FCC Radio Test Report

FCC ID	:	**TVE-241102**
Contains FCC ID	:	**RI7FN990A28HP**
Equipment	:	**Secured Network Extension Device**
Brand Name	:	**FORTINET**
Model Name	:	**FortiExtenderVehicle 511Gxxxxxxxxxx, FORTIEXTENDERVEHICLE-511Gxxxxxxxxxx, FEV-511Gxxxxxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only)**
Applicant	:	**Fortinet, Inc. 909 Kifer Road, Sunnyvale, CA 94086, USA**
Manufacturer	:	**Fortinet, Inc. 909 Kifer Road, Sunnyvale, CA 94086, USA**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Nov. 26, 2024, and testing was started from Dec. 22, 2024 and completed on Apr. 02, 2025. 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

Report No.	Version	Description	Issued Date
FR4N2608AL	01	Initial issue of report	Apr. 25, 2025

Summary of Test Result

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

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and explanations:
None

Reviewed by: Barry Hsiao

Report Producer: Amber Chiu

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	Support
1	TAOGLAS	MA1505.AK.001	MIMO	SMA	WWAN
					GPS
2	WHA YU	ANT DIPOLE 2/5/6GHz C496-510189-A BLACK	Dipole	Reverse SMA	Radio 2_2.4G+ Radio 1_5G
3	WHA YU	ANT DIPOLE 2/5/6GHz C496-510189-A BLACK	Dipole	Reverse SMA	Radio 2_2.4G+ Radio 1_5G
4	WHA YU	ANT DIPOLE 2GHz C496-510188-A BLACK	Dipole	Reverse SMA	BT

Note : Antenna 1 Gain See note 2.

Ant.	Port	Gain (dBi)			
		2.4G	5G	BT	GPS
1	1	-	-	-	4.54
2	1	2.08	2.41	-	-
3	2	2.08	2.41	-	-
4	1	-	-	1.8	-

Note 1: The EUT has four antennas.
For WWAN function:
Ant. 1 (port 1) could transmit/receive.
For 2.4GHz function:
For IEEE 802.11 b/g/n/VHT/ax mode (2TX/2RX) **< Radio 2 >**
Ant. 2 (port 1) and Ant. 3 (port 2) could receive simultaneously.
For 5GHz function:
For IEEE 802.11 a/n/ac/ax mode(2TX/2RX) **< Radio 1 >**
Ant. 2 (port 1) and Ant. 3 (port 2) could receive simultaneously.
For BT function:
For IEEE 802.15.1 Bluetooth mode (1TX/1RX)
Ant. 4 could transmit/receive.
Note 2

Operating Band	Freq. (MHz)	Antenna Gain			
		ANT1(Main0)	ANT1(MIMO1)	ANT1(Main2)	ANT1(MIMO3)
☒ WCDMA Band II	1850 - 1910	1.7			
☒ WCDMA Band IV	1710 - 1755	3.8			
☒ WCDMA Band V	824 - 849	1.6			
☒ LTE Band 2	1850 - 1910	1.7			
☒ LTE Band 4	1710 - 1755	3.8			
☒ LTE Band 5	824 - 849	1.6			
☒ LTE Band 7	2500 - 2570	1.9			
☒ LTE Band 12	699 - 716	2.4			
☒ LTE Band 13	777 - 787	1.2			
☒ LTE Band 14	788 - 798	-0.3			
☒ LTE Band 17	704 - 716	2.4			
☒ LTE Band 25	1850 - 1915	1.7			
☒ LTE Band 26	814 - 849	0.3			
☒ LTE Band 30	2305 - 2315	1			
☒ LTE Band 38	2570 - 2620	0.8			
☒ LTE Band 41	2496 - 2690	1.9			
☒ LTE Band 42	3450 - 3550 3550 - 3600	0.4			
☒ LTE Band 43	3600 - 3700	-0.4			
☒ LTE Band 48	3550 - 3700	0.4			
☒ LTE Band 66	1710 - 1780	3.8			
☒ LTE Band 71	663 - 698	1.9			
☒ 5G Band n2	1850 - 1910	1.7			
☒ 5G Band n5	824- 849	1.6			
☒ 5G Band n7	2500 - 2570	1.9			
☒ 5G Band n12	699 - 716	2.4			
☒ 5G Band n13	777 - 787	1.2			
☒ 5G Band n14	788 - 798	-0.3			
☒ 5G Band n25	1850 - 1915	1.7			

☒ 5G Band n26	814 - 849	0.3
☒ 5G Band n30	2305 - 2315	1
☒ 5G Band n38	2570 - 2620	0.8
☒ 5G Band n41	2496 - 2690	1.9
☒ 5G Band n48	3550 - 3700	0.4
☒ 5G Band n66	1710 - 1780	3.8
☒ 5G Band n71	663 - 698	1.9
☒ 5G Band n77	3450 - 3980	0.9
☒ 5G Band n78	3450 - 3800	0.9

Note 3: Directional gain information

	Maximum Output Power	Power Spectral Density
Non-BF	Directional gain = Max.gain + array gain. For power measurements on IEEE 802.11 devices Array Gain = 0 dB (i.e., no array gain) for N ANT ≤ 4	$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$
BF	$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$	$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From AC Adapter / 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)_1/T
BT-LE(1Mbps)	0.856	0.68	2.141m	500
BT-LE(2Mbps)	0.579	2.37	1.084m	1k

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

1.1.5 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	Description
FortiExtenderVehicle 511Gxxxxxxxxx, FORTIEXTENDERVEHICLE-511Gxxxxxxxxx, FEV-511Gxxxxxxxxx (where “x” can be used as “A-Z”, or “0-9”, or “-“, or blank for software changes or marketing purposes only)	All the models are identical, the different model served as marketing strategy.

From the above models, model: FEV-511G was selected as representative model for the test and its data was recorded in this report.

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	**ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
(TAF: 3785**)**	**TEL:** 886-3-327-3456		**FAX:** 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
AC Conduction	CO04-HY	Simon Cheng	21.7~23.5°C / 53~56%	02/Apr/2025
RF Conducted	TH07-HY	Raven Chien	22.8~23.2°C / 52~56%	28/Dec/2024~08/Jan/2025
Radiated (Co-location)	03CH02-HY	Daniel Lin	20.2~21.1°C / 51~53%	31/Dec/2024
☒ Wen 33rd.St.	**ADD:** No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)			
(TAF: 3785**)**	**TEL:** 886-3-318-0787		**FAX:** 886-3-318-0287	
Test site Designation No. TW0036 with FCC.				
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
Radiated_ Below 1GHz	03CH24-HY	Jack Tang	21.5~21.6°C / 51~52%	27/Dec/2024, 02/Apr/2025
Radiated_ Above 1GHz	03CH24-HY	Billy Wang	22.2~23.4°C / 50~52%	22/Dec/2024~07/Feb/2025

1.4 Measurement Uncertainty

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

Test Items	**Uncertainty**	**Remark**
AC Power-line Conducted Emissions	4.53 dB	Confidence levels of 95%
Bandwidth	3 MHz	Confidence levels of 95%
Maximum Conducted Output Power	2 dB	Confidence levels of 95%
Power Spectral Density	2 dB	Confidence levels of 95%
Emissions in Non-restricted Frequency Bands	0.14 dB	Confidence levels of 95%
Emissions in Restricted Frequency Bands	4.8 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Test Software Version	PuTTY Release 0.62

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	60
2440MHz	60
2480MHz	60
BT-LE(2Mbps)	-
2402MHz	60
2440MHz	60
2480MHz	60

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	CTX
1	Adapter mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	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	Car charger mode		
2	Adapter mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			
Worst Planes of EUT			V

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Radiated measurement
Operating Mode	CTX
1	Radio 1_5G + Radio 2_2.4G+ Bluetooth + WWAN
Refer to Sporton Test Report No.: FA4N2608 for Co-location RF Exposure Evaluation and Appendix G for Radiated Emission Co-location.	

2.3 Accessories

Accessories				
AC Adapter	**Brand Name**	ASIAN	**Model Name**	WA-36W12R
	Power Rating	I/P: 100- 240Vac 50-60Hz, 0.9A Max, O/P: 12Vdc, 3.0A, 36.0W		
	Power Cord	1.5 meter, non-shielded cable, w/o ferrite core		
Vehicle Power Adapter (Car Charger)	**Brand Name**	HUAI YANG	**Model Name**	FEVCBL-2M3-C
	Power Rating	I/P:12 Vdc, 2.0 A or 24 Vdc,1.0 A, O/P:12 Vdc, 2.0 A or 24 Vdc,1.0 A		
	Power Cord	2.3meter, non-shielded cable, w/o ferrite core		
Bluetooth Antenna *1	**Brand Name**	WHA YU	**Model Name**	ANT DIPOLE 2GHz C496-510188-A BLACK
Wi-Fi Antenna *2	**Brand Name**	WHA YU	**Model Name**	ANT DIPOLE 2/5/6GHz C496-510189-A BLACK

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

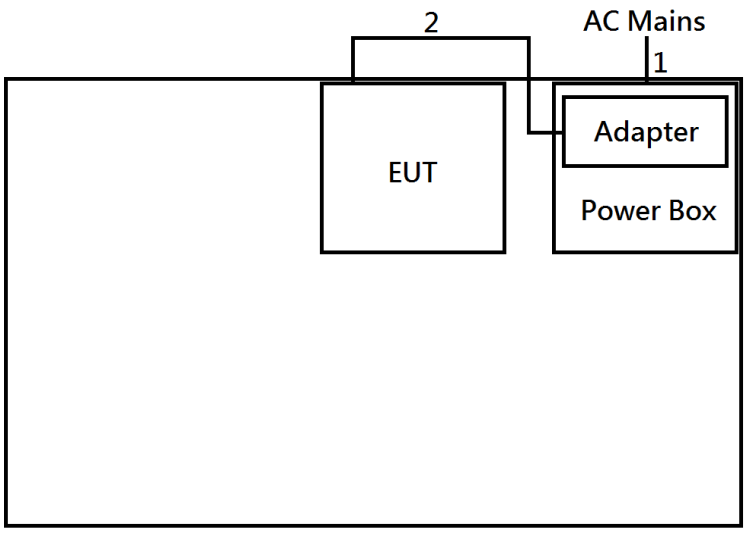
2.4 Support Equipment

Support Equipment – Conducted					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-
3	DC Power Supply	GW	GPS-3030DD	-	-
4	DC Power cable	MiSUMi	WTN1223-BLACK	-	-
5	DC Power cable	MiSUMi	WTN1223-RED	-	-
6	Car Charger Switch	Sporton	Sporton	-	Provided by Sporton

Support Equipment – Radiated					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Battery	YUASA	145G51	-	-
2	Battery	YUASA	115F51	-	-
3	DC Power cable*2	MiSUMi	WTN1223-BLACK	-	-
4	DC Power cable	MiSUMi	WTN1223-RED	-	-
5	Car Charger Switch	Sporton	Sporton	-	Provided by Sporton

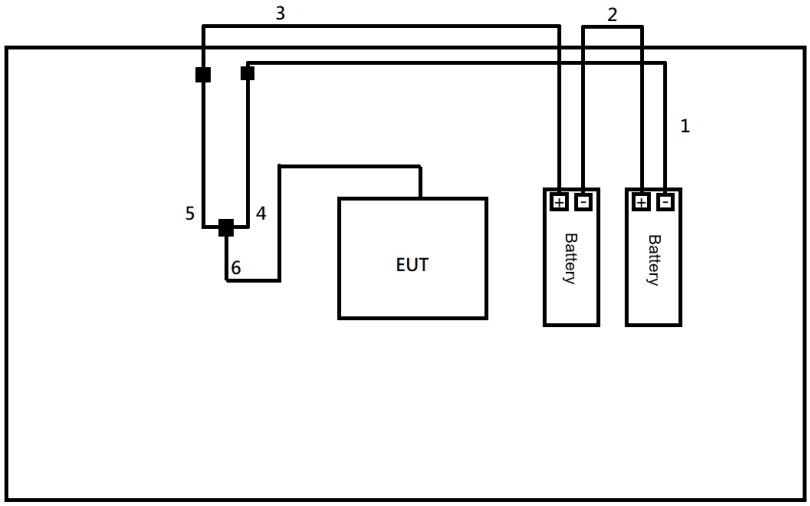
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



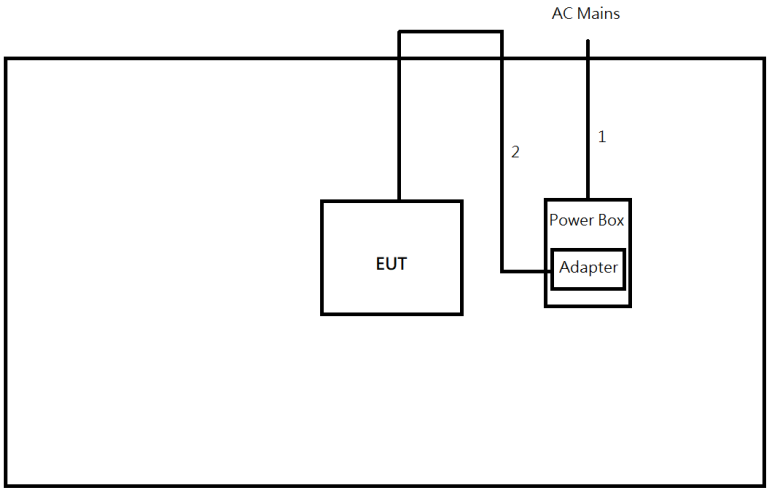
Item	Connection	Shielded	Length(m)	Remark
1	AC power cable	No	1.8	-
2	DC power cable	No	1.5	-

Test Setup Diagram - Radiated Test_Car charger mode



Item	Connection	Shielded	Length(m)	Remark
1	DC Power cable	No	1.0	-
2	DC Power cable	No	1.0	-
3	DC Power cable	No	1.0	-
4	DC Power cable(-)	No	0.1	-
5	DC Power cable(+)	No	0.1	-
6	DC Power cable	No	2.3	-

Test Setup Diagram - Radiated Test_Adapter mode



Item	Connection	Shielded	Length(m)	Remark
1	AC power cable	No	1.8	-
2	DC power cable	No	1.5	-

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

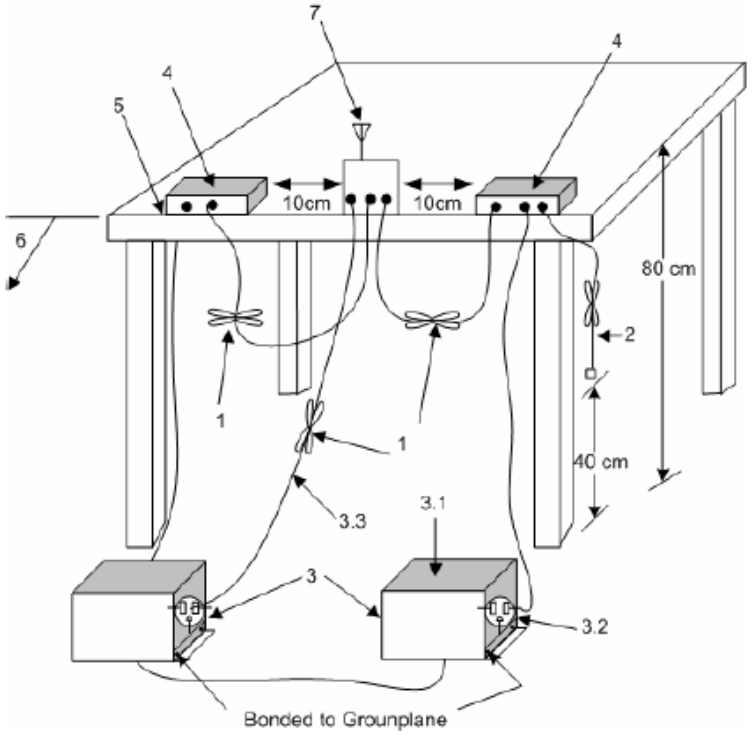
Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

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

AC Power-line Conducted Emissions



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

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 ≥ 500 kHz.

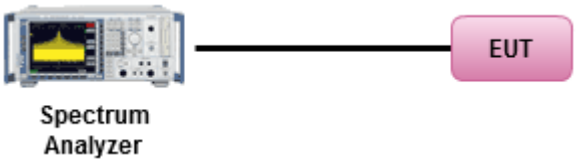
3.2.2 Measuring Instruments

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

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit			
	▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)		
	▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)$ dBm		
	▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm		
	▪ Smart antenna system (SAS):		
		- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm	
		- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm	
		- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3 + 8$dB dBm	
e.i.r.p. Power Limit:			
▪ 2400-2483.5 MHz Band			
	▪ Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)		
	▪ Point-to-point systems (P2P): $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX}])$ dBm		
	▪ Smart antenna system (SAS)		
		- Single beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm	
		- Overlap beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm	
		- Aggregate power on all beams: $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX} + 8])$ 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: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)


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

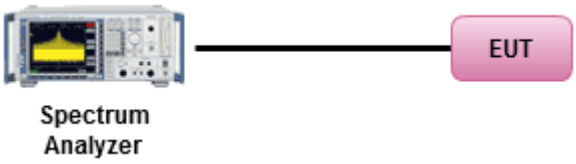
3.4.2 Measuring Instruments

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

Power Spectral Density


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.	

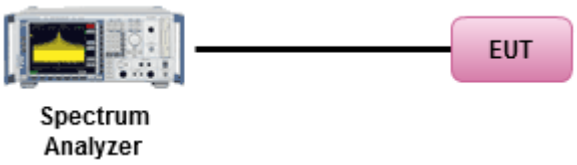
3.5.2 Measuring Instruments

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

Emissions in Non-restricted Frequency Bands


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 below30 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 ≥ 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 ≥ 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

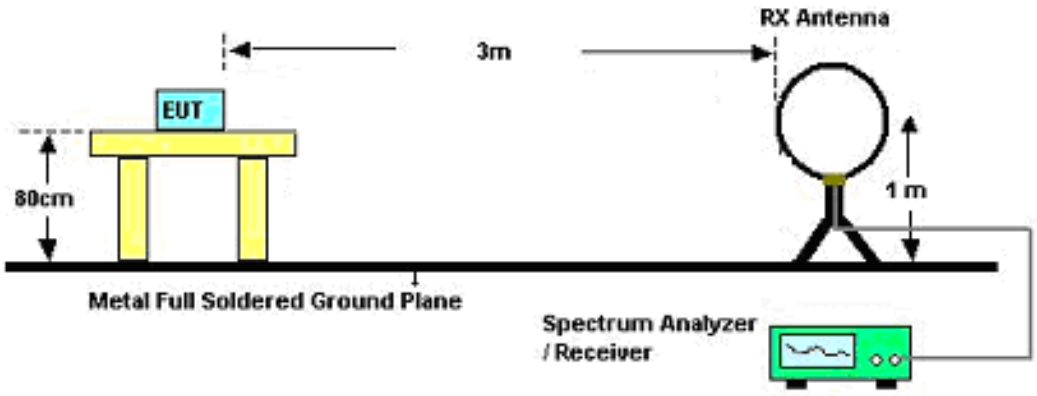
The measured Level is calculated using:

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

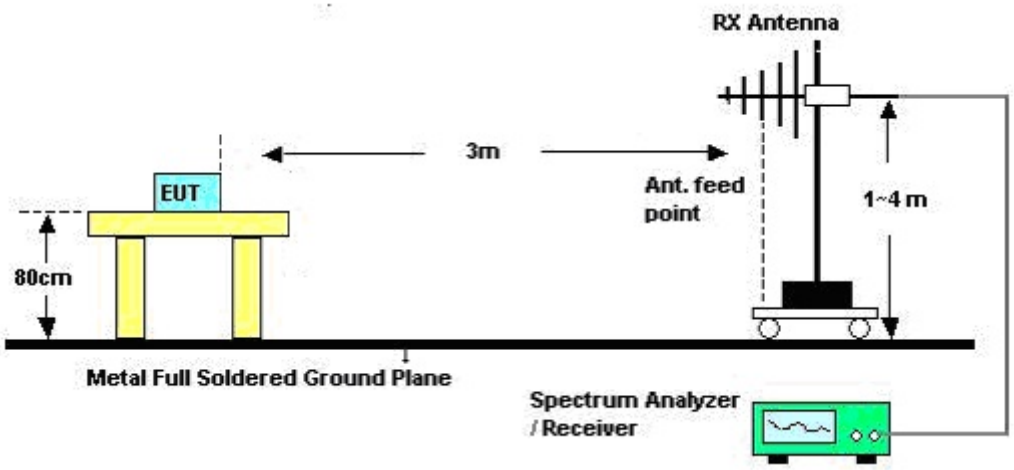
3.6.5 Test Setup

Emissions in Restricted Frequency Bands

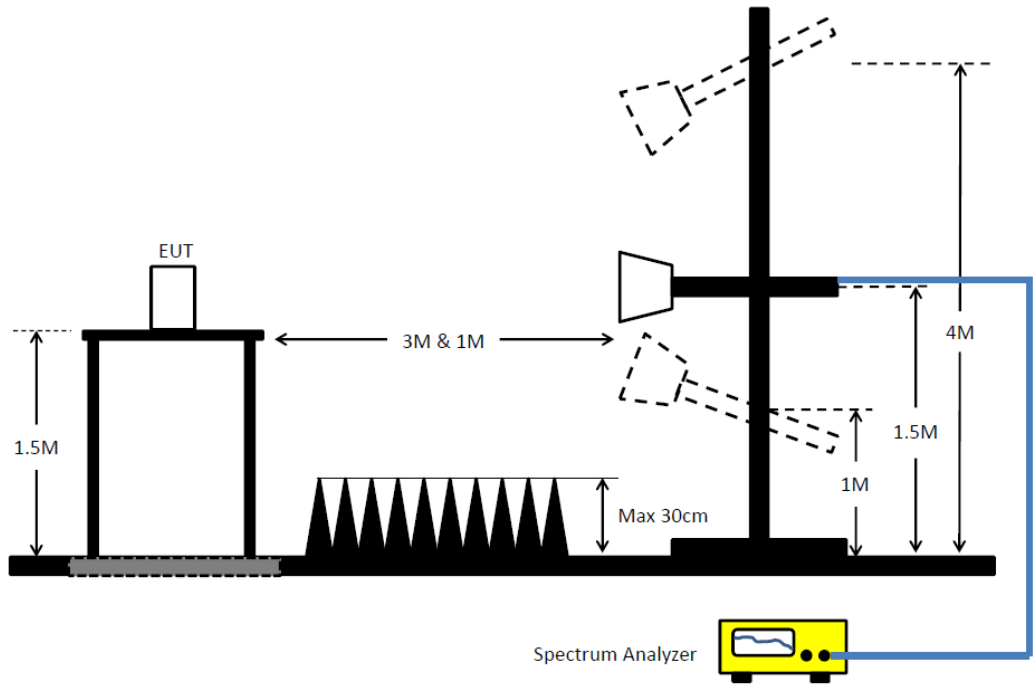
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



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	ROHDE & SCHWARZ	ESR3	102051	9kHz ~ 3.6GHz	17/May/2024	16/May/2025
Two-Line V-Network	ROHDE & SCHWARZ	ENV 216	101578	9kHz ~ 30MHz	11/Oct/2024	10/Oct/2025
RF Cable 5m	TITAN	TITAN	CO04-cable-01	9 kHz~200MHz	26/Feb/2025	25/Feb/2026
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	17/Oct/2024	16/Oct/2025
Software	Sporton	SENSE-EMI	V5.11.3	-	NCR	NCR

NCR: No Calibration Required

Instrument for Conducted Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101515	9kHz~40GHz	02/Feb/2024	01/Feb/2025
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	16/Oct/2024	15/Oct/2025
Power Meter	Anritsu	ML2495A	2105003	300MHz~40GHz	13/Sep/2024	12/Sep/2025
Pulse Sensor	Anritsu	MA2411B	1911254	300MHz~40GHz	13/Sep/2024	12/Sep/2025
SENSE-15247_FS	Sporton	V5.11.21	N/A	N/A	N/A	N/A

Instrument for Radiated Test (03CH24-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH24-HY	30MHz~1GHz 3m	16/Aug/2024	15/Aug/2025
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH24-HY	1GHz~18GHz 3m	30/Jul/2024	29/Jul/2025
EMI Test Receiver	ROHDE & SCHWARZ	ESR	102318	9kHz~3.6GHz	06/Dec/2024	05/Dec/2025
Signal Analyzer	ROHDE&SCHWARZ	FSV3044	101345	10Hz~44GHz	27/Aug/2024	26/Aug/2025
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	19/Mar/2024	18/Mar/2025
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	20/Mar/2025	19/Mar/2026
Bilog Antenna & 6dB Attenuator	TESEQ / Woken	CBL 6112D / 00800N1D01N-06	35376 / 02	30MHz~1GHz	14/Apr/2024	13/Apr/2025
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02744	1GHz~18GHz	15/Aug/2024	14/Aug/2025
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz~40GHz	04/Jun/2024	05/Jun/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	03CH24-cable-01	9kHz~40GHz	01/Oct/2024	30/Sep/2025
Pre-Amplifier	Aglient	8447D	2944A06292	30MHz~1GHz	18/Apr/2024	17/Apr/2025
Amplifier	EM	EM01G18G	060870	1GHz ~18GHz	12/Aug/2024	11/Aug/2025
Microwave Premplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz ~ 40GHz	19/Apr/2024	18/Apr/2025
SENSE-15247-FS	Sporton	V5.11.18	NA	NA	NA	NA

Instrument for Radiated Test (Co-Location)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Site V.S.W.R	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz~18GHz 3M	14/Jul/2024	13/Jul/2025
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02268	1GHz~18GHz	23/Sep/2024	22/Sep/2025
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz~40GHz	04/Jun/2024	03/Jun/2025
RF Cable-R03m	HUBER+SUHNER	SUCOFLEX 104	03CH02-cable-01	1GHz~40GHz	15/Feb/2024	14/Feb/2025
Microwave Preamplifier	Agilent	8449B	3008A02373	1GHz~26.5GHz	01/Oct/2024	30/Sep/2025
Microwave Preamplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz ~40GHz	19/Apr/2024	18/Apr/2025
SENSE-EMI	Sporton	V5.11.9	N/A	N/A	N/A	N/A

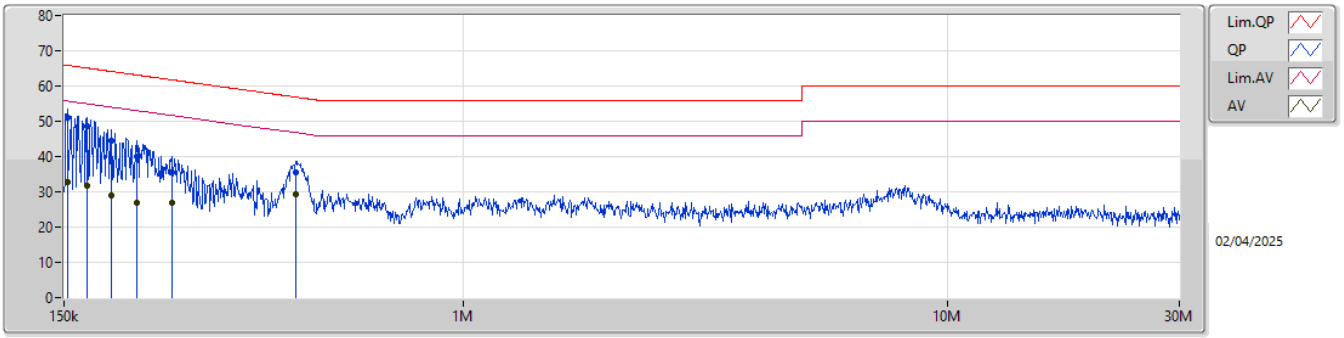
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	150.6k	52.22	65.96	-13.74	Neutral

Result

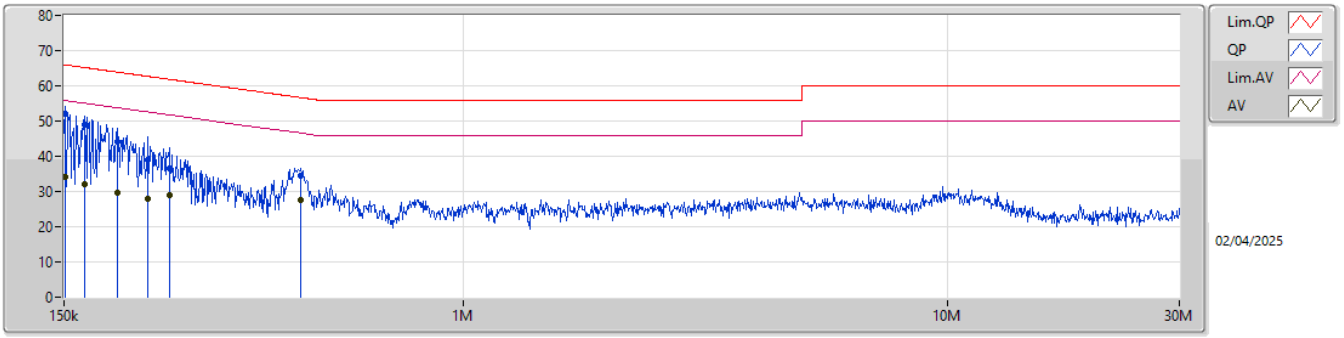
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	152.414k	51.12	65.87	-14.75	Line
Mode 1	Pass	AV	152.414k	32.68	55.87	-23.19	Line
Mode 1	Pass	QP	167.071k	48.60	65.10	-16.50	Line
Mode 1	Pass	AV	167.071k	31.89	55.10	-23.21	Line
Mode 1	Pass	QP	187.577k	44.32	64.15	-19.83	Line
Mode 1	Pass	AV	187.577k	29.04	54.15	-25.11	Line
Mode 1	Pass	QP	212.287k	40.06	63.11	-23.05	Line
Mode 1	Pass	AV	212.287k	26.96	53.11	-26.15	Line
Mode 1	Pass	QP	250.038k	35.65	61.76	-26.11	Line
Mode 1	Pass	AV	250.038k	26.81	51.76	-24.95	Line
Mode 1	Pass	QP	451.436k	35.63	56.84	-21.21	Line
Mode 1	Pass	AV	451.436k	29.31	46.84	-17.53	Line
Mode 1	Pass	QP	150.6k	52.22	65.96	-13.74	Neutral
Mode 1	Pass	AV	150.6k	33.97	55.96	-21.99	Neutral
Mode 1	Pass	QP	165.082k	48.88	65.20	-16.32	Neutral
Mode 1	Pass	AV	165.082k	31.91	55.20	-23.29	Neutral
Mode 1	Pass	QP	192.892k	44.06	63.92	-19.86	Neutral
Mode 1	Pass	AV	192.892k	29.51	53.92	-24.41	Neutral
Mode 1	Pass	QP	223.595k	39.13	62.69	-23.56	Neutral
Mode 1	Pass	AV	223.595k	27.95	52.69	-24.74	Neutral
Mode 1	Pass	QP	247.062k	36.45	61.85	-25.40	Neutral
Mode 1	Pass	AV	247.062k	29.00	51.85	-22.85	Neutral
Mode 1	Pass	QP	462.379k	34.35	56.65	-22.30	Neutral
Mode 1	Pass	AV	462.379k	27.73	46.65	-18.92	Neutral

Conducted Emissions at Powerline_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	152.414k	51.12	65.87	-14.75	19.93	Line	-	31.19	9.95	0.01	9.97
AV	152.414k	32.68	55.87	-23.19	19.93	Line	-	12.75	9.95	0.01	9.97
QP	167.071k	48.60	65.10	-16.50	20.23	Line	-	28.37	10.25	0.01	9.97
AV	167.071k	31.89	55.10	-23.21	20.23	Line	-	11.66	10.25	0.01	9.97
QP	187.577k	44.32	64.15	-19.83	20.07	Line	-	24.25	10.09	0.01	9.97
AV	187.577k	29.04	54.15	-25.11	20.07	Line	-	8.97	10.09	0.01	9.97
QP	212.287k	40.06	63.11	-23.05	19.85	Line	-	20.21	9.87	0.01	9.97
AV	212.287k	26.96	53.11	-26.15	19.85	Line	-	7.11	9.87	0.01	9.97
QP	250.038k	35.65	61.76	-26.11	19.64	Line	-	16.01	9.65	0.02	9.97
AV	250.038k	26.81	51.76	-24.95	19.64	Line	-	7.17	9.65	0.02	9.97
QP	451.436k	35.63	56.84	-21.21	20.05	Line	-	15.58	10.04	0.03	9.98
AV	451.436k	29.31	46.84	-17.53	20.05	Line	-	9.26	10.04	0.03	9.98

Conducted Emissions at Powerline_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	150.6k	52.22	65.96	-13.74	19.90	Neutral	-	32.32	9.92	0.01	9.97
AV	150.6k	33.97	55.96	-21.99	19.90	Neutral	-	14.07	9.92	0.01	9.97
QP	165.082k	48.88	65.20	-16.32	20.20	Neutral	-	28.68	10.22	0.01	9.97
AV	165.082k	31.91	55.20	-23.29	20.20	Neutral	-	11.71	10.22	0.01	9.97
QP	192.892k	44.06	63.92	-19.86	20.03	Neutral	-	24.03	10.05	0.01	9.97
AV	192.892k	29.51	53.92	-24.41	20.03	Neutral	-	9.48	10.05	0.01	9.97
QP	223.595k	39.13	62.69	-23.56	19.80	Neutral	-	19.33	9.82	0.01	9.97
AV	223.595k	27.95	52.69	-24.74	19.80	Neutral	-	8.15	9.82	0.01	9.97
QP	247.062k	36.45	61.85	-25.40	19.68	Neutral	-	16.77	9.69	0.02	9.97
AV	247.062k	29.00	51.85	-22.85	19.68	Neutral	-	9.32	9.69	0.02	9.97
QP	462.379k	34.35	56.65	-22.30	20.05	Neutral	-	14.30	10.04	0.03	9.98
AV	462.379k	27.73	46.65	-18.92	20.05	Neutral	-	7.68	10.04	0.03	9.98

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	702.5k	1.018M	1M02F1D	631.25k	1.004M
BT-LE(2Mbps)	1.338M	2.026M	2M03F1D	655k	1.989M

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

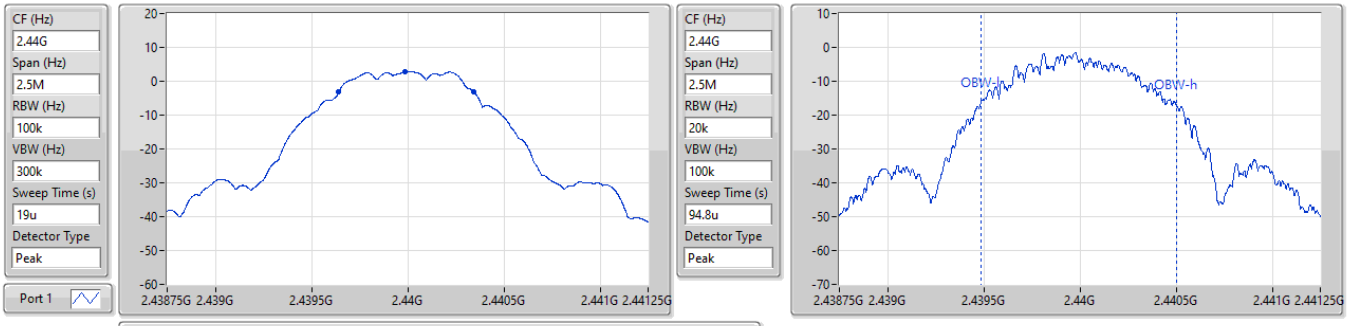
Mode	Result	Limit	Port 1-N dB	Port 1-OBW
		(Hz)	(Hz)	(Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	631.25k	1.004M
2440MHz	Pass	500k	702.5k	1.018M
2480MHz	Pass	500k	662.5k	1.017M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	920k	2.026M
2440MHz	Pass	500k	655k	2.024M
2480MHz	Pass	500k	1.338M	1.989M

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

2.4-2.4835GHz_BT-LE(1Mbps) **EBW-DTS**

2440MHz

29/12/2024

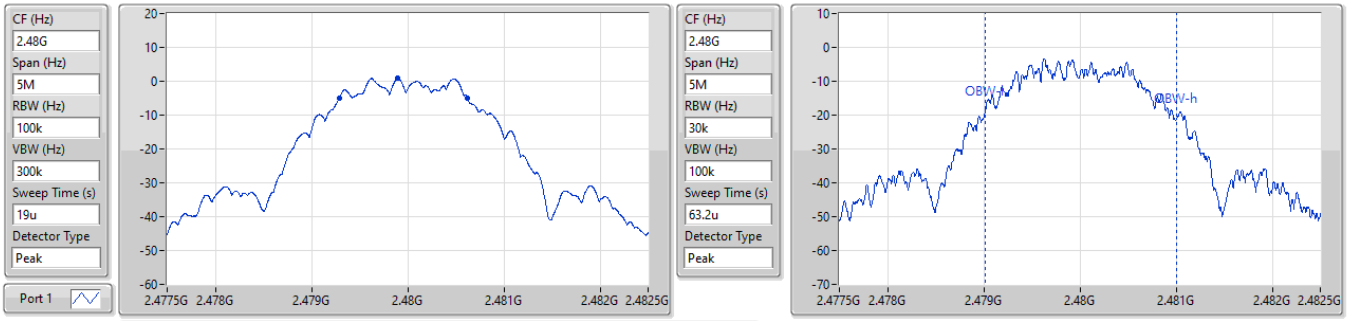


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
702.5k	2.439643G	2.440345G	1.018M	2.439484G	2.440502G	500k	1

2.4-2.4835GHz_BT-LE(2Mbps) **EBW-DTS**

2480MHz

29/12/2024



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.338M	2.479288G	2.480625G	1.989M	2.479015G	2.481004G	500k	1

Summary

Mode	Total Power	Total Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	4.99	0.00316
BT-LE(2Mbps)	4.94	0.00312

Result

Mode	Result	DG	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	1.80	4.99	30.00
2440MHz	Pass	1.80	4.73	30.00
2480MHz	Pass	1.80	4.60	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	1.80	4.94	30.00
2440MHz	Pass	1.80	4.67	30.00
2480MHz	Pass	1.80	4.48	30.00

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

Summary

Mode	PD
	(dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-10.82
BT-LE(2Mbps)	-14.10

RBW = 3kHz;

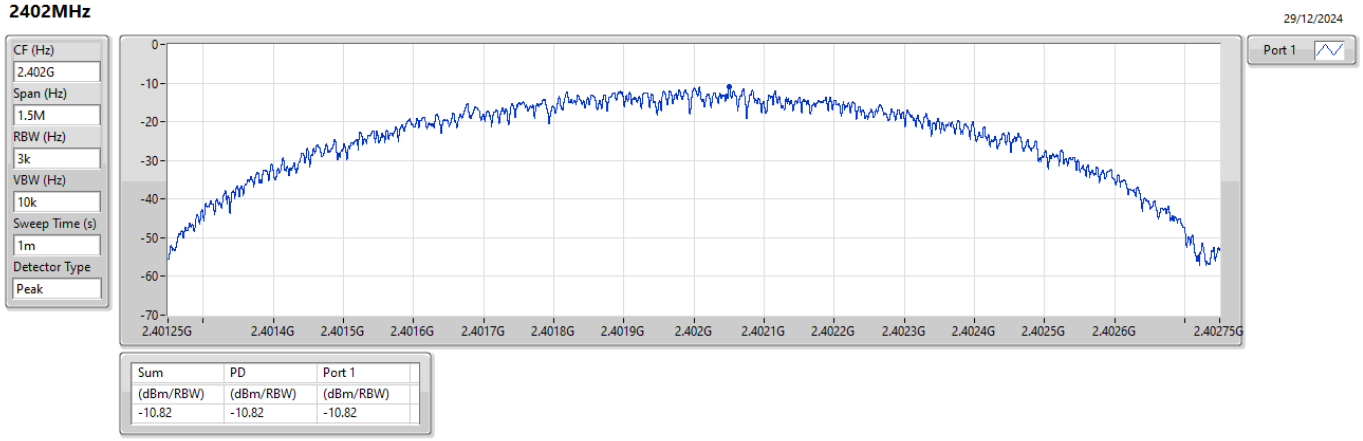
Result

Mode	Result	DG	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	1.80	-10.82	8.00
2440MHz	Pass	1.80	-11.09	8.00
2480MHz	Pass	1.80	-11.67	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	1.80	-14.52	8.00
2440MHz	Pass	1.80	-14.10	8.00
2480MHz	Pass	1.80	-14.23	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;
Inf = There's no restriction for the limit.

2.4-2.4835GHz_BT-LE(1Mbps) **PSD**

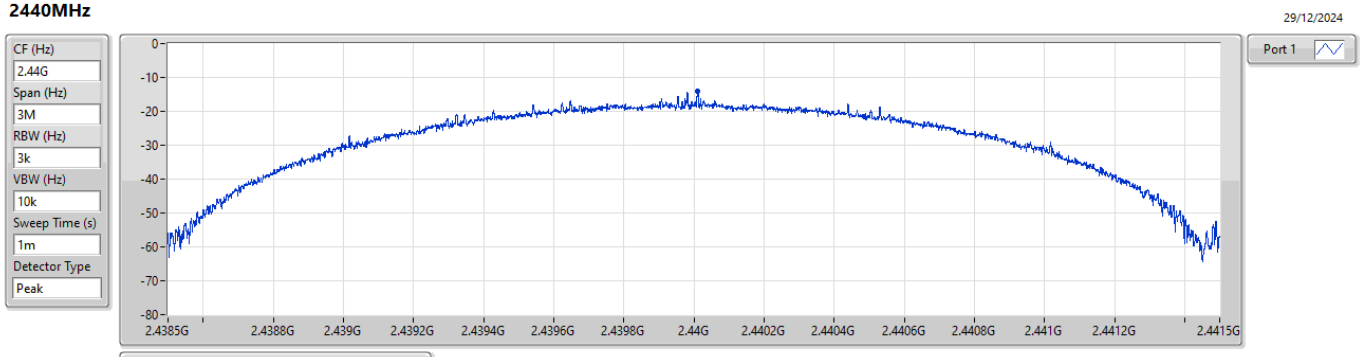
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.82	-10.82	-10.82

2.4-2.4835GHz_BT-LE(2Mbps) **PSD**

2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.10	-14.10	-14.10

Summary

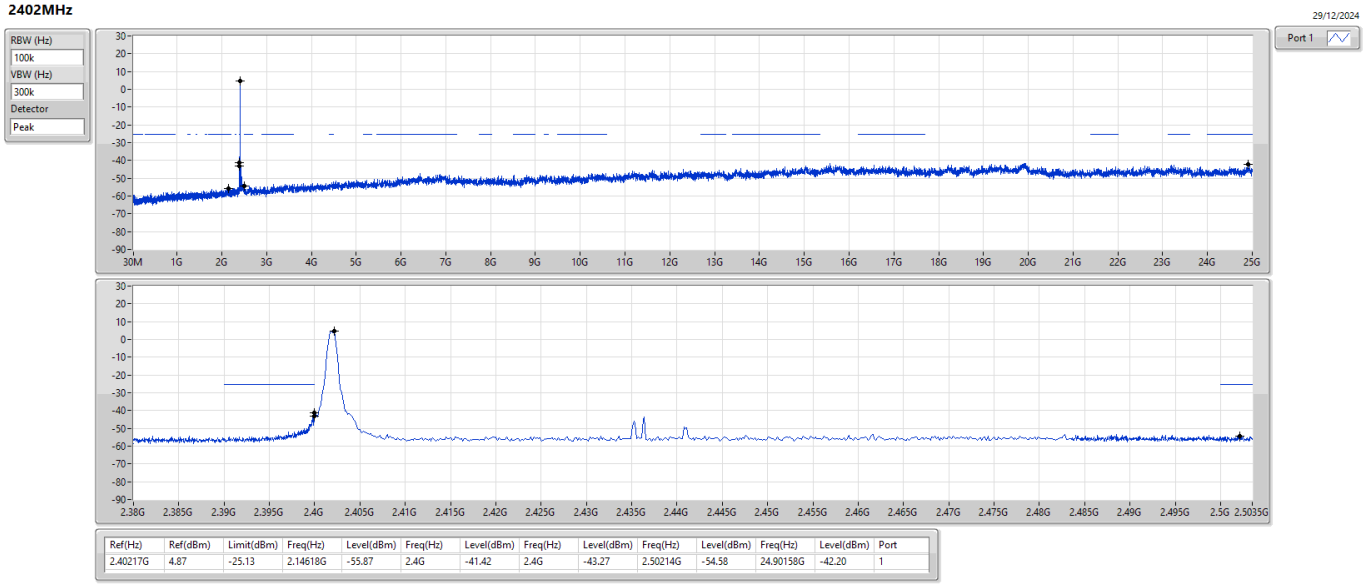
Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.40217G	4.87	-25.13	2.14618G	-55.87	2.4G	-41.42	2.4G	-43.27	2.50214G	-54.58	24.90158G	-42.20	1
BT-LE(2Mbps)	Pass	2.40234G	3.95	-26.05	2.19788G	-55.85	2.4G	-29.21	2.4G	-29.25	2.5003G	-53.95	17.0503G	-42.53	1

Result

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40217G	4.87	-25.13	2.14618G	-55.87	2.4G	-41.42	2.4G	-43.27	2.50214G	-54.58	24.90158G	-42.20	1
2440MHz	Pass	2.40217G	4.87	-25.13	2.13795G	-54.59	2.39648G	-54.16	2.4G	-56.62	2.50058G	-53.97	24.62037G	-42.94	1
2480MHz	Pass	2.40217G	4.87	-25.13	2.17555G	-54.94	2.39708G	-53.94	2.4G	-56.81	2.50166G	-53.68	24.59506G	-42.62	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40234G	3.95	-26.05	2.19788G	-55.85	2.4G	-29.21	2.4G	-29.25	2.5003G	-53.95	17.0503G	-42.53	1
2440MHz	Pass	2.40234G	3.95	-26.05	2.18848G	-55.65	2.39732G	-53.52	2.4G	-56.57	2.5033G	-54.56	16.96594G	-42.53	1
2480MHz	Pass	2.40234G	3.95	-26.05	2.14148G	-55.14	2.39328G	-53.64	2.4G	-55.70	2.50082G	-54.29	16.87595G	-42.87	1

2.4-2.4835GHz_BT-LE(1Mbps) CSENdB-DTS

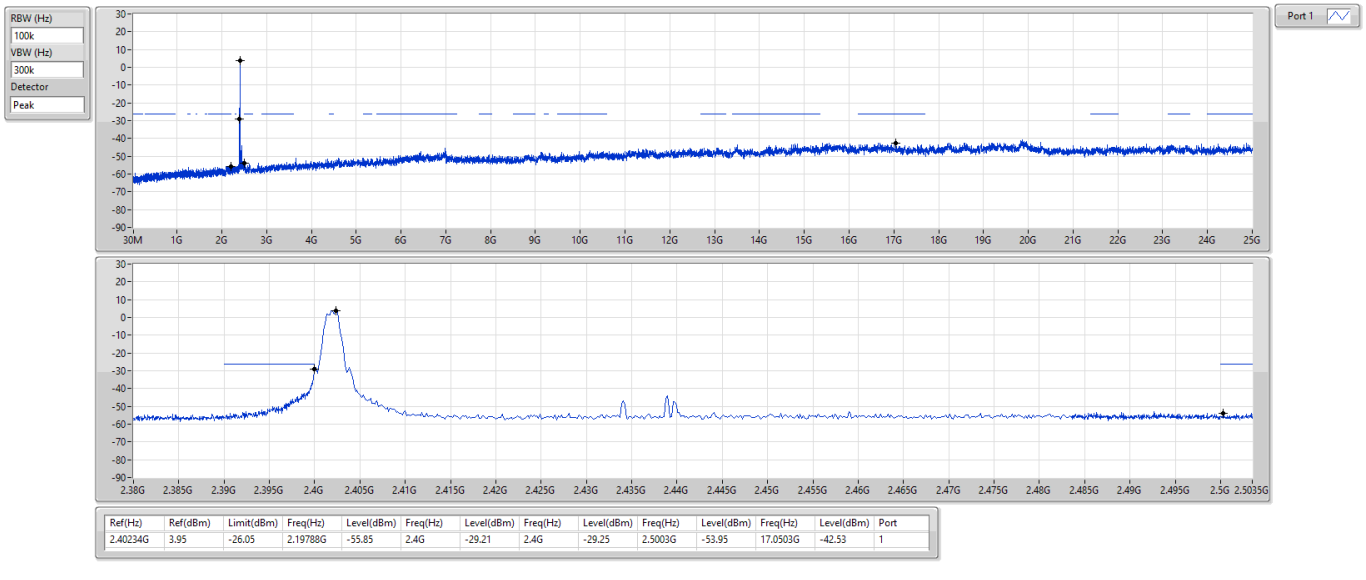
2402MHz



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
2.40217G	4.87	-25.13	2.14618G	-55.87	2.4G	-41.42	2.4G	-43.27	2.50214G	-54.58	24.90158G	-42.20	1

2.4-2.4835GHz_BT-LE(2Mbps) CSENdB-DTS

2402MHz



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
2.40234G	3.95	-26.05	2.19788G	-55.85	2.4G	-29.21	2.4G	-29.25	2.5003G	-53.95	17.0503G	-42.53	1

Summary

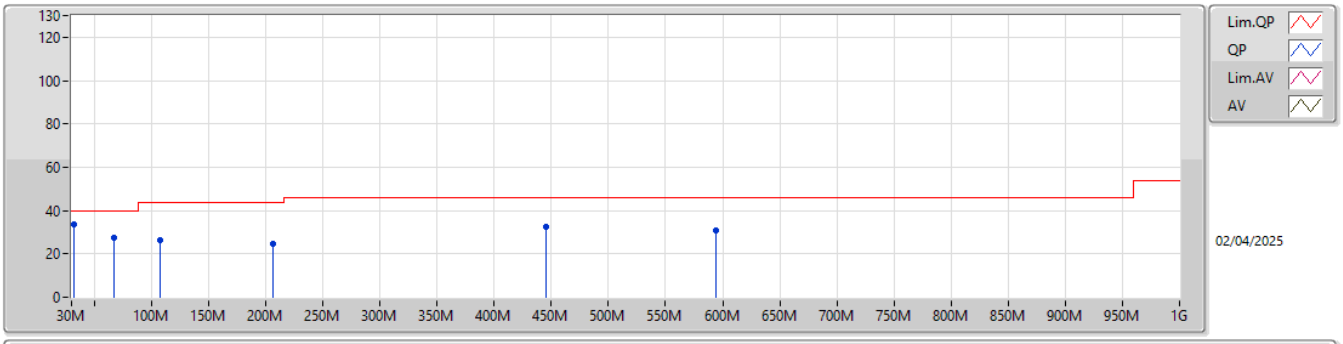
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-LE(2Mbps)	Pass	PK	31.94M	33.64	40.00	-6.36	3	Vertical	360	1.00

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-
2440MHz;Car charger	Pass	PK	229.82M	37.68	46.00	-8.32	3	Vertical	0	1.00
2440MHz;Car charger	Pass	PK	291.9M	30.37	46.00	-15.63	3	Vertical	0	1.00
2440MHz;Car charger	Pass	PK	367.56M	29.91	46.00	-16.09	3	Vertical	0	1.00
2440MHz;Car charger	Pass	PK	437.4M	34.41	46.00	-11.59	3	Vertical	0	1.00
2440MHz;Car charger	Pass	PK	705.12M	32.60	46.00	-13.40	3	Vertical	0	1.00
2440MHz;Car charger	Pass	PK	897.18M	30.74	46.00	-15.26	3	Vertical	0	1.00
2440MHz;Car charger	Pass	PK	225.94M	32.12	46.00	-13.88	3	Horizontal	360	1.00
2440MHz;Car charger	Pass	PK	295.78M	28.29	46.00	-17.71	3	Horizontal	360	1.00
2440MHz;Car charger	Pass	PK	435.46M	33.91	46.00	-12.09	3	Horizontal	360	1.00
2440MHz;Car charger	Pass	PK	625.58M	29.11	46.00	-16.89	3	Horizontal	360	1.00
2440MHz;Car charger	Pass	PK	710.94M	34.49	46.00	-11.51	3	Horizontal	360	1.00
2440MHz;Car charger	Pass	PK	903M	30.21	46.00	-15.79	3	Horizontal	360	1.00
2440MHz;Adapter	Pass	PK	31.94M	33.64	40.00	-6.36	3	Vertical	360	1.00
2440MHz;Adapter	Pass	PK	66.86M	27.28	40.00	-12.72	3	Vertical	360	1.00
2440MHz;Adapter	Pass	PK	107.6M	26.59	43.50	-16.91	3	Vertical	360	1.00
2440MHz;Adapter	Pass	PK	206.54M	24.57	43.50	-18.93	3	Vertical	360	1.00
2440MHz;Adapter	Pass	PK	445.16M	32.38	46.00	-13.62	3	Vertical	360	1.00
2440MHz;Adapter	Pass	PK	594.54M	30.94	46.00	-15.06	3	Vertical	360	1.00
2440MHz;Adapter	Pass	PK	31.94M	31.26	40.00	-8.74	3	Horizontal	0	1.00
2440MHz;Adapter	Pass	PK	111.48M	28.79	43.50	-14.71	3	Horizontal	0	1.00
2440MHz;Adapter	Pass	PK	208.48M	33.69	43.50	-9.81	3	Horizontal	0	1.00
2440MHz;Adapter	Pass	PK	334.58M	30.25	46.00	-15.75	3	Horizontal	0	1.00
2440MHz;Adapter	Pass	PK	441.28M	35.14	46.00	-10.86	3	Horizontal	0	1.00
2440MHz;Adapter	Pass	PK	646.92M	29.69	46.00	-16.31	3	Horizontal	0	1.00

2.4-2.4835GHz_BT-LE(2Mbps)

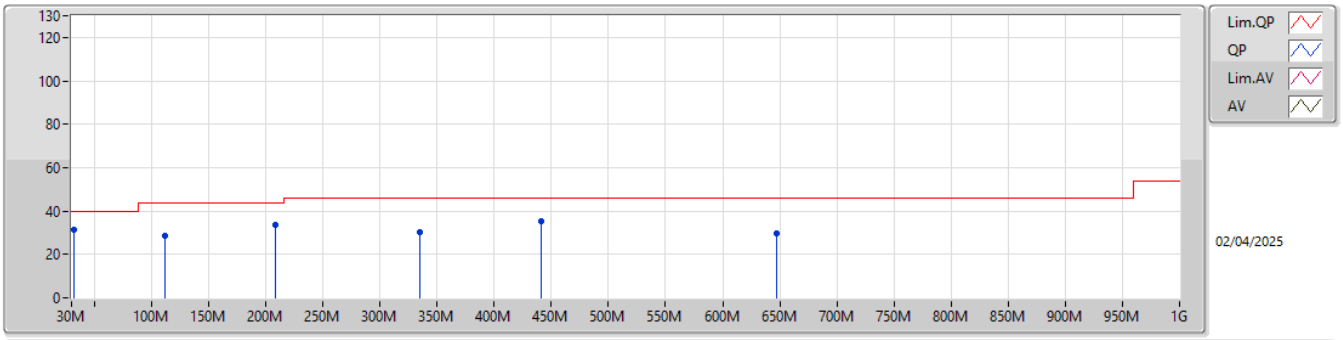
2440MHz_Adapter



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
PK	31.94M	33.64	40.00	-6.36	-4.49	3	Vertical	360	1.00	38.13	22.46	0.43	27.38
PK	66.86M	27.28	40.00	-12.72	-15.43	3	Vertical	360	1.00	42.71	11.29	0.61	27.33
PK	107.6M	26.59	43.50	-16.91	-9.92	3	Vertical	360	1.00	36.51	16.51	0.79	27.22
PK	206.54M	24.57	43.50	-18.93	-11.37	3	Vertical	360	1.00	35.94	14.33	1.11	26.81
PK	445.16M	32.38	46.00	-13.62	-4.55	3	Vertical	360	1.00	36.93	21.74	1.59	27.88
PK	594.54M	30.94	46.00	-15.06	-2.68	3	Vertical	360	1.00	33.62	23.72	1.82	28.22

2.4-2.4835GHz_BT-LE(2Mbps)

2440MHz_Adapter



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
PK	31.94M	31.26	40.00	-8.74	-4.49	3	Horizontal	0	1.00	35.75	22.46	0.43	27.38
PK	111.48M	28.79	43.50	-14.71	-9.59	3	Horizontal	0	1.00	38.38	16.82	0.80	27.21
PK	208.48M	33.69	43.50	-9.81	-11.43	3	Horizontal	0	1.00	45.12	14.26	1.11	26.80
PK	334.58M	30.25	46.00	-15.75	-6.77	3	Horizontal	0	1.00	37.02	18.76	1.39	26.92
PK	441.28M	35.14	46.00	-10.86	-4.51	3	Horizontal	0	1.00	39.65	21.73	1.59	27.83
PK	646.92M	29.69	46.00	-16.31	-2.39	3	Horizontal	0	1.00	32.08	24.13	1.91	28.43

Summary

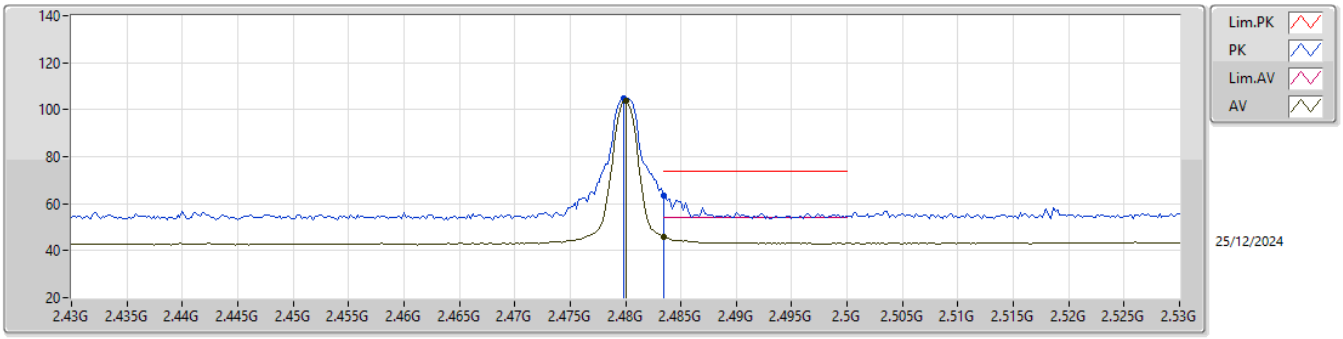
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.4835G	46.02	54.00	-7.98	3	Vertical	198	1.23
BT-LE(2Mbps)	Pass	AV	2.4835G	53.31	54.00	-0.69	3	Vertical	196	1.26

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3872G	42.89	54.00	-11.11	3	Vertical	190	1.33
2402MHz	Pass	AV	2.402G	103.40	Inf	-Inf	3	Vertical	190	1.33
2402MHz	Pass	PK	2.3638G	58.59	74.00	-15.41	3	Vertical	190	1.33
2402MHz	Pass	PK	2.4018G	104.31	Inf	-Inf	3	Vertical	190	1.33
2402MHz	Pass	AV	4.81104G	26.42	54.00	-27.58	3	Vertical	259	1.50
2402MHz	Pass	PK	4.79496G	39.23	74.00	-34.77	3	Vertical	259	1.50
2402MHz	Pass	AV	4.8098G	26.36	54.00	-27.64	3	Horizontal	224	2.31
2402MHz	Pass	PK	4.8102G	39.42	74.00	-34.58	3	Horizontal	224	2.31
2440MHz	Pass	AV	2.3836G	42.74	54.00	-11.26	3	Vertical	204	1.14
2440MHz	Pass	AV	2.44G	103.82	Inf	-Inf	3	Vertical	204	1.14
2440MHz	Pass	AV	2.496G	43.18	54.00	-10.82	3	Vertical	204	1.14
2440MHz	Pass	PK	2.3588G	55.64	74.00	-18.36	3	Vertical	204	1.14
2440MHz	Pass	PK	2.4396G	104.69	Inf	-Inf	3	Vertical	204	1.14
2440MHz	Pass	PK	2.4896G	56.04	74.00	-17.96	3	Vertical	204	1.14
2440MHz	Pass	AV	4.8742G	27.04	54.00	-26.96	3	Vertical	230	1.50
2440MHz	Pass	PK	4.88728G	40.22	74.00	-33.78	3	Vertical	230	1.50
2440MHz	Pass	AV	4.87148G	26.97	54.00	-27.03	3	Horizontal	91	1.03
2440MHz	Pass	PK	4.8808G	40.87	74.00	-33.13	3	Horizontal	91	1.03
2480MHz	Pass	AV	2.48G	103.74	Inf	-Inf	3	Vertical	198	1.23
2480MHz	Pass	AV	2.4835G	46.02	54.00	-7.98	3	Vertical	198	1.23
2480MHz	Pass	PK	2.4798G	104.63	Inf	-Inf	3	Vertical	198	1.23
2480MHz	Pass	PK	2.4835G	63.40	74.00	-10.60	3	Vertical	198	1.23
2480MHz	Pass	AV	4.9652G	27.90	54.00	-26.10	3	Vertical	118	1.75
2480MHz	Pass	PK	4.95692G	40.83	74.00	-33.17	3	Vertical	118	1.75
2480MHz	Pass	AV	4.96284G	27.84	54.00	-26.16	3	Horizontal	236	1.50
2480MHz	Pass	PK	4.96728G	41.31	74.00	-32.69	3	Horizontal	236	1.50
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3864G	42.92	54.00	-11.08	3	Vertical	189	1.54
2402MHz	Pass	AV	2.402G	101.35	Inf	-Inf	3	Vertical	189	1.54
2402MHz	Pass	PK	2.3632G	58.95	74.00	-15.05	3	Vertical	189	1.54
2402MHz	Pass	PK	2.4014G	104.15	Inf	-Inf	3	Vertical	189	1.54
2402MHz	Pass	AV	4.79416G	26.40	54.00	-27.60	3	Vertical	24	1.50
2402MHz	Pass	PK	4.8056G	39.64	74.00	-34.36	3	Vertical	24	1.50
2402MHz	Pass	AV	4.8128G	26.43	54.00	-27.57	3	Horizontal	246	1.50
2402MHz	Pass	PK	4.80192G	40.37	74.00	-33.63	3	Horizontal	246	1.50
2440MHz	Pass	AV	2.3896G	42.81	54.00	-11.19	3	Vertical	203	1.16
2440MHz	Pass	AV	2.44G	101.95	Inf	-Inf	3	Vertical	203	1.16
2440MHz	Pass	AV	2.494G	43.42	54.00	-10.58	3	Vertical	203	1.16
2440MHz	Pass	PK	2.3684G	55.83	74.00	-18.17	3	Vertical	203	1.16
2440MHz	Pass	PK	2.4396G	104.73	Inf	-Inf	3	Vertical	203	1.16
2440MHz	Pass	PK	2.496G	55.97	74.00	-18.03	3	Vertical	203	1.16
2440MHz	Pass	AV	4.87272G	27.01	54.00	-26.99	3	Vertical	14	1.50
2440MHz	Pass	PK	4.88684G	40.67	74.00	-33.33	3	Vertical	14	1.50
2440MHz	Pass	AV	4.87128G	27.11	54.00	-26.89	3	Horizontal	177	1.00
2440MHz	Pass	PK	4.87096G	40.52	74.00	-33.48	3	Horizontal	177	1.00
2480MHz	Pass	AV	2.48G	101.78	Inf	-Inf	3	Vertical	196	1.26
2480MHz	Pass	AV	2.4835G	53.31	54.00	-0.69	3	Vertical	196	1.26
2480MHz	Pass	PK	2.4796G	104.58	Inf	-Inf	3	Vertical	196	1.26
2480MHz	Pass	PK	2.4835G	65.30	74.00	-8.70	3	Vertical	196	1.26
2480MHz	Pass	AV	4.96996G	27.92	54.00	-26.08	3	Vertical	323	1.50
2480MHz	Pass	PK	4.96528G	41.20	74.00	-32.80	3	Vertical	323	1.50
2480MHz	Pass	AV	4.96744G	27.82	54.00	-26.18	3	Horizontal	289	1.50
2480MHz	Pass	PK	4.96284G	41.70	74.00	-32.30	3	Horizontal	289	1.50

2.4-2.4835GHz_BT-LE(1Mbps)

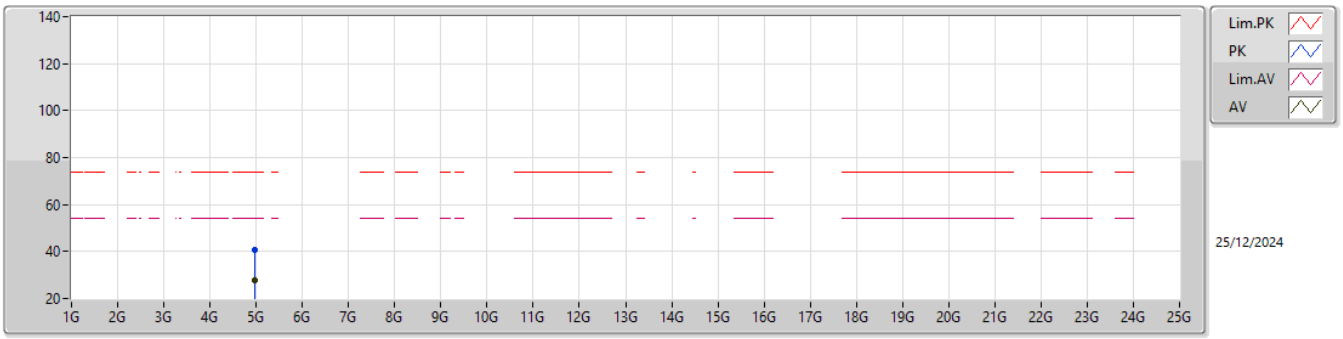
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	103.74	Inf	-Inf	30.71	3	Vertical	198	1.23	73.03	27.90	2.81	-
AV	2.4835G	46.02	54.00	-7.98	30.71	3	Vertical	198	1.23	15.31	27.90	2.81	-
PK	2.4798G	104.63	Inf	-Inf	30.71	3	Vertical	198	1.23	73.92	27.90	2.81	-
PK	2.4835G	63.40	74.00	-10.60	30.71	3	Vertical	198	1.23	32.69	27.90	2.81	-

2.4-2.4835GHz_BT-LE(1Mbps)

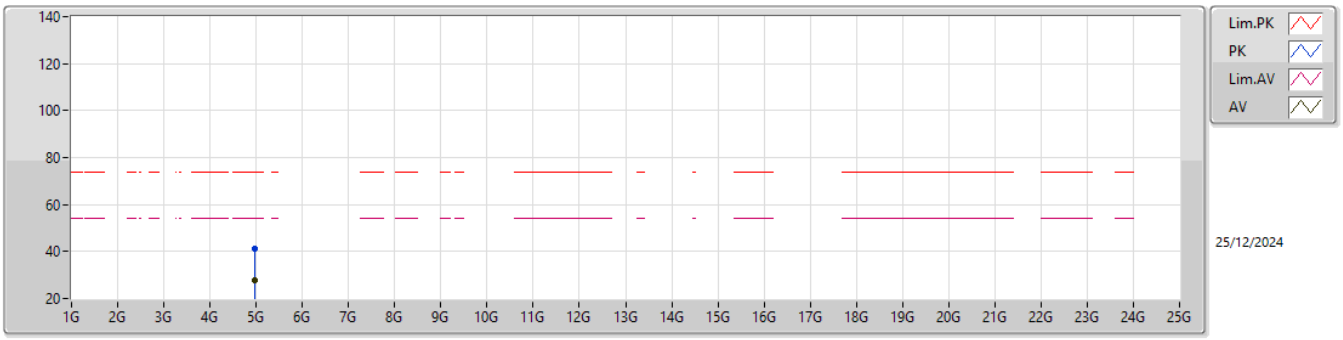
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	4.9652G	27.90	54.00	-26.10	-0.58	3	Vertical	118	1.75	28.48	33.32	4.28	38.18
PK	4.95692G	40.83	74.00	-33.17	-0.64	3	Vertical	118	1.75	41.47	33.26	4.28	38.18

2.4-2.4835GHz_BT-LE(1Mbps)

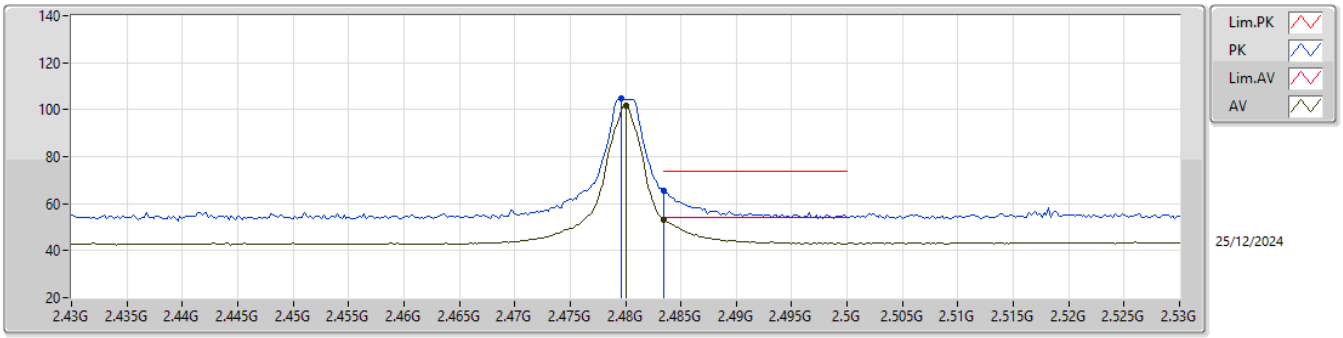
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	4.96284G	27.84	54.00	-26.16	-0.60	3	Horizontal	236	1.50	28.44	33.30	4.28	38.18
PK	4.96728G	41.31	74.00	-32.69	-0.55	3	Horizontal	236	1.50	41.86	33.34	4.29	38.18

2.4-2.4835GHz_BT-LE(2Mbps)

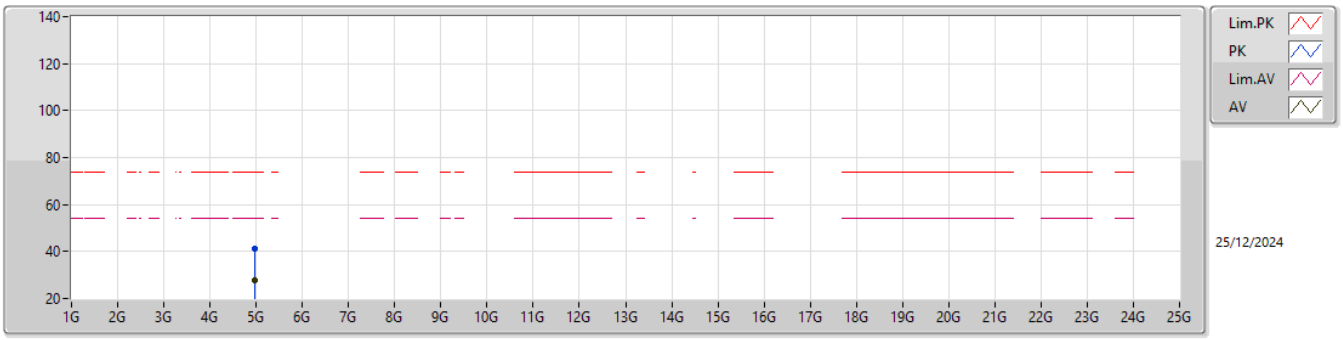
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	101.78	Inf	-Inf	30.71	3	Vertical	196	1.26	71.07	27.90	2.81	-
AV	2.4835G	53.31	54.00	-0.69	30.71	3	Vertical	196	1.26	22.60	27.90	2.81	-
PK	2.4796G	104.58	Inf	-Inf	30.71	3	Vertical	196	1.26	73.87	27.90	2.81	-
PK	2.4835G	65.30	74.00	-8.70	30.71	3	Vertical	196	1.26	34.59	27.90	2.81	-

2.4-2.4835GHz_BT-LE(2Mbps)

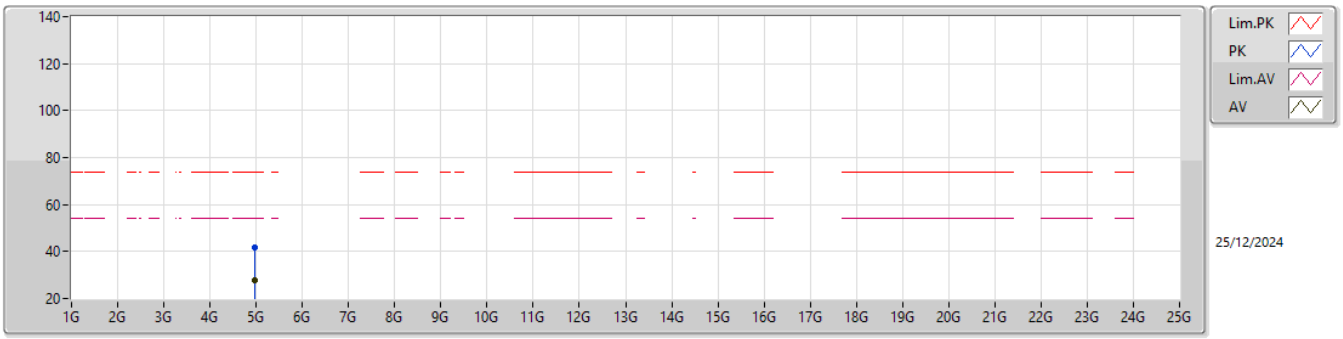
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	4.96996G	27.92	54.00	-26.08	-0.53	3	Vertical	323	1.50	28.45	33.36	4.29	38.18
PK	4.96528G	41.20	74.00	-32.80	-0.58	3	Vertical	323	1.50	41.78	33.32	4.28	38.18

2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	4.96744G	27.82	54.00	-26.18	-0.55	3	Horizontal	289	1.50	28.37	33.34	4.29	38.18
PK	4.96284G	41.70	74.00	-32.30	-0.60	3	Horizontal	289	1.50	42.30	33.30	4.28	38.18

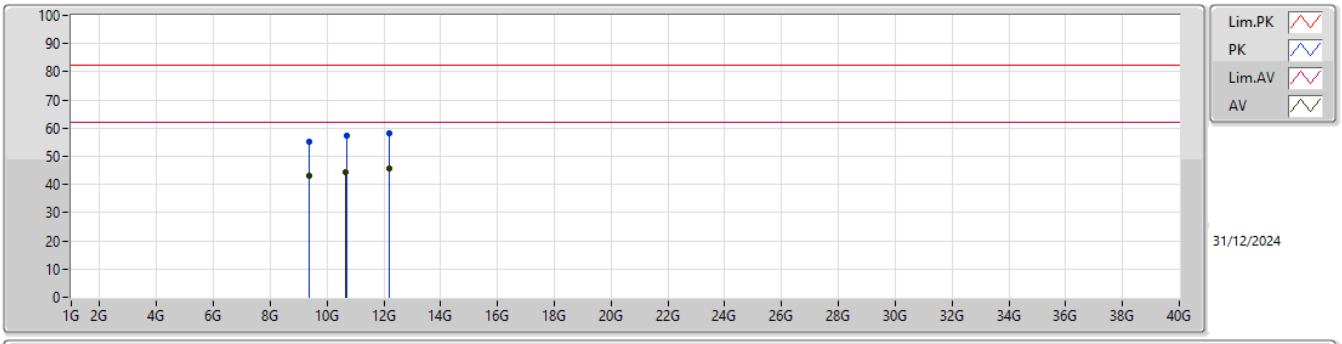
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	AV	13.388G	47.35	62.20	-14.85	Horizontal

Result

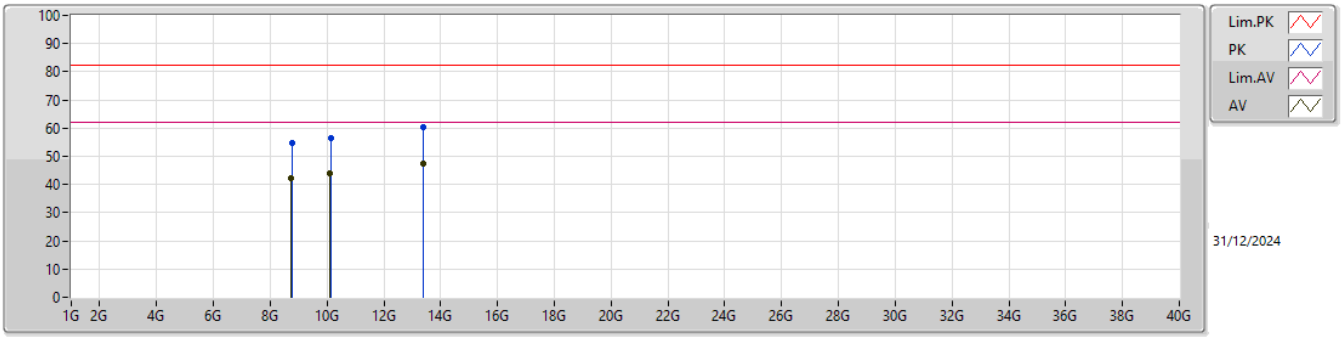
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Mode 1	Pass	AV	9.377G	43.16	62.20	-19.04	3	Vertical	360	1.01
Mode 1	Pass	AV	10.675G	44.47	62.20	-17.73	3	Vertical	42	3.00
Mode 1	Pass	AV	12.183G	45.49	62.20	-16.71	3	Vertical	360	2.42
Mode 1	Pass	PK	9.362G	55.21	82.20	-26.99	3	Vertical	360	1.01
Mode 1	Pass	PK	10.69G	57.34	82.20	-24.86	3	Vertical	42	3.00
Mode 1	Pass	PK	12.198G	58.34	82.20	-23.86	3	Vertical	360	2.42
Mode 1	Pass	AV	8.75021G	42.16	62.20	-20.04	3	Horizontal	360	1.50
Mode 1	Pass	AV	10.117G	43.88	62.20	-18.32	3	Horizontal	240	3.00
Mode 1	Pass	AV	13.388G	47.35	62.20	-14.85	3	Horizontal	65	2.00
Mode 1	Pass	PK	8.755G	54.54	82.20	-27.66	3	Horizontal	360	1.50
Mode 1	Pass	PK	10.132G	56.61	82.20	-25.59	3	Horizontal	240	3.00
Mode 1	Pass	PK	13.403G	60.34	82.20	-21.86	3	Horizontal	65	2.00

Radiated Emissions above 1GHz_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV)	(dB/m)	(dB)	(dB)
AV	9.377G	43.16	62.20	-19.04	13.16	3	Vertical	360	1.01	30.00	38.41	9.57	34.82
AV	10.675G	44.47	62.20	-17.73	14.93	3	Vertical	42	3.00	29.54	38.95	10.41	34.43
AV	12.183G	45.49	62.20	-16.71	16.18	3	Vertical	360	2.42	29.31	39.20	10.82	33.84
PK	9.362G	55.21	82.20	-26.99	13.08	3	Vertical	360	1.01	42.13	38.35	9.54	34.81
PK	10.69G	57.34	82.20	-24.86	14.91	3	Vertical	42	3.00	42.43	38.92	10.41	34.42
PK	12.198G	58.34	82.20	-23.86	16.20	3	Vertical	360	2.42	42.14	39.20	10.83	33.83

Radiated Emissions above 1GHz_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV)	(dB/m)	(dB)	(dB)
AV	8.75021G	42.16	62.20	-20.04	11.86	3	Horizontal	360	1.50	30.30	37.70	8.98	34.82
AV	10.117G	43.88	62.20	-18.32	13.85	3	Horizontal	240	3.00	30.03	38.53	10.28	34.96
AV	13.388G	47.35	62.20	-14.85	19.49	3	Horizontal	65	2.00	27.86	40.10	11.53	32.14
PK	8.755G	54.54	82.20	-27.66	11.87	3	Horizontal	360	1.50	42.67	37.71	8.98	34.82
PK	10.132G	56.61	82.20	-25.59	13.89	3	Horizontal	240	3.00	42.72	38.56	10.28	34.95
PK	13.403G	60.34	82.20	-21.86	19.53	3	Horizontal	65	2.00	40.81	40.11	11.54	32.12