Testing Laboratory 3787

RADIO TEST REPORT

FCC ID	:	**WR932181716523**
Equipment	:	**Video doorbell**
Brand Name	:	**ecobee**
Model Name	:	**EB-CAMSDB-01**
Applicant	:	**Ecobee Incorporated** **25, Dockside Drive Suite 700, Toronto, Canada, M5A0B5**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Jul. 10, 2023, and testing was started from Jul. 21, 2023 and completed on Aug. 07, 2023. We, Sporton International Inc. Hsinchu 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. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR361614AF	01	Initial issue of report	Aug. 31, 2023

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.3	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
4.1	15.247(a)	DTS Bandwidth	PASS	-
4.2	15.247(b)	Maximum Conducted Output Power	PASS	-
4.3	15.247(e)	Power Spectral Density	PASS	-
4.4	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
4.5	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sam Chen
Report Producer: Sophia Shiung

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range	Mode	Ch. Frequency (MHz)	Channel Number
2400–2483.5 MHz	Thread	2401.50-2478.75	1-49 [49]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	Thread	2	1TX

Note:
- BWch is the nominal channel bandwidth.
- Thread uses a O-QPSK (250kbps) modulation.

1.1.2 Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2401.5	26	2442.5
2	2402.5	27	2443.75
3	2403.75	28	2445
4	2406.25	29	2446.25
5	2407.5	30	2447.5
6	2408.75	31	2450
7	2411.25	32	2451.25
8	2412.5	33	2453.75
9	2413.75	34	2455
10	2415	35	2456.25
11	2417.5	36	2457.5
12	2418.75	37	2460
13	2420	38	2461.25
14	2421.25	39	2462.5
15	2423.75	40	2463.75
16	2425	41	2466.25
17	2427.5	42	2467.5
18	2428.75	43	2468.75
19	2430	44	4470
20	2432.5	45	2472.5
21	2433.75	46	2473.75
22	2435	47	2475
23	2437.5	48	2477.5
24	2438.75	49	2478.75
25	2440	-	-

1.1.3 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN / Bluetooth	Thread	Sub-G					
1	1	-	-	PSA	RFMTA160900NNLB001	PIFA	N/A	Note 1
2	-	1	-	PSA	RFPCA361205IMAB401	PIFA	I-PEX	
3	-	-	1	PSA	RFMTA341100NNUB001	PIFA	N/A	

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
4	Socionext	SC1233AR3	Chip	N/A	2

Note 1:

Ant.	Antenna Gain (dBi)				
	WLAN		Bluetooth	Thread	Sub-G
	2.4GHz	5GHz			
1	2.81	4.99	2.81	-	-
2	-	-	-	3.00	-
3	-	-	-	-	1.66

Note 2: The above information was declared by manufacturer.

Note 3: **For 2.4GHz function:**

For IEEE 802.11 b/g/n (TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

For 5GHz function:

For IEEE 802.11a/n/ac (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

For bluetooth function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

For Thread function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

For Sub-G function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

For 24GHz function (1TX/2RX):

Only Ant. 4 can be used as transmitting/receiving antenna.

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
Thread	1	0	n/a (DC>=0.98)	n/a (DC>=0.98)

Note:
- DC is Duty Cycle.
- DCF is Duty Cycle Factor.

1.1.5 EUT Operational Condition

EUT Power Type	From host system (16~24 Vac)			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	Tera Tern Ver:4.75			

Note: The above information was declared by manufacturer.

1.2 Applicable Standards

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

- 47 CFR FCC Part 15.247
- ANSI C63.10-2013

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

- FCC KDB 558074 D01 v05r02
- FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location Information	
Test Lab.：Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.
	Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH01-CB	Jay Lo	23.1~24.5 / 68~72	Jul. 31, 2023~ Aug. 04, 2023
Radiated < 1GHz	03CH05-CB	George Fan	22.9~23.6 / 60~63	Jul. 31, 2023~ Aug. 03, 2023
Radiated > 1GHz	03CH03-CB	George Fan	23.7~24.8 / 56~59	Jul. 21, 2023~ Jul. 26, 2023
AC Conduction	CO01-CB	Ryan Huang	22~23 / 56~57	Aug. 07, 2023

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.4 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.1 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.1 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.2 dB	Confidence levels of 95%
Conducted Emission	3.1 dB	Confidence levels of 95%
Output Power Measurement	0.8 dB	Confidence levels of 95%
Power Density Measurement	3.1 dB	Confidence levels of 95%
Bandwidth Measurement	2.2%	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
Thread_1TX	-
2401.5MHz	160
2440MHz	160
2478.75MHz	130

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	Normal Link
1	EUT_WLAN 2.4GHz + Thread + 24GHz radar
2	EUT_WLAN 5GHz + Thread + 24GHz radar
3	EUT_Bluetooth + Thread + 24GHz radar
Mode 3 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4~5 will follow this same test mode.	
4	EUT_Bluetooth + Sub-G (Hopping mode) + 24GHz radar
5	EUT_Bluetooth + Sub-G (Hybrid mode) + 24GHz radar
For operating, mode 3 is the worst case and it was record in this test report.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Maximum Conducted Output Power 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	Normal Link
	After evaluating, EUT in Y axis was the worst case, so the measurement will follow this same test configuration.
1	EUT in Y axis_WLAN 2.4GHz + Thread + 24GHz radar
2	EUT in Y axis_WLAN 5GHz + Thread + 24GHz radar
3	EUT in Y axis_Bluetooth + Thread + 24GHz radar
Mode 3 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4~5 will follow this same test mode.	
4	EUT in Y axis_Bluetooth + Sub-G (Hopping mode) + 24GHz radar
5	EUT in Y axis_Bluetooth + Sub-G (Hybrid mode) + 24GHz radar
For operating, mode 3 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
	After evaluating, EUT in Y axis was the worst case, so the measurement will follow this same test configuration.
1	EUT in Y axis

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + Thread + 24GHz radar
2	WLAN 2.4GHz + Sub-G (Hopping mode) + 24GHz radar
3	WLAN 2.4GHz + Sub-G (Hybrid mode) + 24GHz radar
4	WLAN 5GHz + Thread + 24GHz radar
5	WLAN 5GHz + Sub-G (Hopping mode) + 24GHz radar
6	WLAN 5GHz + Sub-G (Hybrid mode) + 24GHz radar
7	Bluetooth + Thread + 24GHz radar
8	Bluetooth + Sub-G (Hopping mode) + 24GHz radar
9	Bluetooth + Sub-G (Hybrid mode) + 24GHz radar
Refer to Sporton Test Report No.: FA361614 for Co-location RF Exposure Evaluation.	

Note: The adapter was for measurement only and would not be marketed. Its information is shown as below:

Equipment	Brand Name	Model Name
Power adapter	AMIGO	CT-5723-03

2.3 EUT Operation during Test

For CTX Mode:

The EUT was programmed to be in continuously transmitting mode.

For Normal Link Mode:

During the test, the EUT operation to normal function.

2.4 Accessories

Accessories
CHIME adapter*1: Non-shielded, 0.2m
Backplate*1

2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Power adapter	AMIGO	CT-5723-03	N/A
B	Test fixture	NEWHOUSE	CHM1	N/A
C	NB	DELL	PP13S	N/A

For Radiated (below 1GHz):

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Power adapter	AMIGO	CT-5723-03	N/A
B	Test fixture	NEWHOUSE	CHM1	N/A
C	NB	DELL	PP13S	N/A

For Radiated (above 1GHz):

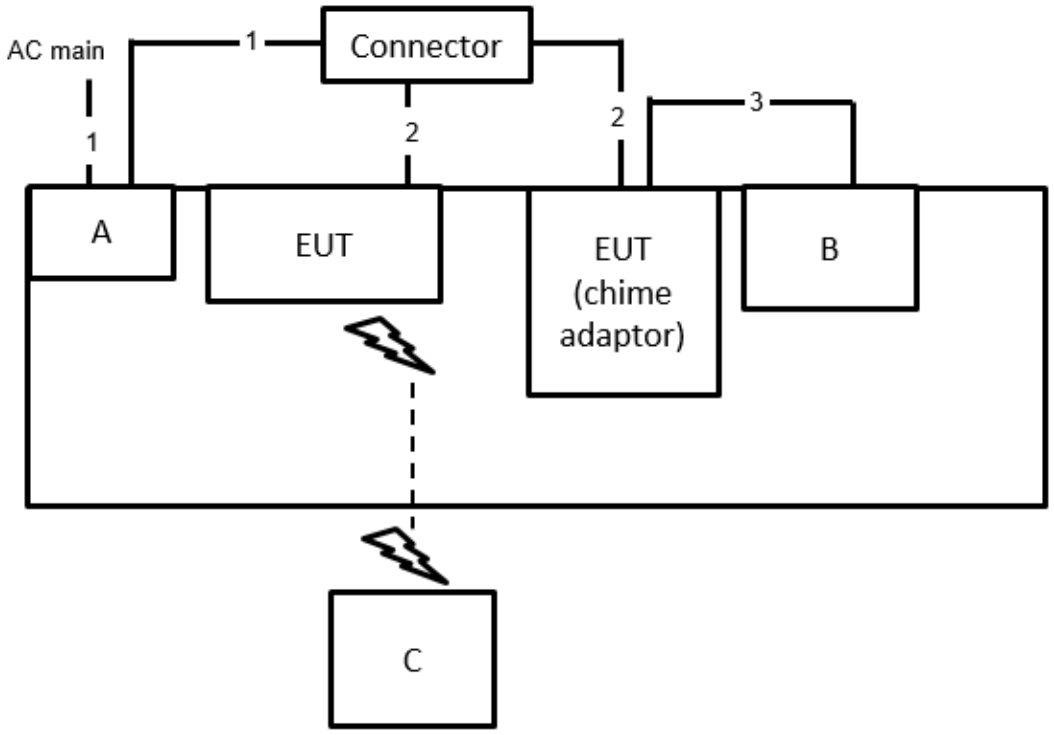
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A
B	Fixture	ALPHA	1EBRC21T..A2G	N/A
C	Power adapter	AMIGO	CT-5723-03	N/A

For RF Conducted:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A
B	Fixture	ALPHA	1EBRC21T..A2G	N/A
C	Power adapter	AMIGO	CT-5723-03	N/A

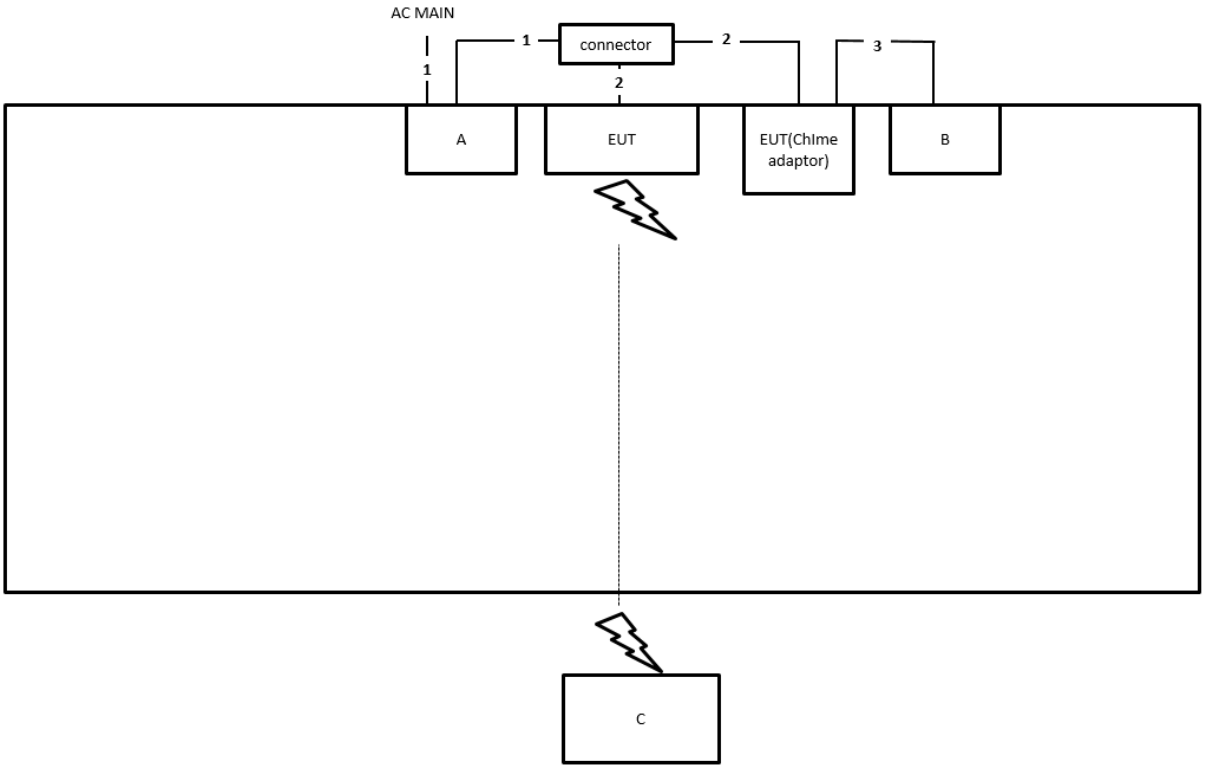
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



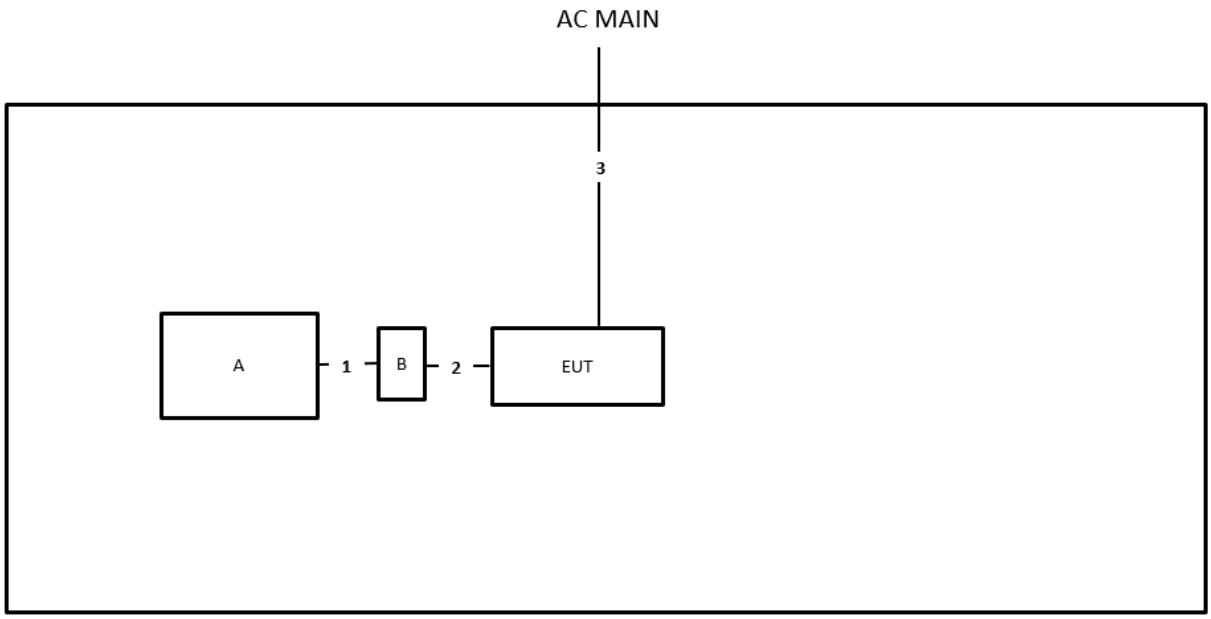
Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	Power cable	No	1.4m
3	Power cable	No	0.2m

Test Setup Diagram - Radiated Test < 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	Power cable	No	1.4m
3	Power cable	No	0.2m

Test Setup Diagram - Radiated Test > 1GHz



Item	Connection	Shielded	Length
1	USB cable	No	0.5m
2	PIN cable	No	0.15m
3	Power cable	No	2.6m

3 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

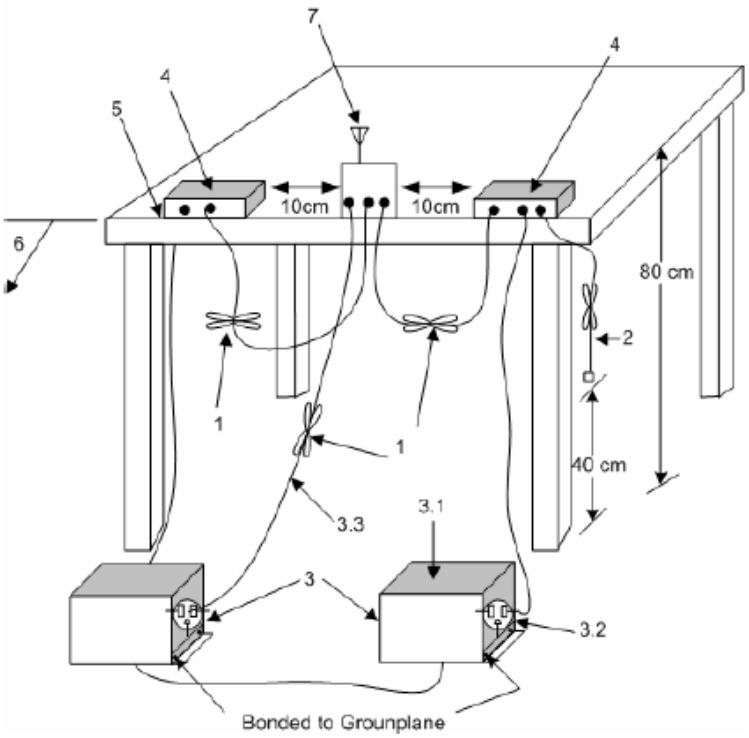
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 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 50 Ω 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.

3.1.5 Measurement Results Calculation

The measured Level is calculated using:

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

b. Margin = -Limit + Level

3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

4 Transmitter Test Result – DTS

4.1 DTS Bandwidth

4.1.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
▪ 6 dB bandwidth ≥ 500 kHz.

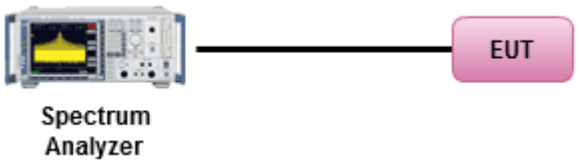
4.1.2 Measuring Instruments

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

4.1.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
☒	Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
☐	Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
☐	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

4.1.4 Test Setup

Emission Bandwidth


4.1.5 Test Result of Emission Bandwidth

Refer as Appendix B

4.2 Maximum Conducted Output Power

4.2.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	▪ If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 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 + 8dB 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.		

4.2.2 Measuring Instruments

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

4.2.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	
	☐ Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).
	☐ Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
▪ Maximum Conducted Output Power	
	[duty cycle ≥ 98% or external video / power trigger]
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)
	duty cycle < 98% and average over on/off periods with duty factor
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
	Measurement using a power meter (PM)
	☐ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
	☒ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as FCC 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]) $EIRP_{total} = P_{total} + DG$

4.2.4 Test Setup

Maximum Conducted Output Power (Power Meter)


4.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

4.3 Power Spectral Density

4.3.1 Power Spectral Density Limit

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

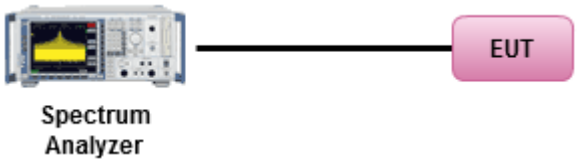
4.3.2 Measuring Instruments

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

4.3.3 Test Procedures

Test Method		
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).		
	☒ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD.	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		☐ Option 1: Measure and sum the spectra across the outputs. Refer as FCC 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.
		☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,
		☐ Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

4.3.4 Test Setup

Power Spectral Density


4.3.5 Test Result of Power Spectral Density

Refer as Appendix D

4.4 Emissions in Non-restricted Frequency Bands

4.4.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dB)**
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD 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 PSD level.

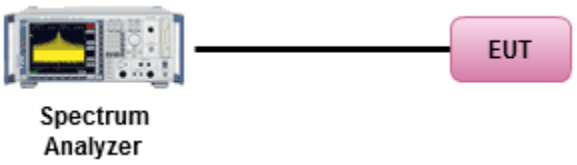
4.4.2 Measuring Instruments

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

4.4.3 Test Procedures

Test Method
▪ Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted bands.

4.4.4 Test Setup

Emissions in Non-restricted Frequency Bands


4.4.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

4.5 Emissions in Restricted Frequency Bands

4.5.1 Emissions in Restricted Frequency Bands Limit

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

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

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements 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.

4.5.2 Measuring Instruments

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

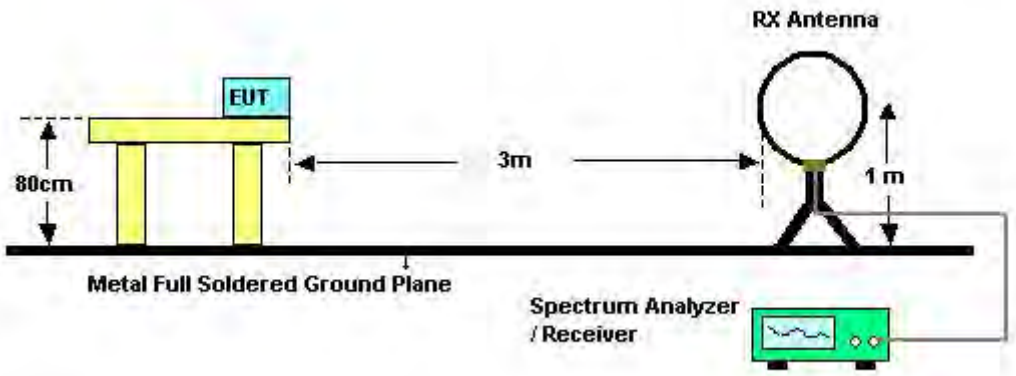
4.5.3 Test Procedures

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 FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.		
		☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle ≥98%).
		☐	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
		☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW≥1/T).
		☐	Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐	Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
		☒	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
▪ For the transmitter band-edge emissions shall be measured using following options below:			
	▪ Refer as FCC KDB 558074 clause 8.7 & C63.10 clause 11.13.1, 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 FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.		
	▪ Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).		
	▪ For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB		
	▪ For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.		

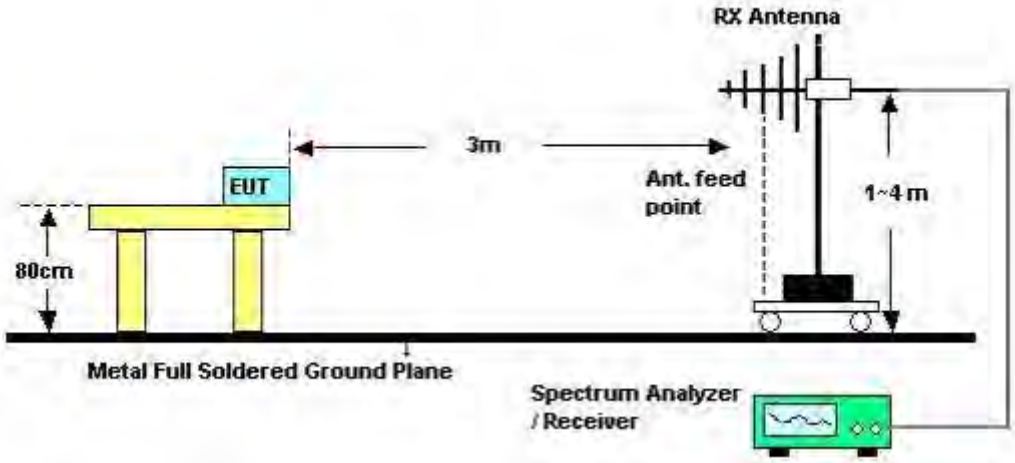
4.5.4 Test Setup

Transmitter Radiated Emissions

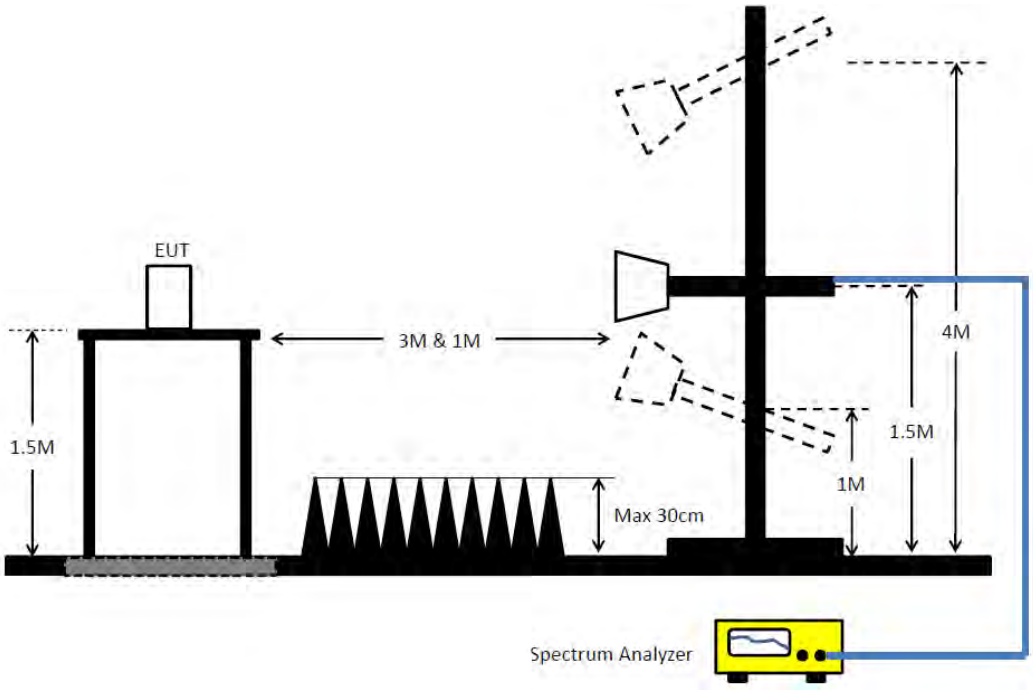
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



4.5.5 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor (if applicable) = Level.

4.5.6 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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

4.5.7 Transmitter Radiated Unwanted Emissions

Refer as Appendix F

5 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.4GHz	Feb. 20, 2023	Feb. 19, 2024	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Feb. 16, 2023	Feb. 15, 2024	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Apr. 27, 2023	Apr. 26, 2024	Conduction (CO01-CB)
Pulse Limiter	Rohde& Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Feb. 09, 2023	Feb. 08, 2024	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	Oct. 18, 2022	Oct. 17, 2023	Conduction (CO01-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6120	31244	9kHz - 30 MHz	Mar. 23, 2023	Mar. 22, 2024	Radiation (03CH05-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 03, 2022	Aug. 02, 2023	Radiation (03CH05-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 02, 2023	Aug. 01, 2024	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 24, 2023	Mar. 23, 2024	Radiation (03CH05-CB)
Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 03, 2023	May 02, 2024	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Apr. 18, 2023	Apr. 17, 2024	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 13, 2023	Jun. 12, 2024	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH05-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH05-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH03-CB	1GHz ~18GHz 3m	May 04, 2023	May 03, 2024	Radiation (03CH03-CB)
Horn Antenna	ETS・Lindgren	3115	6821	750MHz~18GHz	Feb. 03, 2023	Feb. 02, 2024	Radiation (03CH03-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 22, 2022	Aug. 21, 2023	Radiation (03CH03-CB)
Pre-Amplifier	Agilent	8449B	3008A02097	1GHz ~ 26.5GHz	Jun. 30, 2023	Jun. 29, 2024	Radiation (03CH03-CB)

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Pre-Amplifier	SGH	SGH184	20221107-3	18GHz ~ 40GHz	Nov. 16, 2022	Nov. 15, 2023	Radiation (03CH03-CB)
Spectrum Analyzer	R&S	FSP40	100019	9kHz ~ 40GHz	Jun. 12, 2023	Jun. 11, 2024	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-20+29	1GHz ~ 18GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-29	1GHz ~ 18GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH03-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH03-CB)
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH03-CB)
High Cable	Woken	WCA0929M	40G#6	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH03-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH03-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	May 29, 2023	May 28, 2024	Conducted (TH01-CB)
Switch	SPTCB	SP-SWI	SWI-01	1 GHz –26.5 GHz	Oct. 04, 2022	Oct. 03, 2023	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-30	1 GHz – 18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH01-CB)
Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Feb. 22, 2023	Feb. 21, 2024	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Feb. 22, 2023	Feb. 21, 2024	Conducted (TH01-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH01-CB)

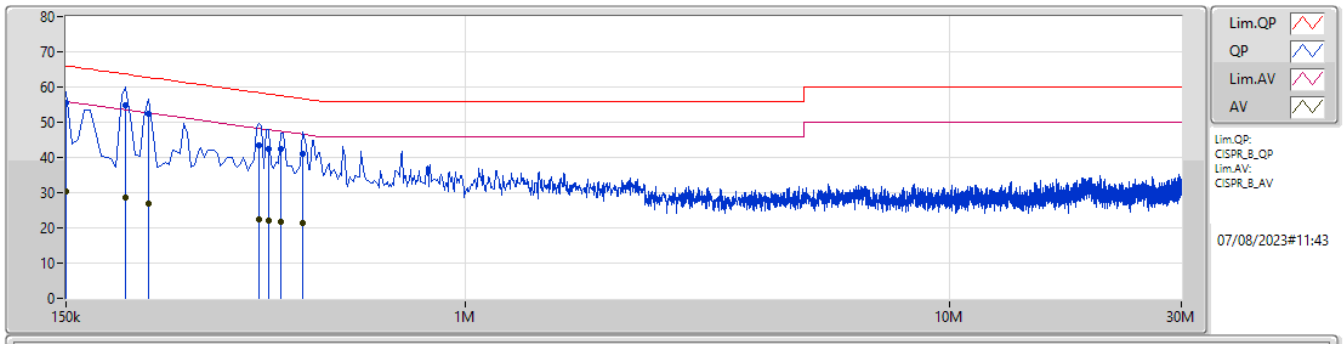
Note: Calibration Interval of instruments listed above is one year.

NCR means Non-Calibration required.

Summary

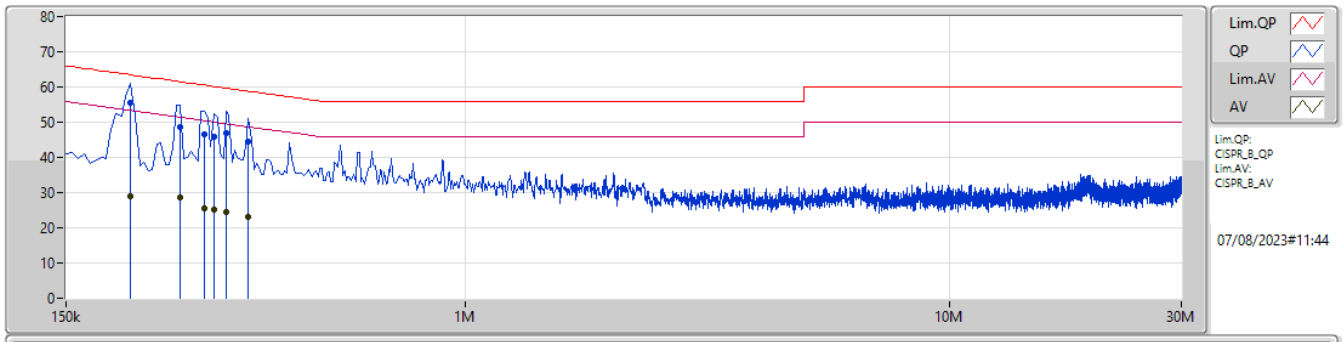
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 3	Pass	QP	204k	55.40	63.44	-8.04	Neutral

Mode 3



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	150k	55.50	66.00	-10.50	10.00	Line	-	45.50	0.09	0.04	9.87
AV	150k	30.50	56.00	-25.50	10.00	Line	-	20.50	0.09	0.04	9.87
QP	199.5k	54.88	63.63	-8.75	9.98	Line	"Worst"	44.90	0.08	0.04	9.86
AV	199.5k	28.72	53.63	-24.91	9.98	Line	-	18.74	0.08	0.04	9.86
QP	222k	52.57	62.75	-10.18	9.99	Line	-	42.58	0.08	0.04	9.87
AV	222k	27.05	52.75	-25.70	9.99	Line	-	17.06	0.08	0.04	9.87
QP	375k	43.56	58.39	-14.83	10.05	Line	-	33.51	0.09	0.06	9.90
AV	375k	22.51	48.39	-25.88	10.05	Line	-	12.46	0.09	0.06	9.90
QP	393k	42.37	58.01	-15.64	10.05	Line	-	32.32	0.09	0.06	9.90
AV	393k	22.10	48.01	-25.91	10.05	Line	-	12.05	0.09	0.06	9.90
QP	415.5k	42.57	57.53	-14.96	10.05	Line	-	32.52	0.09	0.06	9.90
AV	415.5k	21.79	47.53	-25.74	10.05	Line	-	11.74	0.09	0.06	9.90
QP	460.5k	40.87	56.69	-15.82	10.05	Line	-	30.82	0.09	0.06	9.90
AV	460.5k	21.27	46.69	-25.42	10.05	Line	-	11.22	0.09	0.06	9.90

Mode 3



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	204k	55.40	63.44	-8.04	9.97	Neutral	"Worst"	45.43	0.07	0.04	9.86
AV	204k	28.84	53.44	-24.60	9.97	Neutral	-	18.87	0.07	0.04	9.86
QP	258k	48.66	61.49	-12.83	9.99	Neutral	-	38.67	0.07	0.05	9.87
AV	258k	28.65	51.49	-22.84	9.99	Neutral	-	18.66	0.07	0.05	9.87
QP	289.5k	46.55	60.53	-13.98	10.00	Neutral	-	36.55	0.07	0.05	9.88
AV	289.5k	25.63	50.53	-24.90	10.00	Neutral	-	15.63	0.07	0.05	9.88
QP	303k	46.02	60.17	-14.15	10.00	Neutral	-	36.02	0.07	0.05	9.88
AV	303k	25.29	50.17	-24.88	10.00	Neutral	-	15.29	0.07	0.05	9.88
QP	321k	47.03	59.67	-12.64	10.01	Neutral	-	37.02	0.07	0.05	9.89
AV	321k	24.59	49.67	-25.08	10.01	Neutral	-	14.58	0.07	0.05	9.89
QP	357k	44.47	58.79	-14.32	10.02	Neutral	-	34.45	0.07	0.06	9.89
AV	357k	22.95	48.79	-25.84	10.02	Neutral	-	12.93	0.07	0.06	9.89

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
Thread_1TX	1.175M	1.799M	1M80G1D	1.175M	1.787M

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

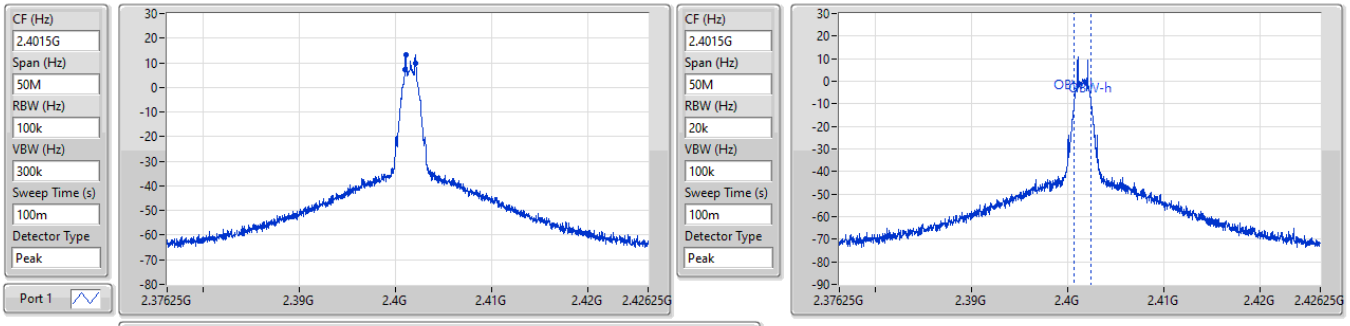
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
Thread_1TX	-	-	-	-
2401.5MHz	Pass	500k	1.175M	1.798M
2440MHz	Pass	500k	1.175M	1.799M
2478.75MHz	Pass	500k	1.175M	1.787M

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

2.4-2.4835GHz_Thread_1TX **EBW**

2401.5MHz

31/07/2023

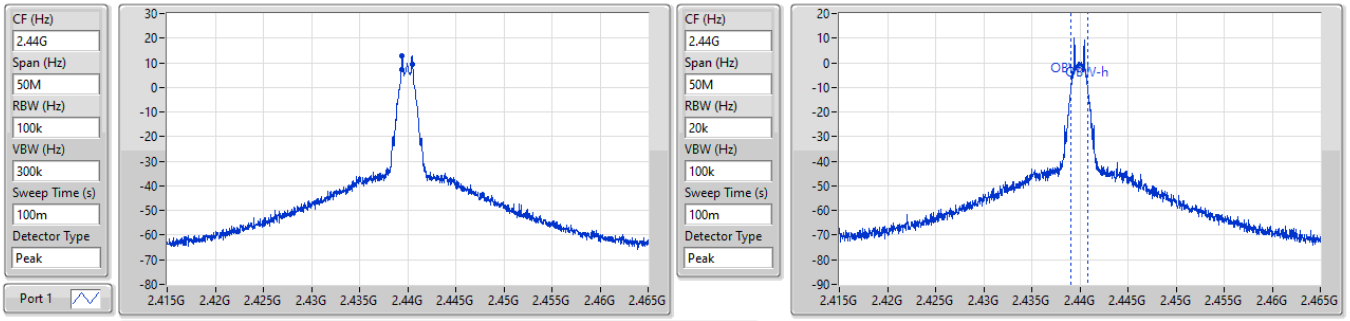


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.175M	2.40095G	2.402125G	1.798M	2.400646G	2.402444G	500k	1

2.4-2.4835GHz_Thread_1TX **EBW**

2440MHz

31/07/2023

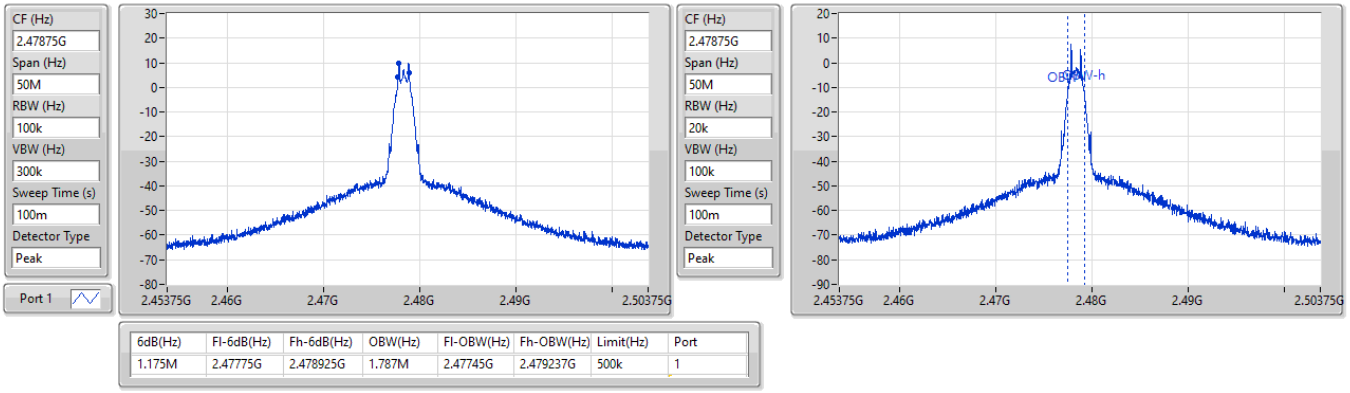


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.175M	2.43935G	2.440525G	1.799M	2.439047G	2.440846G	500k	1

2.4-2.4835GHz_Thread_1TX **EBW**

2478.75MHz

31/07/2023



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.175M	2.47775G	2.478925G	1.787M	2.47745G	2.479237G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Thread_1TX	13.88	0.02443

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
Thread_1TX	-	-	-	-	-
2401.5MHz	Pass	3.00	13.88	13.88	30.00
2440MHz	Pass	3.00	13.50	13.50	30.00
2478.75MHz	Pass	3.00	10.68	10.68	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
Thread_1TX	7.88

RBW = 3kHz;

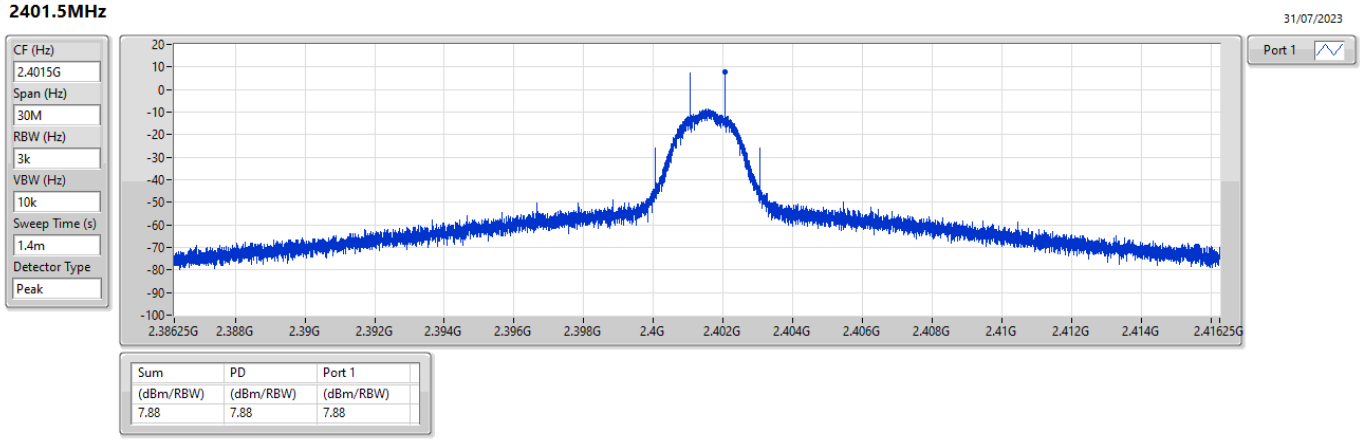
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Thread_1TX	-	-	-	-	-
2401.5MHz	Pass	3.00	7.88	7.88	8.00
2440MHz	Pass	3.00	7.42	7.42	8.00
2478.75MHz	Pass	3.00	4.77	4.77	8.00

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

2.4-2.4835GHz_Thread_1TX **PSD**

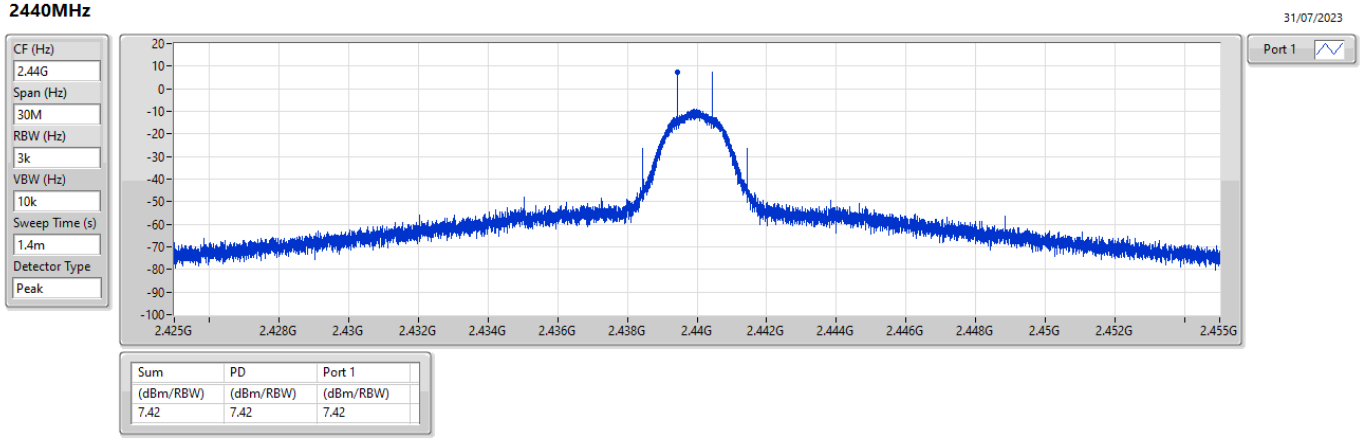
2401.5MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
7.88	7.88	7.88

2.4-2.4835GHz_Thread_1TX **PSD**

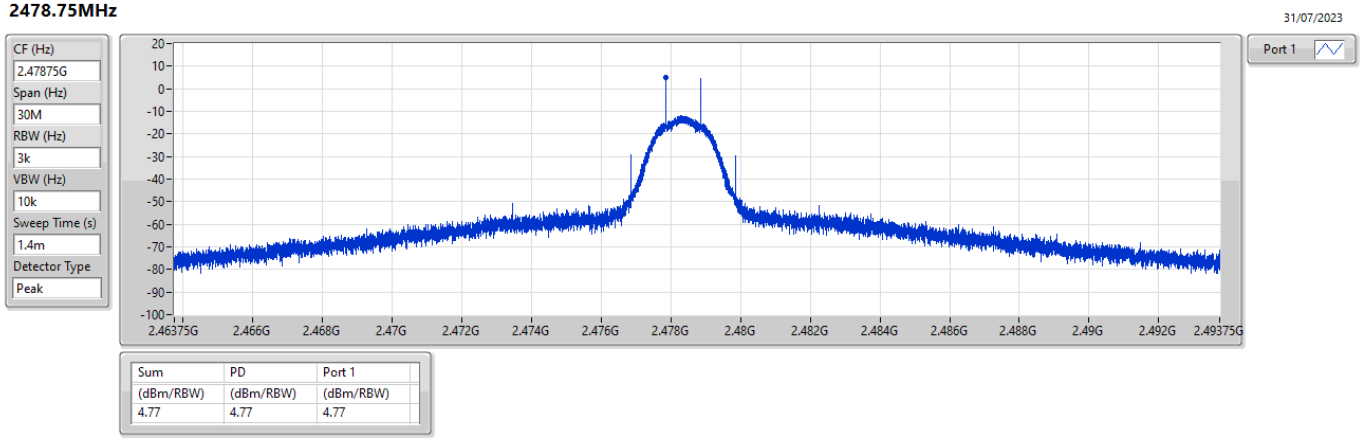
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
7.42	7.42	7.42

2.4-2.4835GHz_Thread_1TX **PSD**

2478.75MHz



Summary

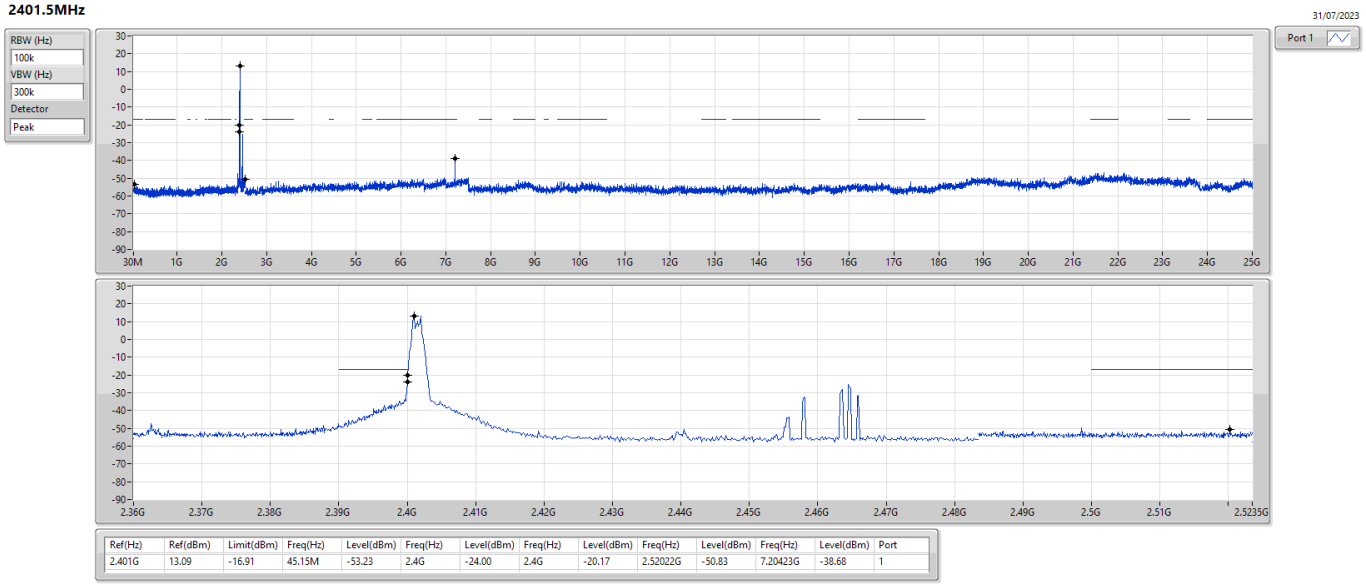
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thread_1TX	Pass	2.401G	13.09	-16.91	45.15M	-53.23	2.4G	-24.00	2.4G	-20.17	2.52022G	-50.83	7.20423G	-38.68	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
Thread_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2401.5MHz	Pass	2.401G	13.09	-16.91	45.15M	-53.23	2.4G	-24.00	2.4G	-20.17	2.52022G	-50.83	7.20423G	-38.68	1
2440MHz	Pass	2.401G	13.09	-16.91	36.99M	-53.37	2.3932G	-51.82	2.4G	-56.5	2.51718G	-50.90	21.49929G	-45.38	1
2478.75MHz	Pass	2.401G	13.09	-16.91	2.02215G	-52.84	2.3992G	-52.28	2.4G	-54.83	2.51622G	-50.17	21.61448G	-46.87	1

2.4-2.4835GHz_Thread_1TX CSENdB

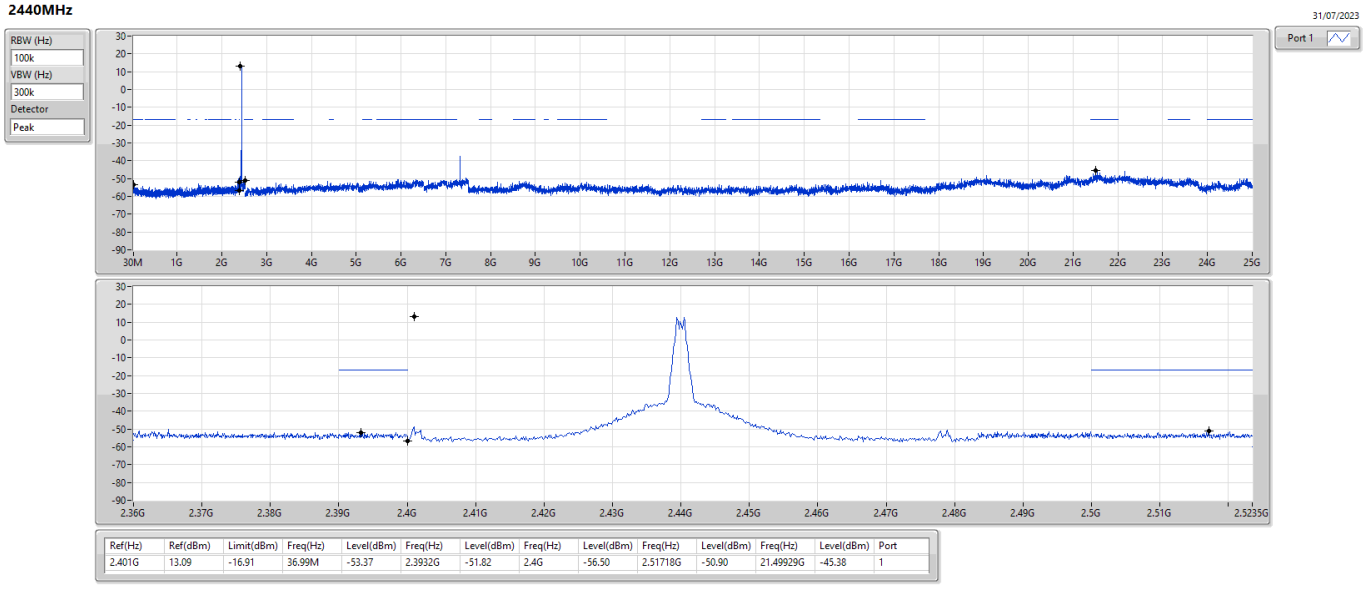
2401.5MHz



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
2.401G	13.09	-16.91	45.15M	-53.23	2.4G	-24.00	2.4G	-20.17	2.52022G	-50.83	7.20423G	-38.68	1

2.4-2.4835GHz_Thread_1TX CSENdB

2440MHz

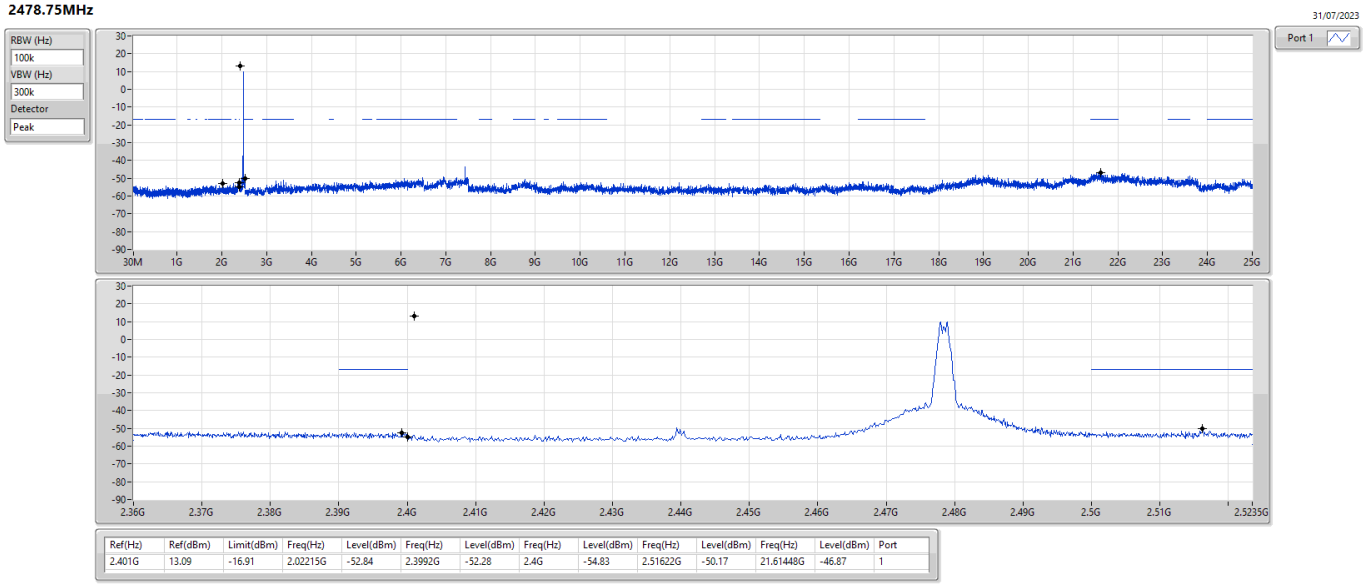


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.401G	13.09	-16.91	36.99M	-53.37	2.3932G	-51.82	2.4G	-56.50	2.51718G	-50.90	21.49929G	-45.38	1

2.4-2.4835GHz_Thread_1TX

CSENdB

2478.75MHz

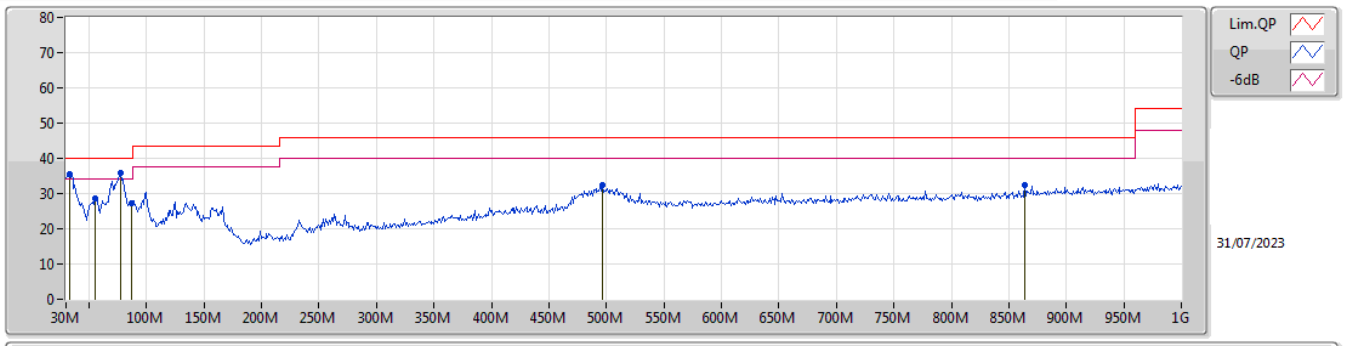


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.401G	13.09	-16.91	2.02215G	-52.84	2.3992G	-52.28	2.4G	-54.83	2.51622G	-50.17	21.61448G	-46.87	1

Summary

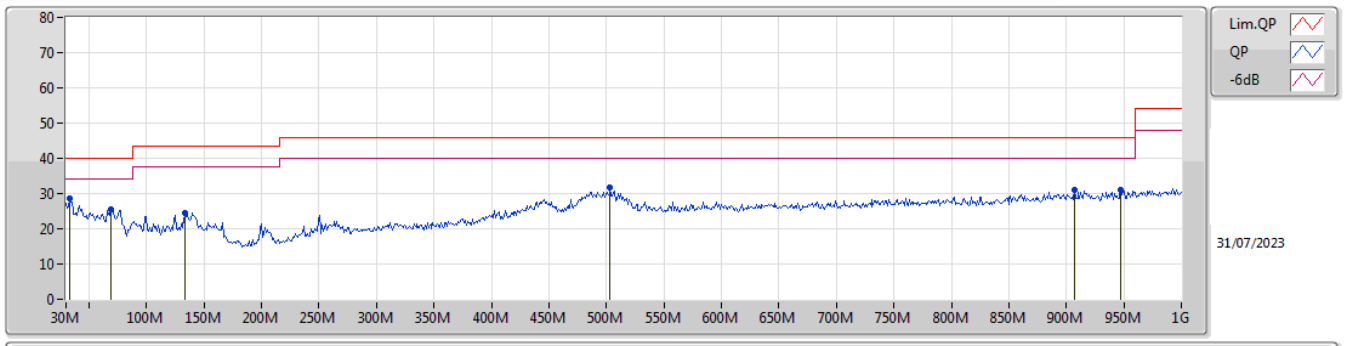
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 3	Pass	PK	77.53M	35.77	40.00	-4.23	Vertical

Mode 3



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV/m)	(dB/m)	(dB)	(dB)
PK	32.91M	35.62	40.00	-4.38	-8.02	3	Vertical	6	1.00	-	43.64	22.55	1.05	31.62
PK	55.22M	28.61	40.00	-11.39	-17.72	3	Vertical	240	1.00	-	46.33	12.85	1.31	31.88
PK	77.53M	35.77	40.00	-4.23	-17.80	3	Vertical	56	1.00	"Worst"	53.57	12.63	1.53	31.96
PK	87.23M	27.37	40.00	-12.63	-16.09	3	Vertical	39	1.00	-	43.46	14.24	1.60	31.93
PK	496.57M	32.42	46.00	-13.58	-5.06	3	Vertical	217	1.00	-	37.48	23.24	3.97	32.27
PK	864.2M	32.25	46.00	-13.75	-1.07	3	Vertical	294	1.50	-	33.32	26.03	5.48	32.58

Mode 3



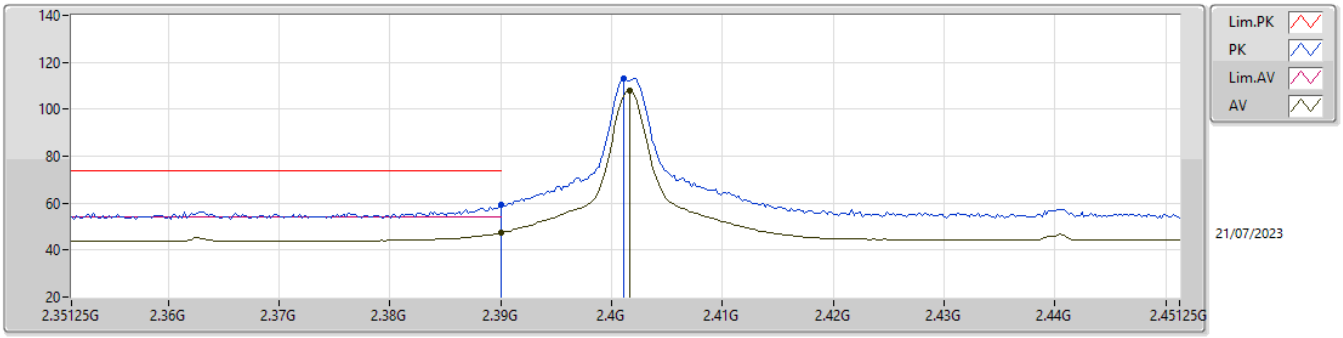
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV/m)	(dB/m)	(dB)	(dB)
PK	32.91M	28.45	40.00	-11.55	-8.02	3	Horizontal	146	1.00	"Worst"	36.47	22.55	1.05	31.62
PK	68.8M	25.37	40.00	-14.63	-18.11	3	Horizontal	248	1.50	-	43.48	12.35	1.44	31.90
PK	133.79M	24.54	43.50	-18.96	-12.25	3	Horizontal	0	1.50	-	36.79	17.76	1.96	31.97
PK	503.36M	31.74	46.00	-14.26	-4.97	3	Horizontal	203	1.00	-	36.71	23.31	4.00	32.28
PK	906.88M	31.12	46.00	-14.88	-0.41	3	Horizontal	83	1.50	-	31.53	26.38	5.67	32.46
PK	947.62M	31.16	46.00	-14.84	-0.17	3	Horizontal	137	1.00	-	31.33	26.69	5.69	32.55

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
Thread_1TX	Pass	AV	2.4835G	53.85	54.00	-0.15	3	Vertical	304	2.47	-

2.4-2.4835GHz_Thread_1TX

2401.5MHz_TX

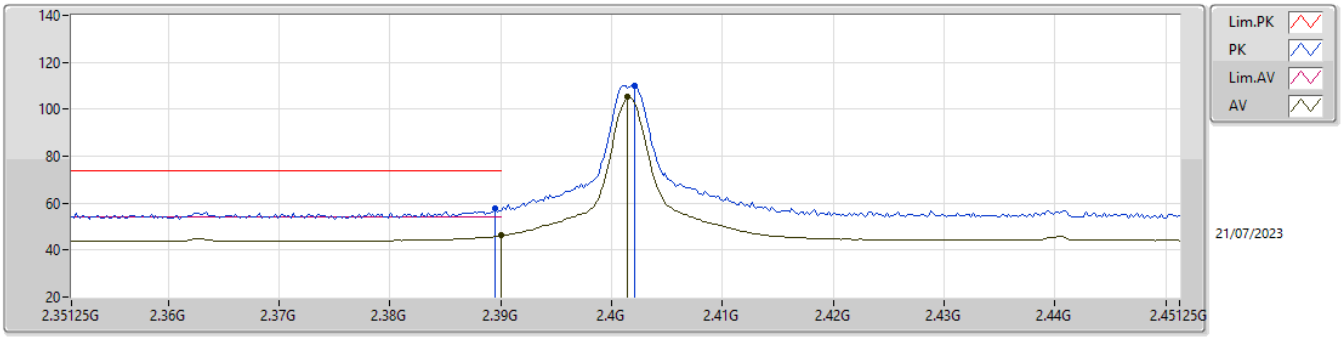


EUT Y_1TX
Setting 200
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.39G	59.27	74.00	-14.73	27.08	3	Vertical	309	2.36	-	28.20	3.99	-
AV	2.39G	47.30	54.00	-6.70	15.11	3	Vertical	309	2.36	-	28.20	3.99	-
PK	2.40105G	112.94	Inf	-Inf	80.74	3	Vertical	309	2.36	-	28.20	4.00	-
AV	2.40165G	107.91	Inf	-Inf	75.71	3	Vertical	309	2.36	-	28.20	4.00	-

2.4-2.4835GHz_Thread_1TX

2401.5MHz_TX

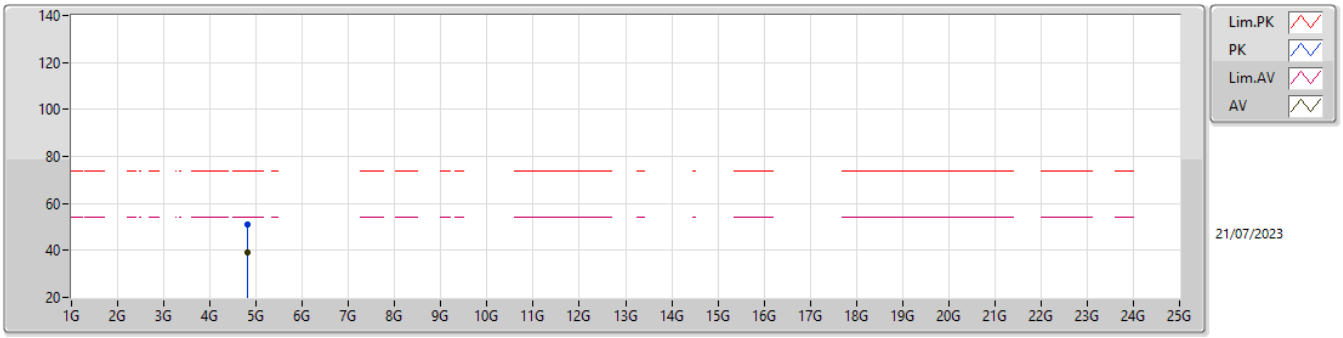


EUT Y_1TX
Setting 200
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.38945G	57.62	74.00	-16.38	25.43	3	Horizontal	276	1.00	-	28.20	3.99	-
AV	2.39G	46.15	54.00	-7.85	13.96	3	Horizontal	276	1.00	-	28.20	3.99	-
PK	2.40205G	110.16	Inf	-Inf	77.96	3	Horizontal	276	1.00	-	28.20	4.00	-
AV	2.40145G	105.17	Inf	-Inf	72.97	3	Horizontal	276	1.00	-	28.20	4.00	-

2.4-2.4835GHz_Thread_1TX

2401.5MHz_TX

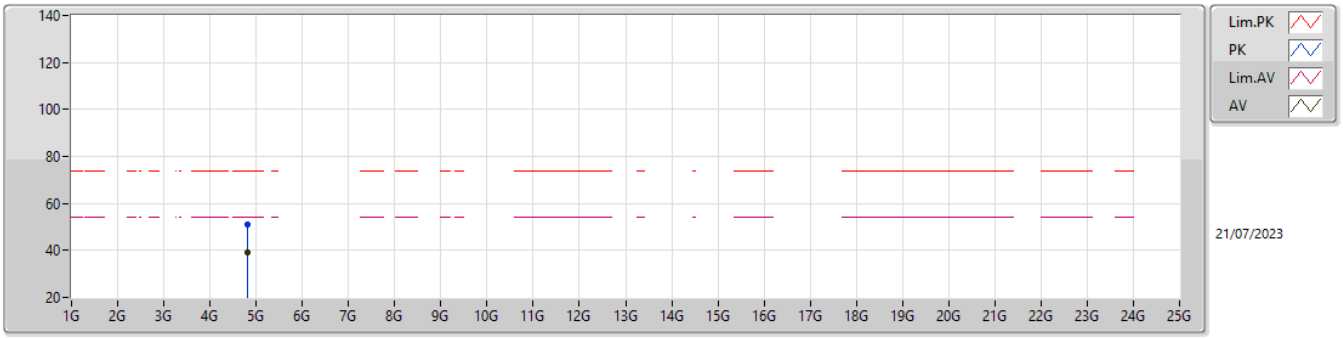


EUT Y_1TX
Setting 200
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.80204G	51.16	74.00	-22.84	45.94	3	Vertical	24	1.08	-	33.40	6.50	34.68
AV	4.80397G	38.94	54.00	-15.06	33.72	3	Vertical	24	1.08	-	33.40	6.50	34.68

2.4-2.4835GHz_Thread_1TX

2401.5MHz_TX

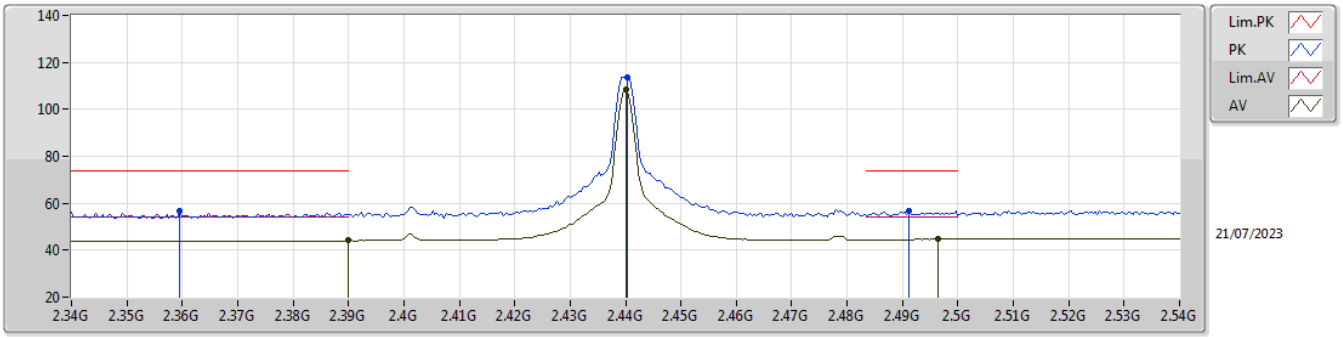


EUT Y_1TX
Setting 200
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.80186G	51.27	74.00	-22.73	46.05	3	Horizontal	13	1.00	-	33.40	6.50	34.68
AV	4.80394G	39.39	54.00	-14.61	34.17	3	Horizontal	13	1.00	-	33.40	6.50	34.68

2.4-2.4835GHz_Thread_1TX

2440MHz_TX

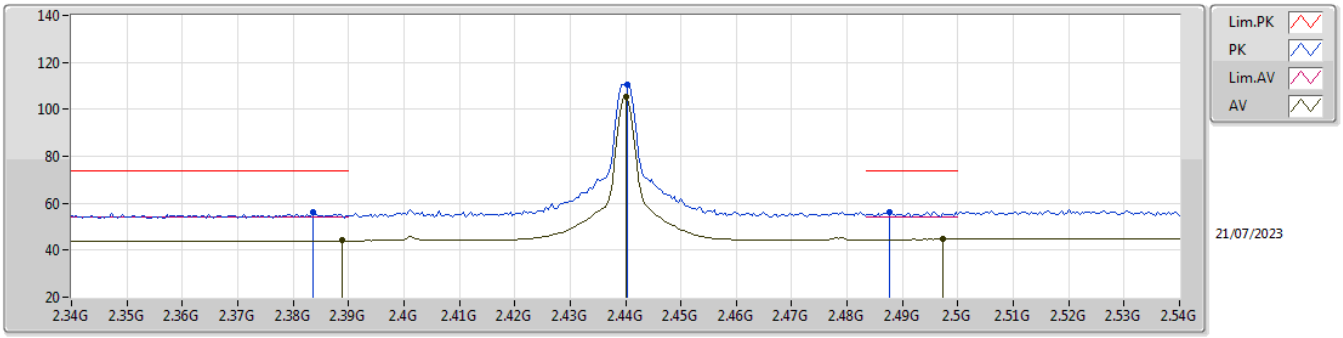


EUT Y_1TX
Setting 200
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3596G	56.89	74.00	-17.11	24.73	3	Vertical	307	2.58	-	28.20	3.96	-
AV	2.39G	44.07	54.00	-9.93	11.88	3	Vertical	307	2.58	-	28.20	3.99	-
PK	2.4404G	113.60	Inf	-Inf	81.36	3	Vertical	307	2.58	-	28.20	4.04	-
AV	2.44G	108.56	Inf	-Inf	76.32	3	Vertical	307	2.58	-	28.20	4.04	-
PK	2.4912G	56.74	74.00	-17.26	24.20	3	Vertical	307	2.58	-	28.45	4.09	-
AV	2.4964G	44.72	54.00	-9.28	12.14	3	Vertical	307	2.58	-	28.48	4.10	-

2.4-2.4835GHz_Thread_1TX

2440MHz_TX

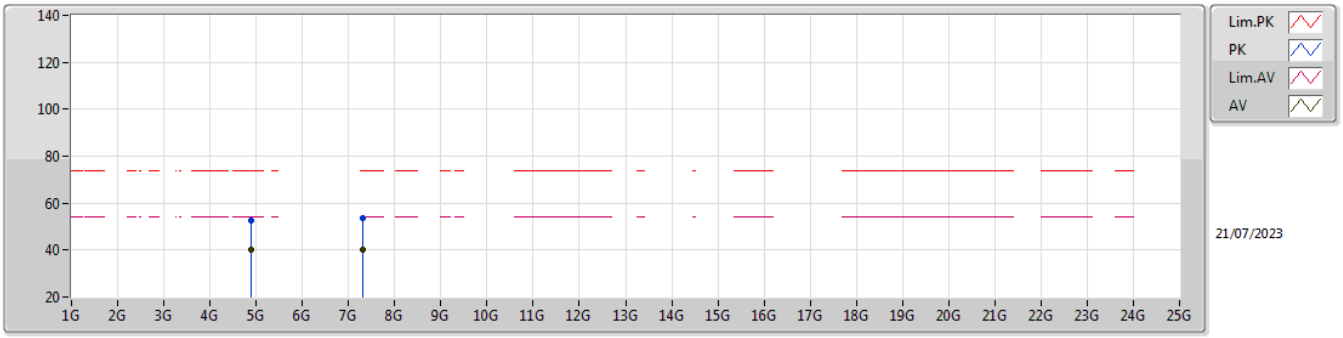


EUT Y_1TX
Setting 200
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3836G	56.06	74.00	-17.94	23.88	3	Horizontal	287	1.00	-	28.20	3.98	-
AV	2.3888G	44.06	54.00	-9.94	11.87	3	Horizontal	287	1.00	-	28.20	3.99	-
PK	2.4404G	110.59	Inf	-Inf	78.35	3	Horizontal	287	1.00	-	28.20	4.04	-
AV	2.44G	105.60	Inf	-Inf	73.36	3	Horizontal	287	1.00	-	28.20	4.04	-
PK	2.4876G	56.15	74.00	-17.85	23.63	3	Horizontal	287	1.00	-	28.43	4.09	-
AV	2.4972G	44.73	54.00	-9.27	12.15	3	Horizontal	287	1.00	-	28.48	4.10	-

2.4-2.4835GHz_Thread_1TX

2440MHz_TX

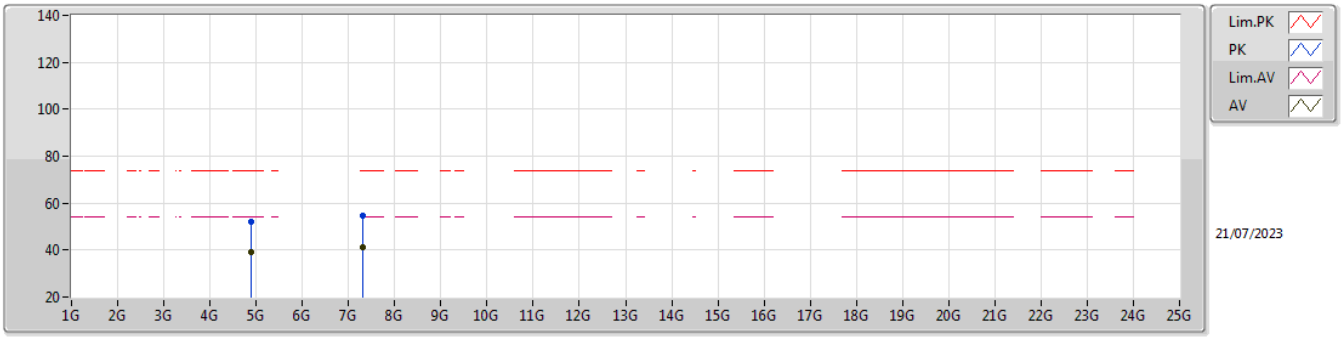


EUT Y_1TX
Setting 200
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87897G	52.60	74.00	-21.40	47.23	3	Vertical	23	1.00	-	33.57	6.54	34.74
AV	4.88074G	40.28	54.00	-13.72	34.90	3	Vertical	23	1.00	-	33.58	6.54	34.74
PK	7.31833G	53.80	74.00	-20.20	43.64	3	Vertical	80	2.25	-	36.84	8.70	35.38
AV	7.32134G	40.19	54.00	-13.81	30.02	3	Vertical	80	2.25	-	36.84	8.70	35.37

2.4-2.4835GHz_Thread_1TX

2440MHz_TX

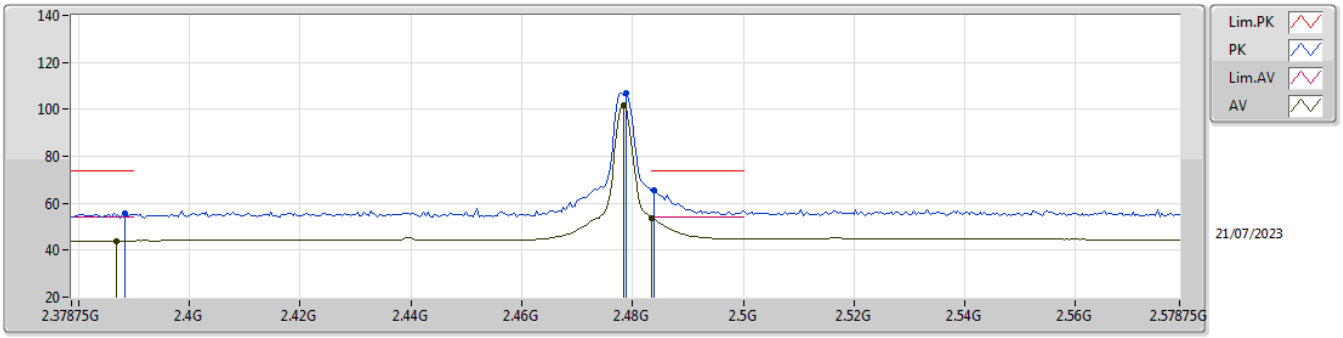


EUT Y_1TX
Setting 200
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.87887G	51.85	74.00	-22.15	46.48	3	Horizontal	3	1.01	-	33.57	6.54	34.74
AV	4.87896G	39.34	54.00	-14.66	33.97	3	Horizontal	3	1.01	-	33.57	6.54	34.74
PK	7.3185G	54.85	74.00	-19.15	44.69	3	Horizontal	282	2.29	-	36.84	8.70	35.38
AV	7.31838G	41.38	54.00	-12.62	31.22	3	Horizontal	282	2.29	-	36.84	8.70	35.38

2.4-2.4835GHz_Thread_1TX

2478.75MHz_TX

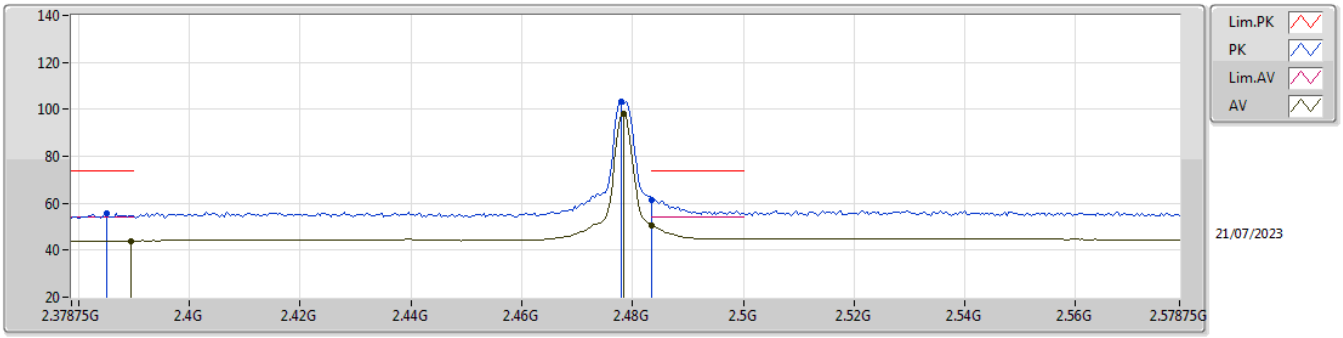


EUT Y_1TX
Setting 130
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.38835G	55.91	74.00	-18.09	23.72	3	Vertical	304	2.47	-	28.20	3.99	-
AV	2.38675G	44.05	54.00	-9.95	11.86	3	Vertical	304	2.47	-	28.20	3.99	-
PK	2.47875G	106.76	Inf	-Inf	74.31	3	Vertical	304	2.47	-	28.37	4.08	-
AV	2.47835G	101.79	Inf	-Inf	69.34	3	Vertical	304	2.47	-	28.37	4.08	-
PK	2.48395G	65.39	74.00	-8.61	32.91	3	Vertical	304	2.47	-	28.40	4.08	-
AV	2.4835G	53.85	54.00	-0.15	21.37	3	Vertical	304	2.47	-	28.40	4.08	-

2.4-2.4835GHz_Thread_1TX

2478.75MHz_TX

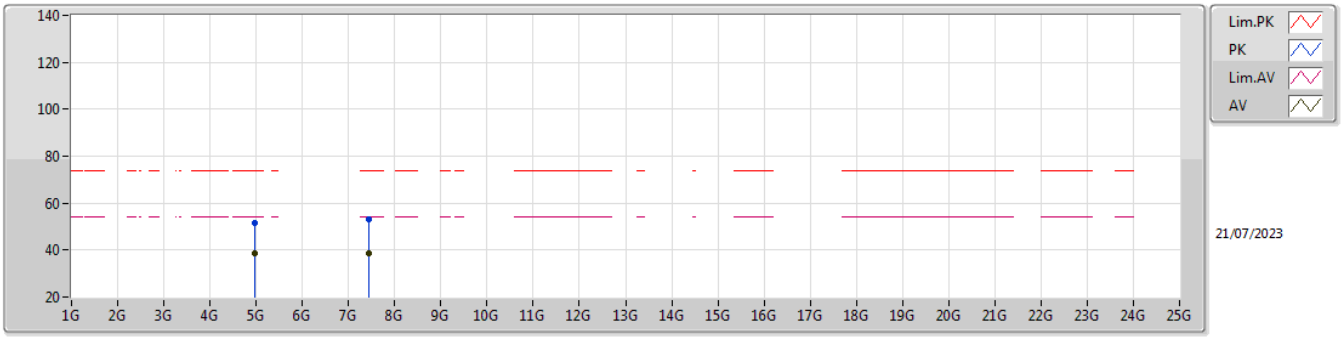


EUT Y_1TX
Setting 130
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.38515G	55.84	74.00	-18.16	23.65	3	Horizontal	291	1.16	-	28.20	3.99	-
AV	2.38955G	44.00	54.00	-10.00	11.81	3	Horizontal	291	1.16	-	28.20	3.99	-
PK	2.47795G	103.26	Inf	-Inf	70.81	3	Horizontal	291	1.16	-	28.37	4.08	-
AV	2.47835G	98.26	Inf	-Inf	65.81	3	Horizontal	291	1.16	-	28.37	4.08	-
PK	2.4835G	61.63	74.00	-12.37	29.15	3	Horizontal	291	1.16	-	28.40	4.08	-
AV	2.4835G	50.58	54.00	-3.42	18.10	3	Horizontal	291	1.16	-	28.40	4.08	-

2.4-2.4835GHz_Thread_1TX

2478.75MHz_TX

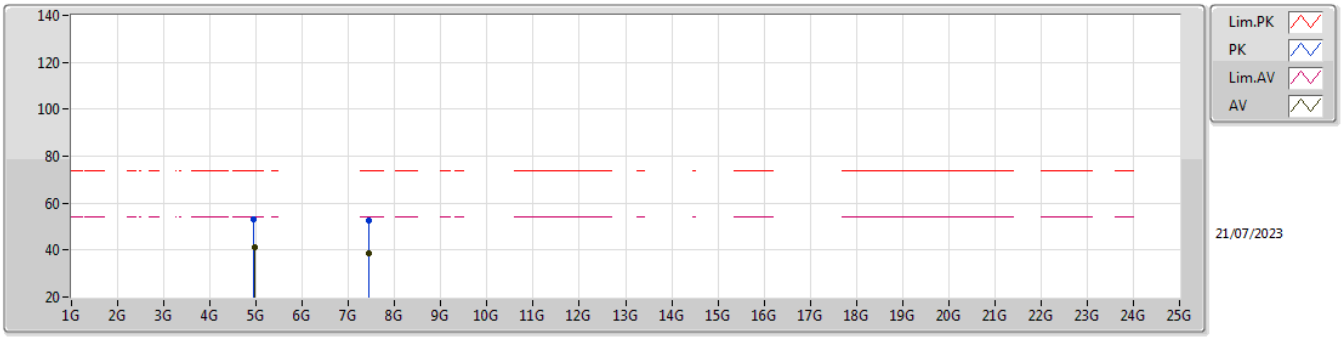


EUT Y_1TX
Setting 130
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.95799G	51.30	74.00	-22.70	45.90	3	Vertical	26	1.00	-	33.62	6.58	34.80
AV	4.95764G	38.73	54.00	-15.27	33.33	3	Vertical	26	1.00	-	33.62	6.58	34.80
PK	7.4374G	52.97	74.00	-21.03	42.50	3	Vertical	0	1.80	-	36.97	8.81	35.31
AV	7.43819G	38.84	54.00	-15.16	28.36	3	Vertical	0	1.80	-	36.98	8.81	35.31

2.4-2.4835GHz_Thread_1TX

2478.75MHz_TX



EUT Y_1TX
Setting 130
03-E-G-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	4.95572G	53.23	74.00	-20.77	47.84	3	Horizontal	311	1.00	-	33.61	6.58	34.80
AV	4.95753G	41.13	54.00	-12.87	35.73	3	Horizontal	311	1.00	-	33.62	6.58	34.80
PK	7.43584G	52.79	74.00	-21.21	42.32	3	Horizontal	2	1.80	-	36.97	8.81	35.31
AV	7.43601G	38.79	54.00	-15.21	28.32	3	Horizontal	2	1.80	-	36.97	8.81	35.31