

FCC Radio Test Report

FCC ID : 2AHDGSAT5
Equipment : AVer Wireless Microphone
Brand Name : AVer
Model Name : SAT5, SATXXXXX (X can be any alphanumeric, symbol or blank for marketing purposes.)
Applicant : AVer Information Inc.
8F, No.157, Da-An Rd., Tucheng Dist., New Taipei City
23673, Taiwan
Manufacturer : AVer Information Inc.
8F, No.157, Da-An Rd., Tucheng Dist., New Taipei City
23673, Taiwan
Standard : 47 CFR FCC Part 15.247

The product was received on Nov. 15, 2023, and testing was started from Nov. 22, 2023 and completed on Dec. 13, 2023. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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



Approved by: Jackson Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

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



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TEL : 886-3-3273456
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Report Template No.: HE1-C10 Ver4.3
FCC ID: 2AHDGSAT5

Summary of Test Result

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

Declaration of Conformity:

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

Comments and explanations:

None

Reviewed by: Barry Hsiao

Report Producer: Ann Hou

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	GFSK	2402-2480	0-78 [79]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	SRD	1.0	1TX

Channel List					
Channel	Freq.(MHz)	Channel	Freq.(MHz)	Channel	Freq.(MHz)
0	2402	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454	-	
26	2428	53	2455		



Note:

- ♦ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	aver-wlmic	aver-wlmic-001-TX	Chip	N/A	4.16

For SRD function:

For SRD 2.4G mode (1TX/1RX)

Ant. 1 can be used as transmitting/receiving.

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
SRD	0.851	0.7	2.128m	1k

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

1.1.5 Table for Multiple Listing

Model Name	Description	Type	SOS Button
SAT5, SATXXXXX (X can be any alphanumeric, symbol or blank for marketing purposes.)	All the models are identical, it denotes transmit device.	Teacher	With
		Student	Without

Note: Model SAT5 was measured during the test.

1.2 Testing Applied Standards

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

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

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

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

1.3 Testing Location Information

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
☒ Hsinhua (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
	TEL: 886-3-327-3456		FAX: 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Daniel Lin	21.1~22.5°C / 49~52%	22/Nov/2023
RF Conducted	TH07-HY	Alan Chien	22.2~23.4°C / 50~52%	13/Dec/2023
Radiated(Below 1G)	03CH03-HY	Edward Wang	23.1~23.4°C / 50~52%	29/Nov/2023
☒ Wenhua 3rd. (TAF: 3785)	ADD: No. 58, Aly. 75, Ln. 564, Wenhua 3rd Rd., Guishan Dist. Taoyuan City 333, Taiwan (R.O.C.)			
	TEL: 886-3-327-0868			
Test site Designation No. TW0036 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated(above 1G)	03CH25-HY	Edward Wang	23.1~23.4°C / 50~52%	29/Nov/2023
☐ Wen 33rd.St. (TAF: 3785)	ADD: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)			
	TEL: 886-3-318-0787		FAX: 886-3-318-0287	
Test site Designation No. TW0008 with FCC.				

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	FCC.exe v2.24
Mode	Power Setting
SRD	-
2402MHz	Default
2440MHz	Default
2480MHz	Default

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	Adapter Mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT		V	

2.3 Accessories

Accessories				
Switching Adaptor	Brand Name	Shenzhen Fujia Appliance Co., LTD.		
	Model Name	FJ-SW1260502000UN		
	Manufacturer	Shenzhen Fujia Appliance Co., LTD.		
	Power Rating	I/P: 100-240Vac, 0.4A, O/P: 5Vdc, 2A		
USB Type C Cable 1	Brand Name	NA	Model Name	USB A to Type C
	Manufacturer	PRO-TECHNOLOGY ENTERPRISES CO.,LTD.		
	DC Power Cable	3 meter, non-shielded cable, w/o ferrite core		
USB Type C Cable 2	Brand Name	NA	Model Name	USB A to Type C
	Manufacturer	PRO-TECHNOLOGY ENTERPRISES CO.,LTD.		
	DC Power Cable	1.5 meter, non-shielded cable, w/o ferrite core		
Battery	Brand Name	HSINYU	Model Name	432535 422534
	Manufacturer	Taiwan Hsinyu Enterprise LTD.		
	Power Rating	3.7Vdc, 1.48Wh	Type	Li-ion
Charger	Brand Name	AVer	Model Name	SAC5
	Manufacturer	AVer Information Inc.	Power Rating	I/P: 5Vac, 2A max
Lanyard *2	Brand Name	NA	Model Name	Lanyard01
Wireless Microphone Receiver	Brand Name	AVer	Model Name	SAR5

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

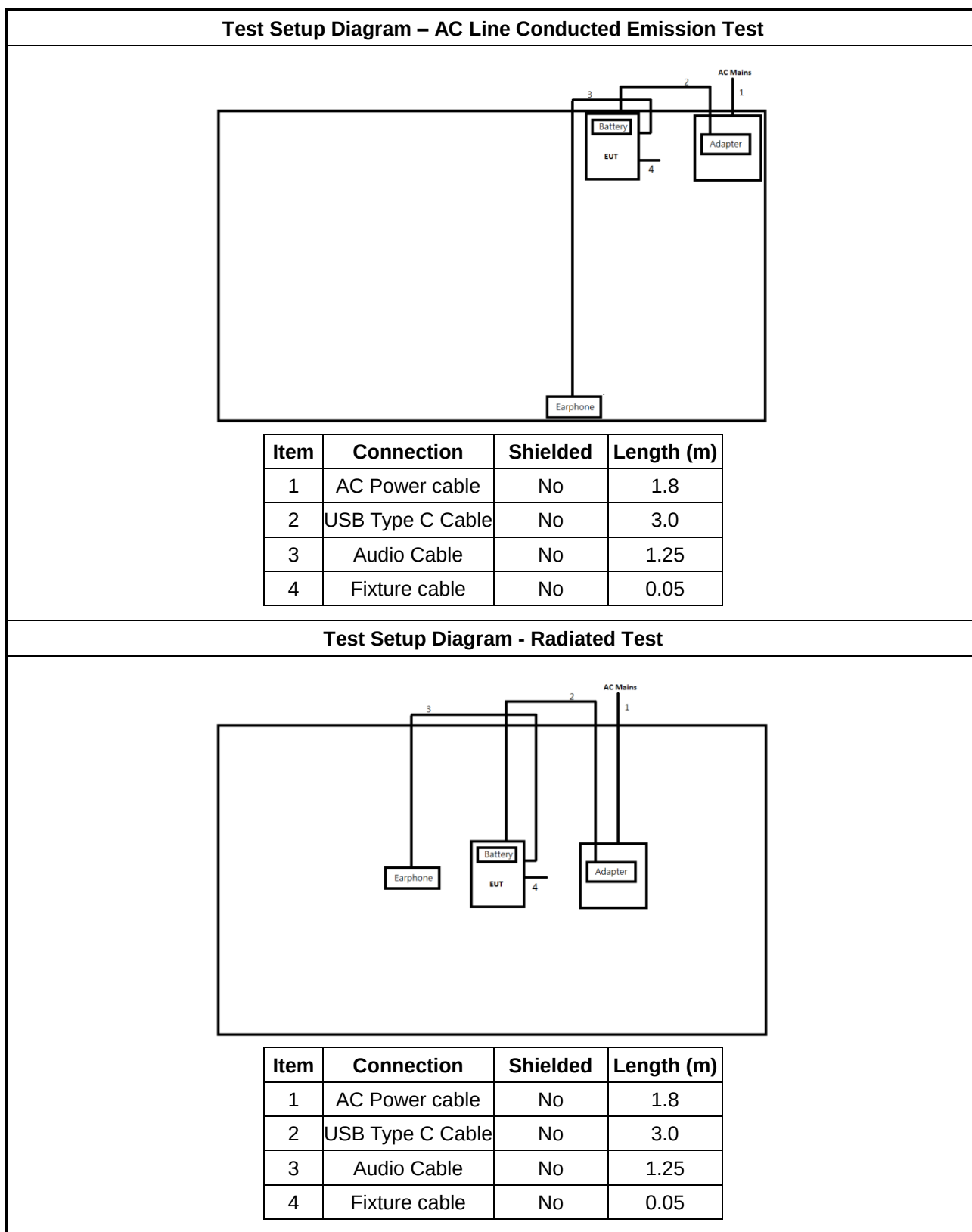
2.4 Support Equipment

Support Equipment – AC Conduction					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Earphone	APPLE	MD827FEA	-	-
2	Fixture cable	YOGADA	Fixture01	-	Provided by Customer

Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-
3	Fixture Board	YOGADA	CP2102	-	Provided by Customer
4	Fixture cable	YOGADA	Fixture01	-	Provided by Customer
5	Fixture Board cable	YOGADA	Fixture02	-	Provided by Customer

Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Earphone	APPLE	MD827FEA	-	-
2	Fixture cable	YOGADA	Fixture01	-	Provided by Customer

2.5 Test Setup Diagram



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

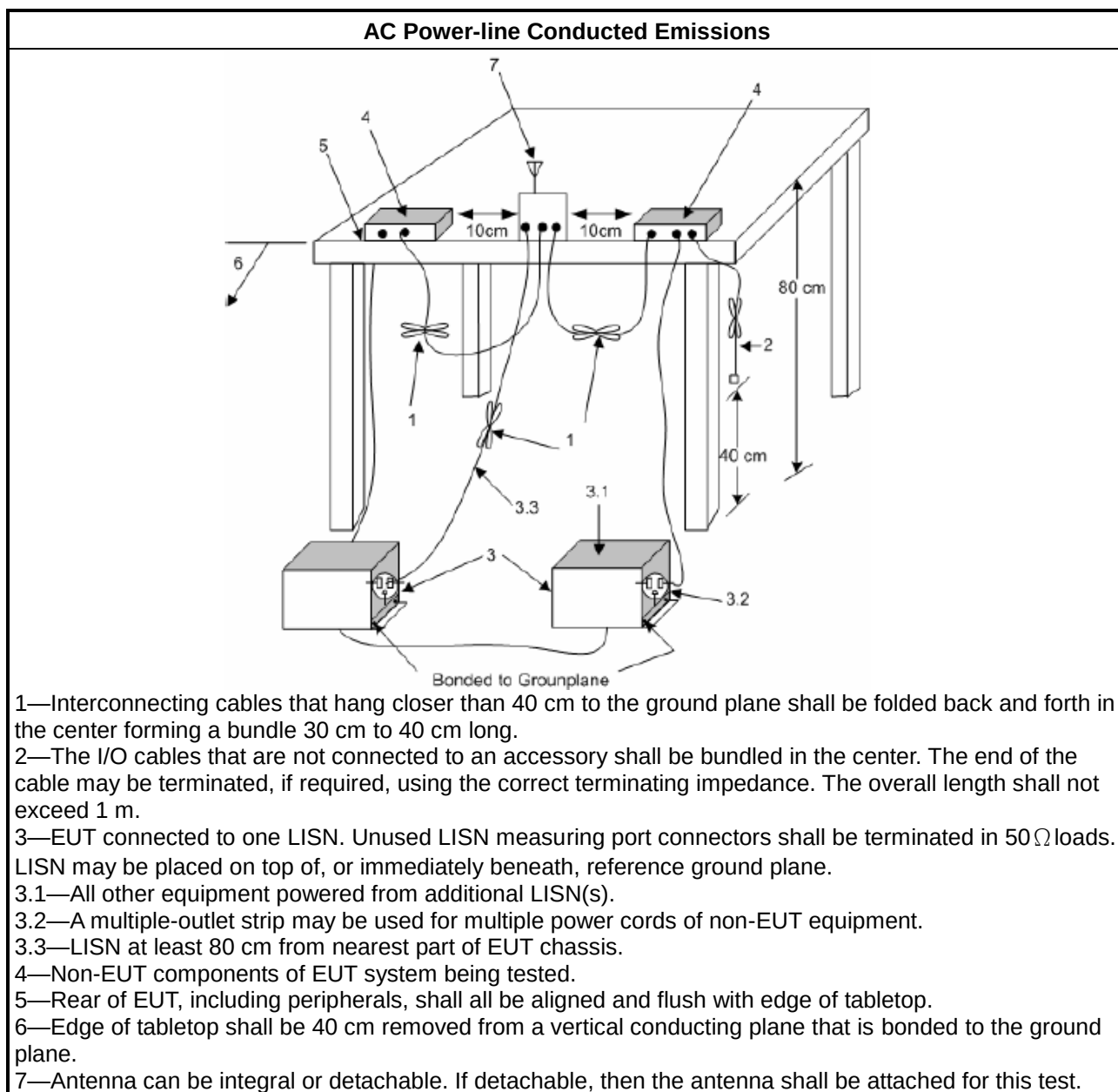
Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

3.1.4 Measurement Results Calculation

The measured Level is calculated using:

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

3.1.5 Test Setup



3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

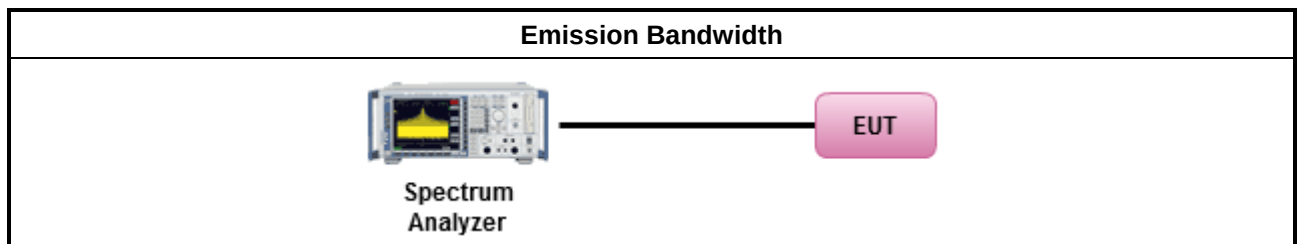
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

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

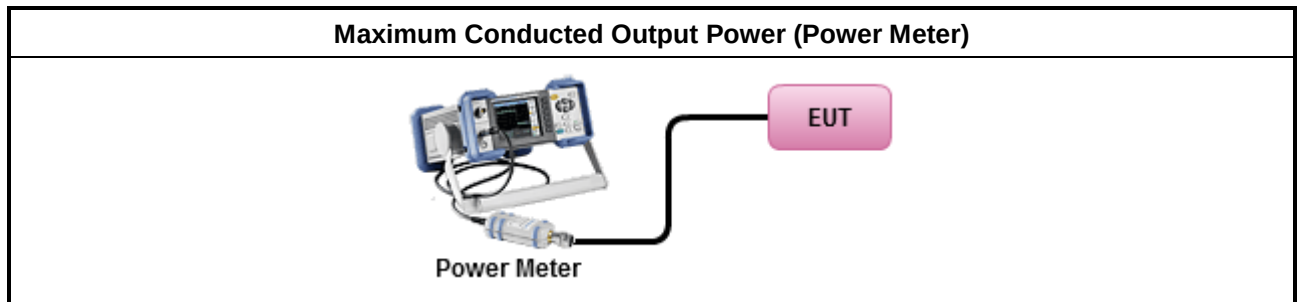
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

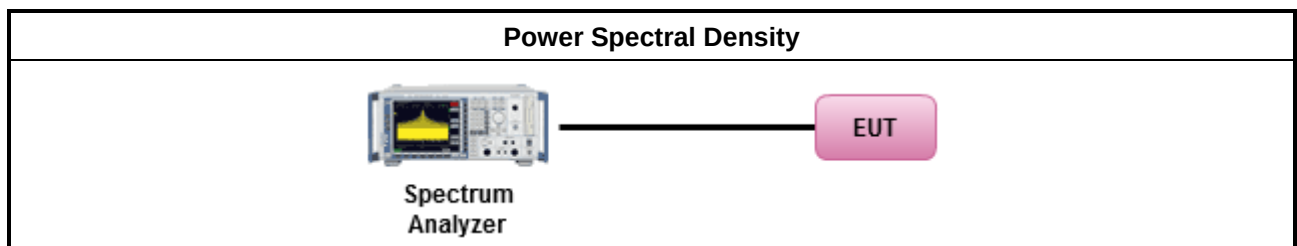
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

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

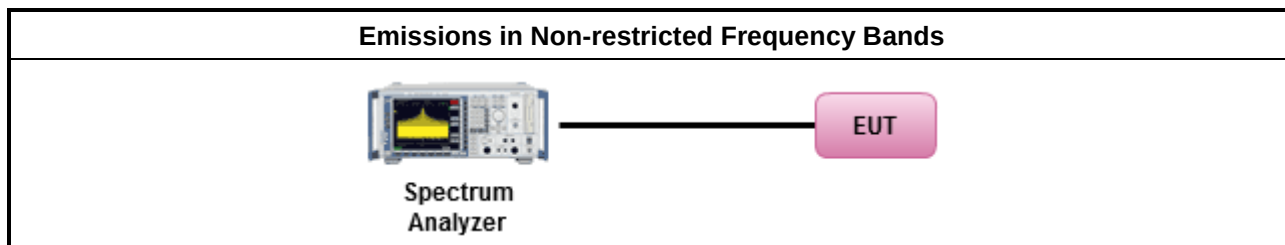
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

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

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

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

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

3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

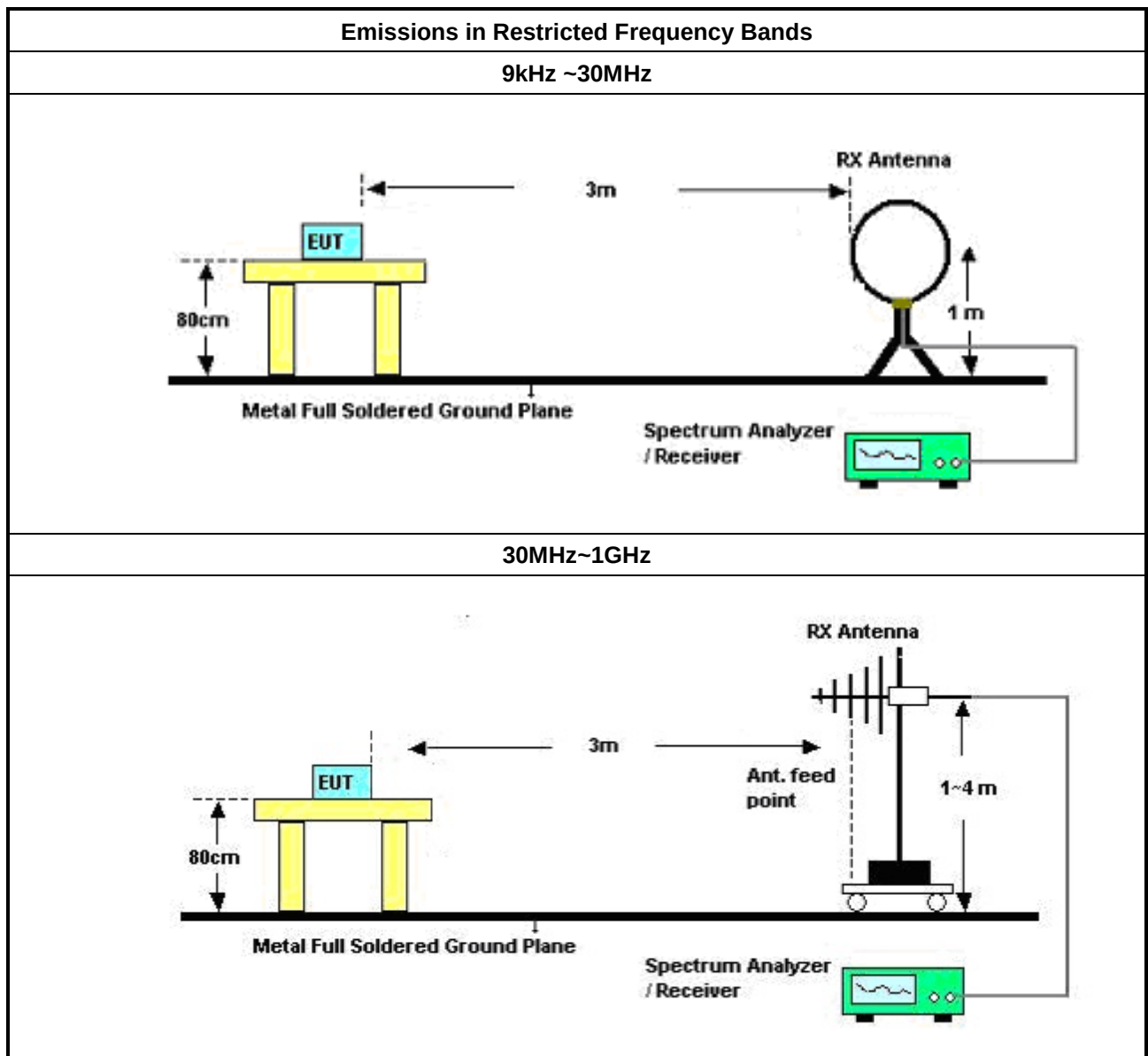
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted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

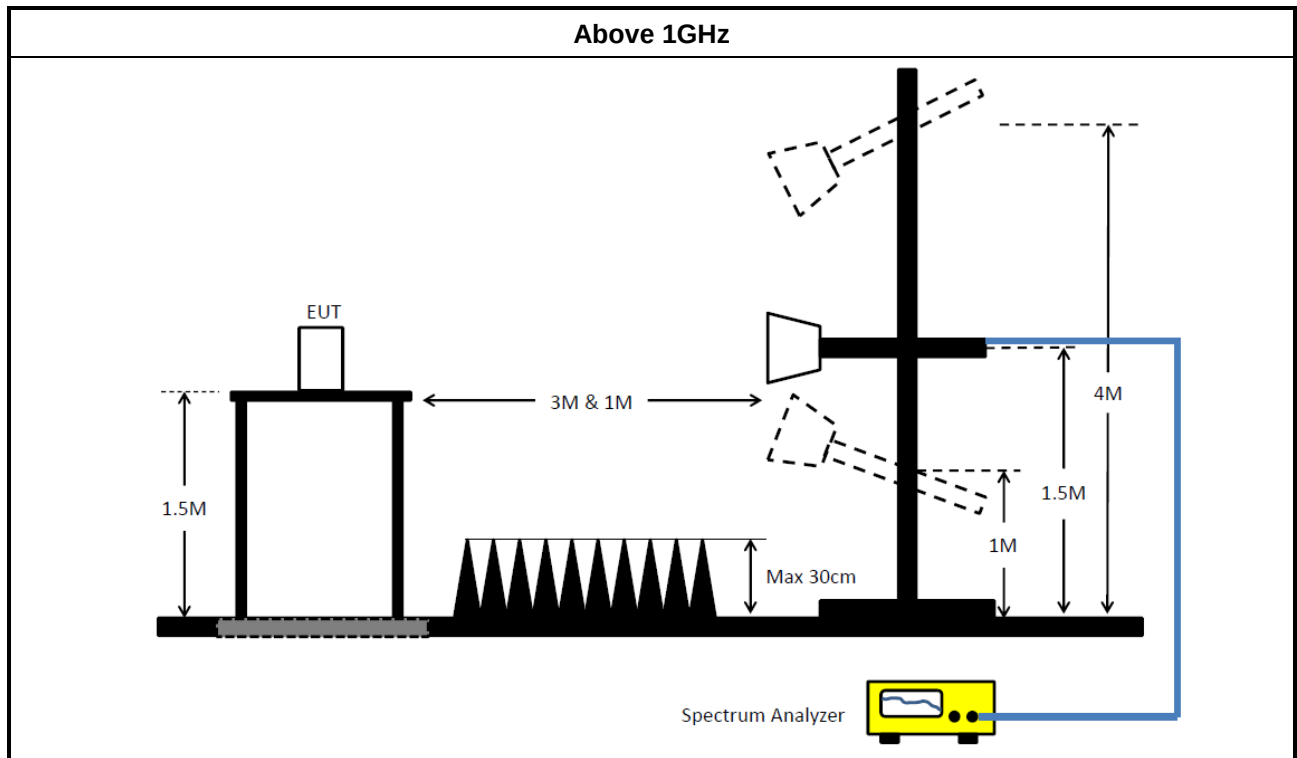
3.6.4 Measurement Results Calculation

The measured Level is calculated using:

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

3.6.5 Test Setup





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

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

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR	102051	9kHz ~ 3.6GHz	16/May/2023	15/May/2024
Two-Line V-Network	R&S	ENV 216	100003	9kHz ~ 30MHz	07/Sep/2023	06/Sep/2024
RF Cable 5m	TITAN	TITAN	CO04-cable-01	9 kHz~200MHz	28/Feb/2023	27/Feb/2024
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	18/Oct/2023	17/Oct/2024
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	14/Feb/2023	13/Feb/2024
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	20/Oct/2023	19/Oct/2024
Power Meter	Anritsu	ML2495A	2105003	300MHz~40GHz	19/Sep/2023	18/Sep/2024
Pulse Sensor	Anritsu	MA2411B	1911254	300MHz~40GHz	19/Sep/2023	18/Sep/2024
SENSE-15247_DTS	Sporton	V5.11.14	N/A	N/A	N/A	N/A

**Instrument for Radiated Test (03CH03-HY)**

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	30/Jul/2023	29/Jul/2024
Signal Analyzer	R&S	FSV40	101500	10Hz~40GHz	26/Oct/2023	25/Oct/2024
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	26/May/2023	25/May/2024
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	23/Mar/2023	22/Mar/2024
Bilog Antenna & 6dB Attenuator	SCHAFFNER / EMCI	CBL6112B / N-6-05	22237 / AT-N-0603	30MHz~1GHz	15/Oct/2023	14/Oct/2024
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz~30MHz	13/Jun/2023	12/Jun/2024
RF Cable-R03m	Jye Bao	RG142	03CH03-cable-02	30MHz~1GHz	13/Jun/2023	12/Jun/2024
Amplifier	Aglient	8447D	2944A08033	10kHz~1.3GHz	14/Sep/2023	13/Sep/2024
SENSE-15247-DTS	Sporton	V5.11.14	NA	NA	NA	NA

Instrument for Radiated Test (03CH25-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH25-HY	1GHz~18GHz 3m	09/Aug/2023	08/Aug/2024
Signal Analyzer	ROHDE&SCHWARZ	FSV3044	101410	10Hz ~ 44 GHz	17/Nov/2023	16/Nov/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02876	1GHz~18GHz	12/Jul/2023	11/Jul/2024
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz ~ 40GHz	01/Jun/2023	31/May/2024
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB007	1GHz~40GHz	24/Apr/2023	23/Apr/2024
Preamplifier	SGH	PRAMP 118-H	20230515-3	1GHz ~18GHz	25/May/2023	24/May/2024
Microwave Prempplier	EMC INSTRUMENTS	EM18G40G	606014	18GHz ~ 40GHz	16/Mar/2023	15/Mar/2024
SENSE-15247-DTS	Sporton	V5.11.14	NA	NA	NA	NA



Conducted Emissions at Powerline

Appendix A

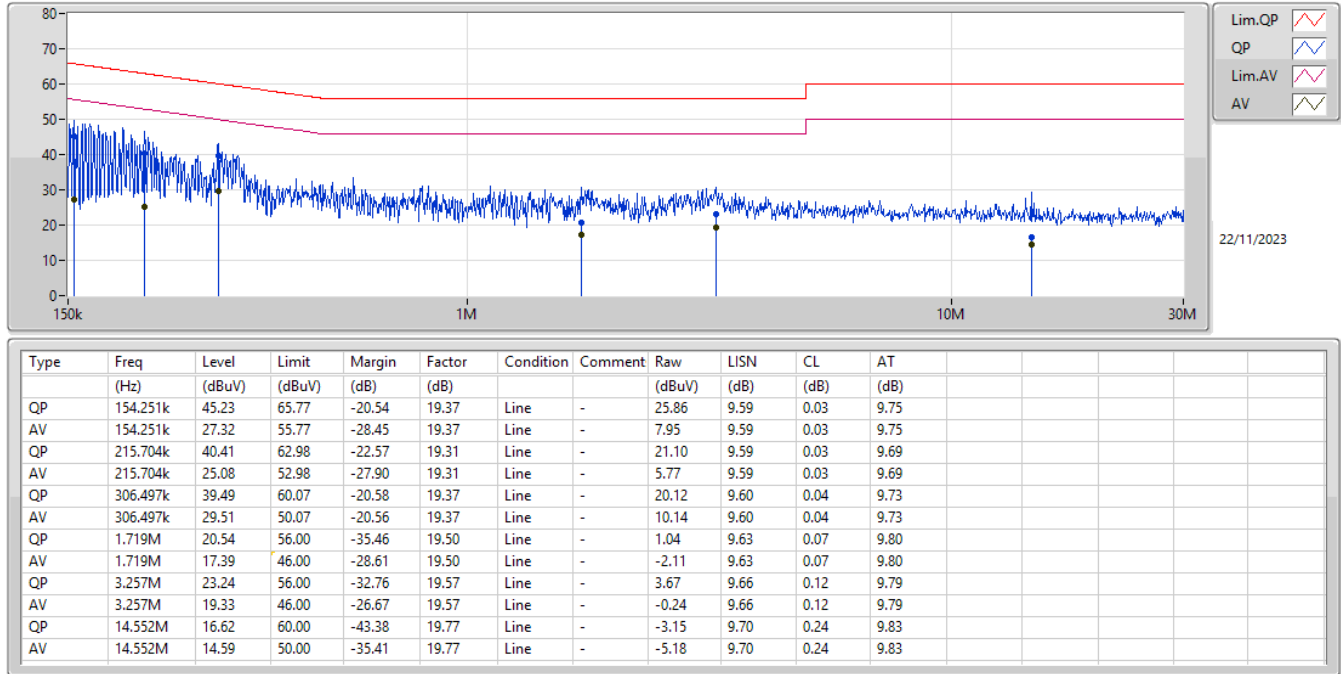
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	151.202k	46.12	65.92	-19.80	Neutral

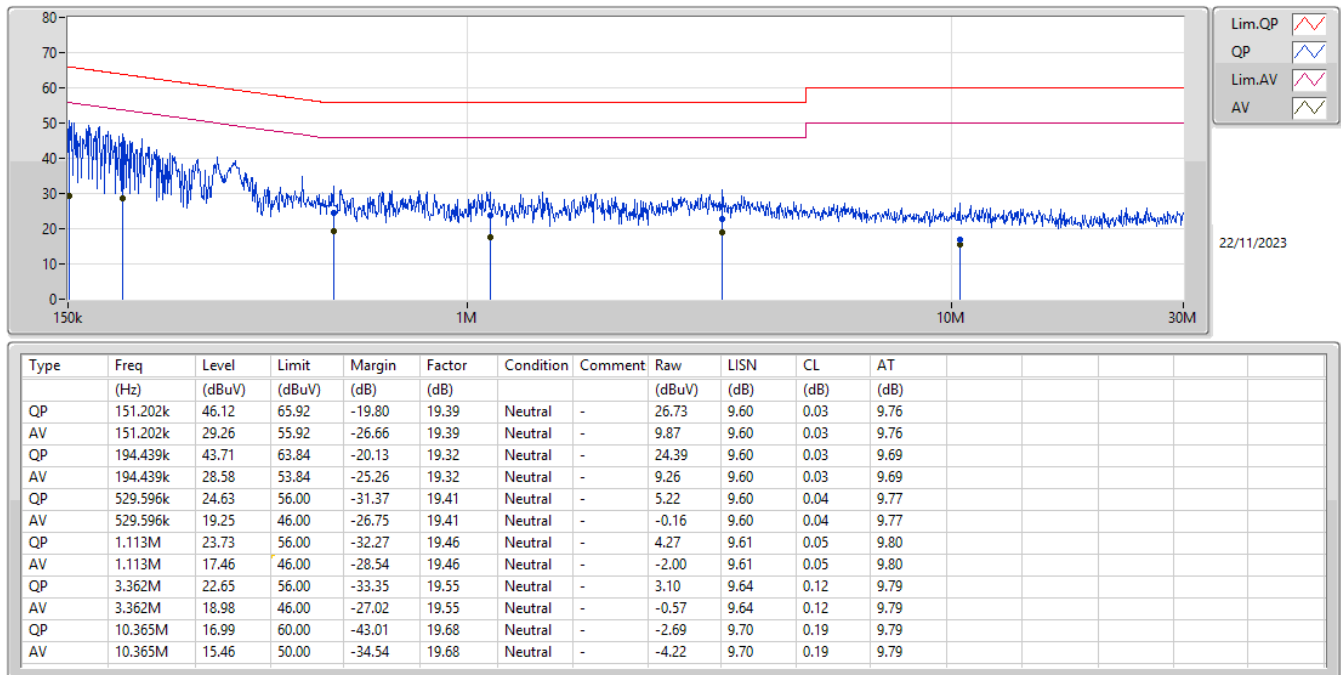
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	154.251k	45.23	65.77	-20.54	Line	-
Mode 1	Pass	AV	154.251k	27.32	55.77	-28.45	Line	-
Mode 1	Pass	QP	215.704k	40.41	62.98	-22.57	Line	-
Mode 1	Pass	AV	215.704k	25.08	52.98	-27.90	Line	-
Mode 1	Pass	QP	306.497k	39.49	60.07	-20.58	Line	-
Mode 1	Pass	AV	306.497k	29.51	50.07	-20.56	Line	-
Mode 1	Pass	QP	1.719M	20.54	56.00	-35.46	Line	-
Mode 1	Pass	AV	1.719M	17.39	46.00	-28.61	Line	-
Mode 1	Pass	QP	3.257M	23.24	56.00	-32.76	Line	-
Mode 1	Pass	AV	3.257M	19.33	46.00	-26.67	Line	-
Mode 1	Pass	QP	14.552M	16.62	60.00	-43.38	Line	-
Mode 1	Pass	AV	14.552M	14.59	50.00	-35.41	Line	-
Mode 1	Pass	QP	151.202k	46.12	65.92	-19.80	Neutral	-
Mode 1	Pass	AV	151.202k	29.26	55.92	-26.66	Neutral	-
Mode 1	Pass	QP	194.439k	43.71	63.84	-20.13	Neutral	-
Mode 1	Pass	AV	194.439k	28.58	53.84	-25.26	Neutral	-
Mode 1	Pass	QP	529.596k	24.63	56.00	-31.37	Neutral	-
Mode 1	Pass	AV	529.596k	19.25	46.00	-26.75	Neutral	-
Mode 1	Pass	QP	1.113M	23.73	56.00	-32.27	Neutral	-
Mode 1	Pass	AV	1.113M	17.46	46.00	-28.54	Neutral	-
Mode 1	Pass	QP	3.362M	22.65	56.00	-33.35	Neutral	-
Mode 1	Pass	AV	3.362M	18.98	46.00	-27.02	Neutral	-
Mode 1	Pass	QP	10.365M	16.99	60.00	-43.01	Neutral	-
Mode 1	Pass	AV	10.365M	15.46	50.00	-34.54	Neutral	-

Conducted Emissions at Powerline_Mode 1



Conducted Emissions at Powerline_Mode 1



**Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
SRD	755k	1.063M	1M06F1D	740k	1.048M

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)
SRD	-	-	-	-
2402MHz	Pass	500k	740k	1.063M
2440MHz	Pass	500k	755k	1.053M
2480MHz	Pass	500k	750k	1.048M

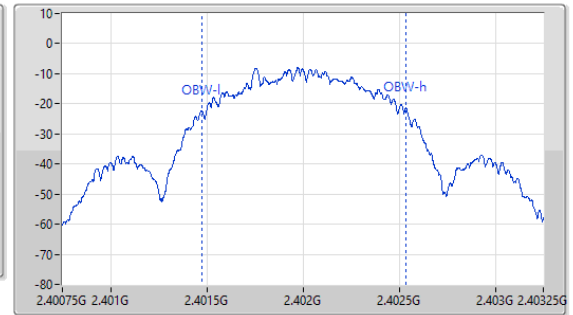
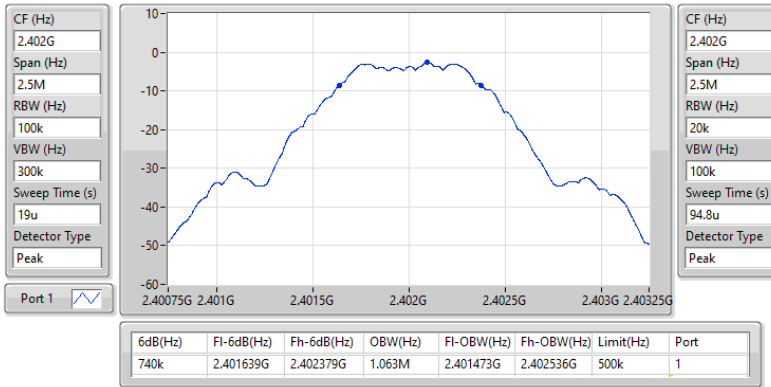
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

2.4-2.4835GHz_SRD

EBW

2402MHz

13/12/2023

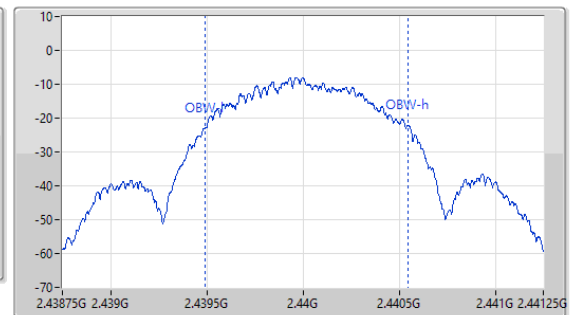
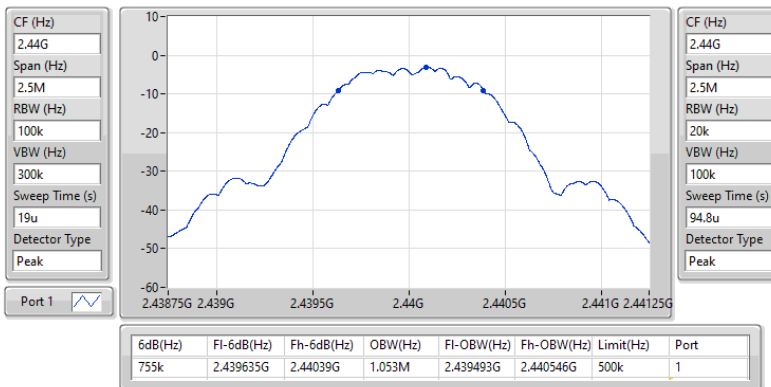


2.4-2.4835GHz_SRD

EBW

2440MHz

13/12/2023

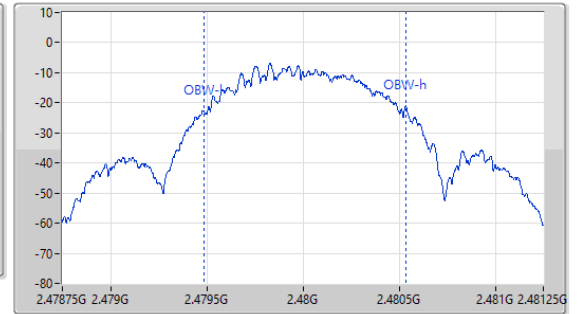
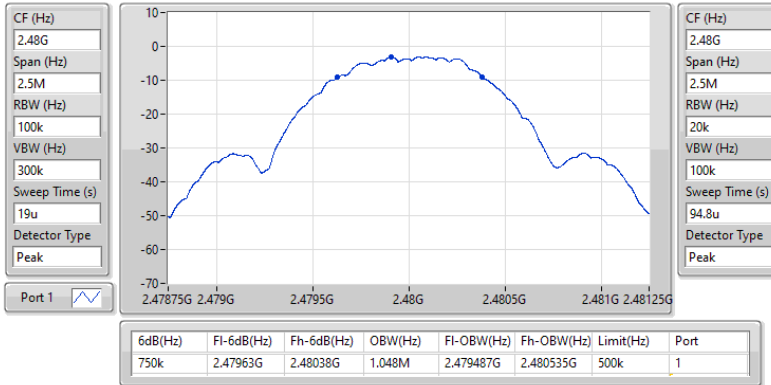


2.4-2.4835GHz_SRD

EBW

2480MHz

13/12/2023





Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
SRD	-0.18	0.00096



Average Power

Appendix C

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
SRD	-	-	-	-	-
2402MHz	Pass	4.16	-0.51	-0.51	30.00
2440MHz	Pass	4.16	-0.36	-0.36	30.00
2480MHz	Pass	4.16	-0.18	-0.18	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
SRD	-16.90

RBW = 3kHz;



Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
SRD	-	-	-	-	-
2402MHz	Pass	4.16	-17.80	-17.80	8.00
2440MHz	Pass	4.16	-17.01	-17.01	8.00
2480MHz	Pass	4.16	-16.90	-16.90	8.00

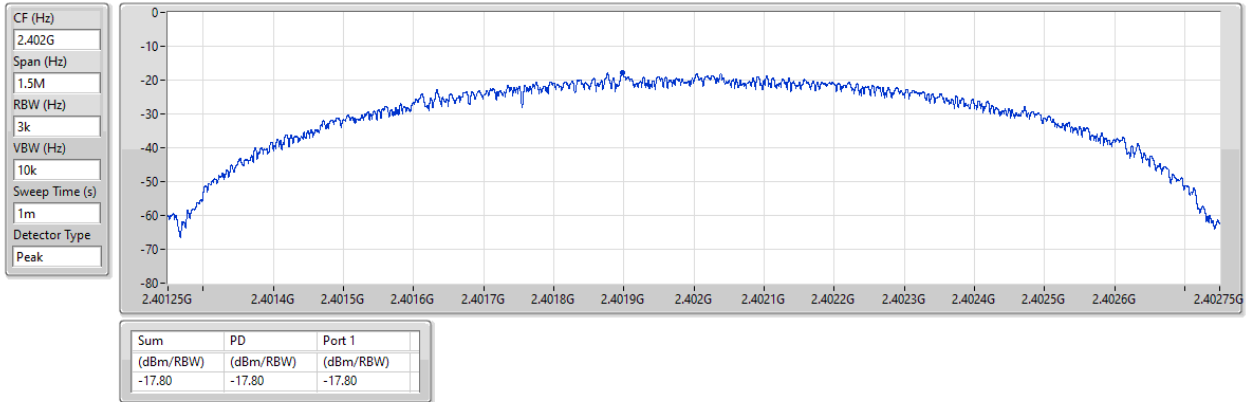
DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

2.4-2.4835GHz_SRD

PSD

2402MHz

13/12/2023

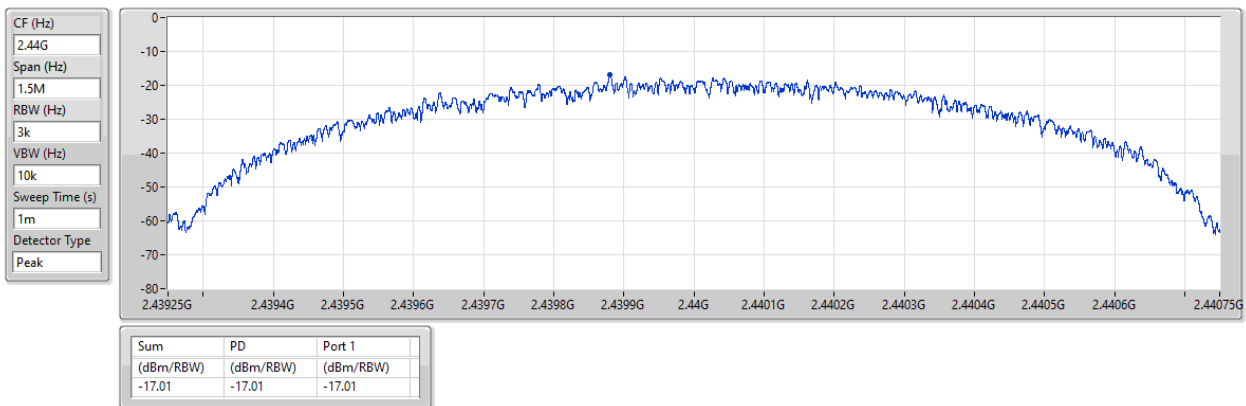


2.4-2.4835GHz_SRD

PSD

2440MHz

13/12/2023

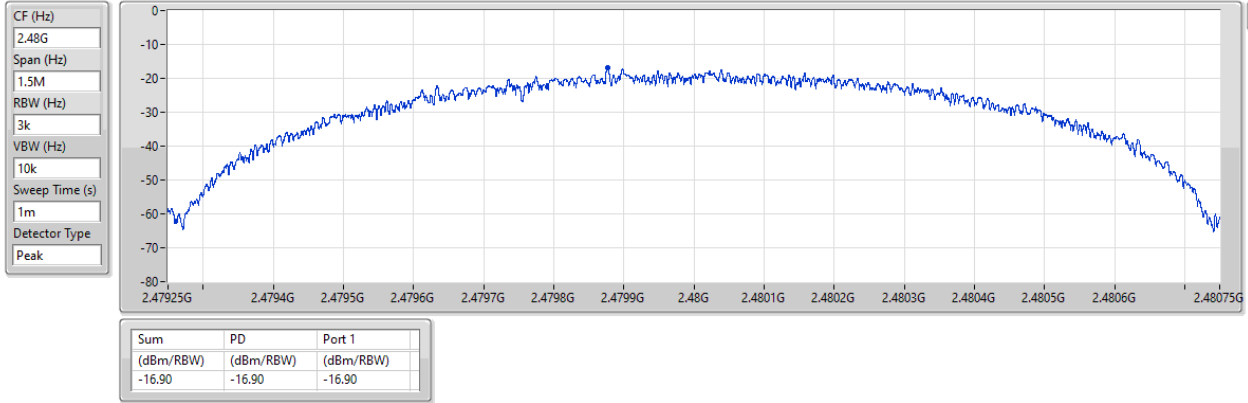


2.4-2.4835GHz_SRD

PSD

2480MHz

13/12/2023





Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
SRD	Pass	2.48033G	-1.46	-31.46	2.01202G	-55.09	2.39992G	-51.23	2.4G	-53.51	16.69496G	-41.32	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)	Port
SRD	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.48033G	-1.46	-31.46	2.01202G	-55.09	2.39992G	-51.23	2.4G	-53.51	16.69496G	-41.32	1
2440MHz	Pass	2.48033G	-1.46	-31.46	2.13752G	-55.07	2.39824G	-54.03	2.4G	-56.10	24.85928G	-42.27	1
2480MHz	Pass	2.48033G	-1.46	-31.46	1.86875G	-54.90	2.39975G	-53.80	2.4G	-56.20	23.22417G	-43.05	1

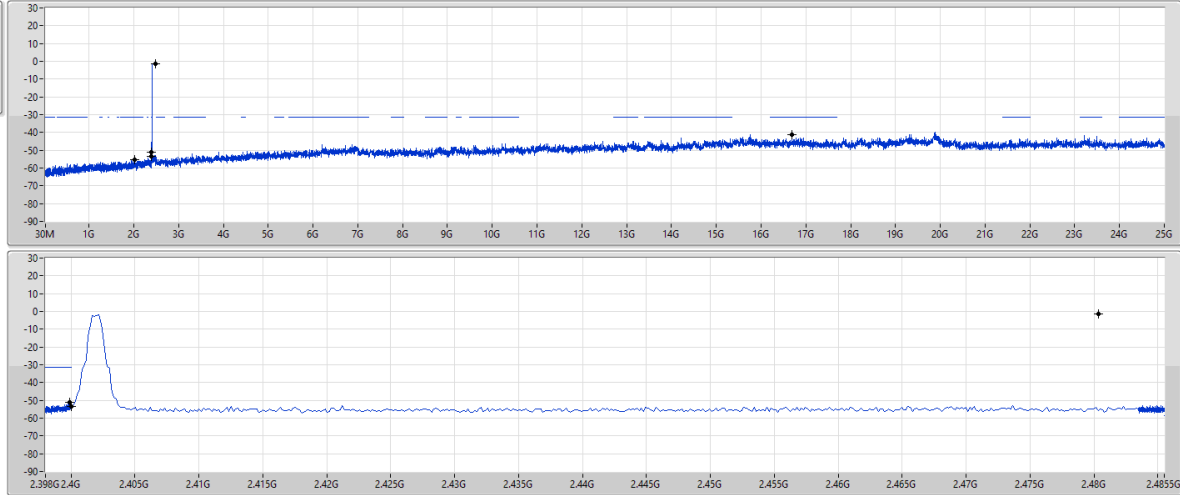
2.4-2.4835GHz_SRD

CSEndB

2402MHz

13/12/2023

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



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48033G	-1.46	-31.46	2.01202G	-55.09	2.39992G	-51.23	2.4G	-53.51	16.69496G	-41.32	1

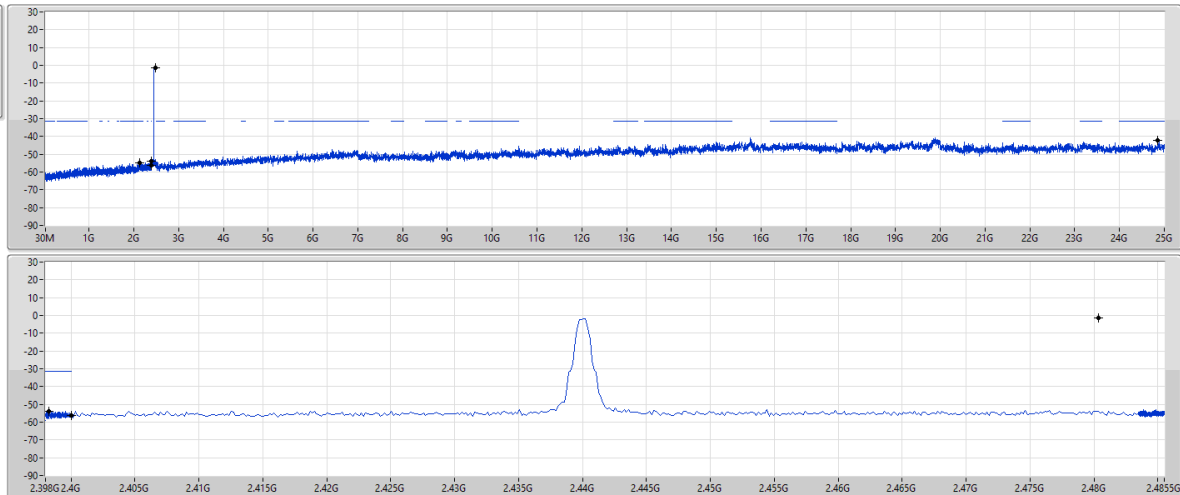
2.4-2.4835GHz_SRD

CSEndB

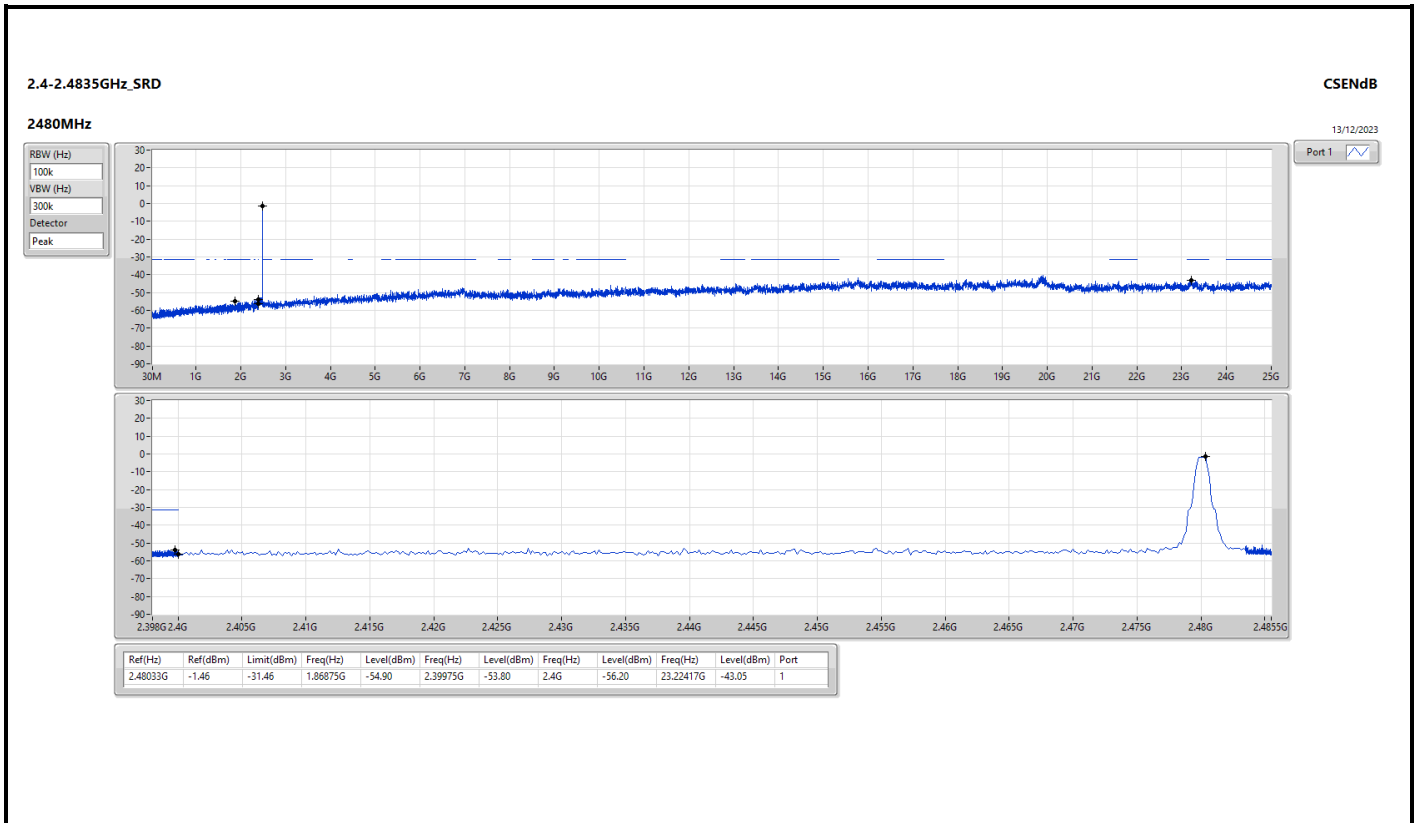
2440MHz

13/12/2023

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



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48033G	-1.46	-31.46	2.13752G	-55.07	2.39824G	-54.03	2.4G	-56.10	24.85928G	-42.27	1





Summary

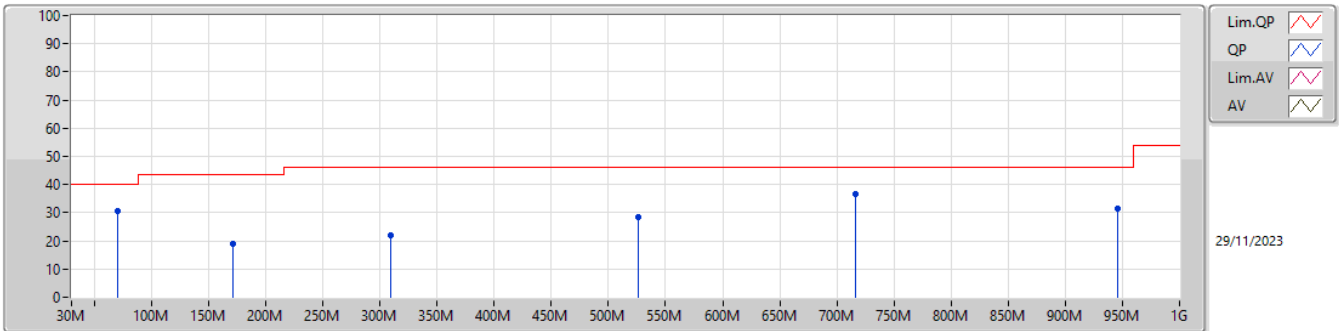
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
SRD	Pass	PK	70.74M	30.65	40.00	-9.35	3	Vertical	360	1.00

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
SRD	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	70.74M	30.65	40.00	-9.35	3	Vertical	360	1.00
2440MHz	Pass	PK	171.62M	19.11	43.50	-24.39	3	Vertical	360	1.00
2440MHz	Pass	PK	309.36M	21.89	46.00	-24.11	3	Vertical	360	1.00
2440MHz	Pass	PK	526.64M	28.38	46.00	-17.62	3	Vertical	360	1.00
2440MHz	Pass	PK	716.76M	36.64	46.00	-9.36	3	Vertical	360	1.00
2440MHz	Pass	PK	945.68M	31.41	46.00	-14.59	3	Vertical	360	1.00
2440MHz	Pass	PK	70.74M	29.16	40.00	-10.84	3	Horizontal	0	1.00
2440MHz	Pass	PK	130.88M	18.16	43.50	-25.34	3	Horizontal	0	1.00
2440MHz	Pass	PK	309.36M	22.02	46.00	-23.98	3	Horizontal	0	1.00
2440MHz	Pass	PK	495.6M	28.57	46.00	-17.43	3	Horizontal	0	1.00
2440MHz	Pass	PK	961.2M	31.27	54.00	-22.73	3	Horizontal	0	1.00
2440MHz	Pass	PK	718.7M	32.32	46.00	-13.68	3	Horizontal	0	1.00

2.4-2.4835GHz_SRD

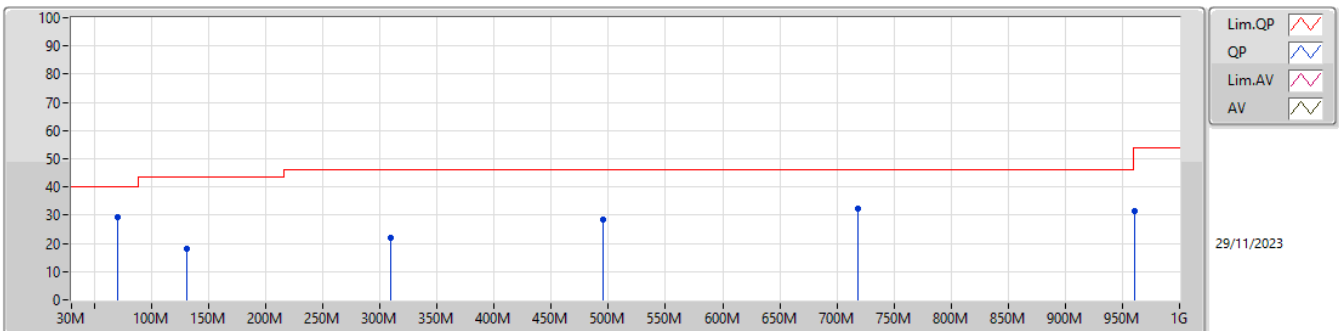
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	70.74M	30.65	40.00	-9.35	-14.69	3	Vertical	360	1.00	45.34	11.50	1.35	27.54
PK	171.62M	19.11	43.50	-24.39	-10.22	3	Vertical	360	1.00	29.33	14.79	2.17	27.18
PK	309.36M	21.89	46.00	-24.11	-5.44	3	Vertical	360	1.00	27.33	18.58	2.96	26.98
PK	526.64M	28.38	46.00	-17.62	-0.93	3	Vertical	360	1.00	29.31	23.27	3.92	28.12
PK	716.76M	36.64	46.00	-9.36	1.04	3	Vertical	360	1.00	35.60	24.49	4.65	28.10
PK	945.68M	31.41	46.00	-14.59	3.81	3	Vertical	360	1.00	27.60	25.97	5.54	27.70

2.4-2.4835GHz_SRD

2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	70.74M	29.16	40.00	-10.84	-14.69	3	Horizontal	0	1.00	43.85	11.50	1.35	27.54
PK	130.88M	18.16	43.50	-25.34	-8.30	3	Horizontal	0	1.00	26.46	17.14	1.89	27.33
PK	309.36M	22.02	46.00	-23.98	-5.44	3	Horizontal	0	1.00	27.46	18.58	2.96	26.98
PK	495.6M	28.57	46.00	-17.43	-1.41	3	Horizontal	0	1.00	29.98	22.72	3.83	27.96
PK	961.2M	31.27	54.00	-22.73	4.46	3	Horizontal	0	1.00	26.81	26.39	5.58	27.51
PK	718.7M	32.32	46.00	-13.68	1.12	3	Horizontal	0	1.00	31.20	24.55	4.66	28.09



Summary

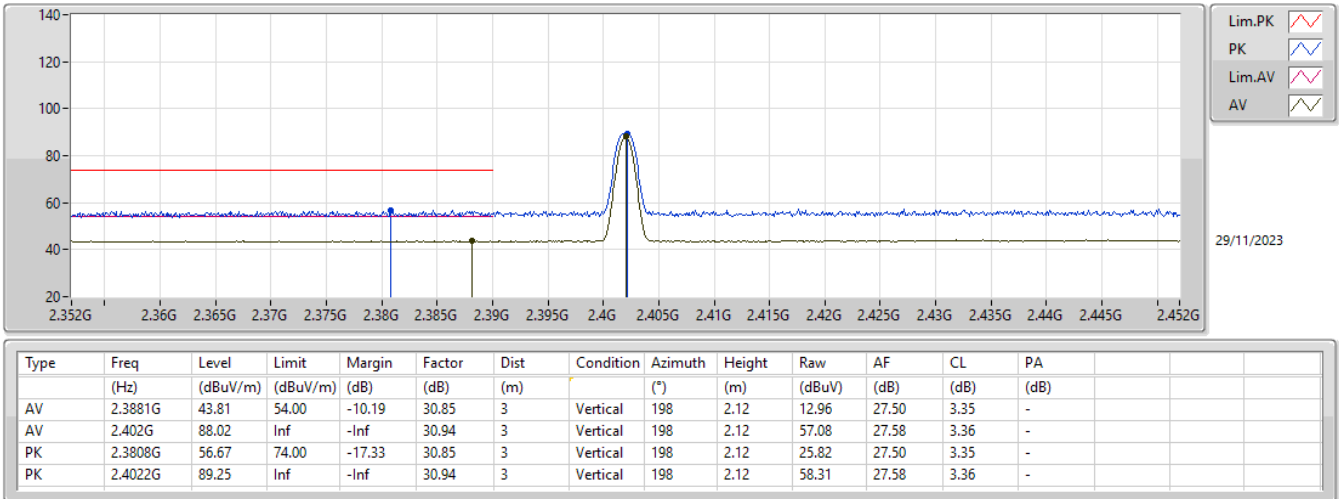
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
SRD	Pass	AV	2.4993G	44.66	54.00	-9.34	3	Vertical	323	2.97

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
SRD	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3881G	43.81	54.00	-10.19	3	Vertical	198	2.12
2402MHz	Pass	AV	2.402G	88.02	Inf	-Inf	3	Vertical	198	2.12
2402MHz	Pass	PK	2.3808G	56.67	74.00	-17.33	3	Vertical	198	2.12
2402MHz	Pass	PK	2.4022G	89.25	Inf	-Inf	3	Vertical	198	2.12
2402MHz	Pass	AV	2.3637G	43.78	54.00	-10.22	3	Horizontal	149	2.91
2402MHz	Pass	AV	2.402G	86.26	Inf	-Inf	3	Horizontal	149	2.91
2402MHz	Pass	PK	2.3573G	57.34	74.00	-16.66	3	Horizontal	149	2.91
2402MHz	Pass	PK	2.4022G	87.52	Inf	-Inf	3	Horizontal	149	2.91
2402MHz	Pass	AV	4.80403G	36.12	54.00	-17.88	3	Vertical	106	1.10
2402MHz	Pass	PK	4.80388G	45.76	74.00	-28.24	3	Vertical	106	1.10
2402MHz	Pass	AV	4.80401G	33.58	54.00	-20.42	3	Horizontal	327	1.01
2402MHz	Pass	PK	4.80411G	44.24	74.00	-29.76	3	Horizontal	327	1.01
2440MHz	Pass	AV	2.381G	43.80	54.00	-10.20	3	Vertical	197	1.95
2440MHz	Pass	AV	2.44G	89.93	Inf	-Inf	3	Vertical	197	1.95
2440MHz	Pass	AV	2.4934G	44.49	54.00	-9.51	3	Vertical	197	1.95
2440MHz	Pass	PK	2.3636G	56.79	74.00	-17.21	3	Vertical	197	1.95
2440MHz	Pass	PK	2.4398G	91.07	Inf	-Inf	3	Vertical	197	1.95
2440MHz	Pass	PK	2.491G	57.34	74.00	-16.66	3	Vertical	197	1.95
2440MHz	Pass	AV	2.3652G	43.75	54.00	-10.25	3	Horizontal	149	2.79
2440MHz	Pass	AV	2.44G	86.90	Inf	-Inf	3	Horizontal	149	2.79
2440MHz	Pass	AV	2.486G	44.49	54.00	-9.51	3	Horizontal	149	2.79
2440MHz	Pass	PK	2.3432G	57.66	74.00	-16.34	3	Horizontal	149	2.79
2440MHz	Pass	PK	2.4402G	88.08	Inf	-Inf	3	Horizontal	149	2.79
2440MHz	Pass	PK	2.492G	57.64	74.00	-16.36	3	Horizontal	149	2.79
2440MHz	Pass	AV	4.88005G	34.79	54.00	-19.21	3	Vertical	107	1.02
2440MHz	Pass	PK	4.88012G	45.69	74.00	-28.31	3	Vertical	107	1.02
2440MHz	Pass	AV	4.88001G	33.48	54.00	-20.52	3	Horizontal	324	1.00
2440MHz	Pass	PK	4.88038G	44.92	74.00	-29.08	3	Horizontal	324	1.00
2480MHz	Pass	AV	2.48G	87.18	Inf	-Inf	3	Vertical	323	2.97
2480MHz	Pass	AV	2.4993G	44.66	54.00	-9.34	3	Vertical	323	2.97
2480MHz	Pass	PK	2.4798G	88.44	Inf	-Inf	3	Vertical	323	2.97
2480MHz	Pass	PK	2.4839G	57.64	74.00	-16.36	3	Vertical	323	2.97
2480MHz	Pass	AV	2.48G	82.24	Inf	-Inf	3	Horizontal	151	1.54
2480MHz	Pass	AV	2.4943G	44.56	54.00	-9.44	3	Horizontal	151	1.54
2480MHz	Pass	PK	2.4797G	83.52	Inf	-Inf	3	Horizontal	151	1.54
2480MHz	Pass	PK	2.491G	57.50	74.00	-16.50	3	Horizontal	151	1.54
2480MHz	Pass	AV	4.95994G	34.23	54.00	-19.77	3	Vertical	92	2.40
2480MHz	Pass	PK	4.95992G	44.67	74.00	-29.33	3	Vertical	92	2.40
2480MHz	Pass	AV	4.96G	33.30	54.00	-20.70	3	Horizontal	329	1.09
2480MHz	Pass	PK	4.96012G	44.71	74.00	-29.29	3	Horizontal	329	1.09

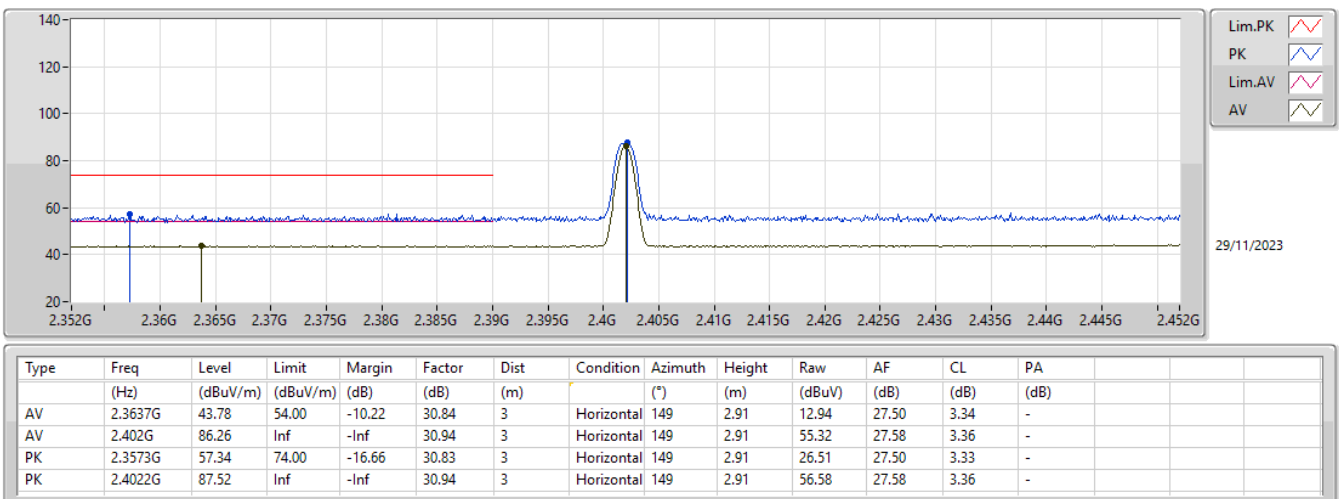
2.4-2.4835GHz_SRD

2402MHz_TX



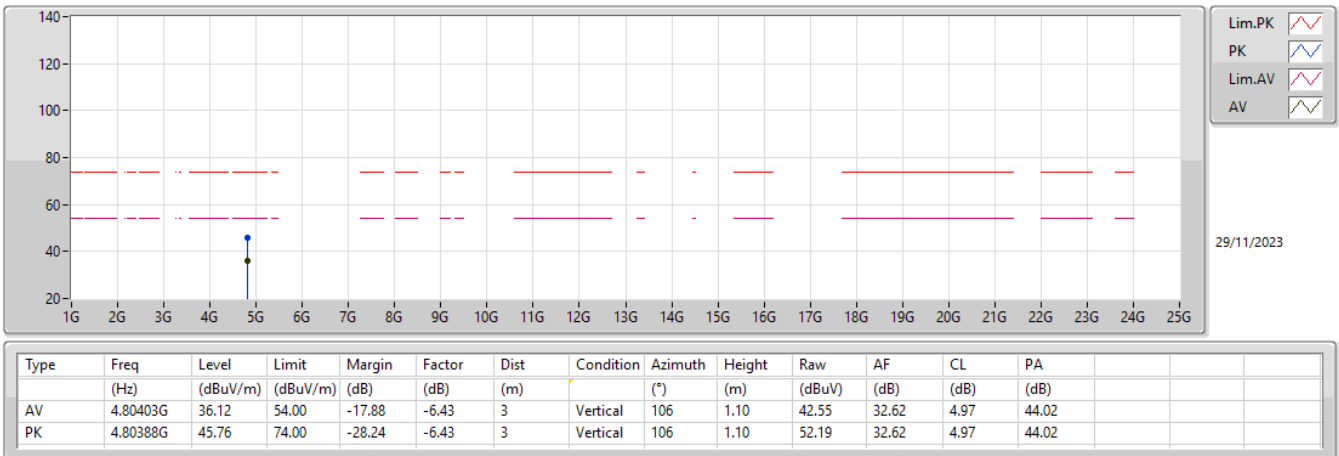
2.4-2.4835GHz_SRD

2402MHz_TX



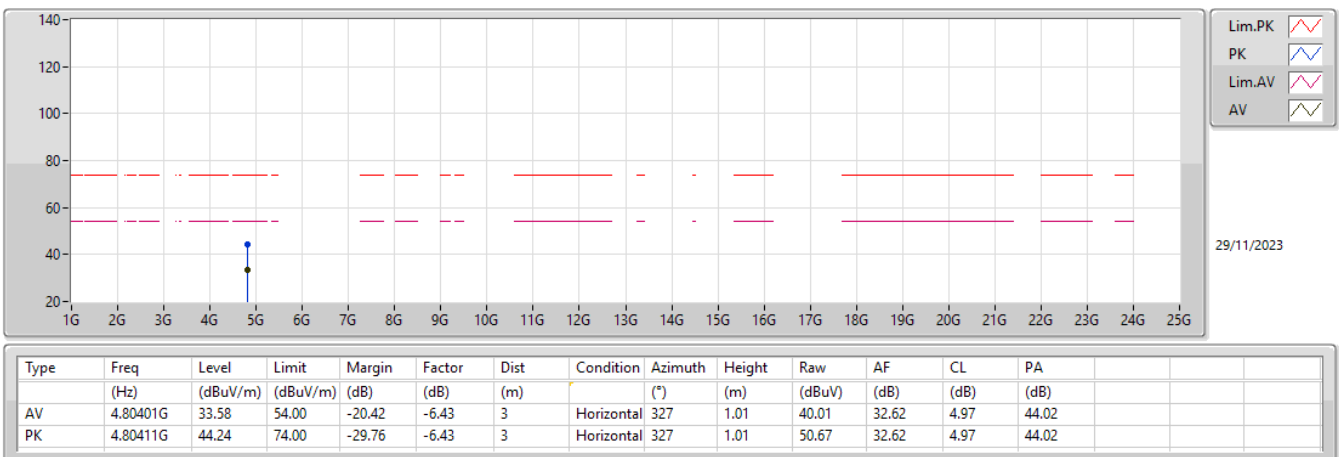
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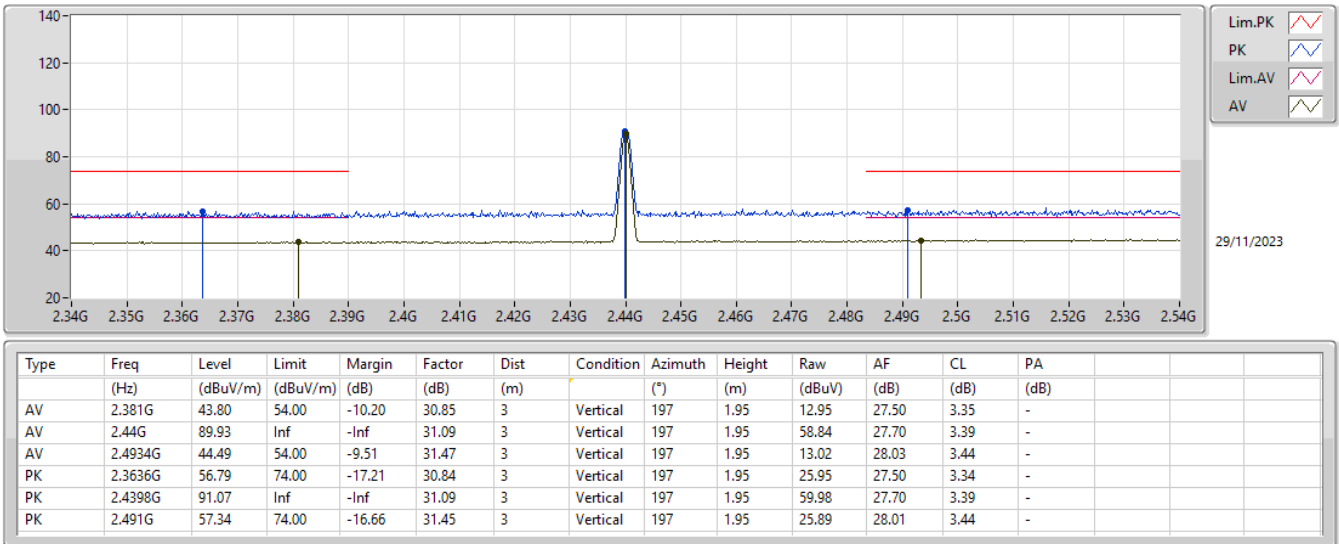
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2402MHz_TX



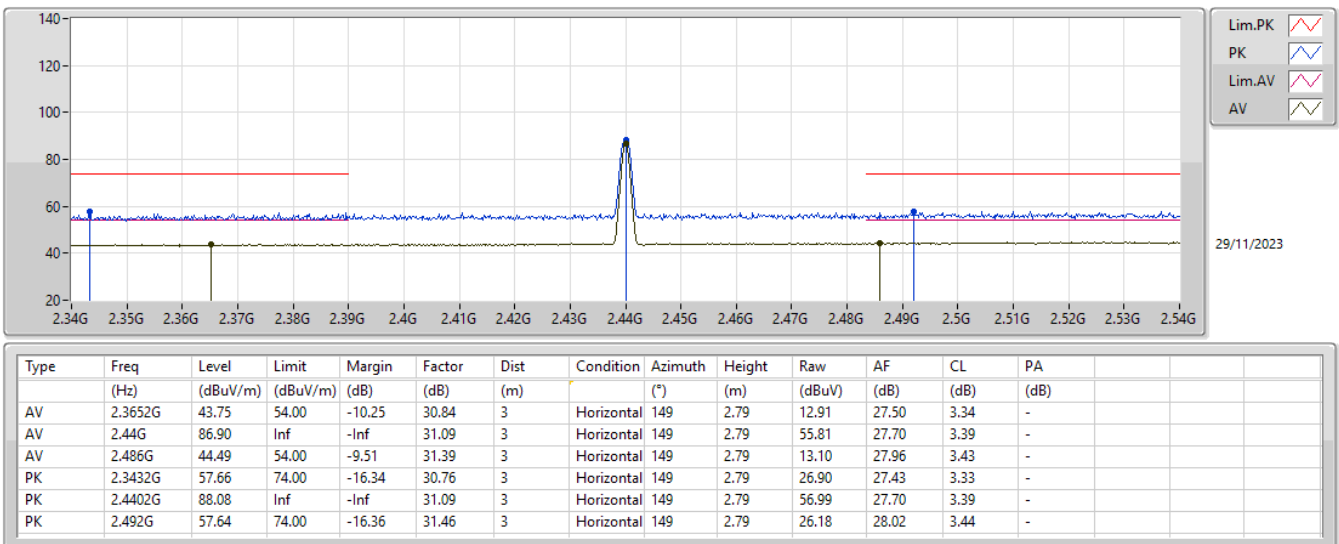
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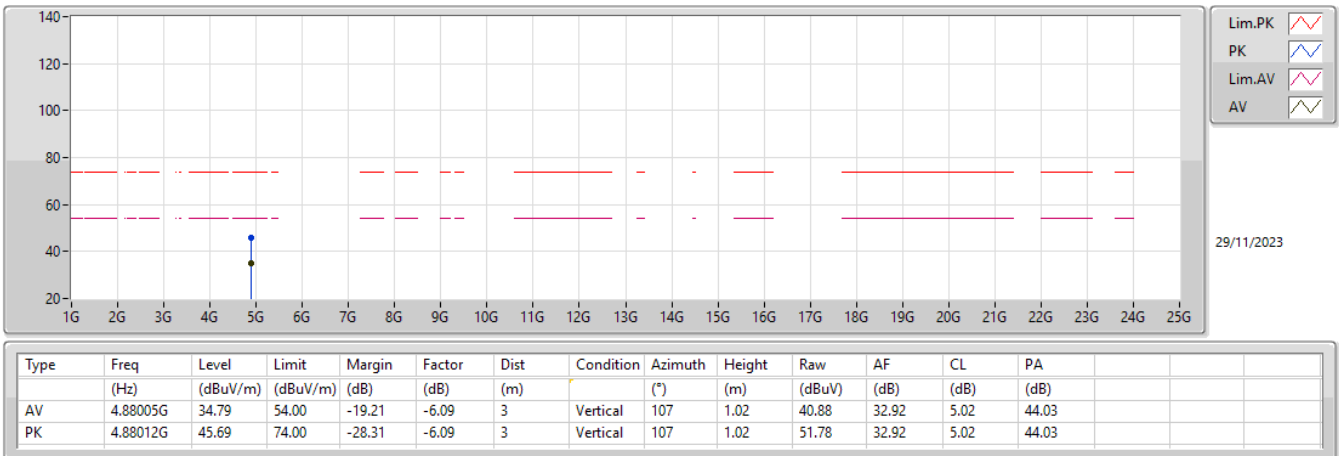
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2440MHz_TX



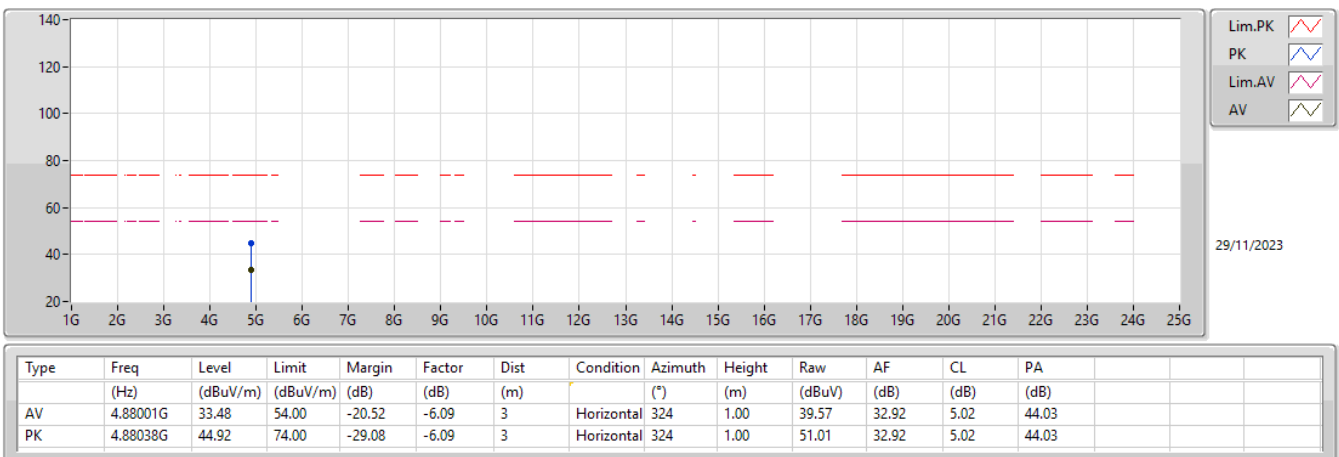
2.4-2.4835GHz_SRD

2440MHz_TX



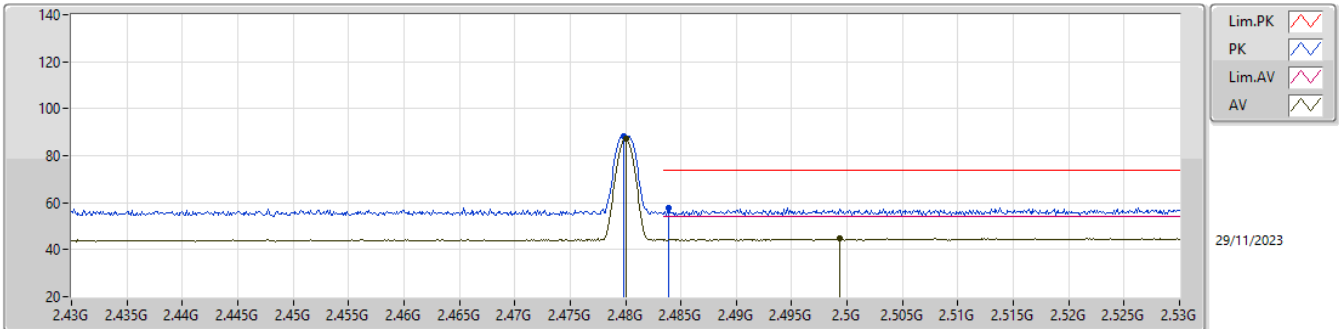
2.4-2.4835GHz_SRD

2440MHz_TX



2.4-2.4835GHz_SRD

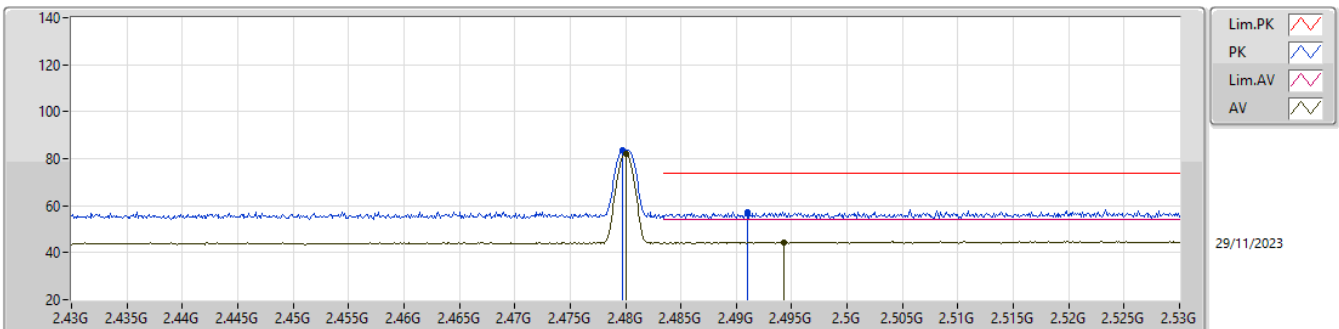
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	87.18	Inf	-Inf	31.33	3	Vertical	323	2.97	55.85	27.90	3.43	-
AV	2.4993G	44.66	54.00	-9.34	31.53	3	Vertical	323	2.97	13.13	28.09	3.44	-
PK	2.4798G	88.44	Inf	-Inf	31.33	3	Vertical	323	2.97	57.11	27.90	3.43	-
PK	2.4839G	57.64	74.00	-16.36	31.37	3	Vertical	323	2.97	26.27	27.94	3.43	-

2.4-2.4835GHz_SRD

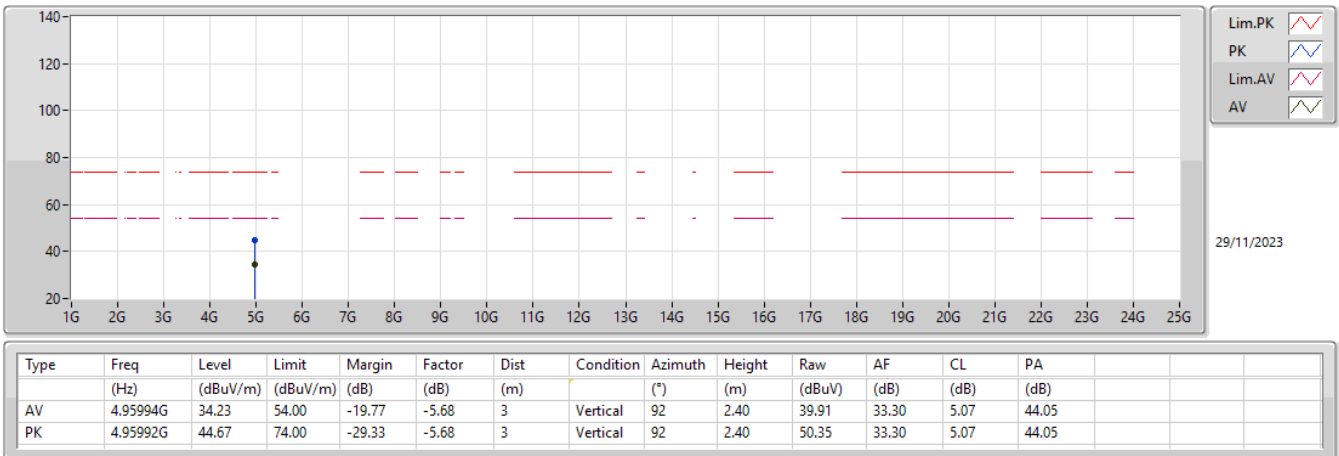
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	82.24	Inf	-Inf	31.33	3	Horizontal	151	1.54	50.91	27.90	3.43	-
AV	2.4943G	44.56	54.00	-9.44	31.48	3	Horizontal	151	1.54	13.08	28.04	3.44	-
PK	2.4797G	83.52	Inf	-Inf	31.33	3	Horizontal	151	1.54	52.19	27.90	3.43	-
PK	2.491G	57.50	74.00	-16.50	31.45	3	Horizontal	151	1.54	26.05	28.01	3.44	-

2.4-2.4835GHz_SRD

2480MHz_TX



2.4-2.4835GHz_SRD

2480MHz_TX

