Cable	Yes	1.96	-

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

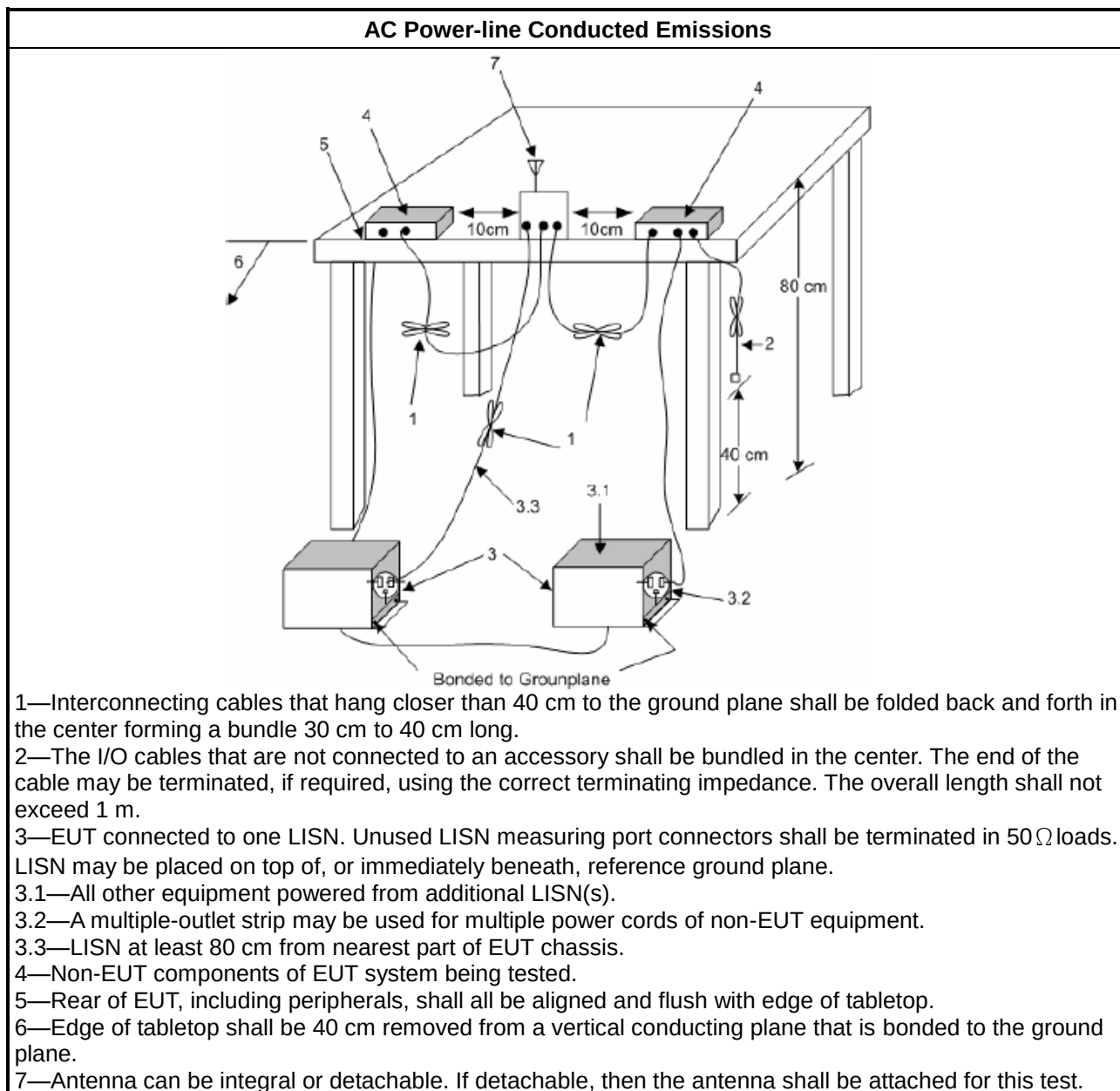
Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

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.

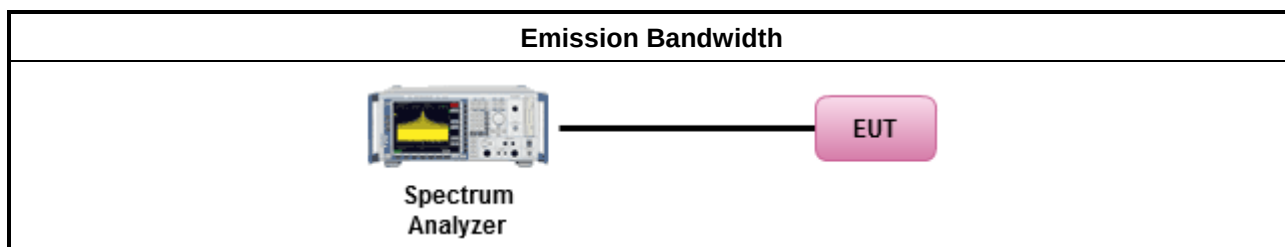
3.2.2 Measuring Instruments

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 $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ 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.	

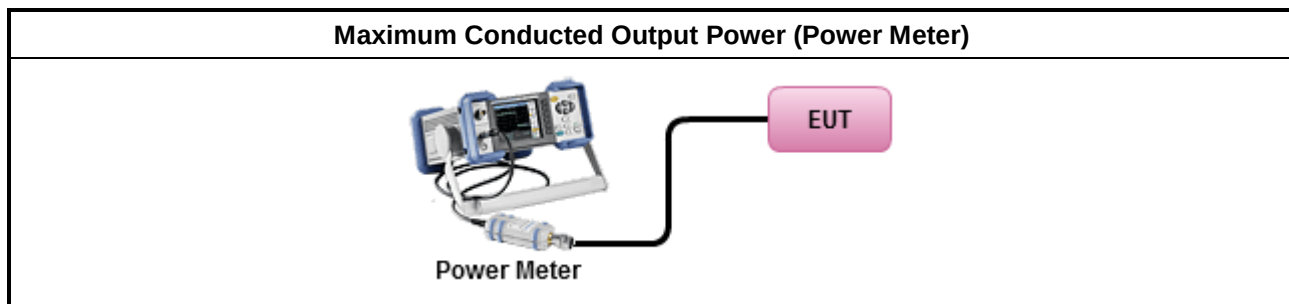
3.3.2 Measuring Instruments

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

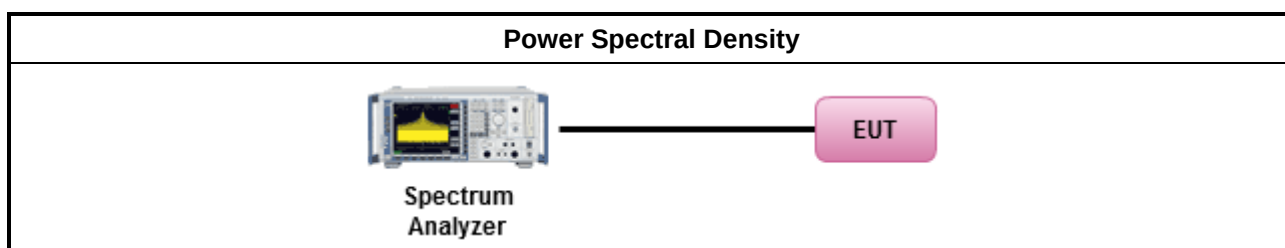
3.4.2 Measuring Instruments

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.	

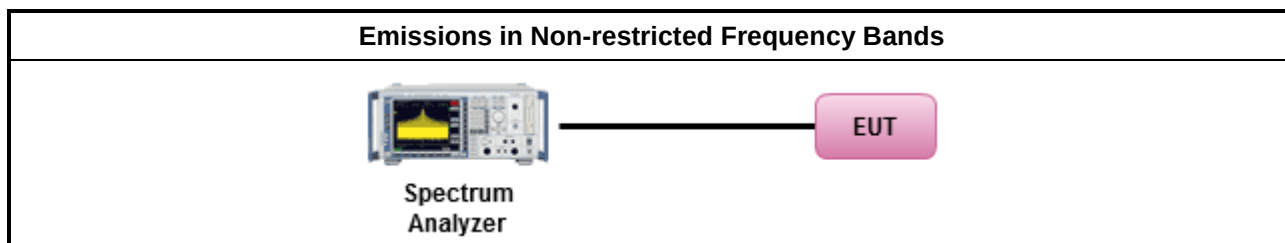
3.5.2 Measuring Instruments

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

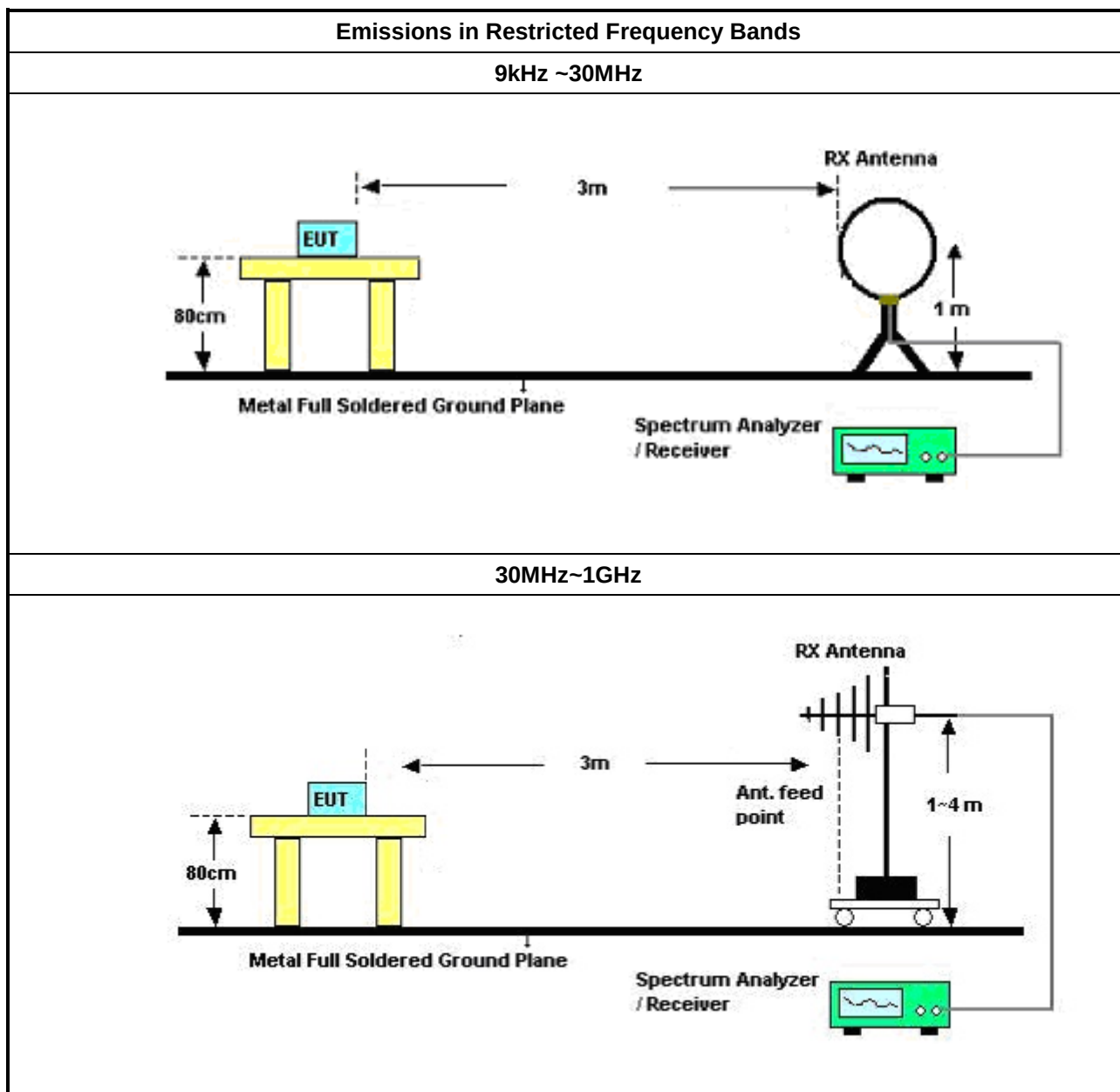
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted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

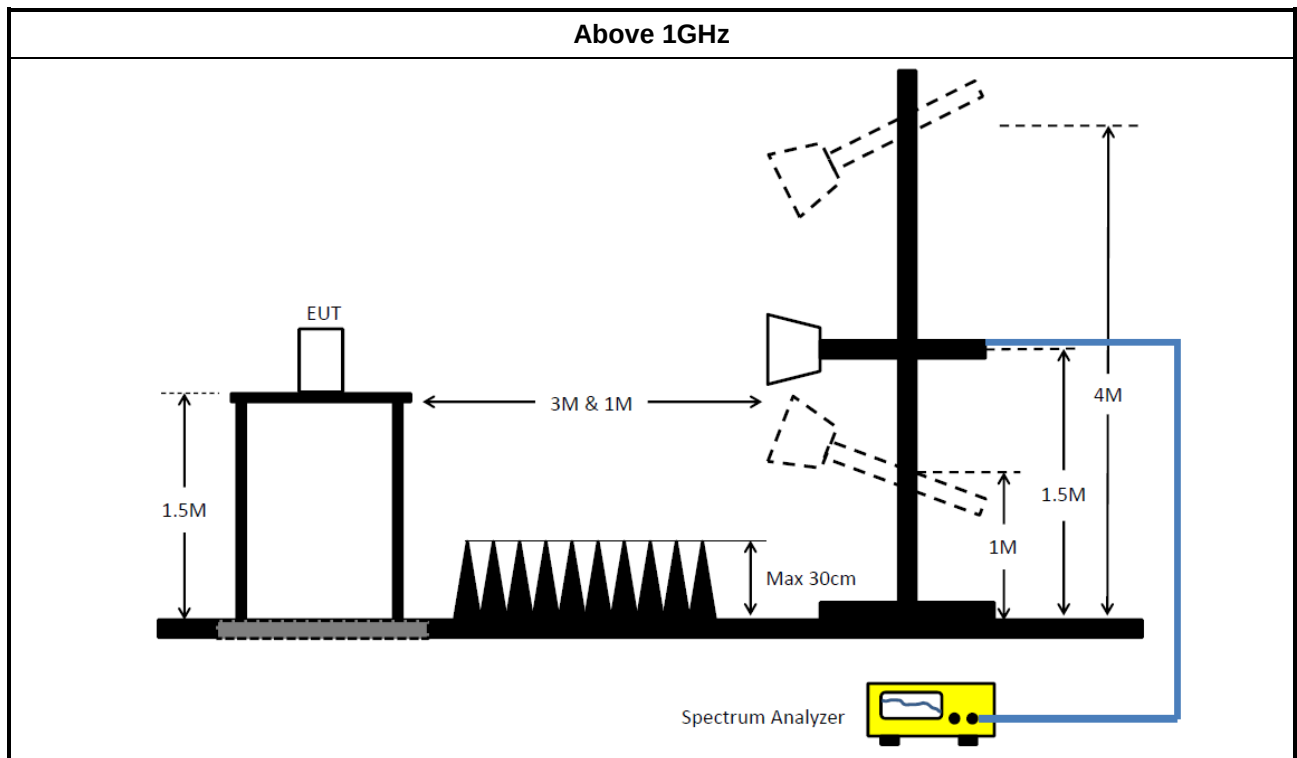
3.6.4 Measurement Results Calculation

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	ESR3	102051	9kHz ~ 3.6GHz	29/May/2020	28/May/2021
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	11/Nov/2020	10/Nov/2021
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	31/Aug/2020	30/Aug/2021
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	21/Sep/2020	20/Sep/2021

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	101029	10Hz~40GHz	19/Oct/2020	18/Oct/2021
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	20/Oct/2020	19/Oct/2021
Pulse Sensor	Anritsu	MA2411B	1027452	300MHz~40GHz	18/Mar/2020	17/Mar/2021
Power Meter	Anritsu	ML2495A	1124009	300MHz~40GHz	18/Mar/2020	17/Mar/2021

Instrument for Radiated Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	06/Aug/2020	05/Aug/2021
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz~18GHz 3m	04/Aug/2020	03/Aug/2021
Signal Analyzer	R&S	FSV40	101500	10Hz~40GHz	19/Aug/2020	18/Aug/2021
Amplifier	HP	8447D	2944A08033	10kHz~1.3GHz	14/Apr/2020	13/Apr/2021
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz~26.5GHz	06/Oct/2020	05/Oct/2021
Bilog Antenna & 6dB Attenuator	SCHAFFNER / EMCI	CBL6112B / N-6-05	22237 / AT-N-0603	30MHz~1GHz	25/Oct/2020	24/Oct/2021
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz~18GHz	26/Mar/2020	25/Mar/2021
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz~30MHz	19/Jun/2020	18/Jun/2021
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	18/Mar/2020	17/Mar/2021
RF CABLE 5+6m	HUBER+SUHNER	SUOFLEX 104	SN MY38596/4+SN 804300/4	1GHz~40GHz	04/Aug/2020	03/Aug/2021
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz~40GHz	13/Mar/2020	12/Mar/2021
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz~40GHz	10/Mar/2020	09/Mar/2021
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2020	15/Mar/2021

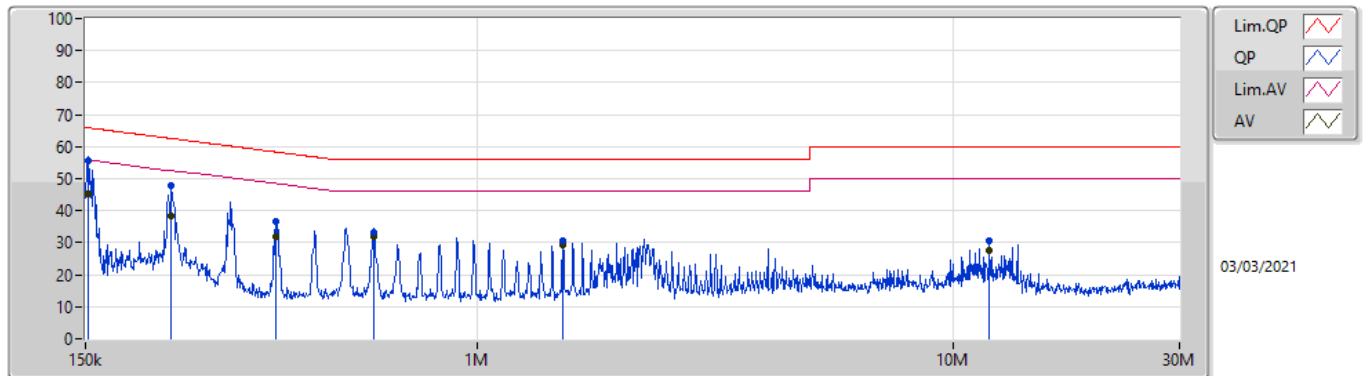
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	152.414k	56.05	65.87	-9.82	Neutral

Mode Configure

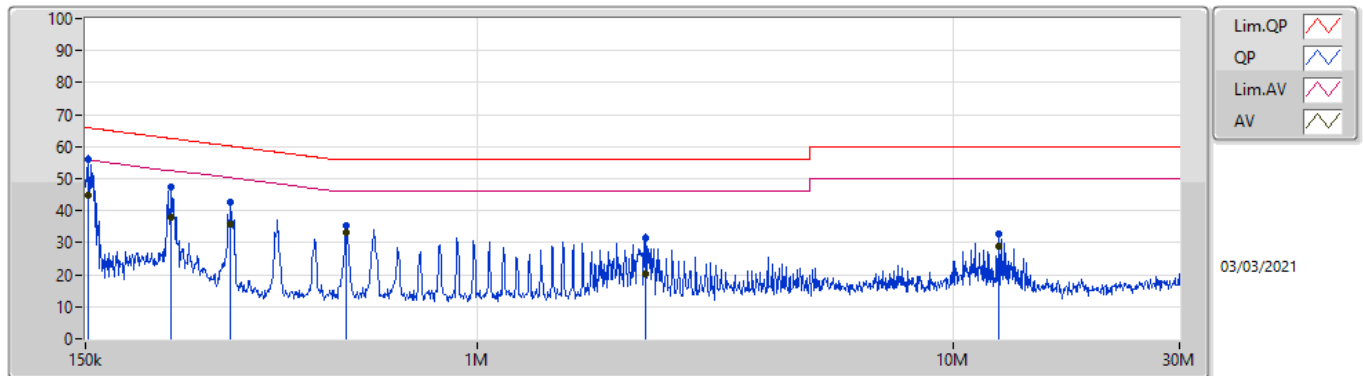
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	151.807k	55.46	65.90	-10.44	Line	-
Mode 1	Pass	AV	151.807k	45.27	55.90	-10.63	Line	-
Mode 1	Pass	QP	227.194k	47.69	62.56	-14.87	Line	-
Mode 1	Pass	AV	227.194k	38.29	52.56	-14.27	Line	-
Mode 1	Pass	QP	377.206k	36.82	58.33	-21.51	Line	-
Mode 1	Pass	AV	377.206k	31.97	48.33	-16.36	Line	-
Mode 1	Pass	QP	606.584k	33.34	56.00	-22.66	Line	-
Mode 1	Pass	AV	606.584k	31.89	46.00	-14.11	Line	-
Mode 1	Pass	QP	1.513M	30.43	56.00	-25.57	Line	-
Mode 1	Pass	AV	1.513M	29.23	46.00	-16.77	Line	-
Mode 1	Pass	QP	11.967M	30.81	60.00	-29.19	Line	-
Mode 1	Pass	AV	11.967M	27.44	50.00	-22.56	Line	-
Mode 1	Pass	QP	152.414k	56.05	65.87	-9.82	Neutral	-
Mode 1	Pass	AV	152.414k	44.82	55.87	-11.05	Neutral	-
Mode 1	Pass	QP	227.194k	47.38	62.56	-15.18	Neutral	-
Mode 1	Pass	AV	227.194k	37.80	52.56	-14.76	Neutral	-
Mode 1	Pass	QP	302.848k	42.66	60.17	-17.51	Neutral	-
Mode 1	Pass	AV	302.848k	35.95	50.17	-14.22	Neutral	-
Mode 1	Pass	QP	531.714k	35.30	56.00	-20.70	Neutral	-
Mode 1	Pass	AV	531.714k	33.27	46.00	-12.73	Neutral	-
Mode 1	Pass	QP	2.256M	31.53	56.00	-24.47	Neutral	-
Mode 1	Pass	AV	2.256M	20.44	46.00	-25.56	Neutral	-
Mode 1	Pass	QP	12.504M	32.91	60.00	-27.09	Neutral	-
Mode 1	Pass	AV	12.504M	28.98	50.00	-21.02	Neutral	-

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	151.807k	55.46	65.90	-10.44	19.60	Line	-	35.86	9.69	0.01	9.90			
AV	151.807k	45.27	55.90	-10.63	19.60	Line	-	25.67	9.69	0.01	9.90			
QP	227.194k	47.69	62.56	-14.87	19.59	Line	-	28.10	9.68	0.01	9.90			
AV	227.194k	38.29	52.56	-14.27	19.59	Line	-	18.70	9.68	0.01	9.90			
QP	377.206k	36.82	58.33	-21.51	19.59	Line	-	17.23	9.67	0.02	9.90			
AV	377.206k	31.97	48.33	-16.36	19.59	Line	-	12.38	9.67	0.02	9.90			
QP	606.584k	33.34	56.00	-22.66	19.55	Line	-	13.79	9.67	0.03	9.85			
AV	606.584k	31.89	46.00	-14.11	19.55	Line	-	12.34	9.67	0.03	9.85			
QP	1.513M	30.43	56.00	-25.57	19.55	Line	-	10.88	9.68	0.07	9.80			
AV	1.513M	29.23	46.00	-16.77	19.55	Line	-	9.68	9.68	0.07	9.80			
QP	11.967M	30.81	60.00	-29.19	19.84	Line	-	10.97	9.71	0.23	9.90			
AV	11.967M	27.44	50.00	-22.56	19.84	Line	-	7.60	9.71	0.23	9.90			

Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	152.414k	56.05	65.87	-9.82	19.60	Neutral	-	36.45	9.69	0.01	9.90			
AV	152.414k	44.82	55.87	-11.05	19.60	Neutral	-	25.22	9.69	0.01	9.90			
QP	227.194k	47.38	62.56	-15.18	19.59	Neutral	-	27.79	9.68	0.01	9.90			
AV	227.194k	37.80	52.56	-14.76	19.59	Neutral	-	18.21	9.68	0.01	9.90			
QP	302.848k	42.66	60.17	-17.51	19.59	Neutral	-	23.07	9.67	0.02	9.90			
AV	302.848k	35.95	50.17	-14.22	19.59	Neutral	-	16.36	9.67	0.02	9.90			
QP	531.714k	35.30	56.00	-20.70	19.57	Neutral	-	15.73	9.67	0.03	9.87			
AV	531.714k	33.27	46.00	-12.73	19.57	Neutral	-	13.70	9.67	0.03	9.87			
QP	2.256M	31.53	56.00	-24.47	19.59	Neutral	-	11.94	9.68	0.09	9.82			
AV	2.256M	20.44	46.00	-25.56	19.59	Neutral	-	0.85	9.68	0.09	9.82			
QP	12.504M	32.91	60.00	-27.09	19.87	Neutral	-	13.04	9.74	0.23	9.90			
AV	12.504M	28.98	50.00	-21.02	19.87	Neutral	-	9.11	9.74	0.23	9.90			



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)	688.75k	1.004M	1M00F1D	683.75k	1.002M
BT-LE(2Mbps)	1.133M	1.899M	1M90F1D	1.13M	1.842M

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

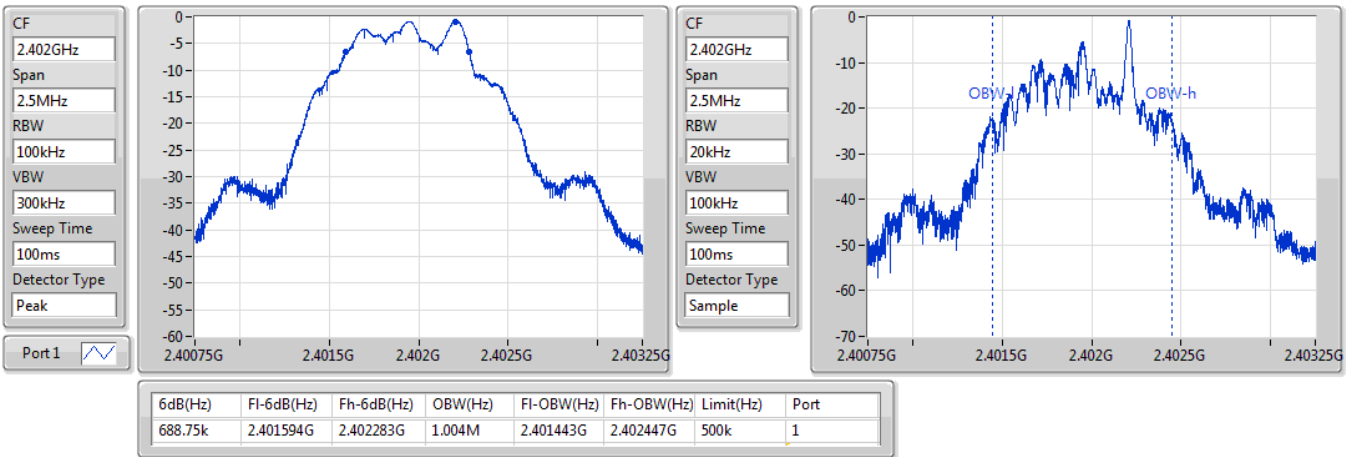
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	688.75k	1.004M
2440MHz	Pass	500k	686.25k	1.002M
2480MHz	Pass	500k	683.75k	1.003M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.133M	1.842M
2440MHz	Pass	500k	1.133M	1.862M
2480MHz	Pass	500k	1.13M	1.899M

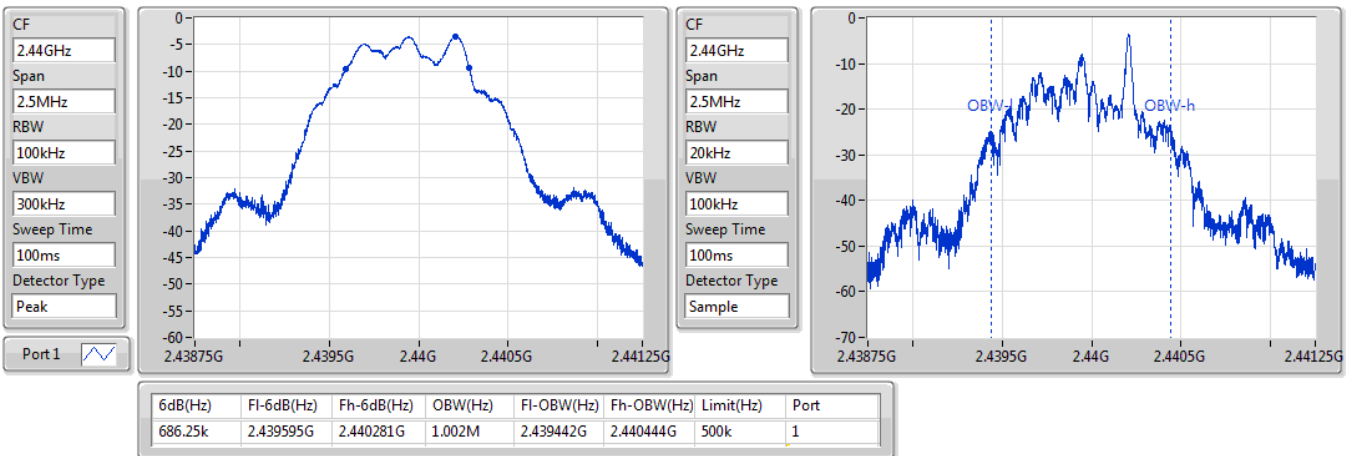
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

BT-LE(1Mbps)
2402MHz

23/02/2021

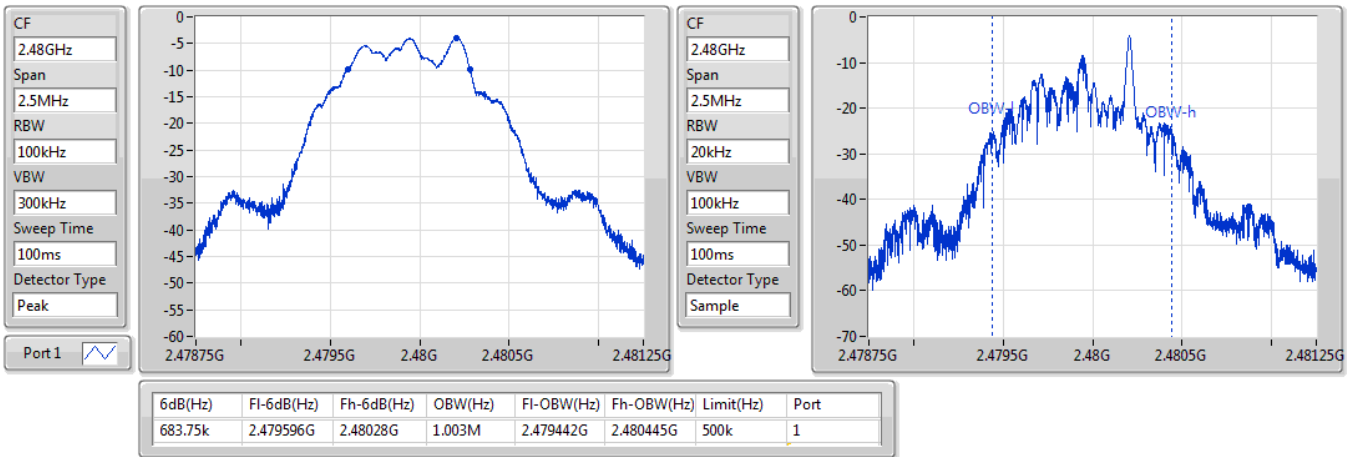

BT-LE(1Mbps)
2440MHz

11/03/2021

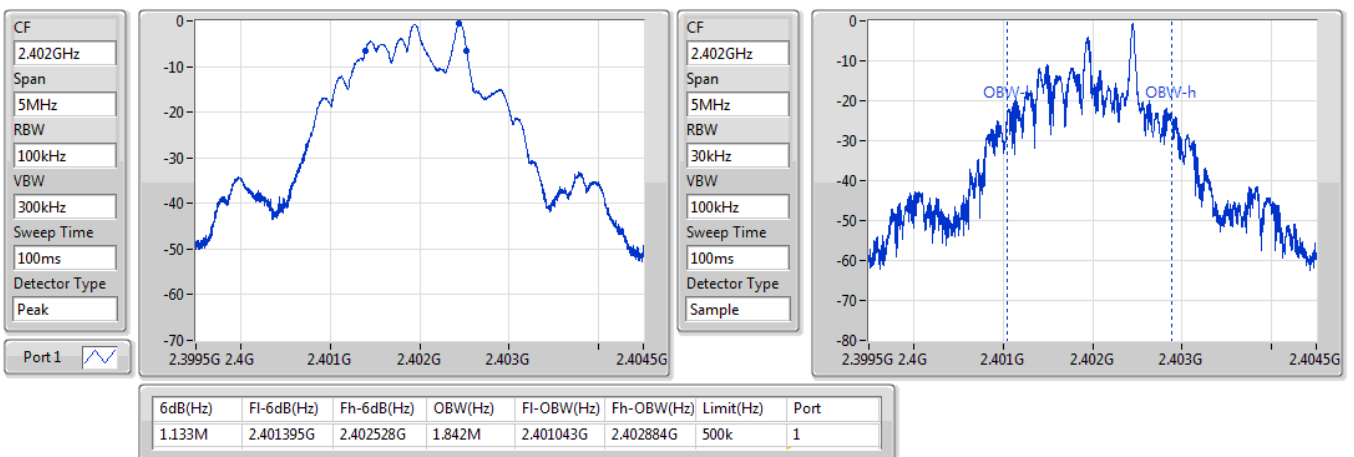


BT-LE(1Mbps)
EBW-DTS
2480MHz

11/03/2021

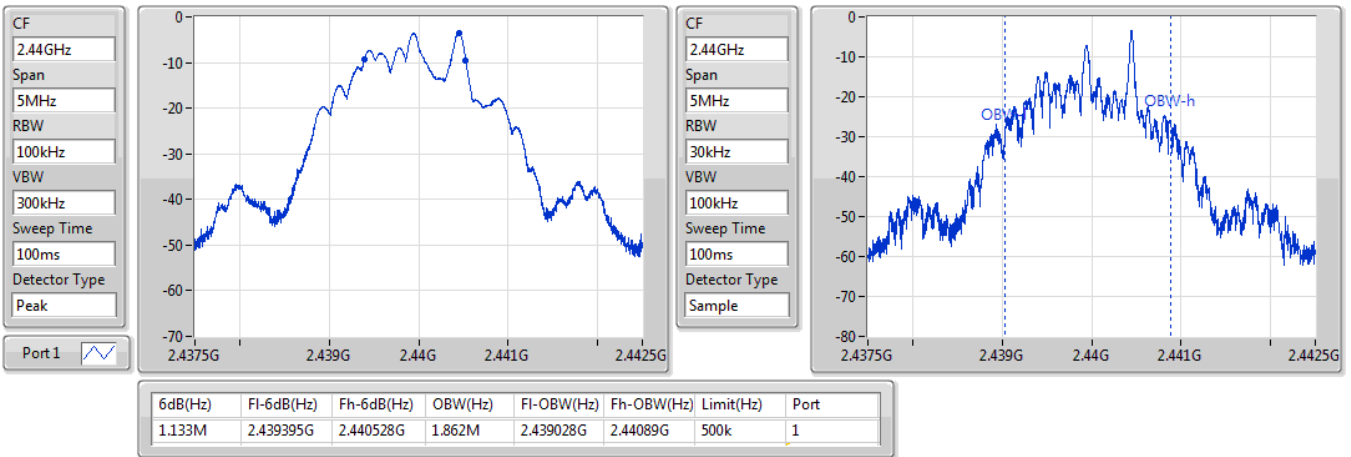

BT-LE(2Mbps)
EBW-DTS
2402MHz

23/02/2021

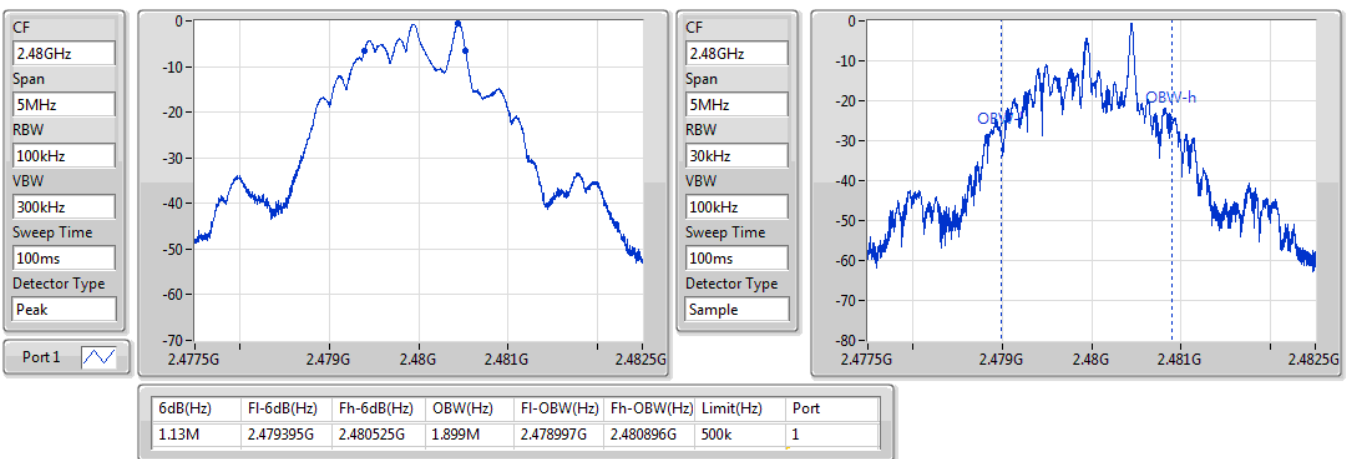


BT-LE(2Mbps)
EBW-DTS
2440MHz

11/03/2021


BT-LE(2Mbps)
EBW-DTS
2480MHz

23/02/2021





Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LF(1Mbps)	-0.97	0.00080
BT-LF(2Mbps)	-0.99	0.00080



Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.50	-0.97	30.00
2440MHz	Pass	0.50	-3.91	30.00
2480MHz	Pass	0.50	-4.35	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	0.50	-0.99	30.00
2440MHz	Pass	0.50	-4.16	30.00
2480MHz	Pass	0.50	-1.02	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-1.04
BT-LE(2Mbps)	-6.05

RBW = 3kHz;



Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.50	-1.04	8.00
2440MHz	Pass	0.50	-3.80	8.00
2480MHz	Pass	0.50	-4.21	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	0.50	-6.05	8.00
2440MHz	Pass	0.50	-10.33	8.00
2480MHz	Pass	0.50	-6.12	8.00

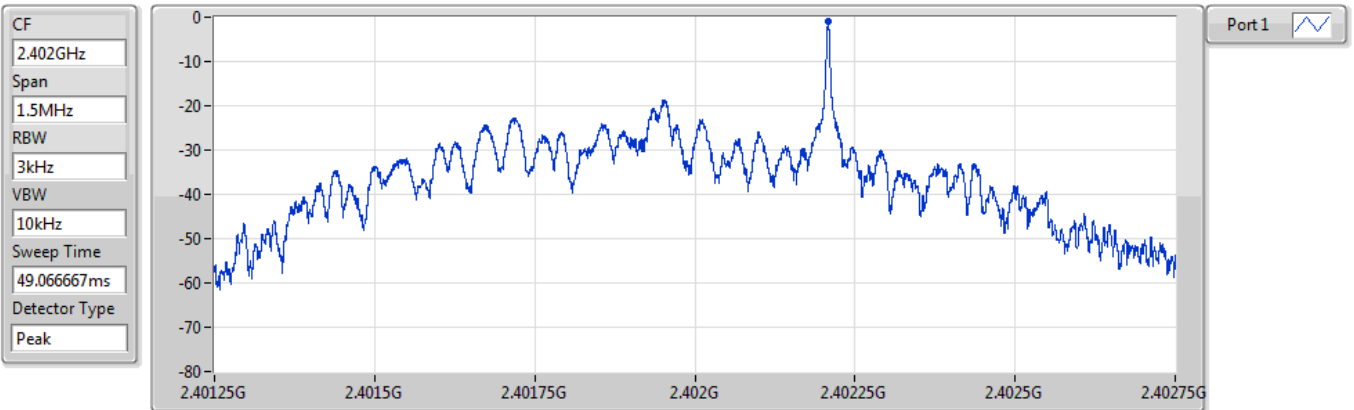
DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

BT-LE(1Mbps)

PSD

2402MHz

23/02/2021



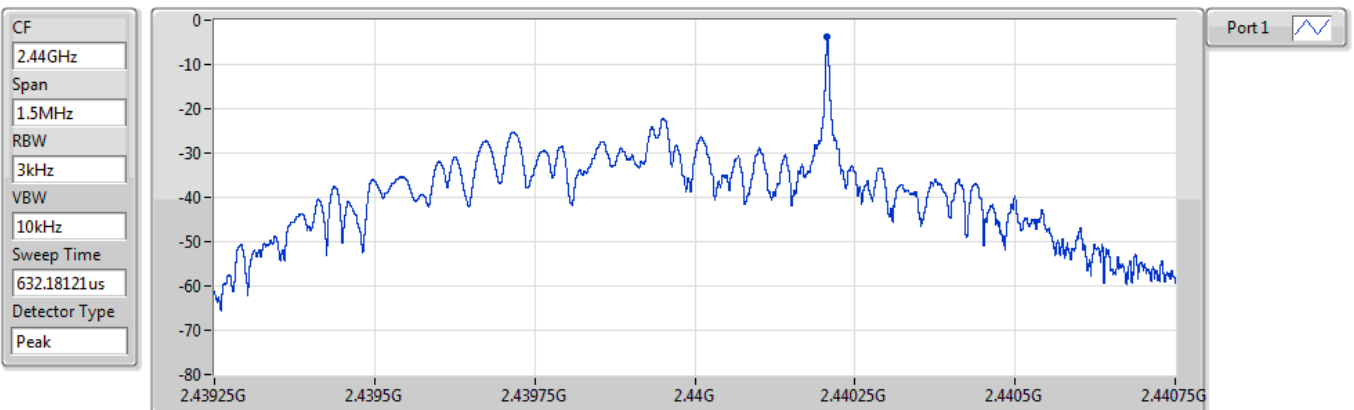
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-1.04	-1.04	-1.04

BT-LE(1Mbps)

PSD

2440MHz

11/03/2021

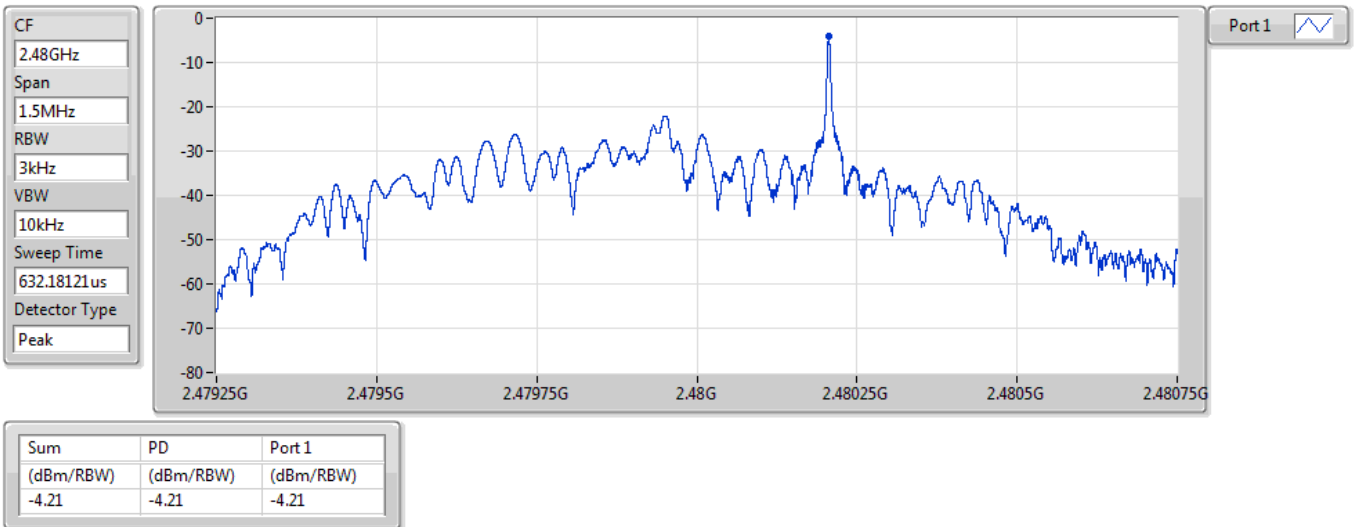


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-3.80	-3.80	-3.80

BT-LE(1Mbps)

2480MHz

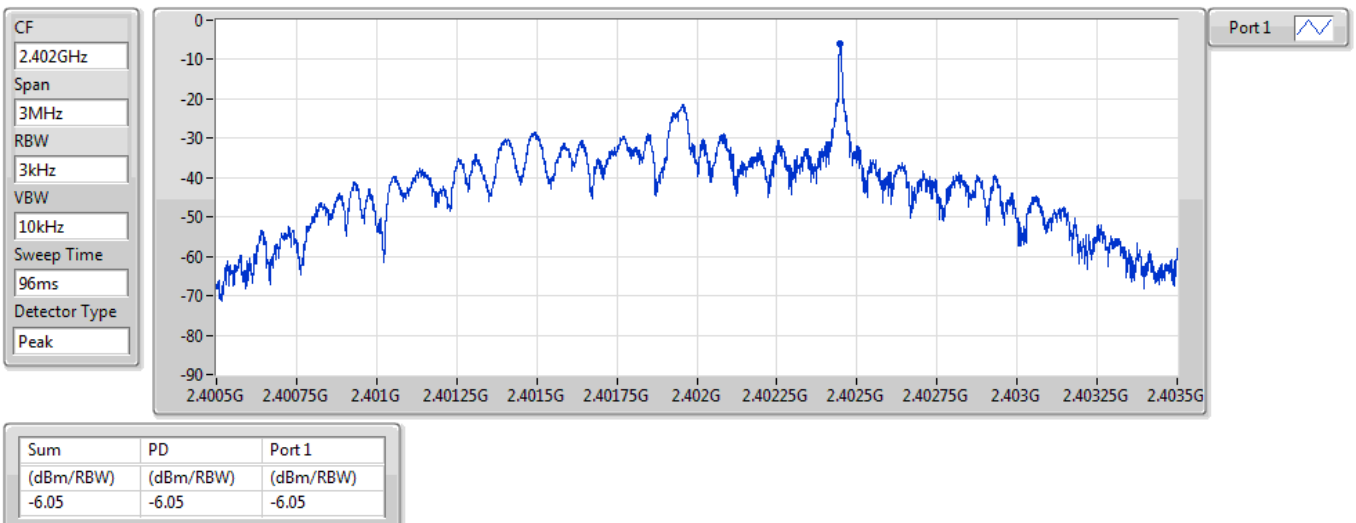
11/03/2021



BT-LE(2Mbps)

2402MHz

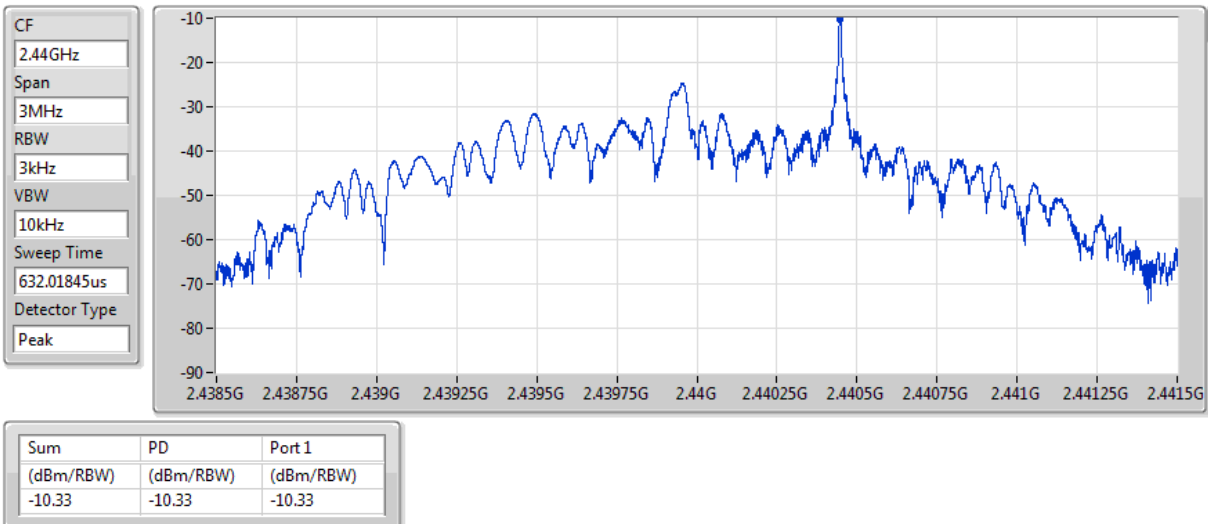
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BT-LE(2Mbps)

2440MHz

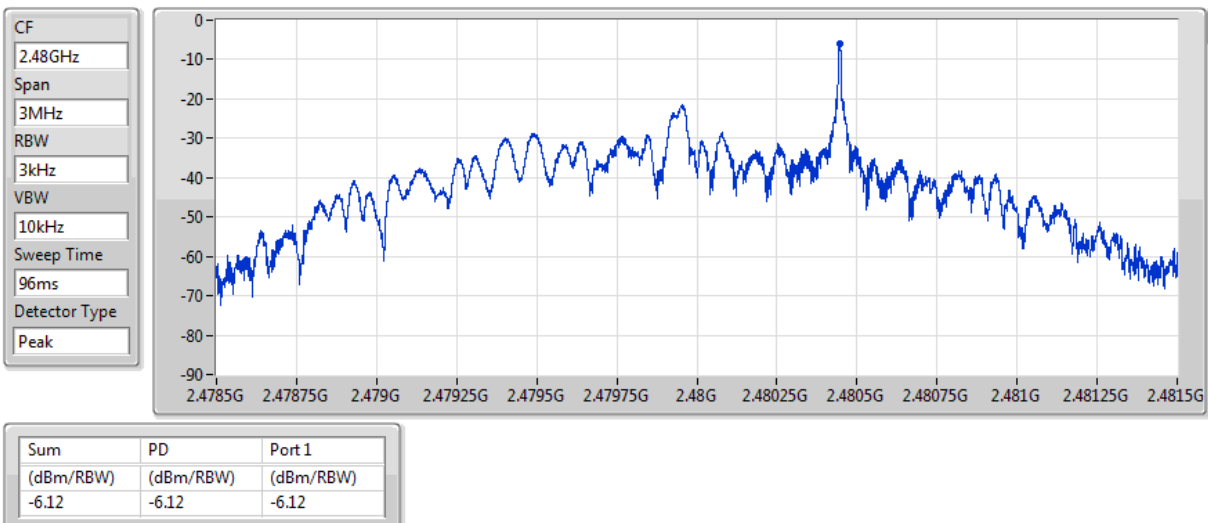
11/03/2021



BT-LE(2Mbps)

2480MHz

23/02/2021





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	2.40217G	-0.29	-30.29	2.19083G	-52.89	2.3999G	-45.16	2.4G	-46.79	2.4935G	-51.24	15.21121G	-40.54	1
BT-LE(2Mbps)	Pass	2.40242G	-0.77	-30.77	1.95259G	-53.70	2.39998G	-34.19	2.4G	-34.62	2.49965G	-51.26	15.21965G	-41.69	1

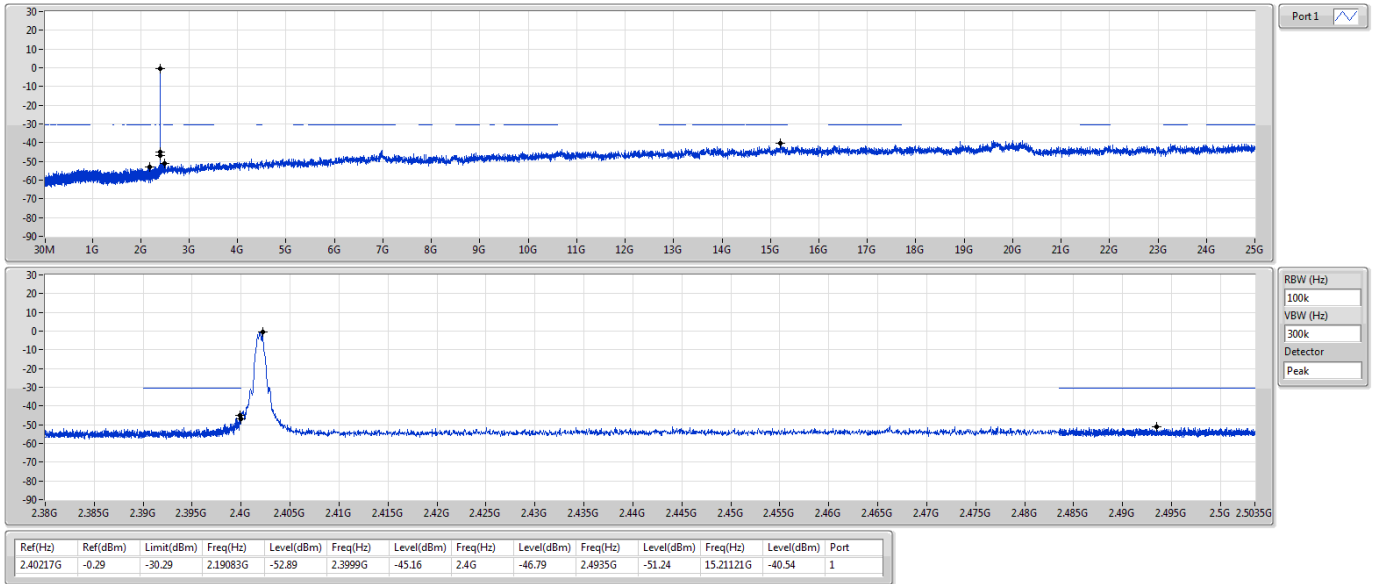
Result

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	2.40217G	-0.29	-30.29	2.19083G	-52.89	2.3999G	-45.16	2.4G	-46.79	2.4935G	-51.24	15.21121G	-40.54	1
2440MHz	Pass	2.40217G	-0.29	-30.29	2.08155G	-53.21	2.39636G	-52.17	2.4835G	-54.75	2.50196G	-51.02	24.626G	-40.48	1
2480MHz	Pass	2.40217G	-0.29	-30.29	2.15704G	-52.72	2.39459G	-51.65	2.4835G	-53.35	2.49372G	-50.84	24.61194G	-39.83	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40242G	-0.77	-30.77	1.95259G	-53.70	2.39998G	-34.19	2.4G	-34.62	2.49965G	-51.26	15.21965G	-41.69	1
2440MHz	Pass	2.40242G	-0.77	-30.77	2.11504G	-54.18	2.39834G	-52.73	2.4835G	-53.89	2.50025G	-51.28	15.21683G	-39.37	1
2480MHz	Pass	2.40242G	-0.77	-30.77	2.02691G	-53.21	2.39997G	-52.20	2.4G	-54.84	2.49857G	-51.76	15.2084G	-40.69	1

BT-LE(1Mbps)

CSEndB-DTS

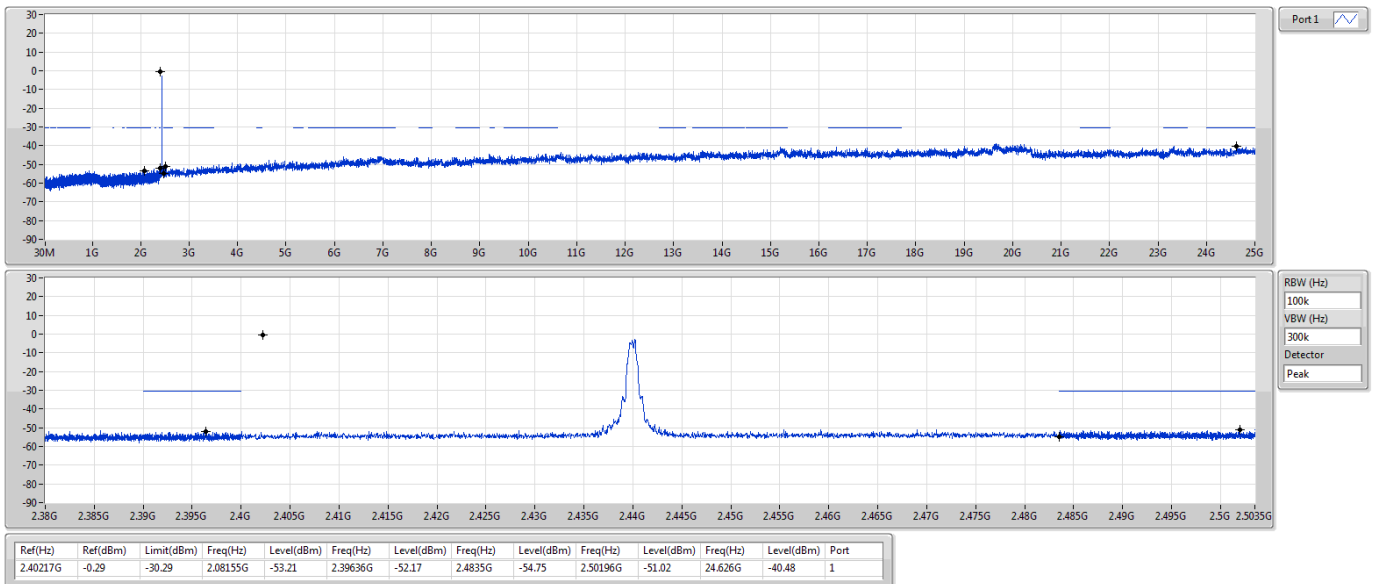
2402MHz



BT-LE(1Mbps)

CSEndB-DTS

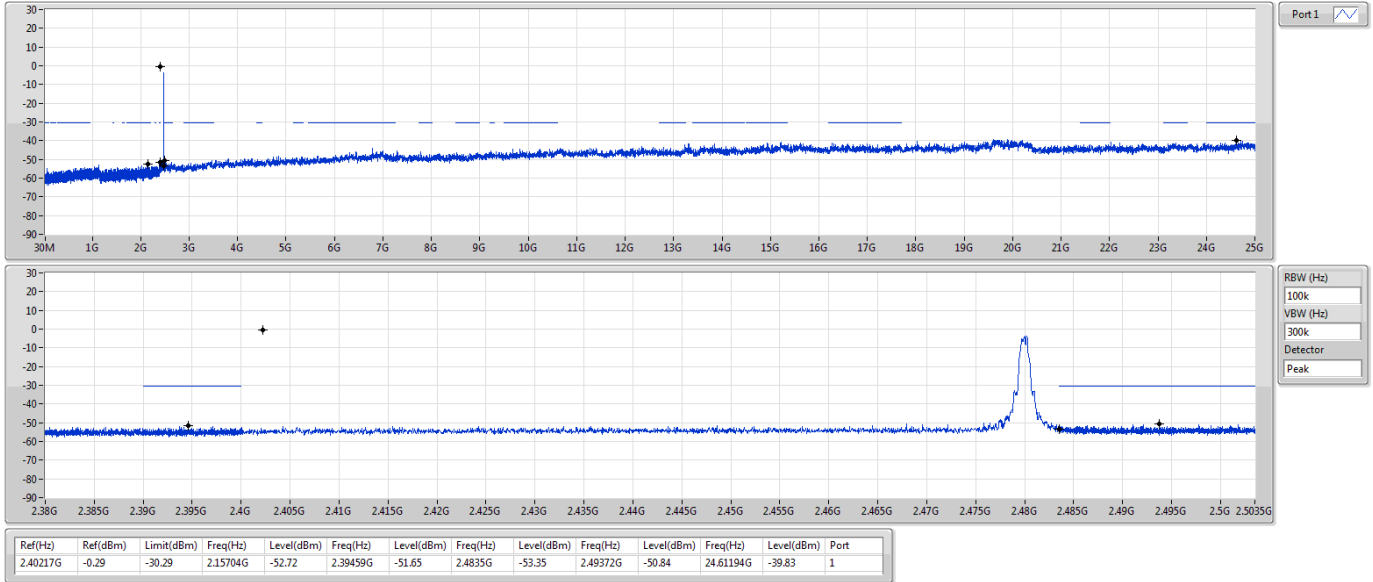
2440MHz



BT-LE(1Mbps)

CSEndB-DTS

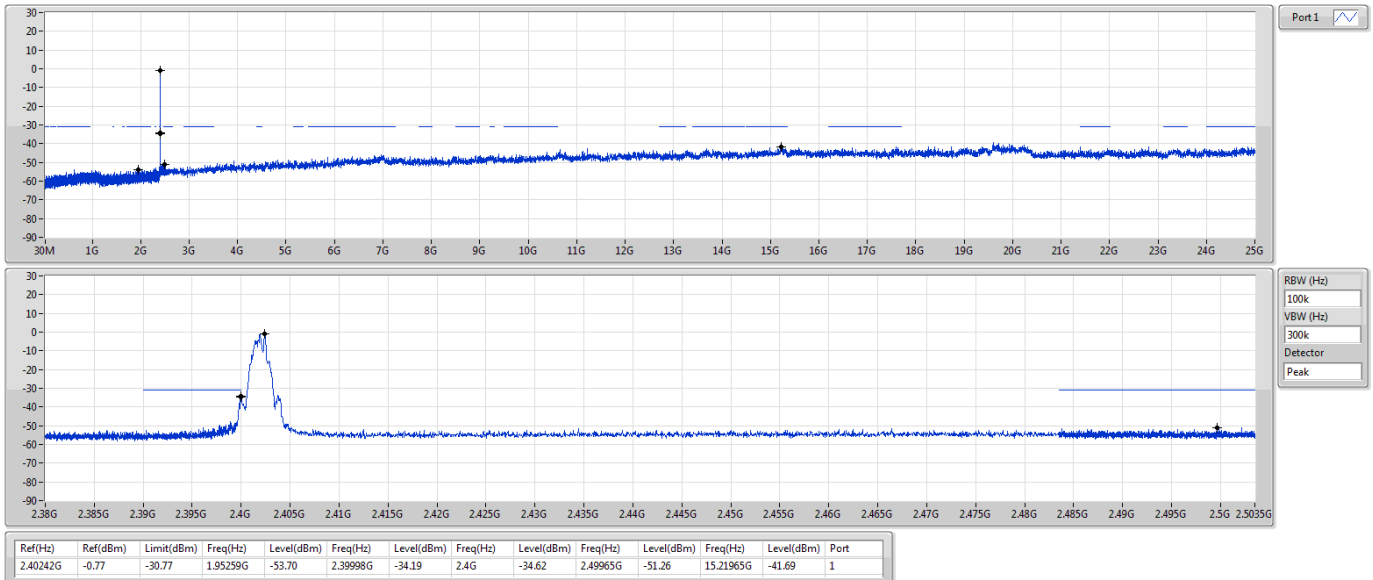
2480MHz



BT-LE(2Mbps)

CSEndB-DTS

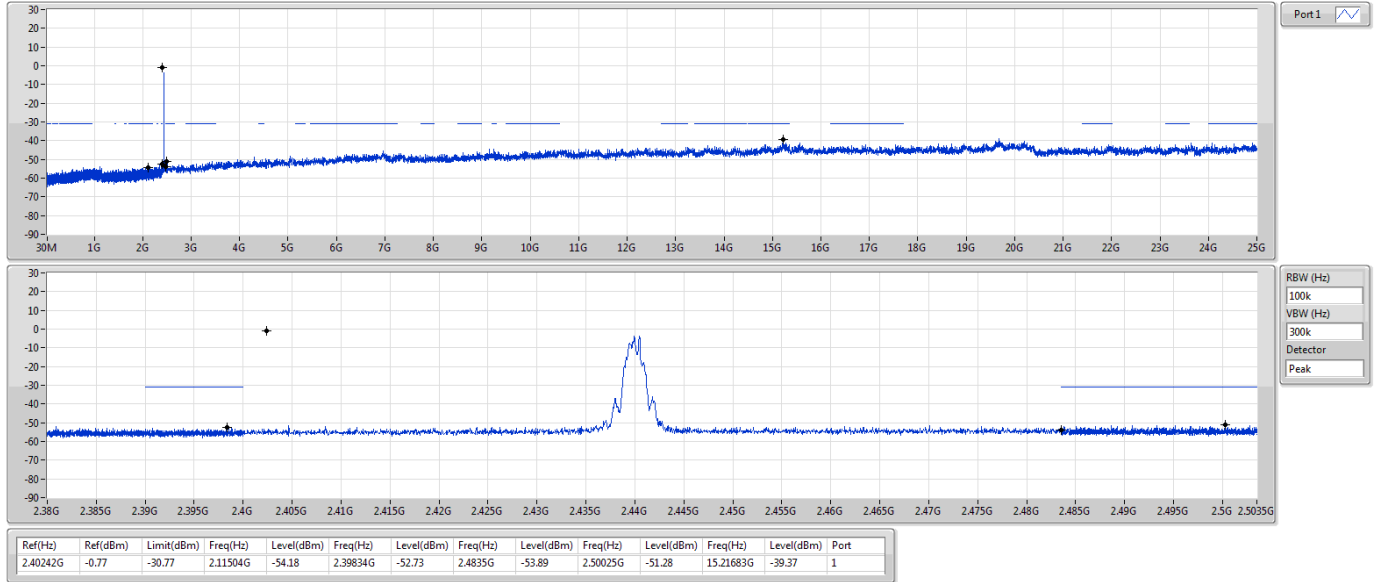
2402MHz



BT-LE(2Mbps)

CSEndB-DTS

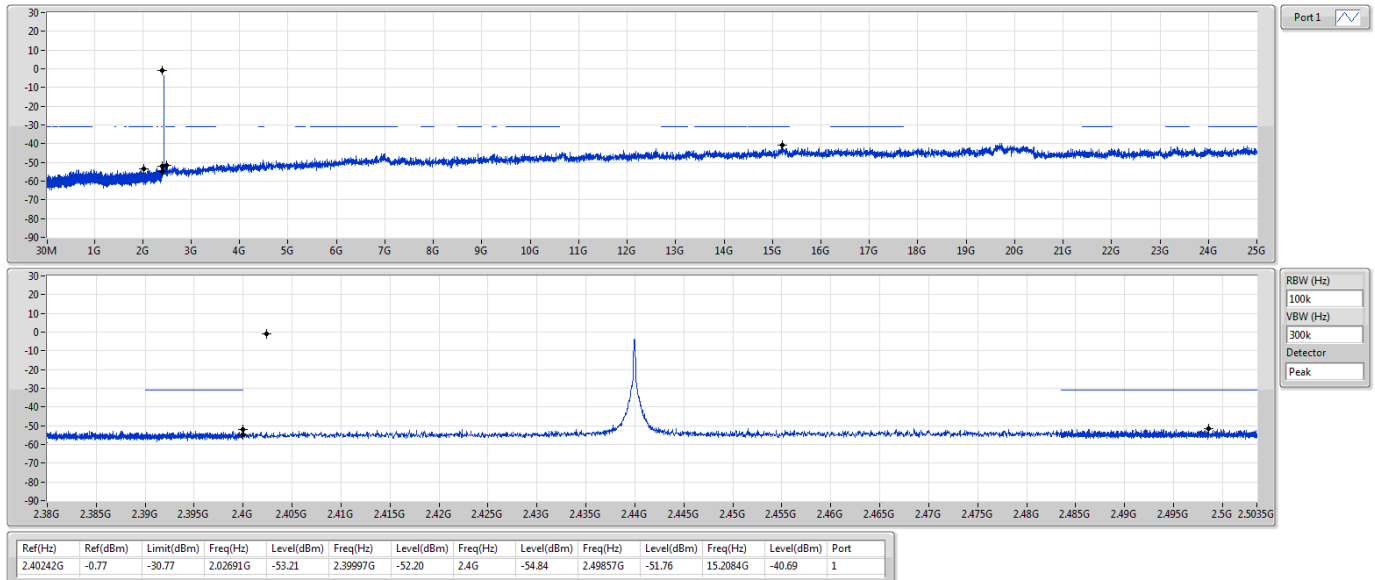
2440MHz



BT-LE(2Mbps)

CSEndB-DTS

2480MHz





Summary

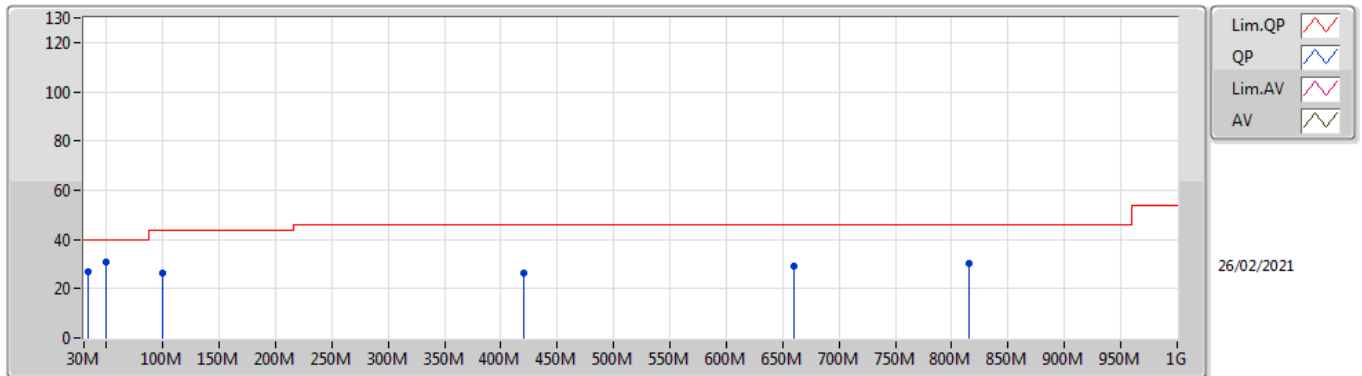
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(2Mbps)	Pass	PK	49.4M	30.75	40.00	-9.25	3	Vertical	360	1.00	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	33.88M	26.81	40.00	-13.19	3	Vertical	360	1.00	-
2440MHz	Pass	PK	49.4M	30.75	40.00	-9.25	3	Vertical	360	1.00	-
2440MHz	Pass	PK	99.84M	26.25	43.50	-17.25	3	Vertical	360	1.00	-
2440MHz	Pass	PK	419.94M	26.53	46.00	-19.47	3	Vertical	360	1.00	-
2440MHz	Pass	PK	660.5M	29.29	46.00	-16.71	3	Vertical	360	1.00	-
2440MHz	Pass	PK	815.7M	30.37	46.00	-15.63	3	Vertical	360	1.00	-
2440MHz	Pass	PK	31.94M	27.57	40.00	-12.43	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	99.84M	28.36	43.50	-15.14	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	163.86M	29.96	43.50	-13.54	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	503.36M	26.95	46.00	-19.05	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	701.24M	29.57	46.00	-16.43	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	947.62M	32.30	46.00	-13.70	3	Horizontal	0	1.00	-

BT-LE(2Mbps)

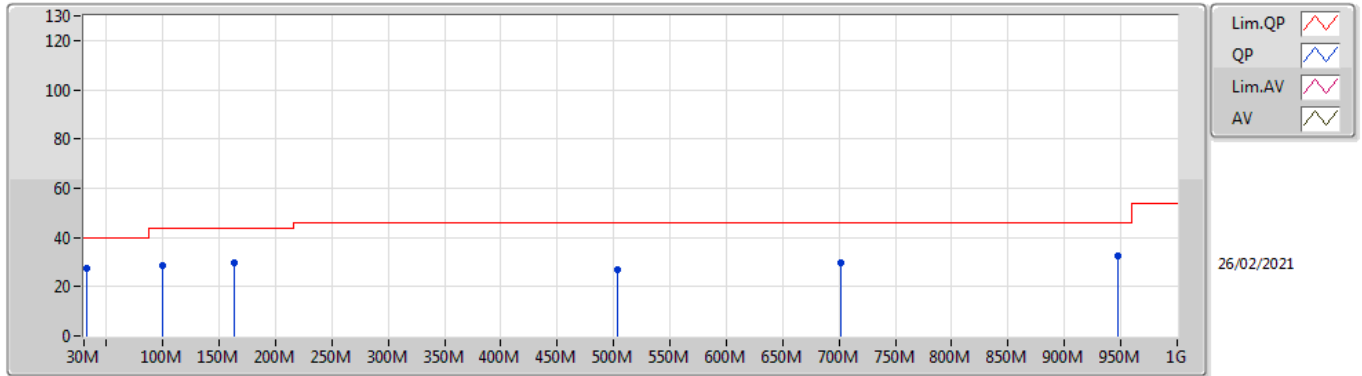
2440MHz_USB



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	33.88M	26.81	40.00	-13.19	-5.33	3	Vertical	360	1.00	-	32.14	21.33	0.90	27.56
PK	49.4M	30.75	40.00	-9.25	-13.16	3	Vertical	360	1.00	-	43.91	13.26	1.09	27.51
PK	99.84M	26.25	43.50	-17.25	-9.59	3	Vertical	360	1.00	-	35.84	16.20	1.60	27.39
PK	419.94M	26.53	46.00	-19.47	-2.30	3	Vertical	360	1.00	-	28.83	21.79	3.34	27.43
PK	660.5M	29.29	46.00	-16.71	0.56	3	Vertical	360	1.00	-	28.73	24.31	4.32	28.07
PK	815.7M	30.37	46.00	-15.63	2.58	3	Vertical	360	1.00	-	27.79	25.53	4.83	27.78

BT-LE(2Mbps)

2440MHz_USB



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	31.94M	27.57	40.00	-12.43	-4.56	3	Horizontal	0	1.00	-	32.13	22.11	0.90	27.57
PK	99.84M	28.36	43.50	-15.14	-9.59	3	Horizontal	0	1.00	-	37.95	16.20	1.60	27.39
PK	163.86M	29.96	43.50	-13.54	-10.08	3	Horizontal	0	1.00	-	40.04	14.99	2.04	27.11
PK	503.36M	26.95	46.00	-19.05	-1.25	3	Horizontal	0	1.00	-	28.20	22.85	3.71	27.81
PK	701.24M	29.57	46.00	-16.43	0.84	3	Horizontal	0	1.00	-	28.73	24.42	4.40	27.98
PK	947.62M	32.30	46.00	-13.70	4.27	3	Horizontal	0	1.00	-	28.03	26.26	5.38	27.37



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	7.44028G	49.94	54.00	-4.06	3	Vertical	84	2.40	-
BT-LE(2Mbps)	Pass	AV	2.4872G	50.76	54.00	-3.24	3	Horizontal	204	1.50	-

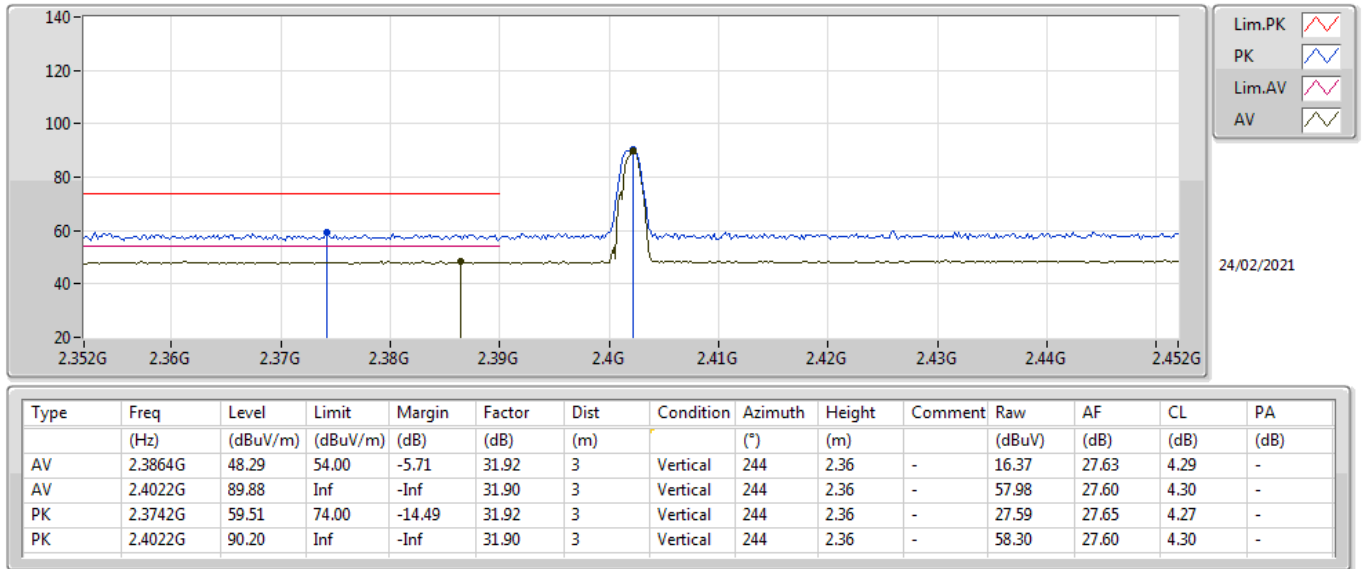
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3864G	48.29	54.00	-5.71	3	Vertical	244	2.36	-
2402MHz	Pass	AV	2.4022G	89.88	Inf	-Inf	3	Vertical	244	2.36	-
2402MHz	Pass	PK	2.3742G	59.51	74.00	-14.49	3	Vertical	244	2.36	-
2402MHz	Pass	PK	2.4022G	90.20	Inf	-Inf	3	Vertical	244	2.36	-
2402MHz	Pass	AV	2.39G	48.33	54.00	-5.67	3	Horizontal	164	1.58	-
2402MHz	Pass	AV	2.4022G	91.45	Inf	-Inf	3	Horizontal	164	1.58	-
2402MHz	Pass	PK	2.3648G	59.48	74.00	-14.52	3	Horizontal	164	1.58	-
2402MHz	Pass	PK	2.4022G	91.67	Inf	-Inf	3	Horizontal	164	1.58	-
2402MHz	Pass	AV	4.8043G	37.29	54.00	-16.71	3	Vertical	258	1.00	-
2402MHz	Pass	PK	4.80425G	47.21	74.00	-26.79	3	Vertical	258	1.00	-
2402MHz	Pass	AV	4.80434G	38.49	54.00	-15.51	3	Horizontal	189	1.21	-
2402MHz	Pass	PK	4.80469G	47.85	74.00	-26.15	3	Horizontal	189	1.21	-
2440MHz	Pass	AV	2.3876G	48.30	54.00	-5.70	3	Vertical	131	1.02	-
2440MHz	Pass	AV	2.44G	85.98	Inf	-Inf	3	Vertical	131	1.02	-
2440MHz	Pass	AV	2.4964G	48.92	54.00	-5.08	3	Vertical	131	1.02	-
2440MHz	Pass	PK	2.3752G	59.31	74.00	-14.69	3	Vertical	131	1.02	-
2440MHz	Pass	PK	2.44G	86.55	Inf	-Inf	3	Vertical	131	1.02	-
2440MHz	Pass	PK	2.4868G	59.16	74.00	-14.84	3	Vertical	131	1.02	-
2440MHz	Pass	AV	2.3632G	48.46	54.00	-5.54	3	Horizontal	11	1.72	-
2440MHz	Pass	AV	2.44G	88.23	Inf	-Inf	3	Horizontal	11	1.72	-
2440MHz	Pass	AV	2.4912G	48.66	54.00	-5.34	3	Horizontal	11	1.72	-
2440MHz	Pass	PK	2.3812G	58.66	74.00	-15.34	3	Horizontal	11	1.72	-
2440MHz	Pass	PK	2.44G	88.76	Inf	-Inf	3	Horizontal	11	1.72	-
2440MHz	Pass	PK	2.4896G	58.84	74.00	-15.16	3	Horizontal	11	1.72	-
2440MHz	Pass	AV	4.8798G	37.21	54.00	-16.79	3	Vertical	342	1.00	-
2440MHz	Pass	AV	7.32033G	48.45	54.00	-5.55	3	Vertical	100	1.18	-
2440MHz	Pass	PK	4.88054G	47.57	74.00	-26.43	3	Vertical	342	1.00	-
2440MHz	Pass	PK	7.31982G	55.01	74.00	-18.99	3	Vertical	100	1.18	-
2440MHz	Pass	AV	4.8797G	37.50	54.00	-16.50	3	Horizontal	312	1.40	-
2440MHz	Pass	AV	7.32033G	47.20	54.00	-6.80	3	Horizontal	45	1.16	-
2440MHz	Pass	PK	4.88044G	47.48	74.00	-26.52	3	Horizontal	312	1.40	-
2440MHz	Pass	PK	7.32037G	54.65	74.00	-19.35	3	Horizontal	45	1.16	-
2480MHz	Pass	AV	2.48G	84.97	Inf	-Inf	3	Vertical	247	1.00	-
2480MHz	Pass	AV	2.4912G	48.92	54.00	-5.08	3	Vertical	247	1.00	-
2480MHz	Pass	PK	2.4798G	85.60	Inf	-Inf	3	Vertical	247	1.00	-
2480MHz	Pass	PK	2.4866G	59.62	74.00	-14.38	3	Vertical	247	1.00	-
2480MHz	Pass	AV	2.48G	87.84	Inf	-Inf	3	Horizontal	171	1.80	-
2480MHz	Pass	AV	2.489G	48.66	54.00	-5.34	3	Horizontal	171	1.80	-
2480MHz	Pass	PK	2.4802G	88.41	Inf	-Inf	3	Horizontal	171	1.80	-
2480MHz	Pass	PK	2.4888G	60.12	74.00	-13.88	3	Horizontal	171	1.80	-
2480MHz	Pass	AV	4.96007G	37.01	54.00	-16.99	3	Vertical	360	1.02	-
2480MHz	Pass	AV	7.44028G	49.94	54.00	-4.06	3	Vertical	84	2.40	-
2480MHz	Pass	PK	4.96024G	47.74	74.00	-26.26	3	Vertical	360	1.02	-
2480MHz	Pass	PK	7.44044G	56.01	74.00	-17.99	3	Vertical	84	2.40	-
2480MHz	Pass	AV	4.96017G	39.79	54.00	-14.21	3	Horizontal	352	2.90	-
2480MHz	Pass	AV	7.44028G	49.50	54.00	-4.50	3	Horizontal	282	1.02	-
2480MHz	Pass	PK	4.95967G	48.82	74.00	-25.18	3	Horizontal	352	2.90	-
2480MHz	Pass	PK	7.44053G	55.63	74.00	-18.37	3	Horizontal	282	1.02	-
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3844G	49.89	54.00	-4.11	3	Vertical	134	1.03	-
2402MHz	Pass	AV	2.4024G	89.30	Inf	-Inf	3	Vertical	134	1.03	-
2402MHz	Pass	PK	2.3852G	59.34	74.00	-14.66	3	Vertical	134	1.03	-
2402MHz	Pass	PK	2.4024G	89.49	Inf	-Inf	3	Vertical	134	1.03	-
2402MHz	Pass	AV	2.378G	49.88	54.00	-4.12	3	Horizontal	162	1.41	-

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2402MHz	Pass	AV	2.4024G	91.26	Inf	-Inf	3	Horizontal	162	1.41	-
2402MHz	Pass	PK	2.3626G	59.61	74.00	-14.39	3	Horizontal	162	1.41	-
2402MHz	Pass	PK	2.4024G	91.39	Inf	-Inf	3	Horizontal	162	1.41	-
2402MHz	Pass	AV	4.80394G	37.72	54.00	-16.28	3	Vertical	150	1.57	-
2402MHz	Pass	PK	4.80406G	47.26	74.00	-26.74	3	Vertical	150	1.57	-
2402MHz	Pass	AV	4.8049G	37.63	54.00	-16.37	3	Horizontal	0	1.64	-
2402MHz	Pass	PK	4.80148G	46.22	74.00	-27.78	3	Horizontal	0	1.64	-
2440MHz	Pass	AV	2.39G	49.74	54.00	-4.26	3	Vertical	103	1.38	-
2440MHz	Pass	AV	2.4404G	87.91	Inf	-Inf	3	Vertical	103	1.38	-
2440MHz	Pass	AV	2.4856G	50.11	54.00	-3.89	3	Vertical	103	1.38	-
2440MHz	Pass	PK	2.346G	59.19	74.00	-14.81	3	Vertical	103	1.38	-
2440MHz	Pass	PK	2.4404G	88.09	Inf	-Inf	3	Vertical	103	1.38	-
2440MHz	Pass	PK	2.486G	59.01	74.00	-14.99	3	Vertical	103	1.38	-
2440MHz	Pass	AV	2.3892G	49.73	54.00	-4.27	3	Horizontal	205	1.50	-
2440MHz	Pass	AV	2.4404G	92.34	Inf	-Inf	3	Horizontal	205	1.50	-
2440MHz	Pass	AV	2.4868G	49.89	54.00	-4.11	3	Horizontal	205	1.50	-
2440MHz	Pass	PK	2.3696G	59.00	74.00	-15.00	3	Horizontal	205	1.50	-
2440MHz	Pass	PK	2.4404G	92.48	Inf	-Inf	3	Horizontal	205	1.50	-
2440MHz	Pass	PK	2.4924G	59.31	74.00	-14.69	3	Horizontal	205	1.50	-
2440MHz	Pass	AV	4.88078G	37.86	54.00	-16.14	3	Vertical	84	1.38	-
2440MHz	Pass	AV	7.32138G	48.16	54.00	-5.84	3	Vertical	173	1.50	-
2440MHz	Pass	PK	4.8797G	46.62	74.00	-27.38	3	Vertical	84	1.38	-
2440MHz	Pass	PK	7.32138G	57.39	74.00	-16.61	3	Vertical	173	1.50	-
2440MHz	Pass	AV	4.88102G	39.83	54.00	-14.17	3	Horizontal	172	1.46	-
2440MHz	Pass	AV	7.32138G	47.29	54.00	-6.71	3	Horizontal	340	1.13	-
2440MHz	Pass	PK	4.88078G	47.09	74.00	-26.91	3	Horizontal	172	1.46	-
2440MHz	Pass	PK	7.32138G	53.70	74.00	-20.30	3	Horizontal	340	1.13	-
2480MHz	Pass	AV	2.4804G	87.21	Inf	-Inf	3	Vertical	103	1.12	-
2480MHz	Pass	AV	2.487G	50.12	54.00	-3.88	3	Vertical	103	1.12	-
2480MHz	Pass	PK	2.4804G	87.41	Inf	-Inf	3	Vertical	103	1.12	-
2480MHz	Pass	PK	2.4835G	59.90	74.00	-14.10	3	Vertical	103	1.12	-
2480MHz	Pass	AV	2.4804G	92.01	Inf	-Inf	3	Horizontal	204	1.50	-
2480MHz	Pass	AV	2.4872G	50.76	54.00	-3.24	3	Horizontal	204	1.50	-
2480MHz	Pass	PK	2.4804G	92.17	Inf	-Inf	3	Horizontal	204	1.50	-
2480MHz	Pass	PK	2.4894G	59.69	74.00	-14.31	3	Horizontal	204	1.50	-
2480MHz	Pass	AV	4.9609G	38.90	54.00	-15.10	3	Vertical	153	1.50	-
2480MHz	Pass	AV	7.44138G	49.20	54.00	-4.80	3	Vertical	215	2.32	-
2480MHz	Pass	PK	4.9669G	47.17	74.00	-26.83	3	Vertical	153	1.50	-
2480MHz	Pass	PK	7.44114G	54.36	74.00	-19.64	3	Vertical	215	2.32	-
2480MHz	Pass	AV	4.96084G	41.33	54.00	-12.67	3	Horizontal	175	1.50	-
2480MHz	Pass	AV	7.44132G	50.01	54.00	-3.99	3	Horizontal	138	1.11	-
2480MHz	Pass	PK	4.9609G	47.70	74.00	-26.30	3	Horizontal	175	1.50	-
2480MHz	Pass	PK	7.43988G	54.64	74.00	-19.36	3	Horizontal	138	1.11	-

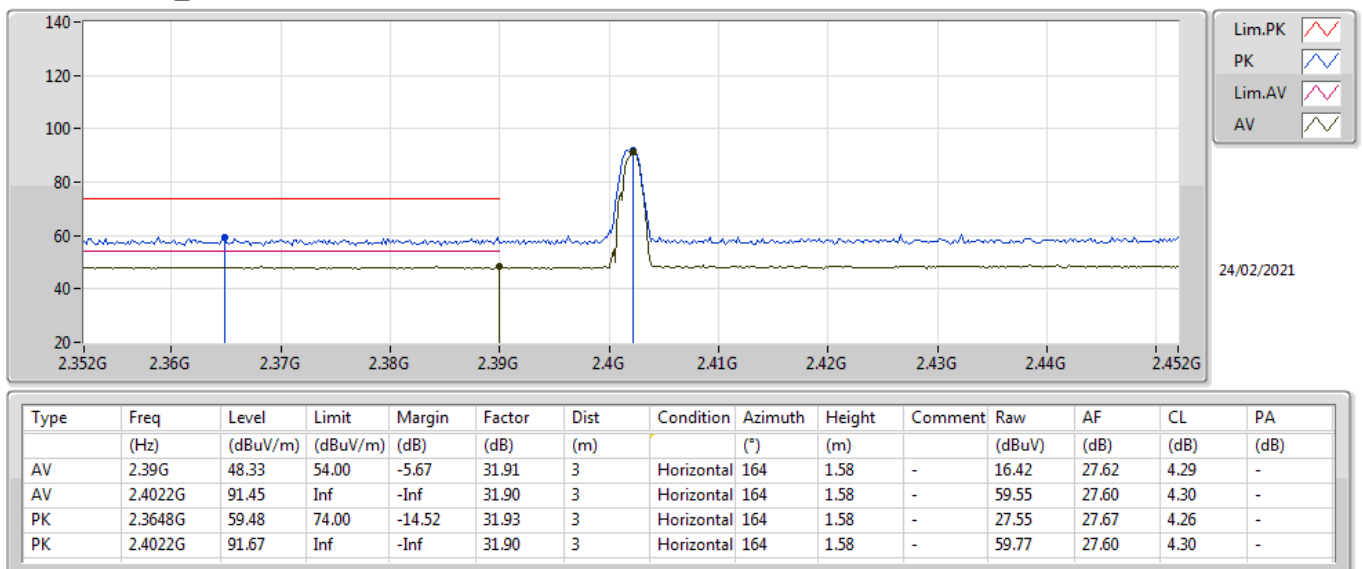
BT-LE(1Mbps)

2402MHz_TX



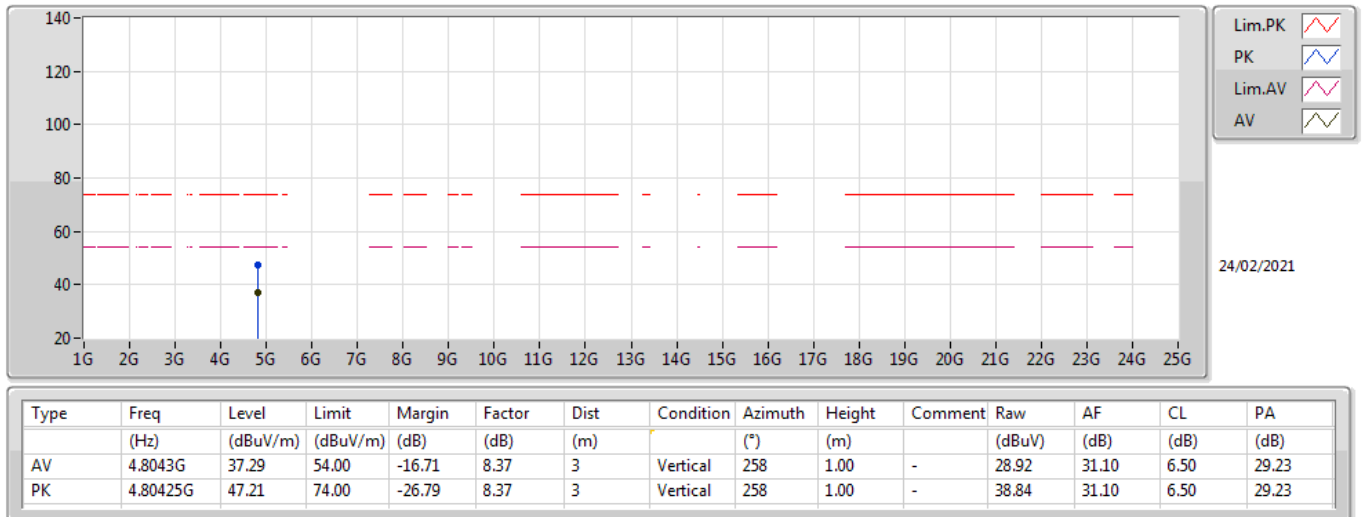
BT-LE(1Mbps)

2402MHz_TX



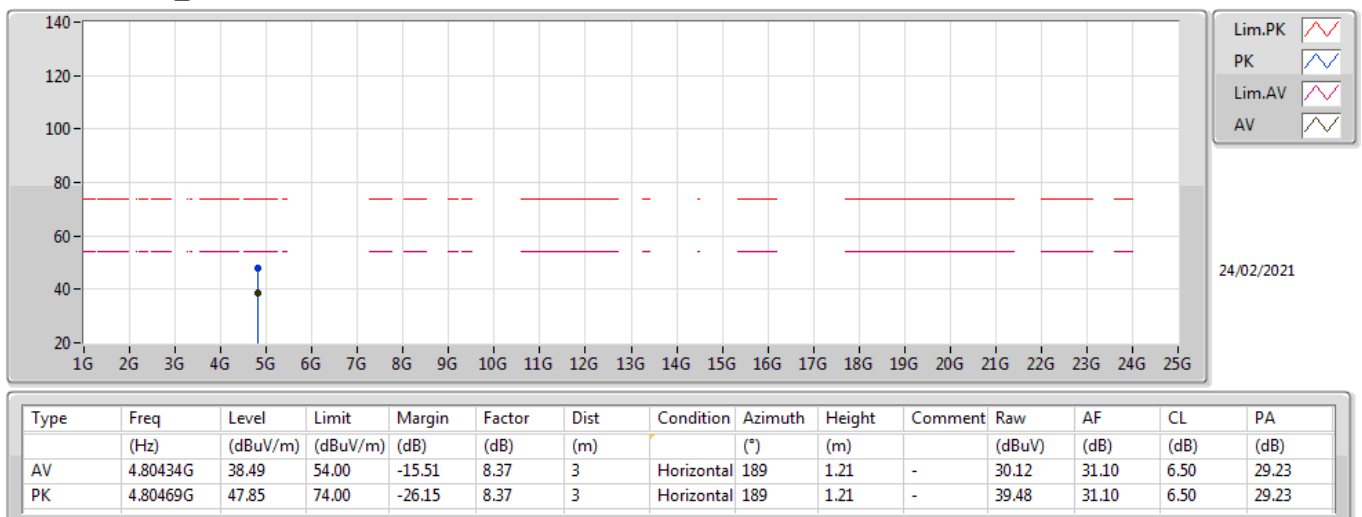
BT-LE(1Mbps)

2402MHz_TX



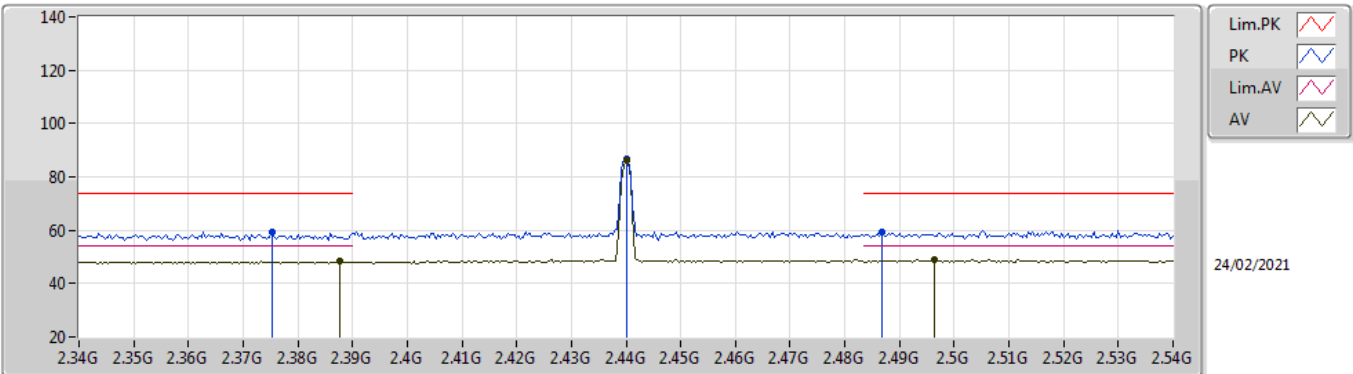
BT-LE(1Mbps)

2402MHz_TX



BT-LE(1Mbps)

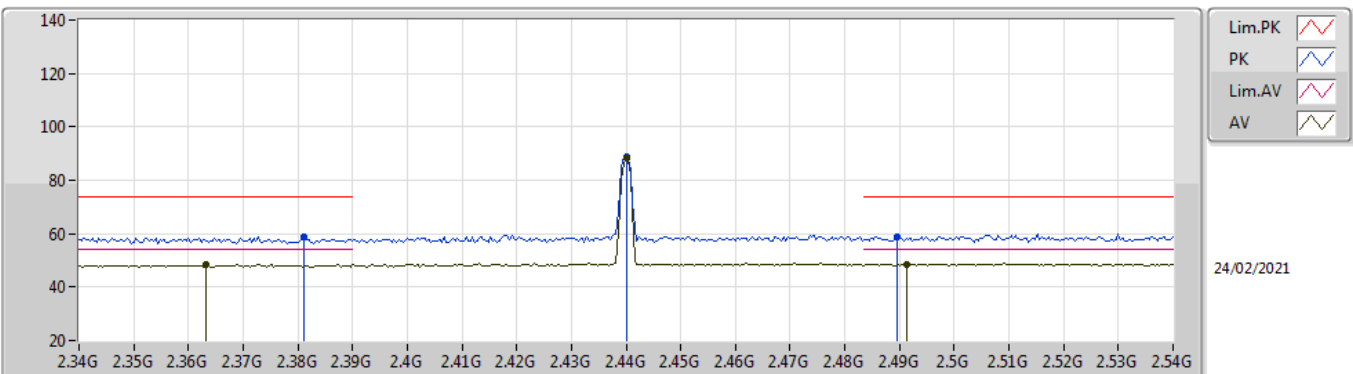
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3876G	48.30	54.00	-5.70	31.91	3	Vertical	131	1.02	-	16.39	27.62	4.29	-
AV	2.44G	85.98	Inf	-Inf	31.86	3	Vertical	131	1.02	-	54.12	27.52	4.34	-
AV	2.4964G	48.92	54.00	-5.08	31.81	3	Vertical	131	1.02	-	17.11	27.41	4.40	-
PK	2.3752G	59.31	74.00	-14.69	31.93	3	Vertical	131	1.02	-	27.38	27.65	4.28	-
PK	2.44G	86.55	Inf	-Inf	31.86	3	Vertical	131	1.02	-	54.69	27.52	4.34	-
PK	2.4868G	59.16	74.00	-14.84	31.82	3	Vertical	131	1.02	-	27.34	27.43	4.39	-

BT-LE(1Mbps)

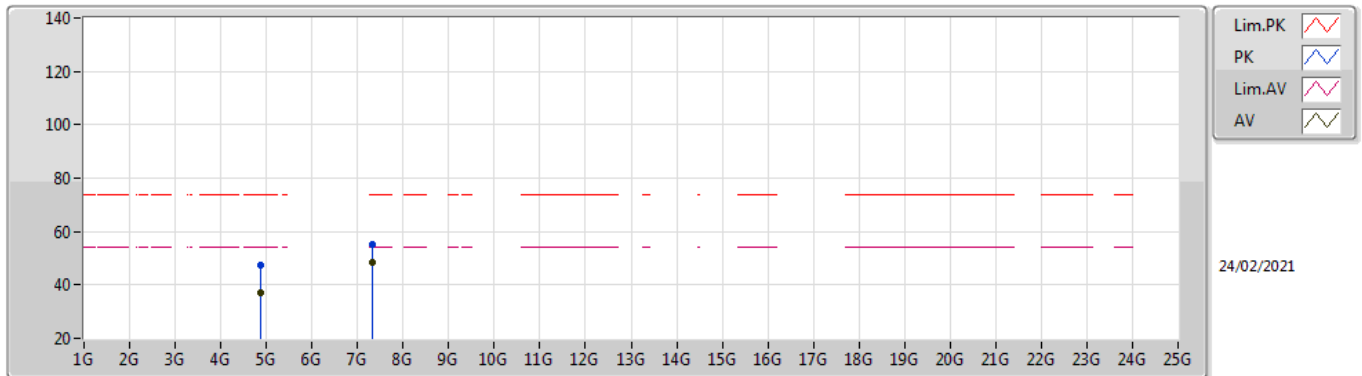
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3632G	48.46	54.00	-5.54	31.93	3	Horizontal	11	1.72	-	16.53	27.67	4.26	-
AV	2.44G	88.23	Inf	-Inf	31.86	3	Horizontal	11	1.72	-	56.37	27.52	4.34	-
AV	2.4912G	48.66	54.00	-5.34	31.81	3	Horizontal	11	1.72	-	16.85	27.42	4.39	-
PK	2.3812G	58.66	74.00	-15.34	31.92	3	Horizontal	11	1.72	-	26.74	27.64	4.28	-
PK	2.44G	88.76	Inf	-Inf	31.86	3	Horizontal	11	1.72	-	56.90	27.52	4.34	-
PK	2.4896G	58.84	74.00	-15.16	31.81	3	Horizontal	11	1.72	-	27.03	27.42	4.39	-

BT-LE(1Mbps)

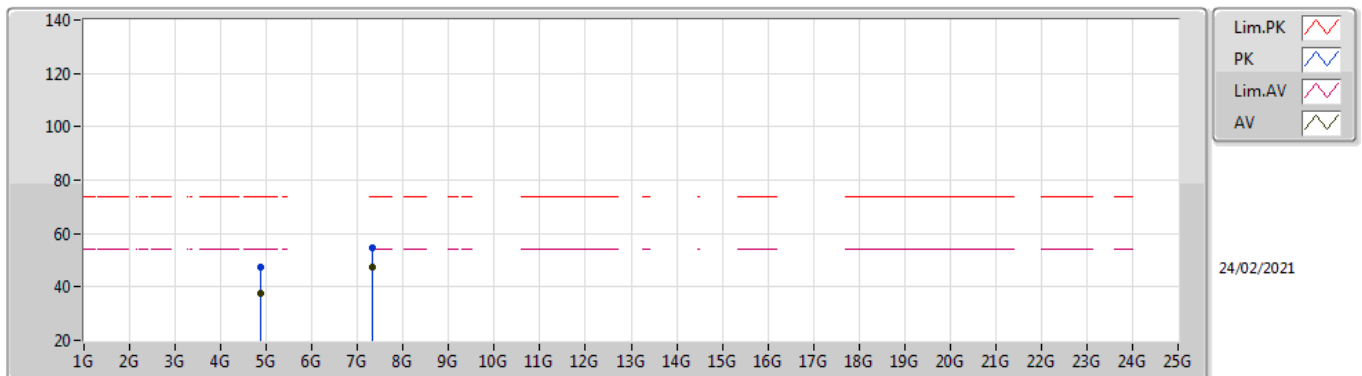
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.8798G	37.21	54.00	-16.79	8.47	3	Vertical	342	1.00	-	28.74	31.10	6.58	29.21
AV	7.32033G	48.45	54.00	-5.55	13.77	3	Vertical	100	1.18	-	34.68	36.34	7.60	30.17
PK	4.88054G	47.57	74.00	-26.43	8.47	3	Vertical	342	1.00	-	39.10	31.10	6.58	29.21
PK	7.31982G	55.01	74.00	-18.99	13.77	3	Vertical	100	1.18	-	41.24	36.34	7.60	30.17

BT-LE(1Mbps)

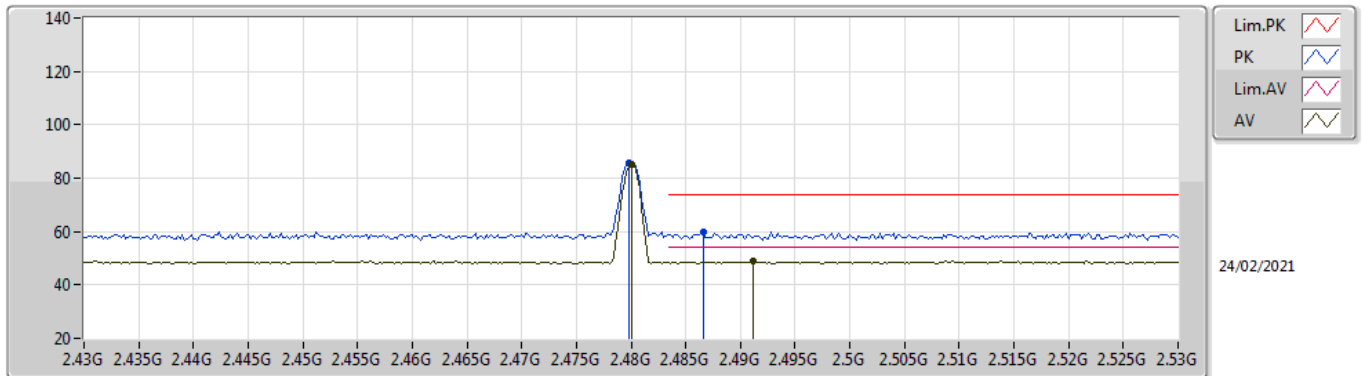
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.8797G	37.50	54.00	-16.50	8.47	3	Horizontal	312	1.40	-	29.03	31.10	6.58	29.21
AV	7.32033G	47.20	54.00	-6.80	13.77	3	Horizontal	45	1.16	-	33.43	36.34	7.60	30.17
PK	4.88044G	47.48	74.00	-26.52	8.47	3	Horizontal	312	1.40	-	39.01	31.10	6.58	29.21
PK	7.32037G	54.65	74.00	-19.35	13.77	3	Horizontal	45	1.16	-	40.88	36.34	7.60	30.17

BT-LE(1Mbps)

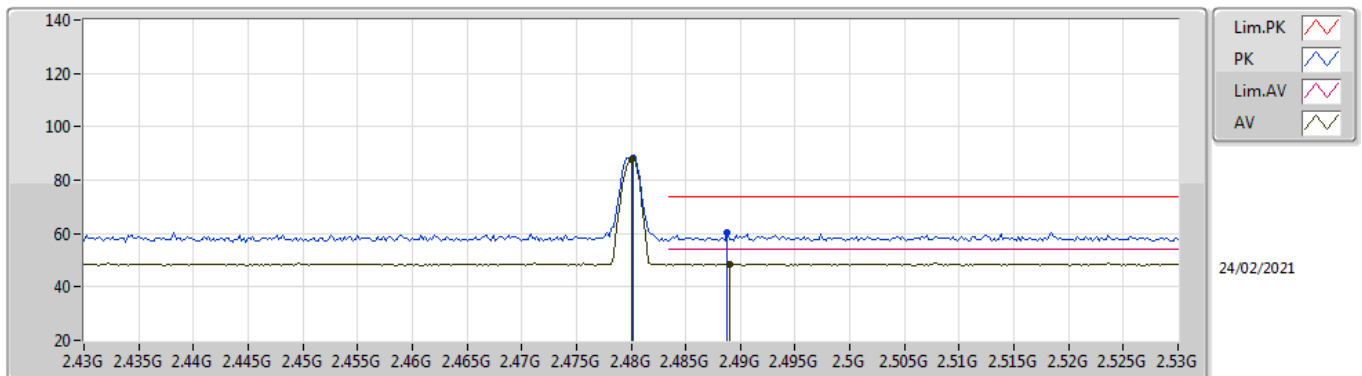
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	84.97	Inf	-Inf	31.82	3	Vertical	247	1.00	-	53.15	27.44	4.38	-
AV	2.4912G	48.92	54.00	-5.08	31.81	3	Vertical	247	1.00	-	17.11	27.42	4.39	-
PK	2.4798G	85.60	Inf	-Inf	31.82	3	Vertical	247	1.00	-	53.78	27.44	4.38	-
PK	2.4866G	59.62	74.00	-14.38	31.82	3	Vertical	247	1.00	-	27.80	27.43	4.39	-

BT-LE(1Mbps)

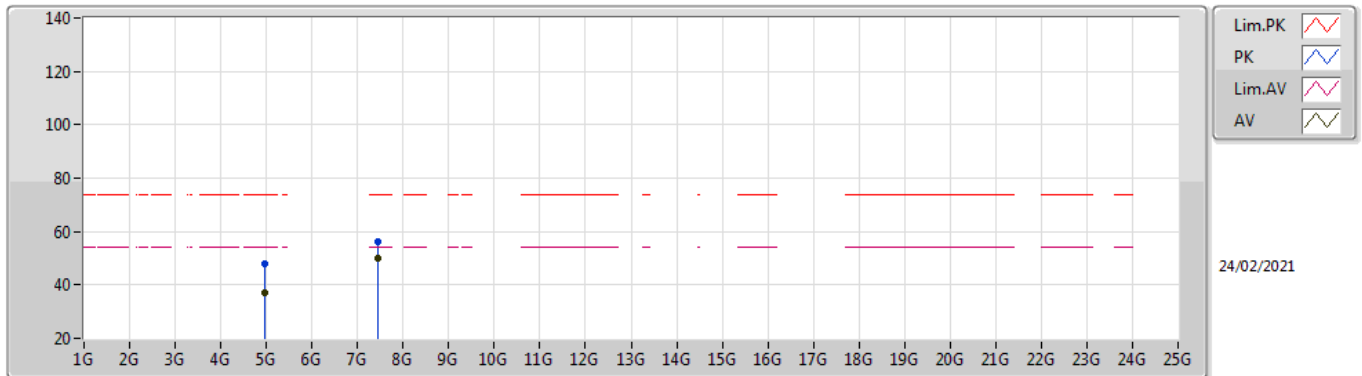
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	87.84	Inf	-Inf	31.82	3	Horizontal	171	1.80	-	56.02	27.44	4.38	-
AV	2.489G	48.66	54.00	-5.34	31.81	3	Horizontal	171	1.80	-	16.85	27.42	4.39	-
PK	2.4802G	88.41	Inf	-Inf	31.82	3	Horizontal	171	1.80	-	56.59	27.44	4.38	-
PK	2.4888G	60.12	74.00	-13.88	31.81	3	Horizontal	171	1.80	-	28.31	27.42	4.39	-

BT-LE(1Mbps)

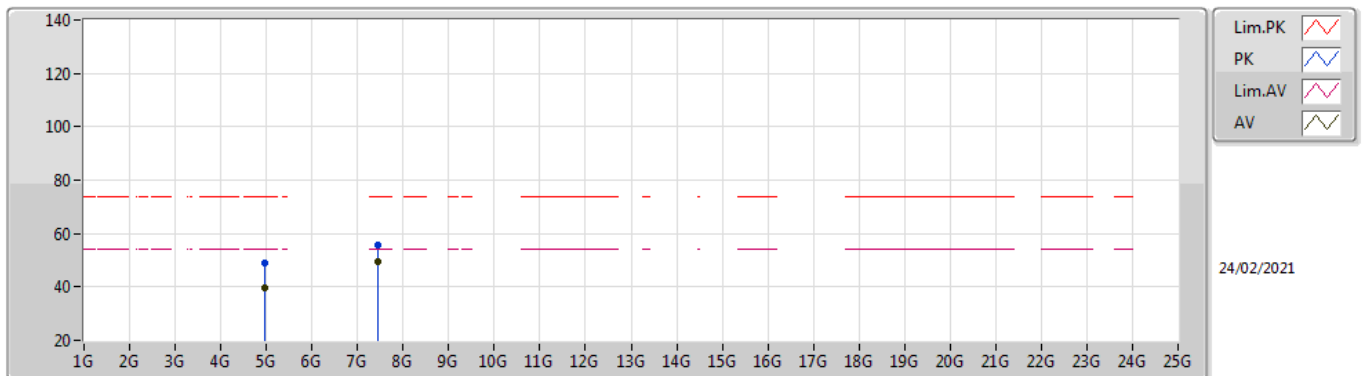
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96007G	37.01	54.00	-16.99	8.68	3	Vertical	360	1.02	-	28.33	31.20	6.66	29.18
AV	7.44028G	49.94	54.00	-4.06	13.62	3	Vertical	84	2.40	-	36.32	36.24	7.64	30.26
PK	4.96024G	47.74	74.00	-26.26	8.68	3	Vertical	360	1.02	-	39.06	31.20	6.66	29.18
PK	7.44044G	56.01	74.00	-17.99	13.62	3	Vertical	84	2.40	-	42.39	36.24	7.64	30.26

BT-LE(1Mbps)

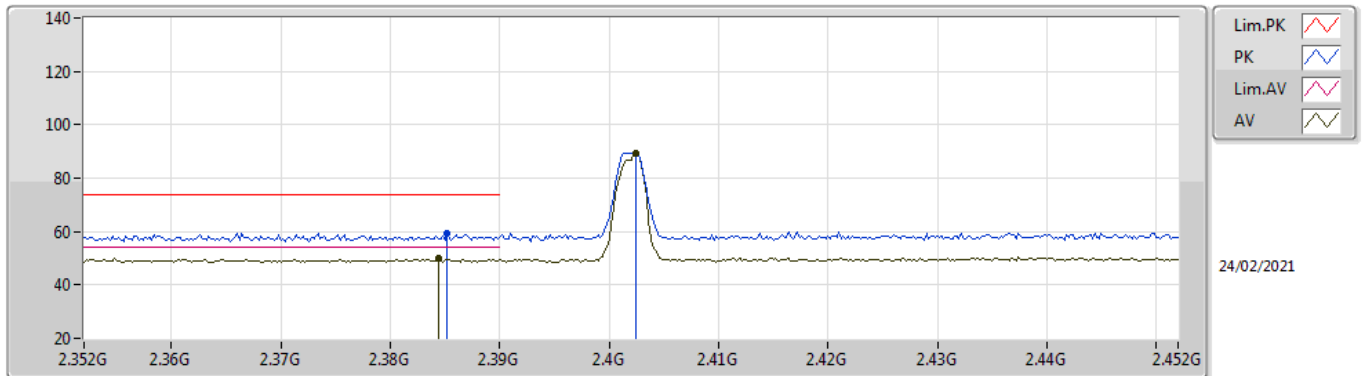
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96017G	39.79	54.00	-14.21	8.68	3	Horizontal	352	2.90	-	31.11	31.20	6.66	29.18
AV	7.44028G	49.50	54.00	-4.50	13.62	3	Horizontal	282	1.02	-	35.88	36.24	7.64	30.26
PK	4.95967G	48.82	74.00	-25.18	8.68	3	Horizontal	352	2.90	-	40.14	31.20	6.66	29.18
PK	7.44053G	55.63	74.00	-18.37	13.62	3	Horizontal	282	1.02	-	42.01	36.24	7.64	30.26

BT-LE(2Mbps)

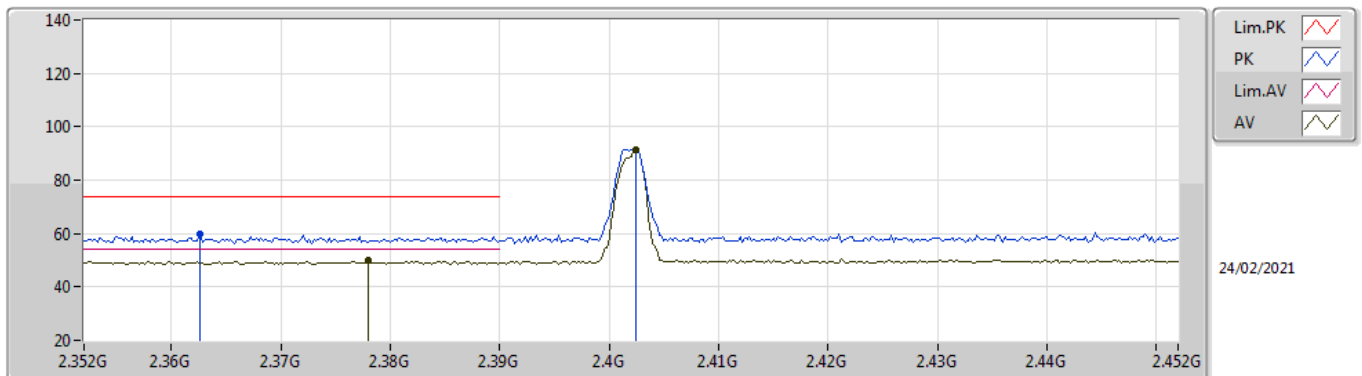
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3844G	49.89	54.00	-4.11	31.91	3	Vertical	134	1.03	-	17.98	27.63	4.28	-
AV	2.4024G	89.30	Inf	-Inf	31.90	3	Vertical	134	1.03	-	57.40	27.60	4.30	-
PK	2.3852G	59.34	74.00	-14.66	31.92	3	Vertical	134	1.03	-	27.42	27.63	4.29	-
PK	2.4024G	89.49	Inf	-Inf	31.90	3	Vertical	134	1.03	-	57.59	27.60	4.30	-

BT-LE(2Mbps)

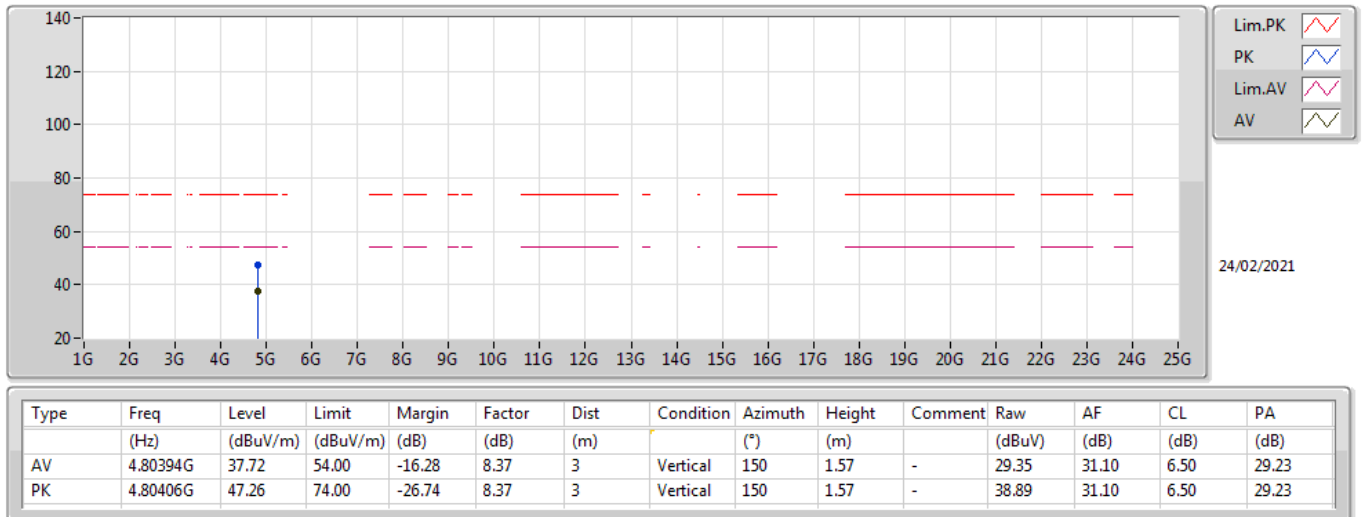
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.378G	49.88	54.00	-4.12	31.92	3	Horizontal	162	1.41	-	17.96	27.64	4.28	-
AV	2.4024G	91.26	Inf	-Inf	31.90	3	Horizontal	162	1.41	-	59.36	27.60	4.30	-
PK	2.3626G	59.61	74.00	-14.39	31.93	3	Horizontal	162	1.41	-	27.68	27.67	4.26	-
PK	2.4024G	91.39	Inf	-Inf	31.90	3	Horizontal	162	1.41	-	59.49	27.60	4.30	-

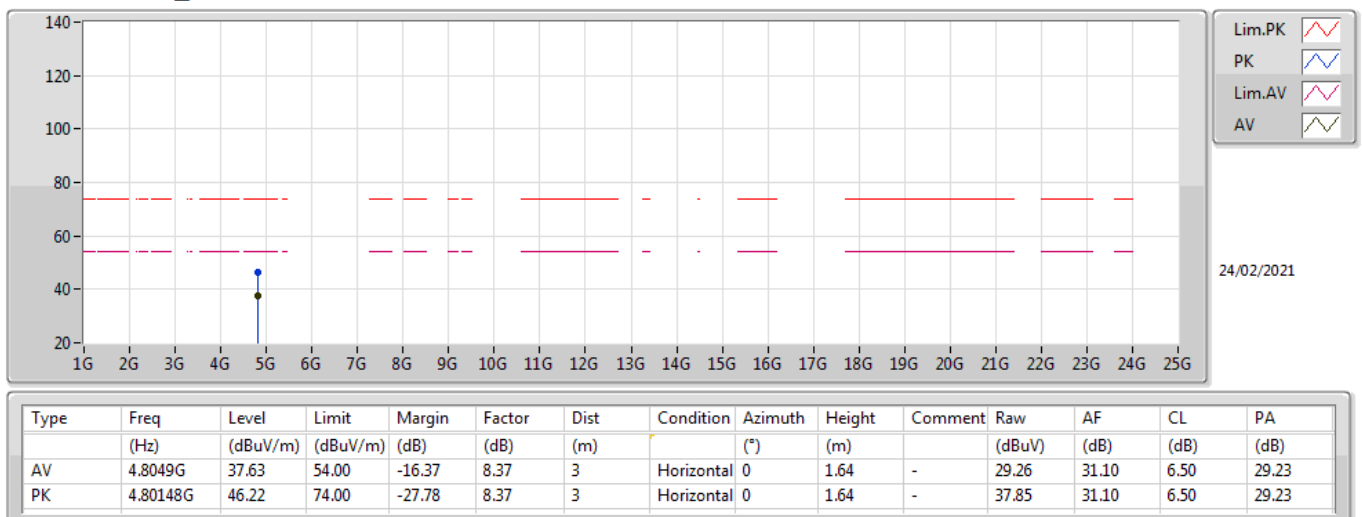
BT-LE(2Mbps)

2402MHz_TX



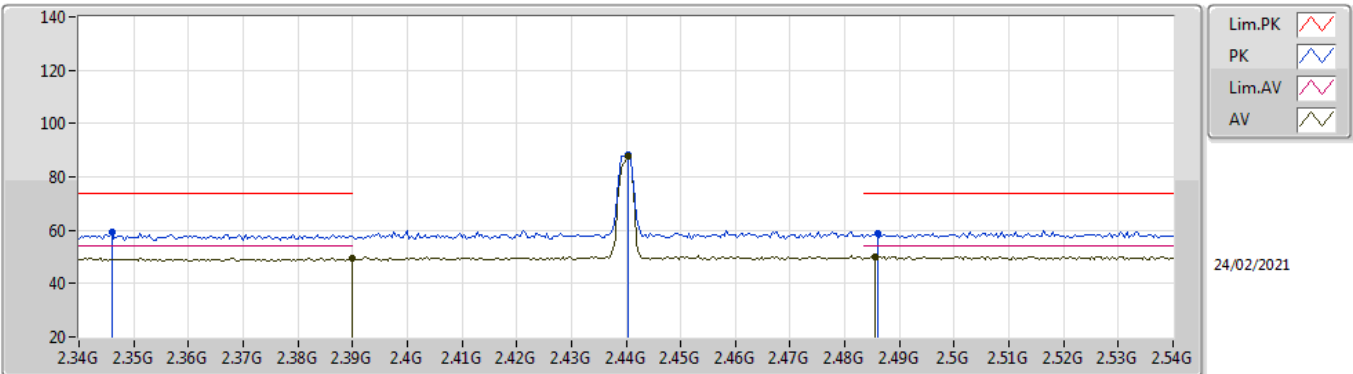
BT-LE(2Mbps)

2402MHz_TX



BT-LE(2Mbps)

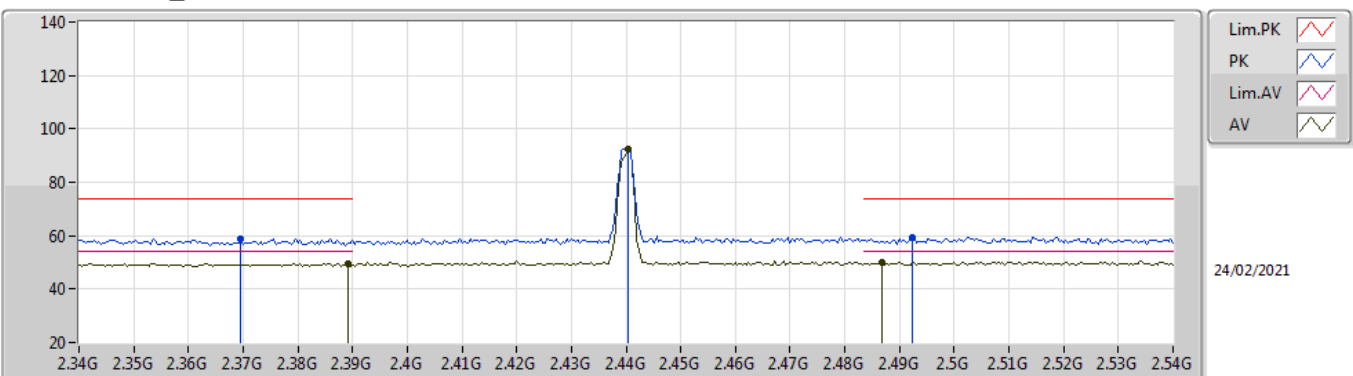
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.39G	49.74	54.00	-4.26	31.91	3	Vertical	103	1.38	-	17.83	27.62	4.29	-
AV	2.4404G	87.91	Inf	-Inf	31.86	3	Vertical	103	1.38	-	56.05	27.52	4.34	-
AV	2.4856G	50.11	54.00	-3.89	31.82	3	Vertical	103	1.38	-	18.29	27.43	4.39	-
PK	2.346G	59.19	74.00	-14.81	31.97	3	Vertical	103	1.38	-	27.22	27.72	4.25	-
PK	2.4404G	88.09	Inf	-Inf	31.86	3	Vertical	103	1.38	-	56.23	27.52	4.34	-
PK	2.486G	59.01	74.00	-14.99	31.82	3	Vertical	103	1.38	-	27.19	27.43	4.39	-

BT-LE(2Mbps)

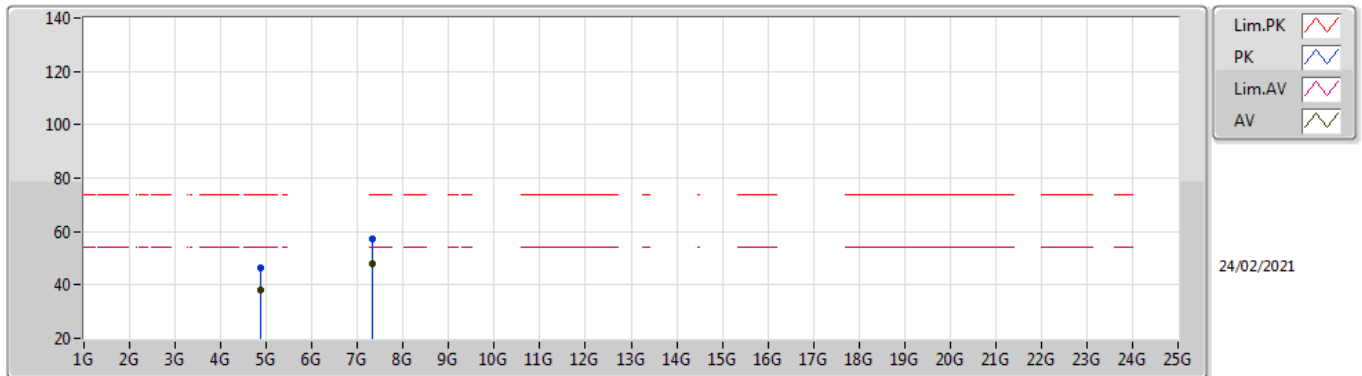
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3892G	49.73	54.00	-4.27	31.91	3	Horizontal	205	1.50	-	17.82	27.62	4.29	-
AV	2.4404G	92.34	Inf	-Inf	31.86	3	Horizontal	205	1.50	-	60.48	27.52	4.34	-
AV	2.4868G	49.89	54.00	-4.11	31.82	3	Horizontal	205	1.50	-	18.07	27.43	4.39	-
PK	2.3696G	59.00	74.00	-15.00	31.93	3	Horizontal	205	1.50	-	27.07	27.66	4.27	-
PK	2.4404G	92.48	Inf	-Inf	31.86	3	Horizontal	205	1.50	-	60.62	27.52	4.34	-
PK	2.4924G	59.31	74.00	-14.69	31.81	3	Horizontal	205	1.50	-	27.50	27.42	4.39	-

BT-LE(2Mbps)

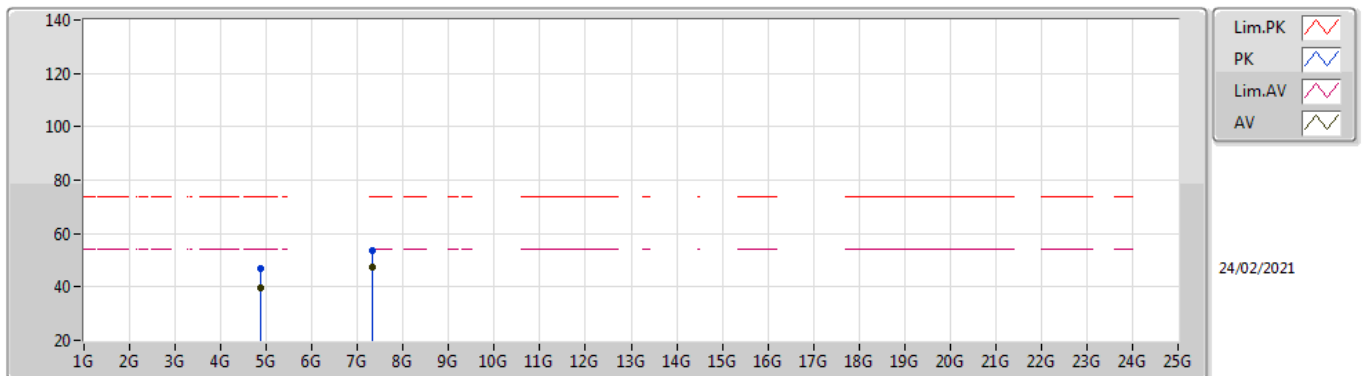
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88078G	37.86	54.00	-16.14	8.47	3	Vertical	84	1.38	-	29.39	31.10	6.58	29.21
AV	7.32138G	48.16	54.00	-5.84	13.77	3	Vertical	173	1.50	-	34.39	36.34	7.60	30.17
PK	4.8797G	46.62	74.00	-27.38	8.47	3	Vertical	84	1.38	-	38.15	31.10	6.58	29.21
PK	7.32138G	57.39	74.00	-16.61	13.77	3	Vertical	173	1.50	-	43.62	36.34	7.60	30.17

BT-LE(2Mbps)

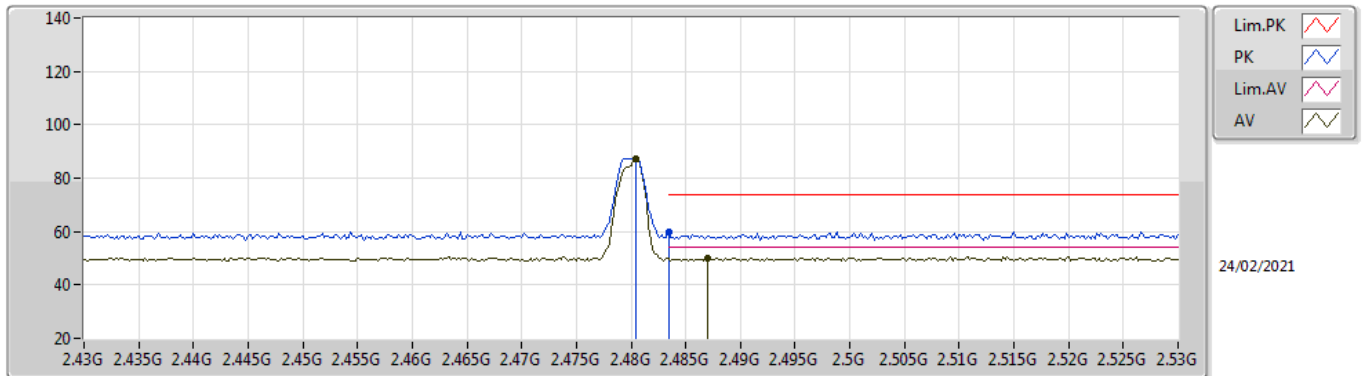
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88102G	39.83	54.00	-14.17	8.47	3	Horizontal	172	1.46	-	31.36	31.10	6.58	29.21
AV	7.32138G	47.29	54.00	-6.71	13.77	3	Horizontal	340	1.13	-	33.52	36.34	7.60	30.17
PK	4.88078G	47.09	74.00	-26.91	8.47	3	Horizontal	172	1.46	-	38.62	31.10	6.58	29.21
PK	7.32138G	53.70	74.00	-20.30	13.77	3	Horizontal	340	1.13	-	39.93	36.34	7.60	30.17

BT-LE(2Mbps)

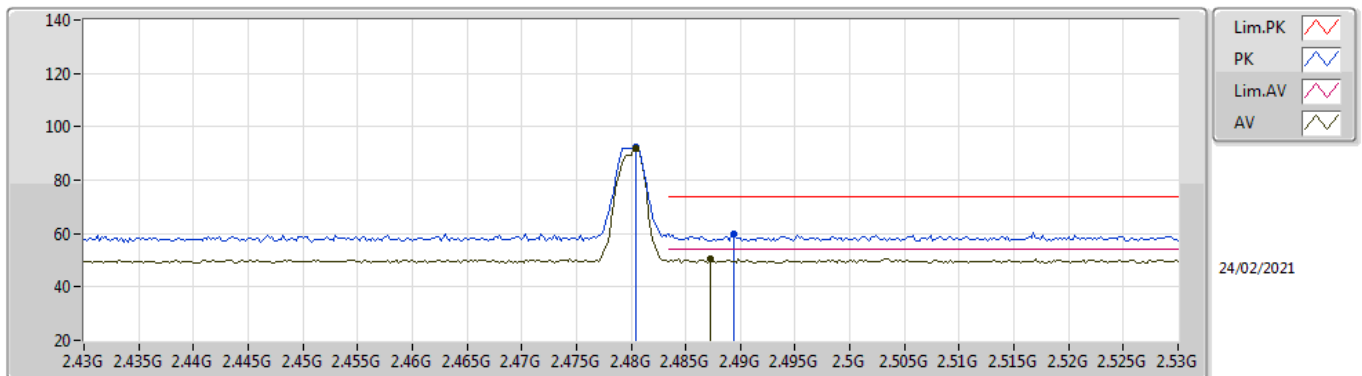
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.4804G	87.21	Inf	-Inf	31.82	3	Vertical	103	1.12	-	55.39	27.44	4.38	-
AV	2.487G	50.12	54.00	-3.88	31.82	3	Vertical	103	1.12	-	18.30	27.43	4.39	-
PK	2.4804G	87.41	Inf	-Inf	31.82	3	Vertical	103	1.12	-	55.59	27.44	4.38	-
PK	2.4835G	59.90	74.00	-14.10	31.81	3	Vertical	103	1.12	-	28.09	27.43	4.38	-

BT-LE(2Mbps)

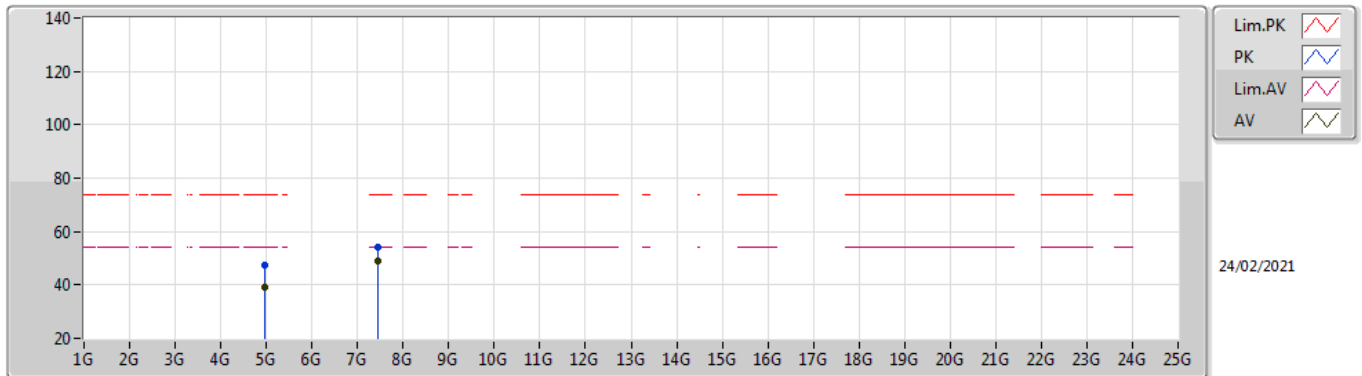
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.4804G	92.01	Inf	-Inf	31.82	3	Horizontal	204	1.50	-	60.19	27.44	4.38	-
AV	2.4872G	50.76	54.00	-3.24	31.82	3	Horizontal	204	1.50	-	18.94	27.43	4.39	-
PK	2.4804G	92.17	Inf	-Inf	31.82	3	Horizontal	204	1.50	-	60.35	27.44	4.38	-
PK	2.4894G	59.69	74.00	-14.31	31.81	3	Horizontal	204	1.50	-	27.88	27.42	4.39	-

BT-LE(2Mbps)

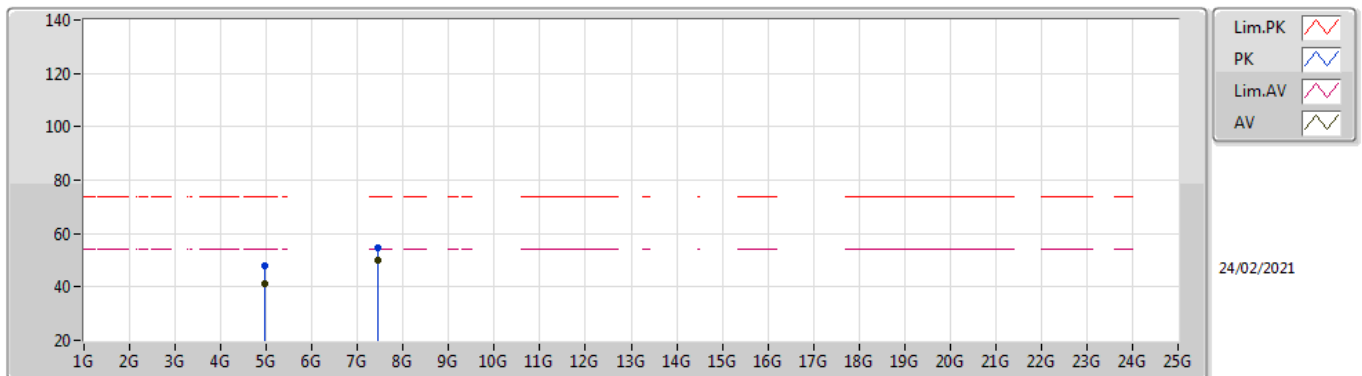
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.9609G	38.90	54.00	-15.10	8.68	3	Vertical	153	1.50	-	30.22	31.20	6.66	29.18
AV	7.44138G	49.20	54.00	-4.80	13.63	3	Vertical	215	2.32	-	35.57	36.25	7.64	30.26
PK	4.9669G	47.17	74.00	-26.83	8.69	3	Vertical	153	1.50	-	38.48	31.20	6.67	29.18
PK	7.44114G	54.36	74.00	-19.64	13.63	3	Vertical	215	2.32	-	40.73	36.25	7.64	30.26

BT-LE(2Mbps)

2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96084G	41.33	54.00	-12.67	8.68	3	Horizontal	175	1.50	-	32.65	31.20	6.66	29.18
AV	7.44132G	50.01	54.00	-3.99	13.63	3	Horizontal	138	1.11	-	36.38	36.25	7.64	30.26
PK	4.9609G	47.70	74.00	-26.30	8.68	3	Horizontal	175	1.50	-	39.02	31.20	6.66	29.18
PK	7.43988G	54.64	74.00	-19.36	13.62	3	Horizontal	138	1.11	-	41.02	36.24	7.64	30.26