

FCC Radio Test Report

FCC ID : 2ADKMI2001401
Equipment : Pet health scale
Brand Name : Brook Zoo
Model Name : ZBZ_PHS-001
Applicant : Zeroplus Technology Corporation
3F., No. 121, Jian 8th Rd., Chung Ho District,
New Taipei City 235, Taiwan
Manufacturer : ZHONGSHAN KANGNUO ELECTRONIC CO.,LTD.
NO.9 DONGCHENG NORTH ROAD,DONGSHENG,
ZHONGSHAN,GUANGDONG,CHINA
Standard : 47 CFR FCC Part 15.247

The product was received on Sep. 30, 2021, and testing was started from Jan. 17, 2022 and completed on Jan. 17, 2022. 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

[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	Not Required	Only employ battery power.
3.1	15.247(a)	DTS Bandwidth	PASS	-
3.2	15.247(b)	Maximum Conducted Output Power	PASS	-
3.3	15.247(e)	Power Spectral Density	PASS	-
3.4	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.5	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: Anne Kuo

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

Note:

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

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Elink	BM16	PCB	N/A	0

Note 1: The EUT has one antenna.

For BT function:

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

Only Ant. 1 can be used as transmitting/receiving.

1.1.3 EUT Information

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

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.294	5.32	294.688u	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
RF Conducted	TH01-HY	Johnny Yu	20.4~25.7°C / 48.6~57.3%	17/Jan/2022
Radiated	03CH02-HY	Lego Lin	21.5~23.2°C / 56~60%	17/Jan/2022
☐ 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
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 Channel Mode

Test Software Version	BK RF Test_V1.8
------------------------------	-----------------

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	3
2440MHz	0
2480MHz	0

2.2 The Worst Case Measurement Configuration

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

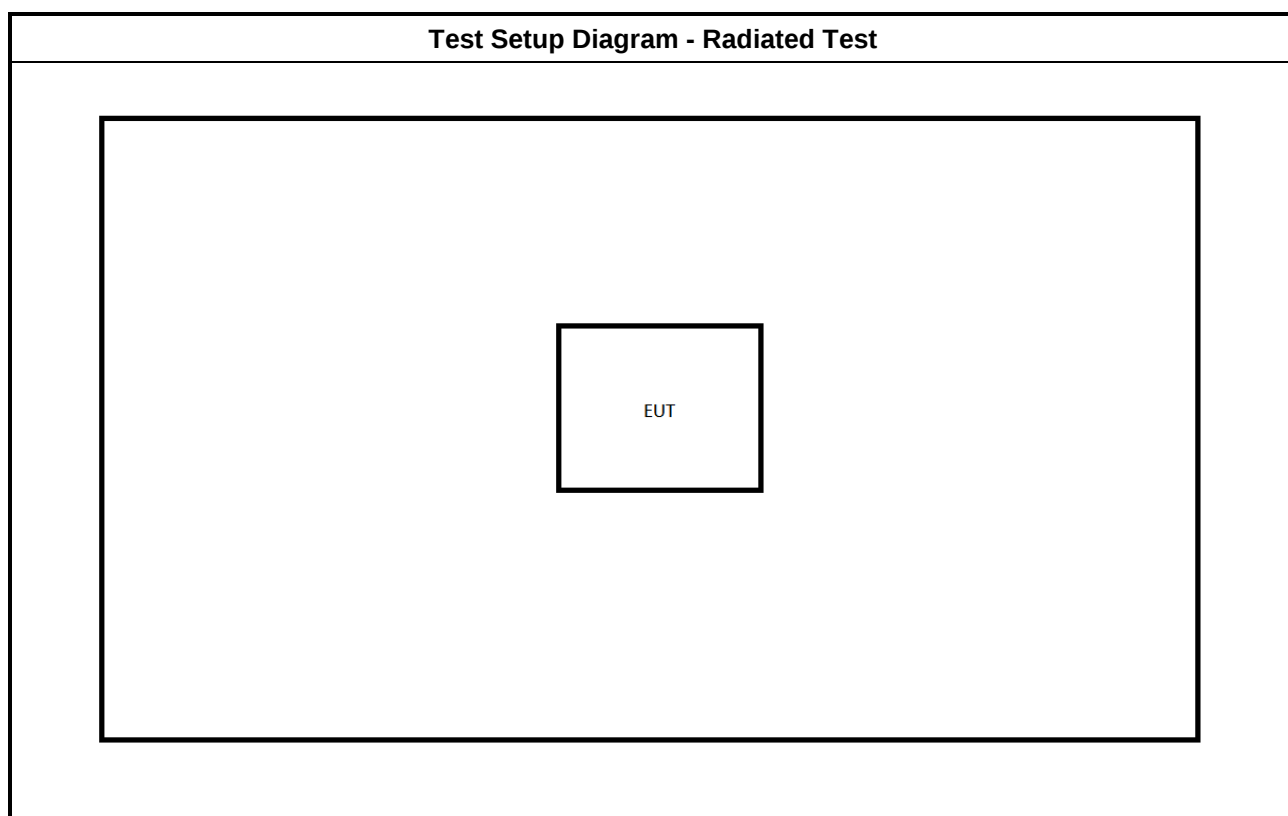
The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should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

2.3 Support Equipment

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

Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Battery*4	Panasonic	R03 UM-4N	-	-
2	Fixture	Sporton	Sporton	-	-

2.4 Test Setup Diagram



3 Transmitter Test Result

3.1 DTS Bandwidth

3.1.1 6dB Bandwidth Limit

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

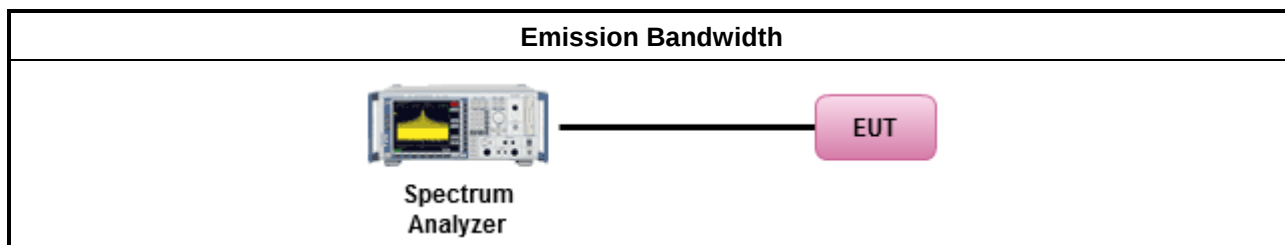
3.1.2 Measuring Instruments

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

3.1.3 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.

3.1.4 Test Setup



3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A

3.2 Maximum Conducted Output Power

3.2.1 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.	

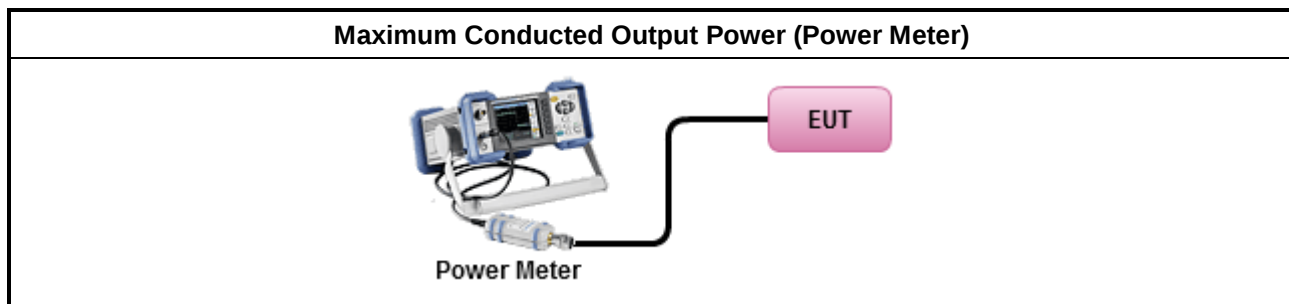
3.2.2 Measuring Instruments

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

3.2.3 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]) $EIRP_{total} = P_{total} + DG$	

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

3.3 Power Spectral Density

3.3.1 Power Spectral Density Limit

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

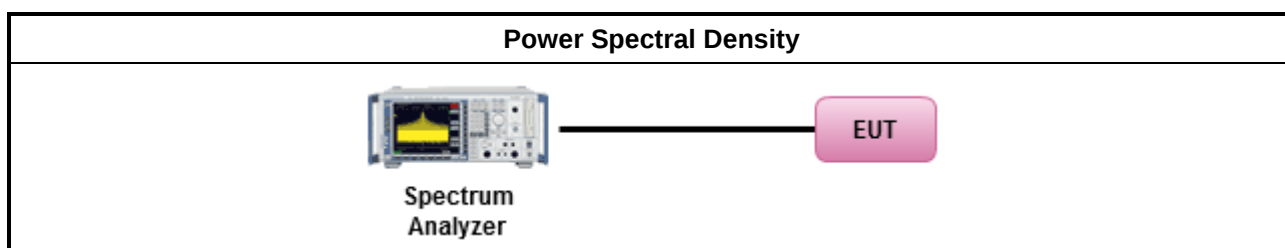
3.3.2 Measuring Instruments

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

3.3.3 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.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Refer as Appendix C

3.4 Emissions in Non-restricted Frequency Bands

3.4.1 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.	

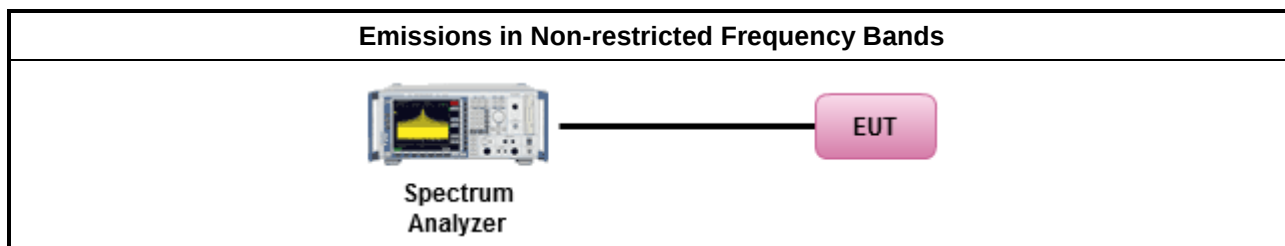
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup



3.4.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix D

3.5 Emissions in Restricted Frequency Bands

3.5.1 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.

3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

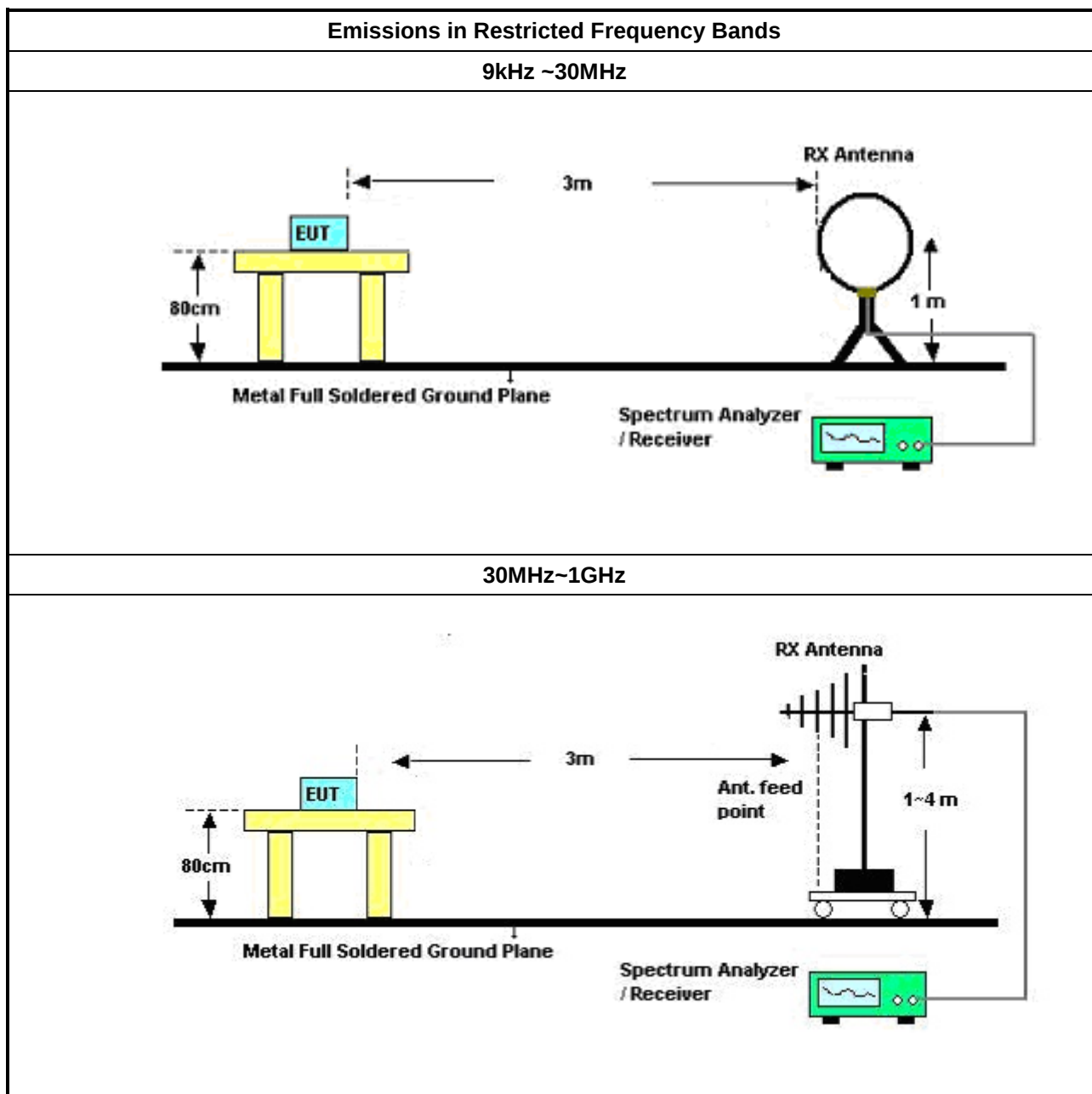
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted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

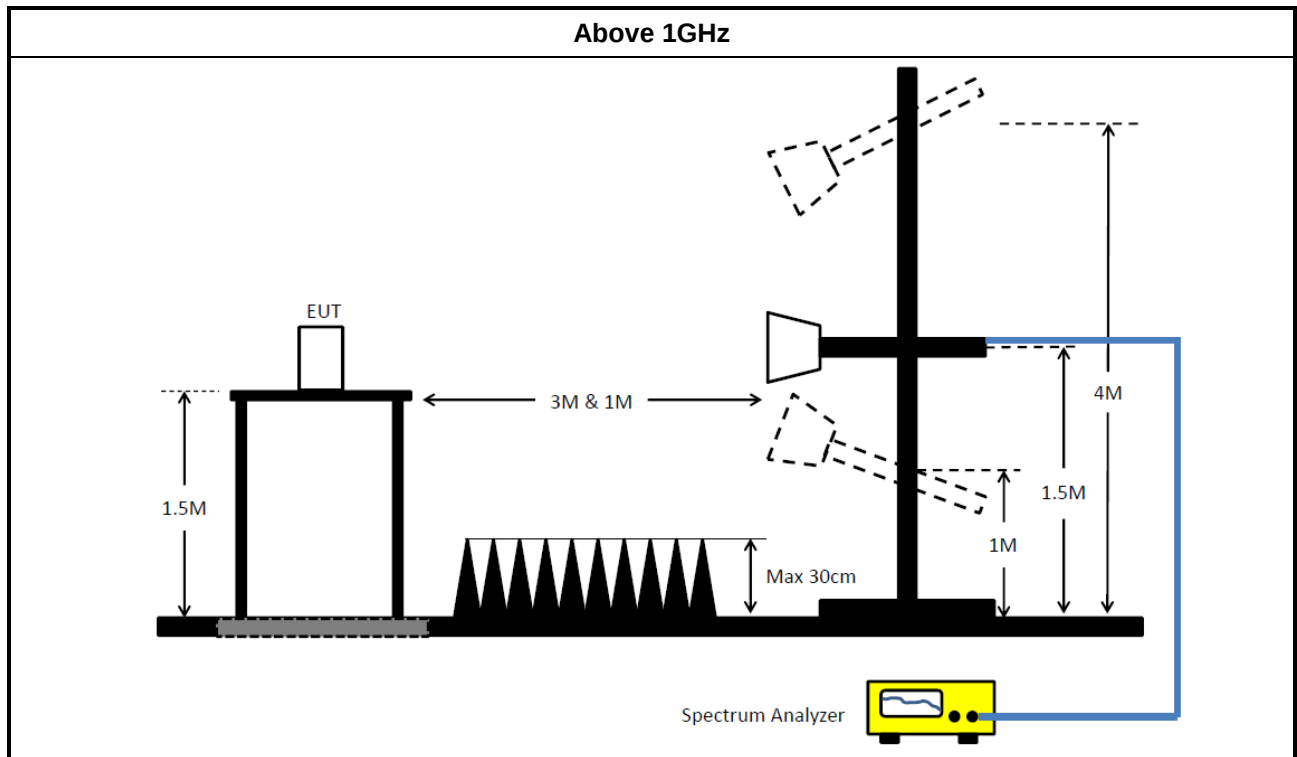
3.5.4 Measurement Results Calculation

The measured Level is calculated using:

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

3.5.5 Test Setup





3.5.6 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.

3.5.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix E

4 Test Equipment and Calibration Data

Instrument for Conducted Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101013	10Hz~40GHz	30/Mar/2021	29/Mar/2022
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	21/Oct/2021	20/Oct/2022
Pulse Sensor	Anritsu	MA2411B	0917017	300MHz~40GHz	23/Feb/2021	22/Feb/2022
Power Meter	Anritsu	ML2495A	0949003	300MHz~40GHz	23/Feb/2021	22/Feb/2022
SENSE-15247_FS	Sporton	V5.10.7.13	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	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	02/Aug/2021	01/Aug/2022
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz~18GHz 3m	01/Aug/2021	31/Jul/2022
Signal Analyzer	R&S	FSP40	100593	9kHz~40GHz	12/Mar/2021	11/Mar/2022
Amplifier	Agilent	8447D	2944A11149	100kHz~1.3GHz	29/Jun/2021	28/Jun/2022
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz~26.5GHz	03/Nov/2021	02/Nov/2022
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz~1GHz	04/Sep/2021	03/Sep/2022
Double Ridged Guide Horn Antenna	SCHWARZBEC	BBHA 9120 D	BBHA 9120 D 01543	1GHz~18GHz	04/Jun/2021	03/Jun/2022
RF Cable	MVE	400LL	MVE-1-0802	9kHz~30MHz	05/May/2021	04/May/2022
RF Cable	MVE	400LL	MVE-1-0802	30MHz~1GHz	05/May/2021	04/May/2022
RF Cable-R03m	HUBER+SUHNER	SUCOFLEX104	805193/4+ 805192/4	1GHz~40GHz	06/Apr/2021	05/Apr/2022
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	15GHz~40GHz	11/Mar/2021	10/Mar/2022
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2021	15/Mar/2022
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	19/Apr/2021	18/Apr/2022
SENSE-15247_FS	Sporton	V5.10.7.13	N/A	N/A	N/A	N/A



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)	860k	1.204M	1M20F1D	795k	1.093M

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

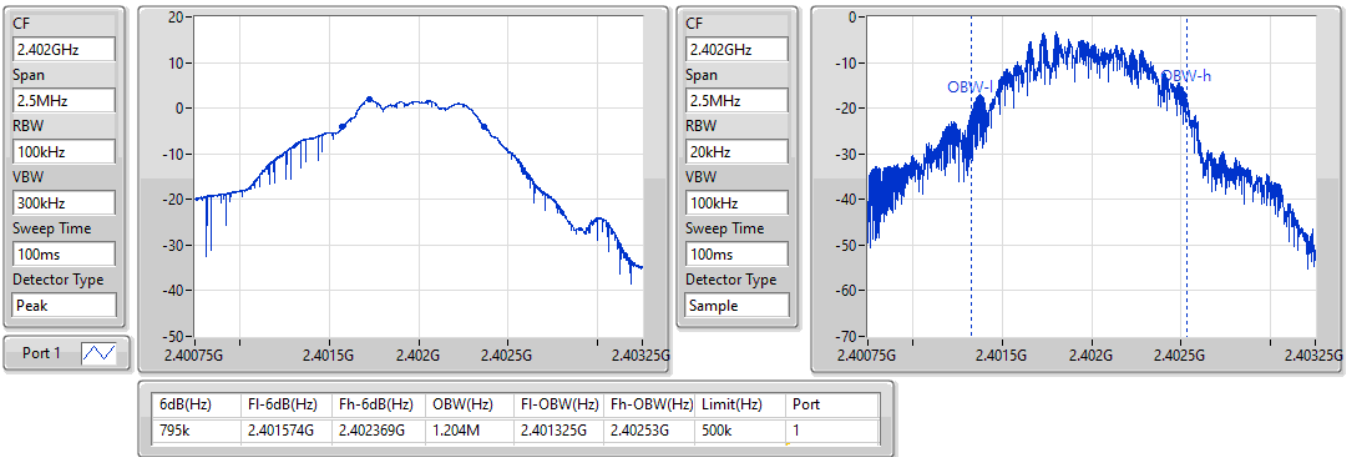
**Result**

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	795k	1.204M
2440MHz	Pass	500k	858.75k	1.093M
2480MHz	Pass	500k	860k	1.093M

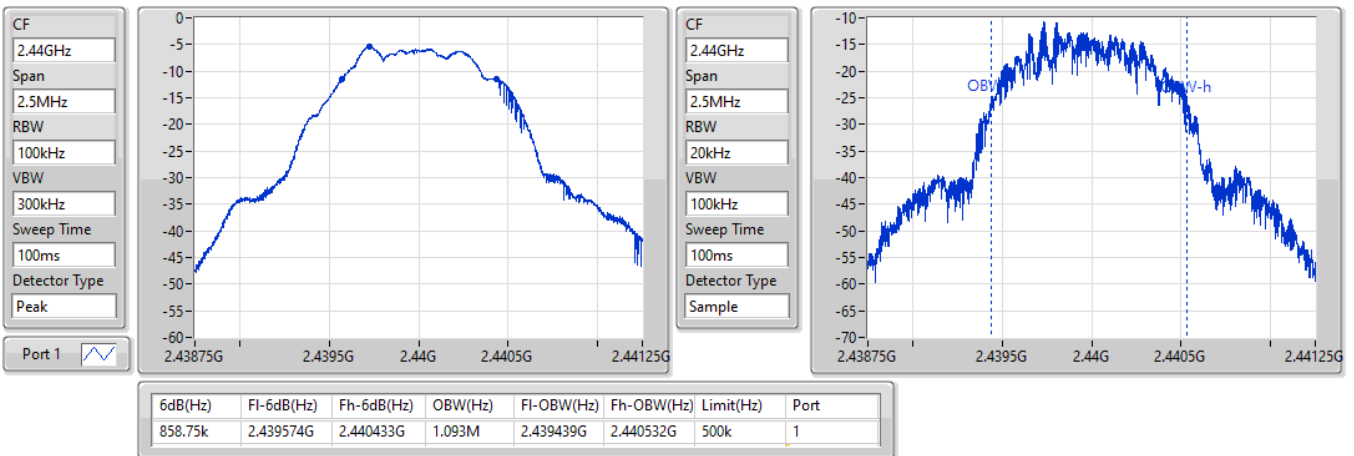
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

BT-LE(1Mbps)
2402MHz
EBW-DTS

17/01/2022

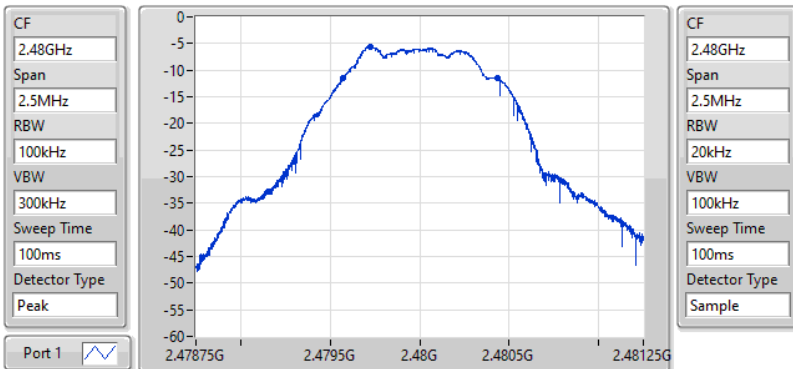

BT-LE(1Mbps)
2440MHz
EBW-DTS

17/01/2022



BT-LE(1Mbps)

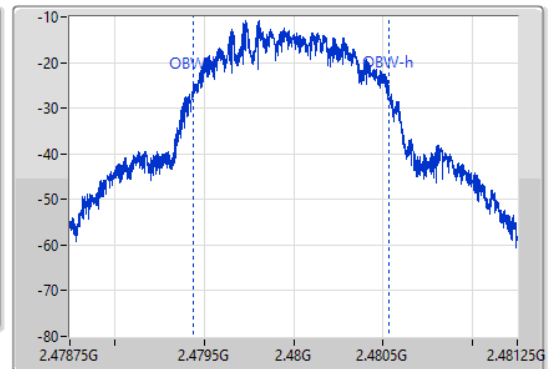
2480MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
860k	2.479573G	2.480433G	1.093M	2.479437G	2.48053G	500k	1

EBW-DTS

17/01/2022





Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	3.13	0.00206



Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.00	3.13	30.00
2440MHz	Pass	0.00	-4.06	30.00
2480MHz	Pass	0.00	-4.16	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-13.73

RBW = 3kHz;



Result

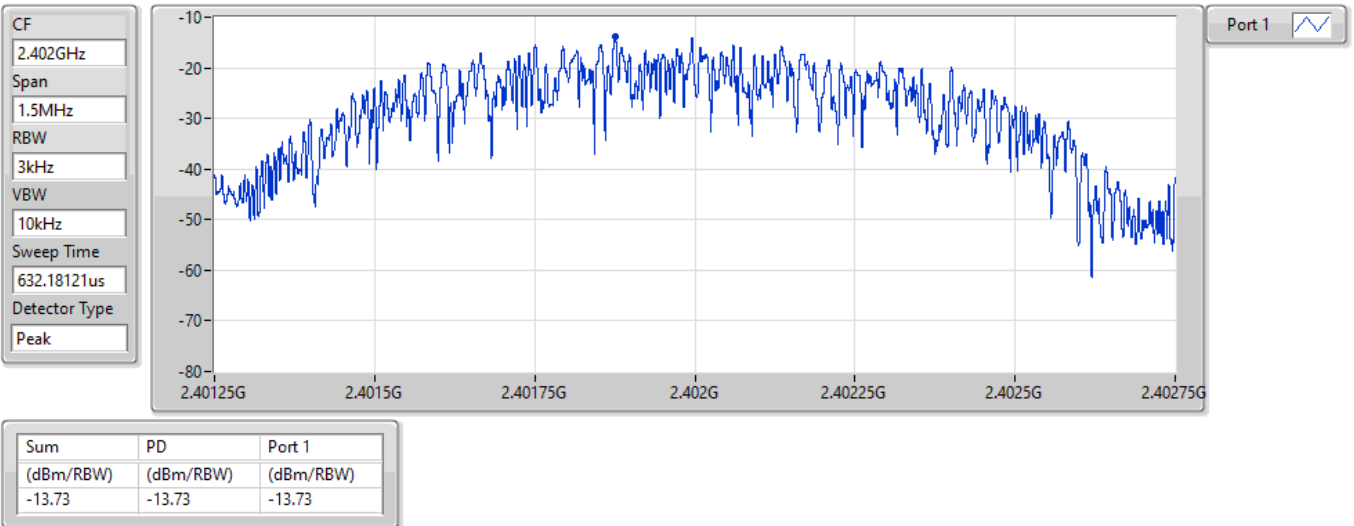
Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.00	-13.73	8.00
2440MHz	Pass	0.00	-21.36	8.00
2480MHz	Pass	0.00	-21.93	8.00

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)

2402MHz

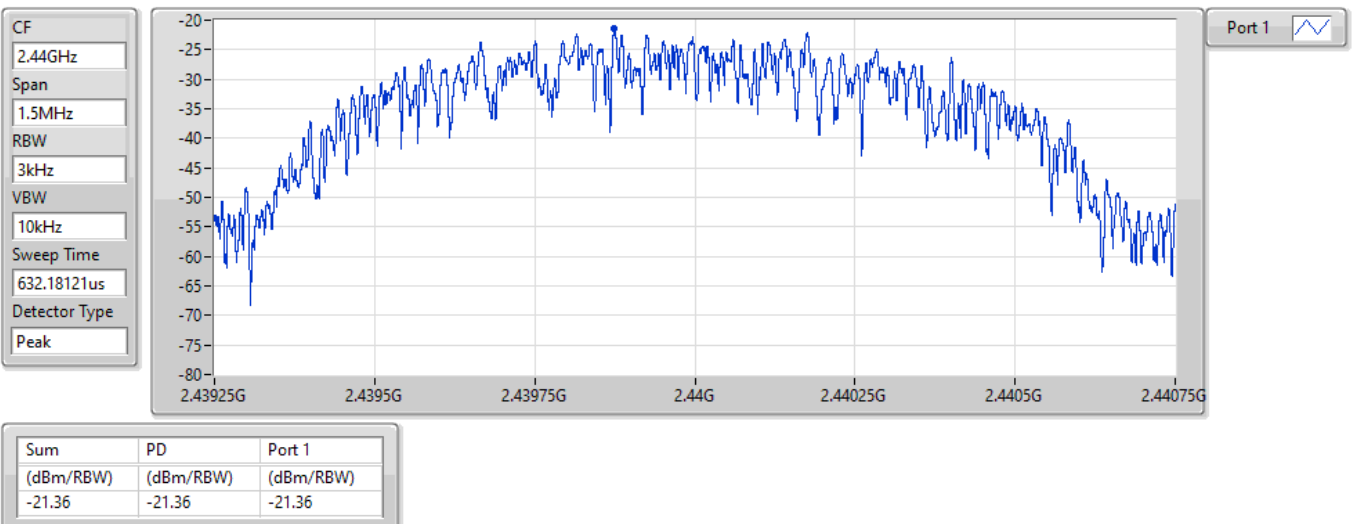
17/01/2022



BT-LE(1Mbps)

2440MHz

17/01/2022

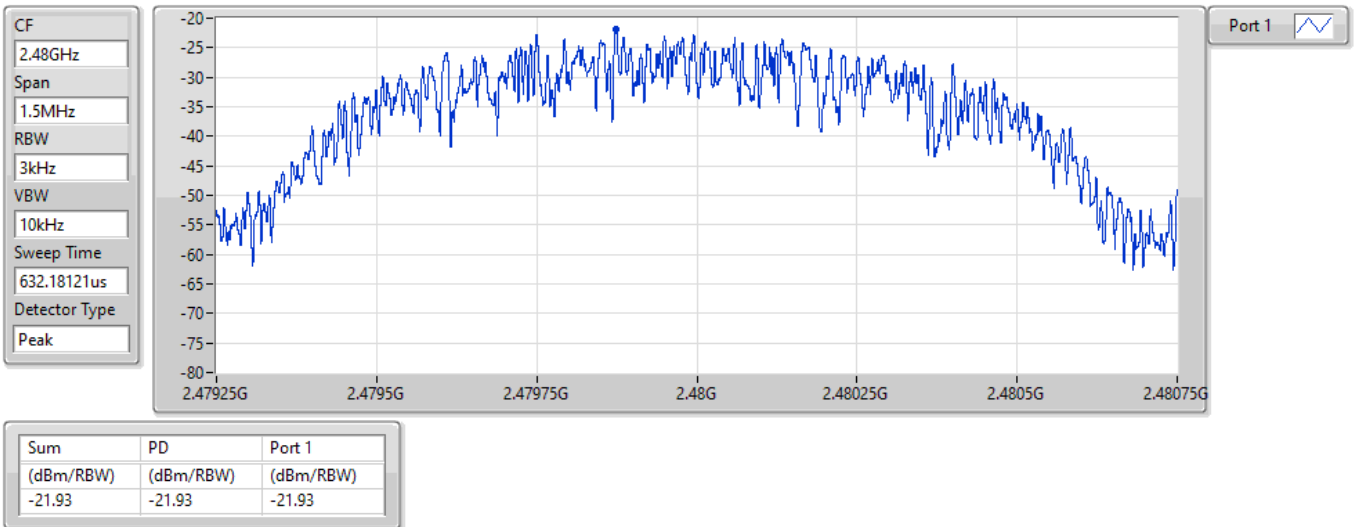


BT-LE(1Mbps)

2480MHz

PSD

17/01/2022





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	2.40171G	1.78	-28.22	2.1591G	-55.87	2.4G	-41.61	2.4G	-40.10	2.49722G	-53.46	21.84487G	-42.45	1



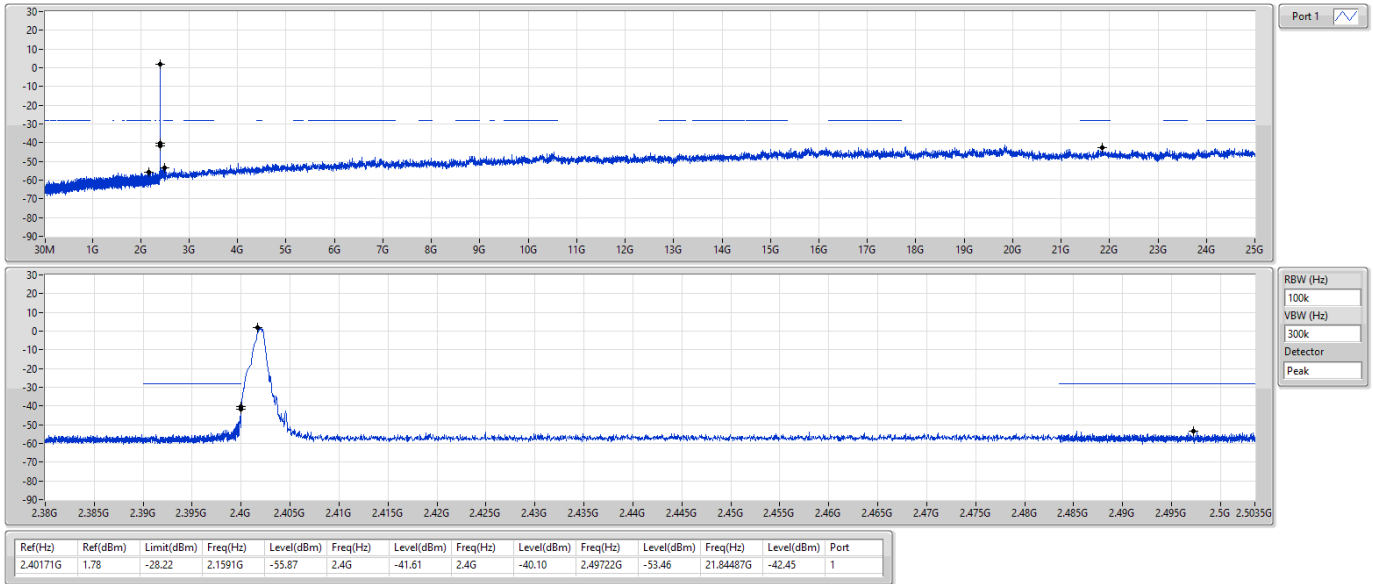
Result

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	2.40171G	1.78	-28.22	2.1591G	-55.87	2.4G	-41.61	2.4G	-40.10	2.49722G	-53.46	21.84487G	-42.45	1
2440MHz	Pass	2.40171G	1.78	-28.22	1.81218G	-56.06	2.39949G	-54.01	2.4G	-56.64	2.49855G	-53.78	24.19294G	-43.09	1
2480MHz	Pass	2.40171G	1.78	-28.22	2.18289G	-56.10	2.39599G	-54.65	2.4835G	-56.35	2.48504G	-54.15	16.84502G	-42.40	1

BT-LE(1Mbps)

CSEndB-DTS

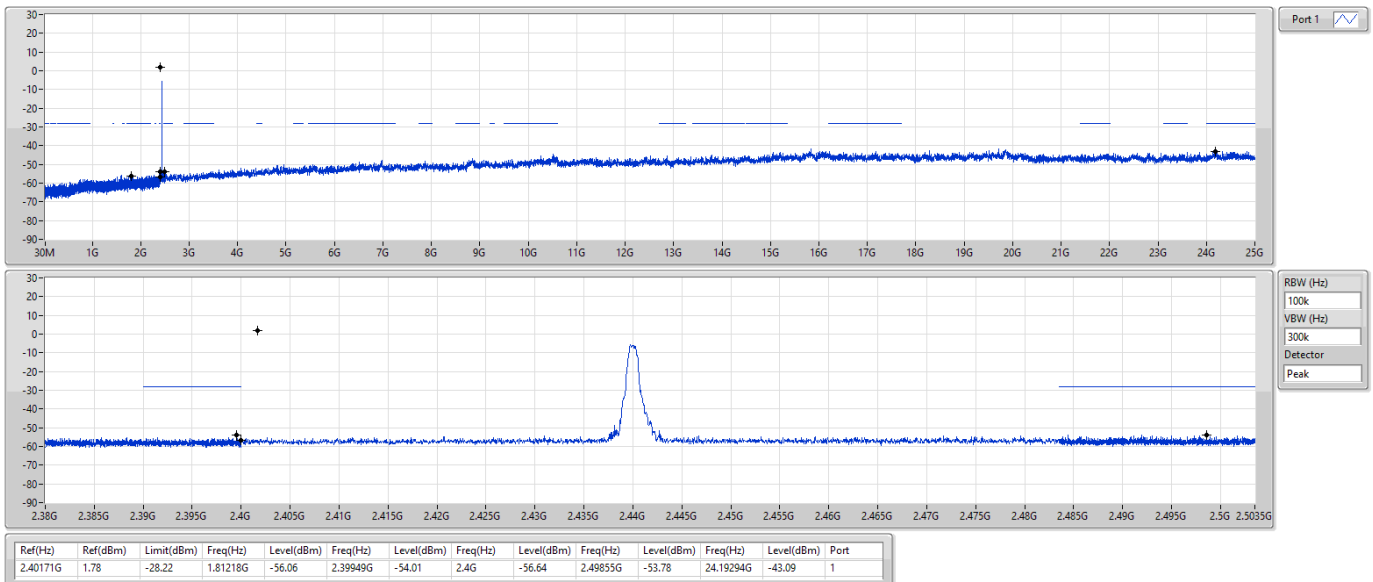
2402MHz



BT-LE(1Mbps)

CSEndB-DTS

2440MHz

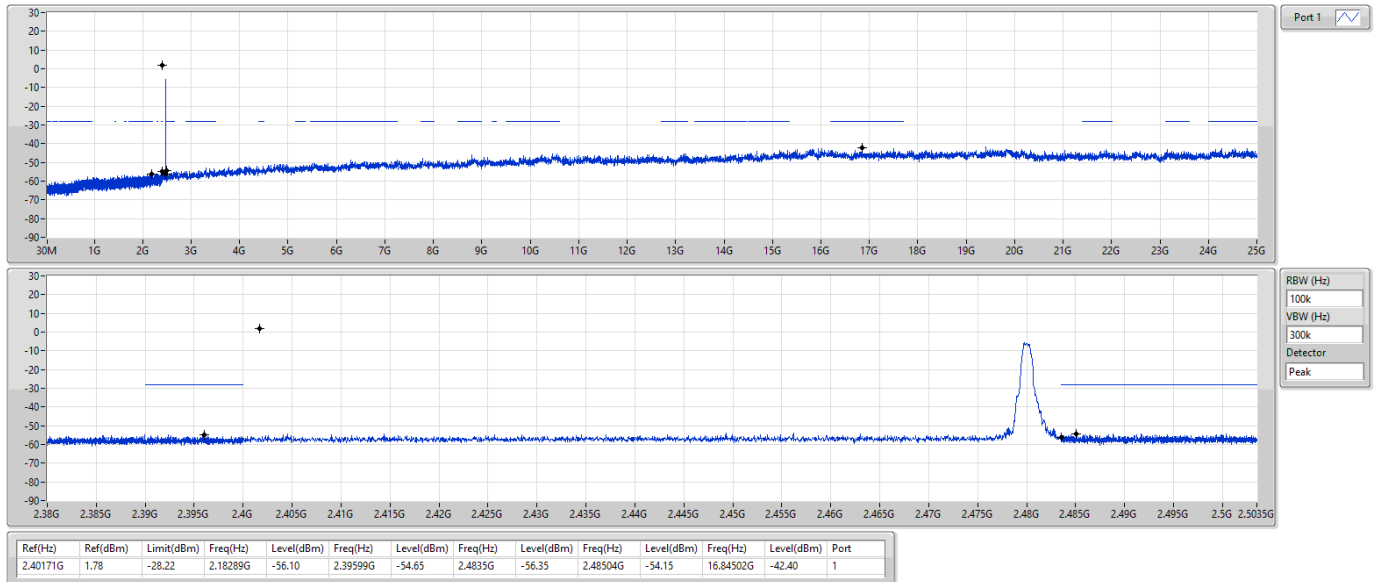


BT-LE(1Mbps)

CSEndB-DTS

2480MHz

17/01/2022





Summary

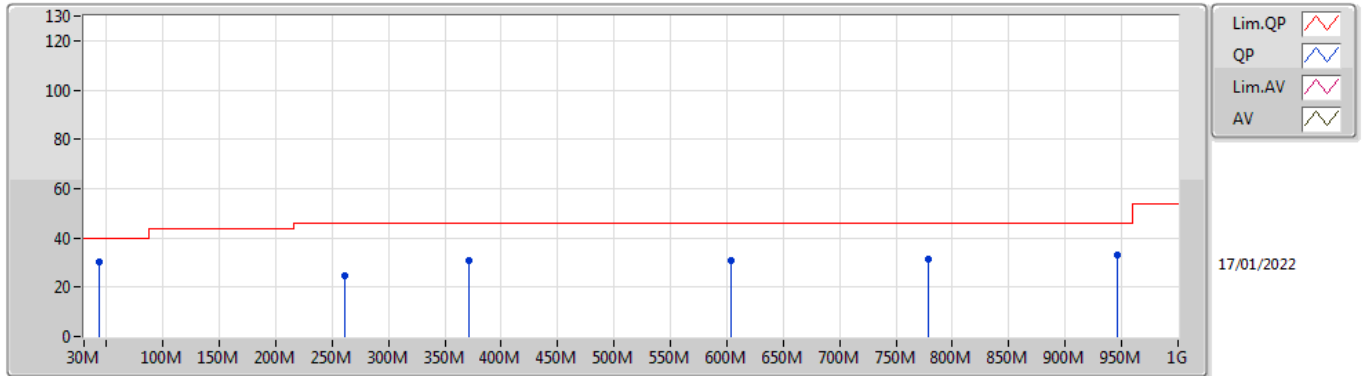
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	371.44M	39.16	46.00	-6.84	3	Horizontal	0	1.00	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	43.58M	30.30	40.00	-9.70	3	Vertical	360	1.00	-
2440MHz	Pass	PK	260.86M	24.82	46.00	-21.18	3	Vertical	360	1.00	-
2440MHz	Pass	PK	371.44M	30.84	46.00	-15.16	3	Vertical	360	1.00	-
2440MHz	Pass	PK	604.24M	30.54	46.00	-15.46	3	Vertical	360	1.00	-
2440MHz	Pass	PK	778.84M	31.57	46.00	-14.43	3	Vertical	360	1.00	-
2440MHz	Pass	PK	945.68M	33.33	46.00	-12.67	3	Vertical	360	1.00	-
2440MHz	Pass	PK	288.02M	31.26	46.00	-14.74	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	371.44M	39.16	46.00	-6.84	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	491.72M	38.82	46.00	-7.18	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	520.82M	38.89	46.00	-7.11	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	784.66M	37.92	46.00	-8.08	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	947.62M	36.89	46.00	-9.11	3	Horizontal	0	1.00	-

BT-LE(1Mbps)

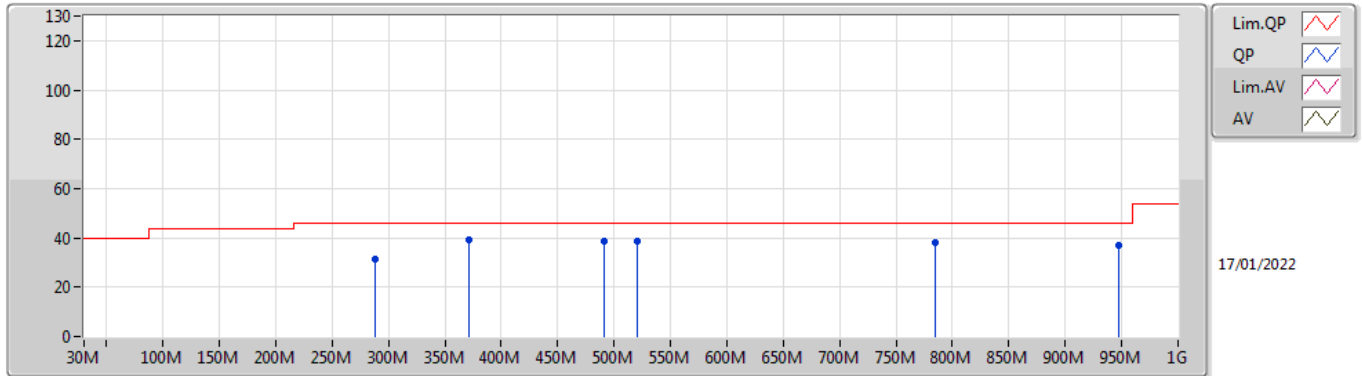
2440MHz_Battery



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	43.58M	30.30	40.00	-9.70	-10.69	3	Vertical	360	1.00	-	40.99	15.82	1.00	27.51
PK	260.86M	24.82	46.00	-21.18	-6.08	3	Vertical	360	1.00	-	30.90	18.75	2.20	27.03
PK	371.44M	30.84	46.00	-15.16	-4.88	3	Vertical	360	1.00	-	35.72	20.01	2.63	27.52
PK	604.24M	30.54	46.00	-15.46	-1.08	3	Vertical	360	1.00	-	31.62	23.95	3.38	28.41
PK	778.84M	31.57	46.00	-14.43	0.84	3	Vertical	360	1.00	-	30.73	25.00	3.80	27.96
PK	945.68M	33.33	46.00	-12.67	2.92	3	Vertical	360	1.00	-	30.41	26.05	4.17	27.30

BT-LE(1Mbps)

2440MHz_Battery



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	288.02M	31.26	46.00	-14.74	-6.64	3	Horizontal	0	1.00	-	37.90	18.10	2.31	27.05
PK	371.44M	39.16	46.00	-6.84	-4.88	3	Horizontal	0	1.00	-	44.04	20.01	2.63	27.52
PK	491.72M	38.82	46.00	-7.18	-2.54	3	Horizontal	0	1.00	-	41.36	22.71	3.05	28.30
PK	520.82M	38.89	46.00	-7.11	-2.56	3	Horizontal	0	1.00	-	41.45	22.65	3.13	28.34
PK	784.66M	37.92	46.00	-8.08	0.92	3	Horizontal	0	1.00	-	37.00	25.04	3.82	27.94
PK	947.62M	36.89	46.00	-9.11	2.95	3	Horizontal	0	1.00	-	33.94	26.06	4.18	27.29



Summary

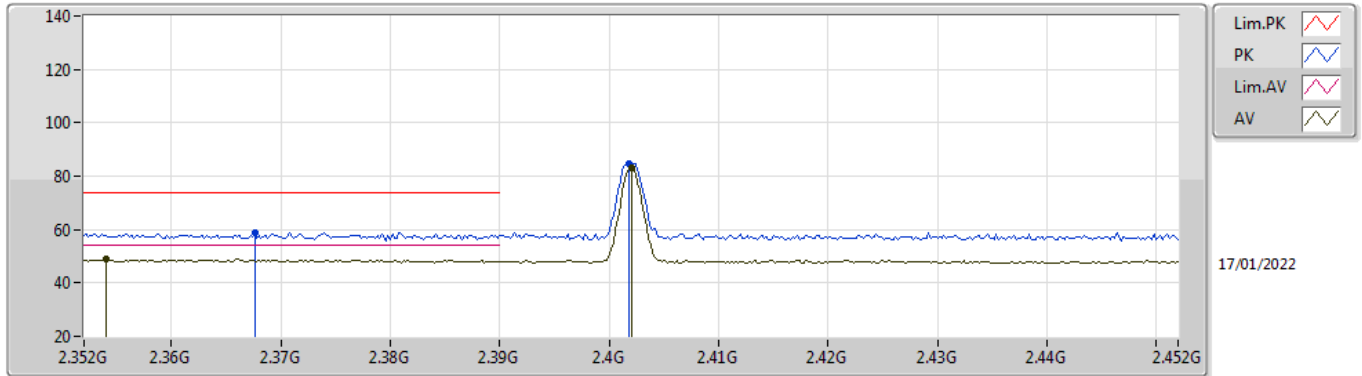
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LTE(1Mbps)	Pass	AV	7.43928G	52.31	54.00	-1.69	3	Vertical	43	1.25	-

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	2.354G	48.99	54.00	-5.01	3	Vertical	183	3.00	-
2402MHz	Pass	AV	2.402G	83.19	Inf	-Inf	3	Vertical	183	3.00	-
2402MHz	Pass	PK	2.3676G	58.98	74.00	-15.02	3	Vertical	183	3.00	-
2402MHz	Pass	PK	2.4018G	84.51	Inf	-Inf	3	Vertical	183	3.00	-
2402MHz	Pass	AV	2.3682G	48.98	54.00	-5.02	3	Horizontal	64	1.29	-
2402MHz	Pass	AV	2.402G	87.58	Inf	-Inf	3	Horizontal	64	1.29	-
2402MHz	Pass	PK	2.368G	58.49	74.00	-15.51	3	Horizontal	64	1.29	-
2402MHz	Pass	PK	2.4022G	88.83	Inf	-Inf	3	Horizontal	64	1.29	-
2402MHz	Pass	AV	4.80348G	37.38	54.00	-16.62	3	Vertical	229	1.11	-
2402MHz	Pass	PK	4.80337G	45.47	74.00	-28.53	3	Vertical	229	1.11	-
2402MHz	Pass	AV	4.80347G	33.83	54.00	-20.17	3	Horizontal	67	1.50	-
2402MHz	Pass	PK	4.8039G	43.92	74.00	-30.08	3	Horizontal	67	1.50	-
2440MHz	Pass	AV	2.3524G	48.75	54.00	-5.25	3	Vertical	183	2.98	-
2440MHz	Pass	AV	2.44G	80.04	Inf	-Inf	3	Vertical	183	2.98	-
2440MHz	Pass	AV	2.4996G	48.18	54.00	-5.82	3	Vertical	183	2.98	-
2440MHz	Pass	PK	2.34G	59.62	74.00	-14.38	3	Vertical	183	2.98	-
2440MHz	Pass	PK	2.4404G	81.44	Inf	-Inf	3	Vertical	183	2.98	-
2440MHz	Pass	PK	2.4856G	58.31	74.00	-15.69	3	Vertical	183	2.98	-
2440MHz	Pass	AV	2.3764G	48.92	54.00	-5.08	3	Horizontal	66	1.45	-
2440MHz	Pass	AV	2.44G	84.33	Inf	-Inf	3	Horizontal	66	1.45	-
2440MHz	Pass	AV	2.5G	48.38	54.00	-5.62	3	Horizontal	66	1.45	-
2440MHz	Pass	PK	2.376G	60.73	74.00	-13.27	3	Horizontal	66	1.45	-
2440MHz	Pass	PK	2.4404G	85.57	Inf	-Inf	3	Horizontal	66	1.45	-
2440MHz	Pass	PK	2.4868G	57.72	74.00	-16.28	3	Horizontal	66	1.45	-
2440MHz	Pass	AV	4.88025G	33.37	54.00	-20.63	3	Vertical	29	1.00	-
2440MHz	Pass	AV	7.31923G	51.75	54.00	-2.25	3	Vertical	344	1.08	-
2440MHz	Pass	PK	4.87896G	43.03	74.00	-30.97	3	Vertical	29	1.00	-
2440MHz	Pass	PK	7.31912G	57.95	74.00	-16.05	3	Vertical	344	1.08	-
2440MHz	Pass	AV	4.88014G	32.97	54.00	-21.03	3	Horizontal	200	1.00	-
2440MHz	Pass	AV	7.3193G	49.12	54.00	-4.88	3	Horizontal	232	1.02	-
2440MHz	Pass	PK	4.87888G	43.34	74.00	-30.66	3	Horizontal	200	1.00	-
2440MHz	Pass	PK	7.32076G	55.67	74.00	-18.33	3	Horizontal	232	1.02	-
2480MHz	Pass	AV	2.48G	79.97	Inf	-Inf	3	Vertical	179	2.76	-
2480MHz	Pass	AV	2.4848G	48.51	54.00	-5.49	3	Vertical	179	2.76	-
2480MHz	Pass	PK	2.4802G	81.33	Inf	-Inf	3	Vertical	179	2.76	-
2480MHz	Pass	PK	2.4924G	58.63	74.00	-15.37	3	Vertical	179	2.76	-
2480MHz	Pass	AV	2.48G	85.04	Inf	-Inf	3	Horizontal	68	1.65	-
2480MHz	Pass	AV	2.4934G	48.21	54.00	-5.79	3	Horizontal	68	1.65	-
2480MHz	Pass	PK	2.4802G	86.47	Inf	-Inf	3	Horizontal	68	1.65	-
2480MHz	Pass	PK	2.4996G	59.11	74.00	-14.89	3	Horizontal	68	1.65	-
2480MHz	Pass	AV	4.96037G	32.53	54.00	-21.47	3	Vertical	95	1.50	-
2480MHz	Pass	AV	7.43928G	52.31	54.00	-1.69	3	Vertical	43	1.25	-
2480MHz	Pass	PK	4.96031G	43.19	74.00	-30.81	3	Vertical	95	1.50	-
2480MHz	Pass	PK	7.43903G	58.22	74.00	-15.78	3	Vertical	43	1.25	-
2480MHz	Pass	AV	4.9604G	32.80	54.00	-21.20	3	Horizontal	50	1.50	-
2480MHz	Pass	AV	7.43931G	48.36	54.00	-5.64	3	Horizontal	234	1.04	-
2480MHz	Pass	PK	4.95971G	43.72	74.00	-30.28	3	Horizontal	50	1.50	-
2480MHz	Pass	PK	7.43929G	55.47	74.00	-18.53	3	Horizontal	234	1.04	-

BT-LE(1Mbps)

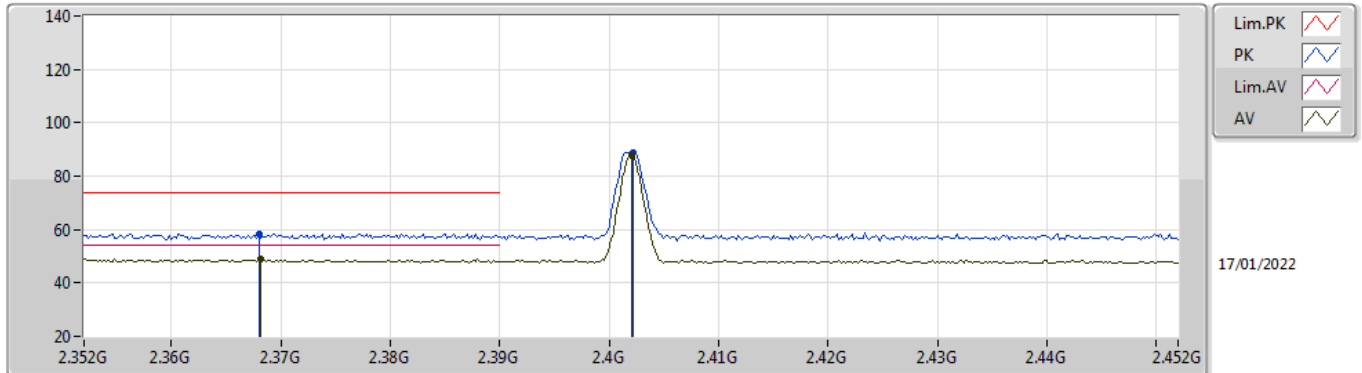
2402MHz_TX



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	2.354G	48.99	54.00	-5.01	35.03	3	Vertical	183	3.00	-	13.96	27.79	7.24	-
AV	2.402G	83.19	Inf	-Inf	34.95	3	Vertical	183	3.00	-	48.24	27.69	7.26	-
PK	2.3676G	58.98	74.00	-15.02	35.01	3	Vertical	183	3.00	-	23.97	27.76	7.25	-
PK	2.4018G	84.51	Inf	-Inf	34.95	3	Vertical	183	3.00	-	49.56	27.69	7.26	-

BT-LE(1Mbps)

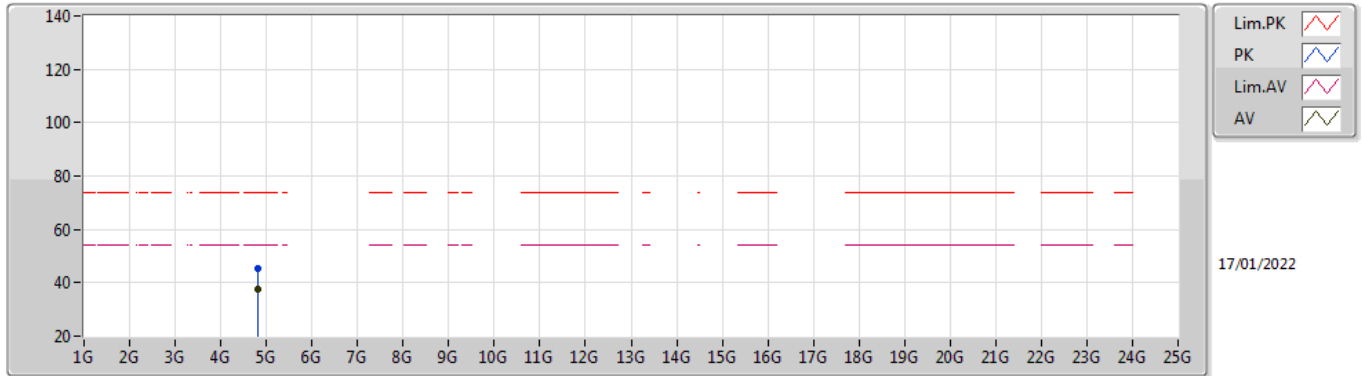
2402MHz_TX



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	2.3682G	48.98	54.00	-5.02	35.01	3	Horizontal	64	1.29	-	13.97	27.76	7.25	-
AV	2.402G	87.58	Inf	-Inf	34.95	3	Horizontal	64	1.29	-	52.63	27.69	7.26	-
PK	2.368G	58.49	74.00	-15.51	35.01	3	Horizontal	64	1.29	-	23.48	27.76	7.25	-
PK	2.402G	88.83	Inf	-Inf	34.95	3	Horizontal	64	1.29	-	53.88	27.69	7.26	-

BT-LE(1Mbps)

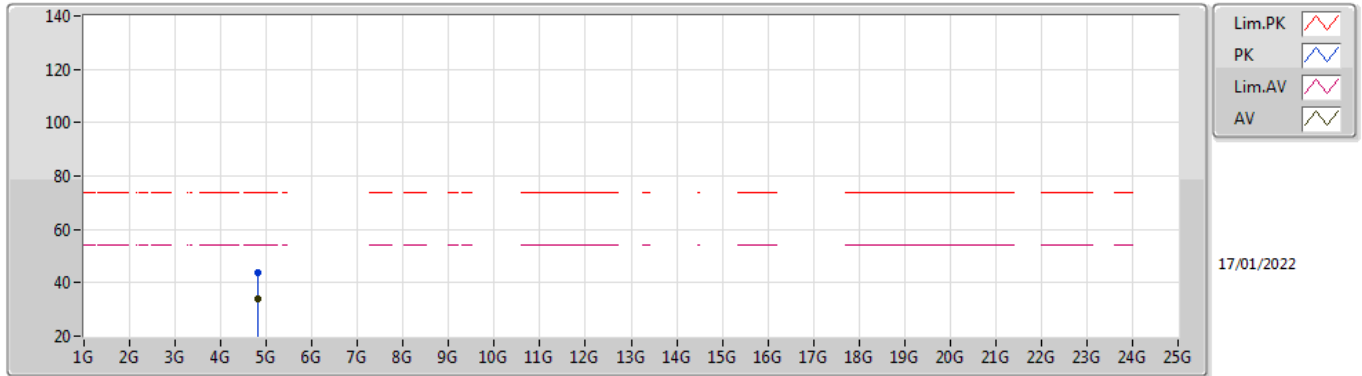
2402MHz_TX



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	4.80348G	37.38	54.00	-16.62	5.82	3	Vertical	229	1.11	-	31.56	31.11	8.90	34.19
PK	4.80337G	45.47	74.00	-28.53	5.82	3	Vertical	229	1.11	-	39.65	31.11	8.90	34.19

BT-LE(1Mbps)

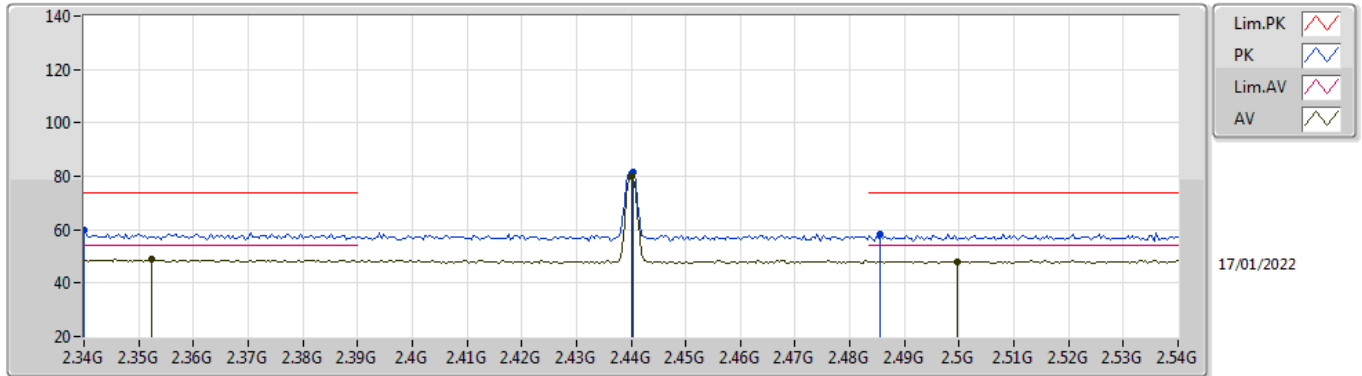
2402MHz_TX



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	4.80347G	33.83	54.00	-20.17	5.82	3	Horizontal	67	1.50	-	28.01	31.11	8.90	34.19
PK	4.8039G	43.92	74.00	-30.08	5.82	3	Horizontal	67	1.50	-	38.10	31.11	8.90	34.19

BT-LE(1Mbps)

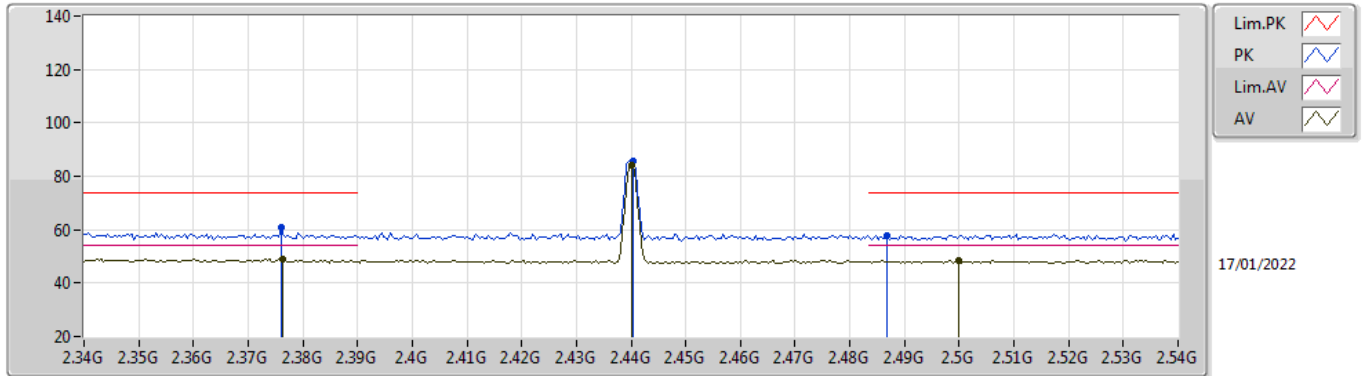
2440MHz_TX



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	2.3524G	48.75	54.00	-5.25	35.04	3	Vertical	183	2.98	-	13.71	27.80	7.24	-
AV	2.44G	80.04	Inf	-Inf	34.75	3	Vertical	183	2.98	-	45.29	27.46	7.29	-
AV	2.4996G	48.18	54.00	-5.82	34.74	3	Vertical	183	2.98	-	13.44	27.40	7.34	-
PK	2.34G	59.62	74.00	-14.38	35.05	3	Vertical	183	2.98	-	24.57	27.82	7.23	-
PK	2.4404G	81.44	Inf	-Inf	34.75	3	Vertical	183	2.98	-	46.69	27.46	7.29	-
PK	2.4856G	58.31	74.00	-15.69	34.73	3	Vertical	183	2.98	-	23.58	27.40	7.33	-

BT-LE(1Mbps)

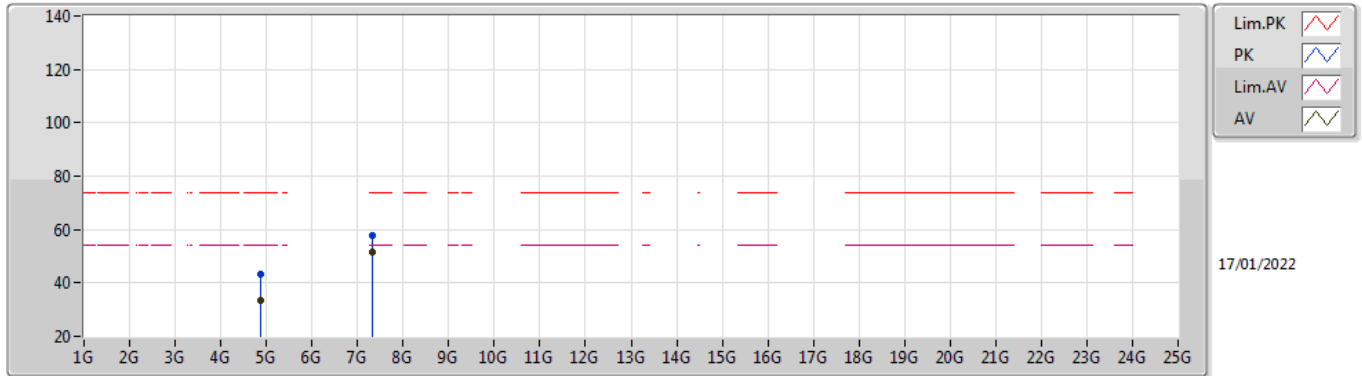
2440MHz_TX



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	2.3764G	48.92	54.00	-5.08	35.00	3	Horizontal	66	1.45	-	13.92	27.75	7.25	-
AV	2.44G	84.33	Inf	-Inf	34.75	3	Horizontal	66	1.45	-	49.58	27.46	7.29	-
AV	2.5G	48.38	54.00	-5.62	34.74	3	Horizontal	66	1.45	-	13.64	27.40	7.34	-
PK	2.376G	60.73	74.00	-13.27	35.00	3	Horizontal	66	1.45	-	25.73	27.75	7.25	-
PK	2.4404G	85.57	Inf	-Inf	34.75	3	Horizontal	66	1.45	-	50.82	27.46	7.29	-
PK	2.4868G	57.72	74.00	-16.28	34.73	3	Horizontal	66	1.45	-	22.99	27.40	7.33	-

BT-LE(1Mbps)

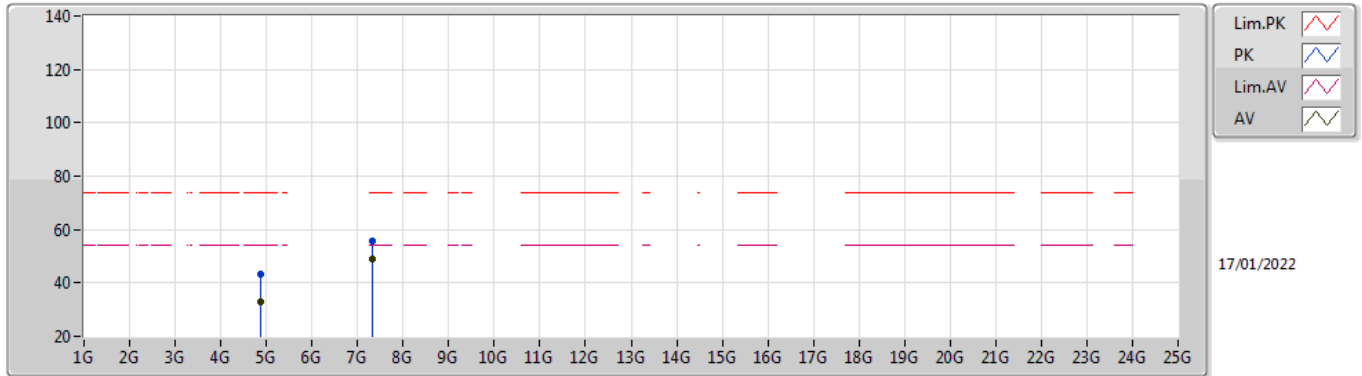
2440MHz_TX



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	4.88025G	33.37	54.00	-20.63	6.00	3	Vertical	29	1.00	-	27.37	31.20	8.96	34.16
AV	7.31923G	51.75	54.00	-2.25	12.49	3	Vertical	344	1.08	-	39.26	36.36	10.63	34.50
PK	4.87896G	43.03	74.00	-30.97	6.00	3	Vertical	29	1.00	-	37.03	31.20	8.96	34.16
PK	7.31912G	57.95	74.00	-16.05	12.49	3	Vertical	344	1.08	-	45.46	36.36	10.63	34.50

BT-LE(1Mbps)

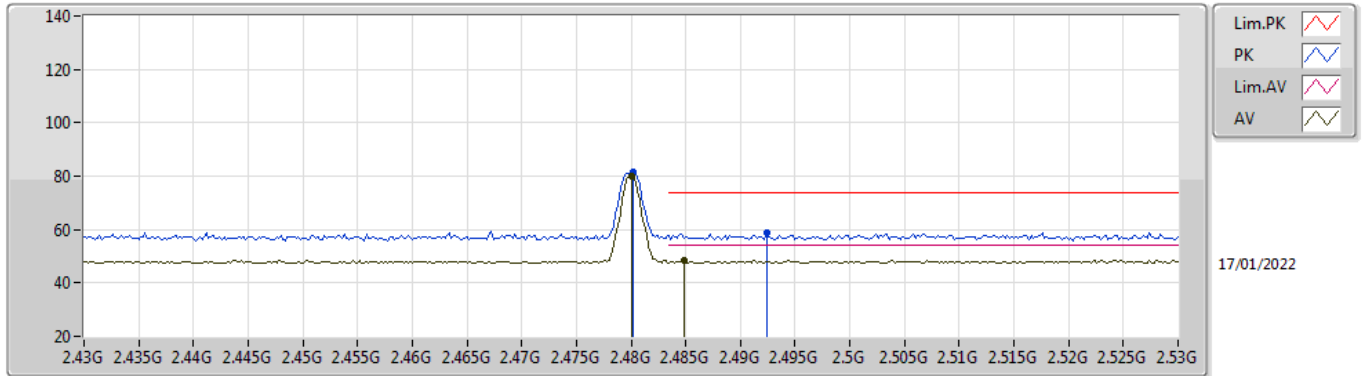
2440MHz_TX



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	4.88014G	32.97	54.00	-21.03	6.00	3	Horizontal	200	1.00	-	26.97	31.20	8.96	34.16
AV	7.3193G	49.12	54.00	-4.88	12.49	3	Horizontal	232	1.02	-	36.63	36.36	10.63	34.50
PK	4.87888G	43.34	74.00	-30.66	6.00	3	Horizontal	200	1.00	-	37.34	31.20	8.96	34.16
PK	7.32076G	55.67	74.00	-18.33	12.49	3	Horizontal	232	1.02	-	43.18	36.36	10.63	34.50

BT-LE(1Mbps)

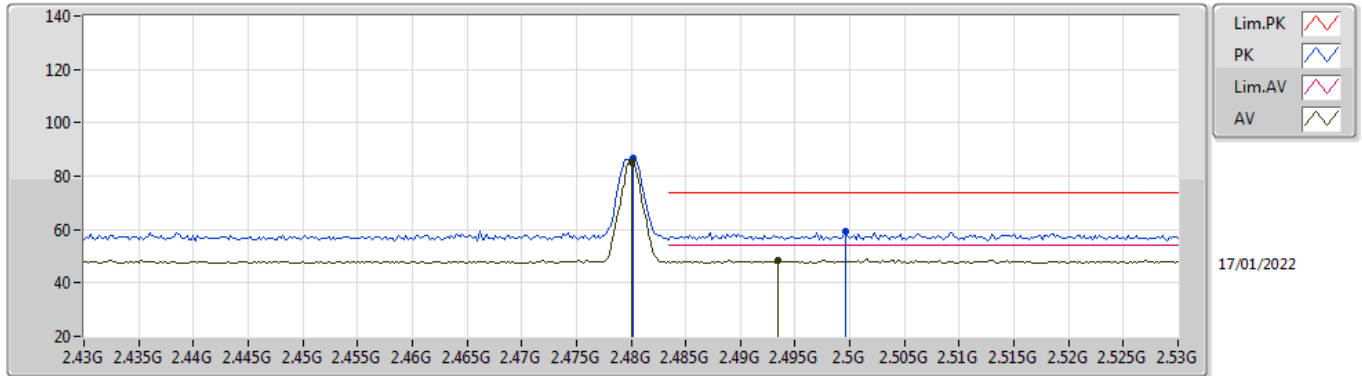
2480MHz_TX



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	79.97	Inf	-Inf	34.72	3	Vertical	179	2.76	-	45.25	27.40	7.32	-
AV	2.4848G	48.51	54.00	-5.49	34.73	3	Vertical	179	2.76	-	13.78	27.40	7.33	-
PK	2.4802G	81.33	Inf	-Inf	34.72	3	Vertical	179	2.76	-	46.61	27.40	7.32	-
PK	2.4924G	58.63	74.00	-15.37	34.73	3	Vertical	179	2.76	-	23.90	27.40	7.33	-

BT-LE(1Mbps)

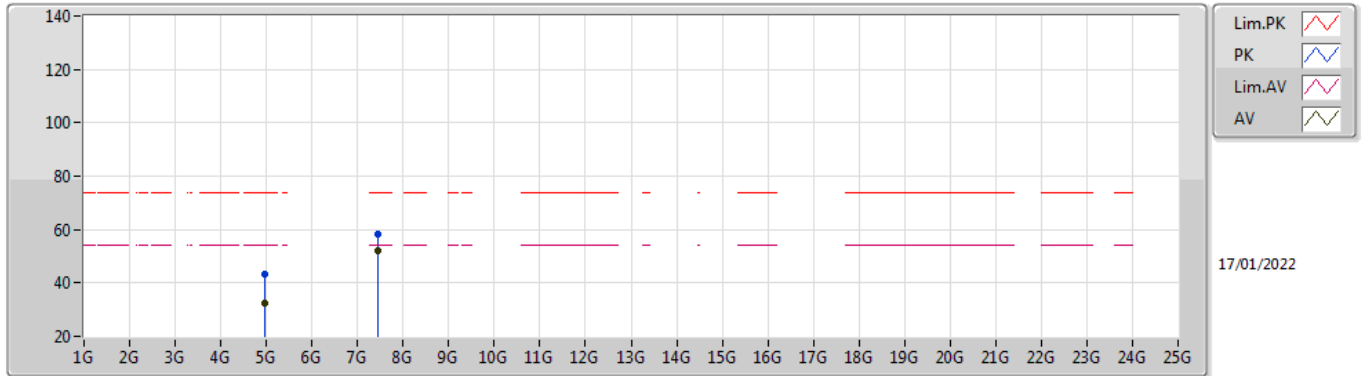
2480MHz_TX



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	2.48G	85.04	Inf	-Inf	34.72	3	Horizontal	68	1.65	-	50.32	27.40	7.32	-
AV	2.4934G	48.21	54.00	-5.79	34.73	3	Horizontal	68	1.65	-	13.48	27.40	7.33	-
PK	2.4802G	86.47	Inf	-Inf	34.72	3	Horizontal	68	1.65	-	51.75	27.40	7.32	-
PK	2.4996G	59.11	74.00	-14.89	34.74	3	Horizontal	68	1.65	-	24.37	27.40	7.34	-

BT-LE(1Mbps)

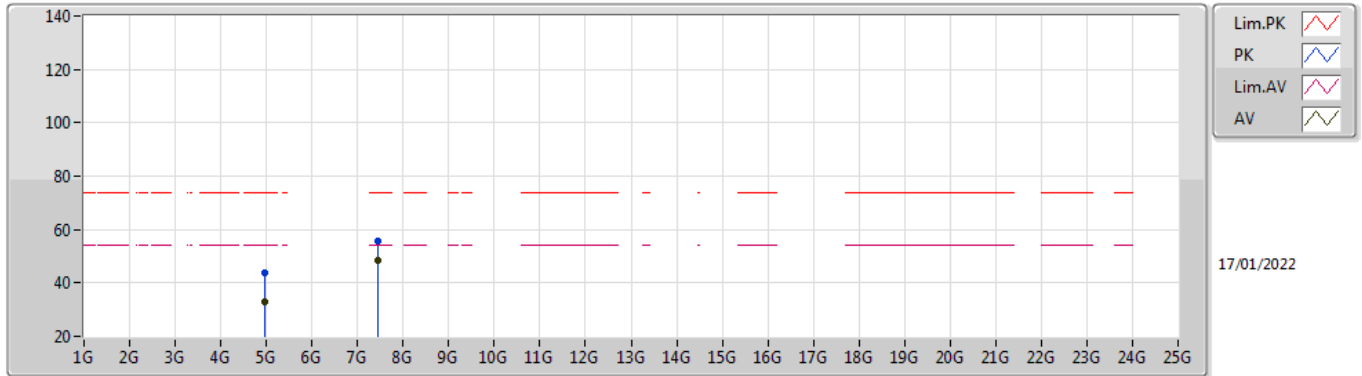
2480MHz_TX



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	4.96037G	32.53	54.00	-21.47	6.32	3	Vertical	95	1.50	-	26.21	31.42	9.02	34.12
AV	7.43928G	52.31	54.00	-1.69	12.51	3	Vertical	43	1.25	-	39.80	36.28	10.72	34.49
PK	4.96031G	43.19	74.00	-30.81	6.32	3	Vertical	95	1.50	-	36.87	31.42	9.02	34.12
PK	7.43903G	58.22	74.00	-15.78	12.51	3	Vertical	43	1.25	-	45.71	36.28	10.72	34.49

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	4.9604G	32.80	54.00	-21.20	6.32	3	Horizontal	50	1.50	-	26.48	31.42	9.02	34.12
AV	7.43931G	48.36	54.00	-5.64	12.51	3	Horizontal	234	1.04	-	35.85	36.28	10.72	34.49
PK	4.95971G	43.72	74.00	-30.28	6.32	3	Horizontal	50	1.50	-	37.40	31.42	9.02	34.12
PK	7.43929G	55.47	74.00	-18.53	12.51	3	Horizontal	234	1.04	-	42.96	36.28	10.72	34.49