Report No. : FR3N2709AC





RADIO TEST REPORT

FCC ID	: TLZ-CU5XX
Equipment	: Wireless MCU with Integrated Tri-radio Wi-Fi 6 + BLE 5.3/802.15.4 LGA module, Wireless MCU with Integrated Wi Fi 6 and Bluetooth Low Energy 5. 3 Module
Brand Name	: AzureWave
Model Name	: AW-CU570, AW-CU598
Applicant	: AzureWave Technologies, Inc. 8F., No.94, Baozhong Rd. , Xindian Dist., New Taipei City , Taiwan 231
Manufacturer	: AzureWave Technologies, Inc.
	8F., No.94, Baozhong Rd. , Xindian Dist., New Taipei City , Taiwan 231
Standard	: 47 CFR FCC Part 15.247

The product was received on Dec. 12, 2023, and testing was started from Dec. 26, 2023 and completed on Jun. 14, 2024. 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: Rex Liao

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

TEL : 886-3-656-9065 FAX : 886-3-656-9085 Report Template No.: CB-A10_6 Ver1.3

Page Number : 1 of 30 Issued Date : Jun. 28, 2024 Report Version : 01



Table of Contents

Histor	y of this test report3
Summ	ary of Test Result4
1	General Description5
1.1	Information5
1.2	Applicable Standards
1.3	Testing Location Information
1.4	Measurement Uncertainty9
2	Test Configuration of EUT10
2.1	Test Channel Mode
2.2	The Worst Case Measurement Configuration10
2.3	EUT Operation during Test11
2.4	Accessories11
2.5	Support Equipment11
2.6	Test Setup Diagram13
3	Transmitter Test Result16
3.1	AC Power-line Conducted Emissions16
3.2	DTS Bandwidth18
3.3	Maximum Conducted Output Power19
3.4	Power Spectral Density
3.5	Emissions in Non-restricted Frequency Bands
3.6	Emissions in Restricted Frequency Bands24
4	Test Equipment and Calibration Data28
Appen	dix A. Test Results of AC Power-line Conducted Emissions
Appen	dix B. Test Results of DTS Bandwidth
Appen	dix C. Test Results of Maximum Conducted Output Power
Appen	dix D. Test Results of Power Spectral Density
Appen	dix E. Test Results of Emissions in Non-restricted Frequency Bands
Appen	dix F. Test Results of Emissions in Restricted Frequency Bands
Appen	dix G. Test Photos

Photographs of EUT v01



History of this test report

Report No.	Version	Description	Issued Date
FR3N2709AC	01	Initial issue of report	Jun. 28, 2024



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	-

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 (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]
		I	
Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1.0	1TX
2.4-2.4835GHz	BT-LE(Coded S=2)	1.0	1TX
2.4-2.4835GHz	BT-LE(Coded S=8)	1.0	1TX
2.4-2.4835GHz	BT-LE(2Mbps)	2.0	1TX

Note:

- Bluetooth LE uses a GFSK modulation.
- BWch is the nominal channel bandwidth.



1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ARISTOTLE	RFA-27-C38H1-C198	Dipole	u.FL	
2	Molex	2128600011	Dipole	u.FL	Note 1
3	LYNwave	2570	РСВ	N/A	

Note 1:

Note 1:								
A 1	Port			Gain (dBi)				
Ant.	WLAN 2.4GHz	WLAN 5GHz	Bluetooth	Thread	WLAN 2.4GHz	WLAN 5GHz	Bluetooth	Thread
1	-	1	-	-	3	5	3	3
2	1	-	1	1	Note 2			
3	1	1	1	1	2.2	4.4	2.2	2.2

Note 2: The Ant. 2 has one RF cable (Brand: TE Connectivity / Model Name: Linx Connectivity / Remark: 11.5cm), and its gains are listed below.

Ant	Gain (dBi)						
Ant.		WLAN 2.4GHz	WLAN 5GHz	Bluetooth	Thread		
	Max Peak Gain	5.3	4.5	5.3	5.3		
2	Cable Loss	0.34	0.34	0.34	0.34		
	Net Gain	4.96	4.16	4.96	4.96		

Note 3: The above information was declared by manufacturer.

Note 4: For RF Conducted tests:

The Ant. 2 in WLAN 2.4GHz / Bluetooth / Thread and the Ant. 1 in WLAN 5GHz have higher gain than others in the same band. Therefore, they were selected to perform the test.

For AC Conduction and Radiated tests:

The EUT has two types of antenna. The antennas with higher gain in each band of each type were selected to test and their data were recorded in this report. Thus, Ant. 1 & Ant. 3 were selected to test WLAN 5GHz, and Ant. 2 & Ant. 3 were selected to test WLAN 2.4GHz / Bluetooth / Thread.

Note 5: For 2.4GHz function:

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

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

For 5GHz function:

For IEEE 802.11a/n/ac/ax (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.



1.1.3 Mode Test Duty Cycle

Mode	DC	DCF	Т	VBW
		(dB)	(s)	(Hz)_1/T
BT-LE(1Mbps)	0.622	2.06	388.75u	3k
BT-LE(2Mbps)	0.33	4.81	206.25u	10k

Note:

DC is Duty Cycle.

DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

EUT Power Type	From host system			
Function	Point-to-multipoint D Point-to-point			
Test Software Version	DutApiMimoApApp 2.0.0.2			
	LE 1M PHY: 1 Mb/s			
Support Modo	LE Coded PHY (S=2): 500 Kb/s			
Support Mode	LE Coded PHY (S=8): 125 Kb/s			
	LE 2M PHY: 2 Mb/s			

Note: The above information was declared by manufacturer.

1.1.5 Table for Multiple Listing

The two EUTs are identical except for the difference listed below:

EUT	Equipment Name	Model Name	Thread Function	
1	Wireless MCU with Integrated Tri-radio Wi-Fi 6 +	AW-CU570	V	
.1	BLE 5.3/802.15.4 LGA module	AVV-CU570	V	
2	Wireless MCU with Integrated Wi Fi 6 and	AW-CU598	v	
2	Bluetooth Low Energy 5. 3 Module	AVV-C0598	X	

Note 1: From the above EUTs, EUT 1 (AW-CU570) was selected as representative EUT for the test and its data was recorded in this report.

Note 2: 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 InformationTest Lab. : Sporton International Inc. Hsinchu LaboratoryHsinchuADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)(TAF: 3787)TEL: 886-3-656-9065FAX: 886-3-656-9085Test 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	TH02-CB	Mason Chan	21.1~22.8 / 63~67	Dec. 28, 2023~ Mar. 01, 2024
Dedicted + 10Uz	03CH01-CB	Double	22.4-23.5 / 55-58	Feb. 07, 2024~
Radiated < 1GHz	03CH04-CB	Paul Hu	21-22 / 56-59	May 23, 2024
Radiated > 1GHz	03CH01-CB	Paul Hu	22.4~23.5 / 55~58	Dec. 26, 2023~
Radiated > TGHZ	03CH06-CB	Paul Hu	21.9~22.8 / 56~58	Feb. 29, 2024
AC Conduction	CO01-CB	Tim Chen	20~21 / 63~64	Feb. 22, 2024~ Jun. 14, 2024



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%



Test Configuration of EUT 2

Test Channel Mode 2.1

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

The Worst Case Measurement Configuration 2.2

Т	he 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	СТХ
1	EUT 1 + Ant. 2_Thread
2	EUT 1 + Ant. 2_Bluetooth
3	EUT 1 + Ant. 2_WLAN 2.4GHz
4	EUT 1 + Ant. 1_WLAN 5GHz
5	EUT 1 + Ant. 3_Thread
6	EUT 1 + Ant. 3_Bluetooth
7	EUT 1 + Ant. 3_WLAN 2.4GHz
8	EUT 1 + Ant. 3_WLAN 5GHz
For operating, mode 6 is	the worst case and it was recorded in this test report.

For operating, mode 6 is the worst case and it was recorded in this test report.

1	The Worst Case Mode for Following Conformance Tests		
Tests Item	Max Pow	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands	
Test Condition	Con	Conducted measurement at transmit chains	
Test Mode	1	1 EUT 1 + Ant. 2	



Th	e 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.
	СТХ
Operating Mode < 1GHz	The EUT was performed at X axis, Y axis and Z axis position in Radiated Emission test > 1GHz, and the worst case was found at Y axis. Thus, the measurement will follow this same test configuration.
1	EUT 1 in Y axis + Ant. 2_WLAN 2.4GHz
2	EUT 1 in Y axis + Ant. 2_Bluetooth
3	EUT 1 in Y axis + Ant. 2_Thread
4	EUT 1 in Y axis + Ant. 1_WLAN 5GHz
5	EUT 1 in Y axis + Ant. 3_WLAN 2.4GHz
6	EUT 1 in Y axis + Ant. 3_Bluetooth
7	EUT 1 in Y axis + Ant. 3_Thread
8	EUT 1 in Y axis + Ant. 3_WLAN 5GHz
For operating, mode 2 is the	he worst case and it was recorded in this test report.
	СТХ
Operating Mode > 1GHz	The EUT was performed at X axis, Y axis and Z axis position, and the worst case was found at Y axis. Thus, the measurement will follow this same test configuration.
1	EUT 1 in Y axis + Ant. 2
2	EUT 1 in Y axis + Ant. 3

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

N/A

2.5 Support Equipment

For AC Conduction:

	Support Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
А	Fixture	AzureWave	2570-i4	N/A
В	NB	DELL	E6430	N/A



For Radiated < 1GHz:

		Support Equ	ipment	
No.	Equipment	Brand Name	Model Name	FCC ID
А	Fixture	AzureWave	2570-i4	N/A
В	DC Power Supply	MOTECH	LPS-305	N/A

For Radiated > 1GHz:

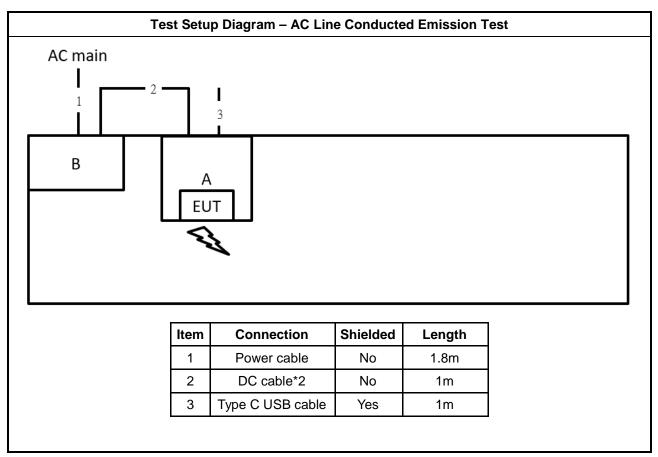
		Support Equ	ipment	
No.	Equipment	Brand Name	Model Name	FCC ID
А	Fixture	AzureWave	2570-i4	N/A
В	DC Power Supply	MOTECH	LPS-305	N/A
С	NB	DELL	E4300	N/A

For RF Conducted:

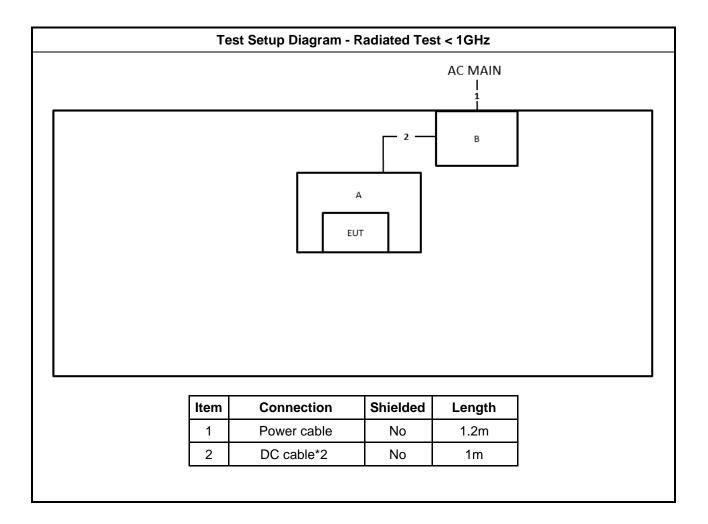
		Support Equ	ipment	
No.	Equipment	Brand Name	Model Name	FCC ID
А	NB	DELL	E4300	N/A
В	Fixture	AzureWave	2570-i4	N/A



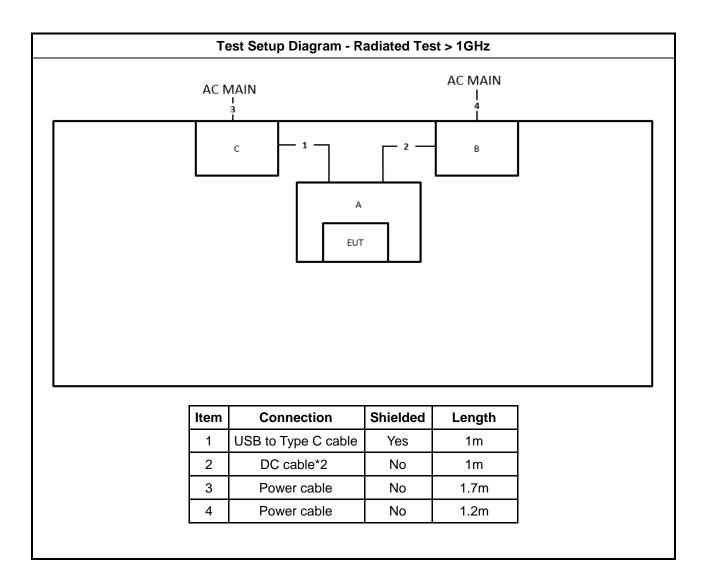
2.6 Test Setup Diagram













3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Pow	er-line Conducted Emissions I	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.

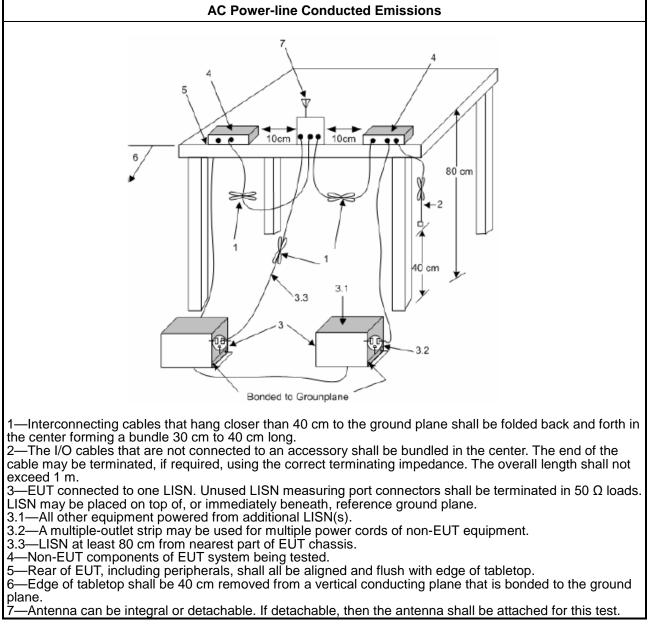
3.1.3 Test Procedures

Test Method

• Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.



3.1.4 Test Setup



1.1.1. 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

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A



3.2 **DTS Bandwidth**

3.2.1 6dB Bandwidth Limit

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

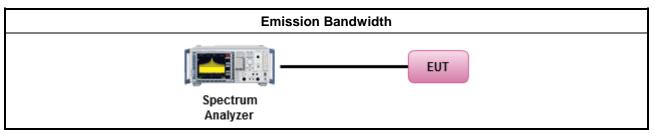
3.2.2 **Measuring Instruments**

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

3.2.3 **Test Procedures**

	Test Method
• F	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.

Test Setup 3.2.4



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 $G_{TX} \le 6$ dBi, then $P_{Out} \le 30$ dBm (1 W)	f G⊤x ≤ 6 dBi, then I	P _{Out} ≤ 30 dBm (1 W)
--	-----------------------	---------------------------------

•	Point-to-multipoint systems	(P2M): If G _{TX} > 6 dBi, t	hen $P_{Out} = 30 - (G_{TX} - 6) dBm$
---	-----------------------------	--------------------------------------	---------------------------------------

- 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 $G_{TX} > 6 \text{ dBi}$, then $P_{Out} = 30 (G_{TX} 6)/3 \text{ dBm}$
 - Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 (G_{TX} 6)/3 + 8$ dB 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.

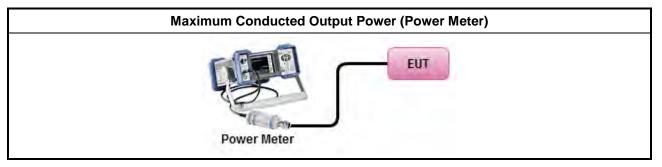
3.3.3 Test Procedures

	Test Method							
•	Maximum Peak Conducted Output Power							
	Refer as 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-14 (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-2 (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-3 (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 a 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 (usin an gate RF average power meter).							
TEI	886-3-656-9065 Page Number 19 of 30							



•	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} = P₁ + P₂ + + P_n (calculated in linear unit [mW] and transfer to log unit [dBm]) EIRP_{total} = P_{total} + DG 							

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C



3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

3.4.2 Measuring Instruments

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

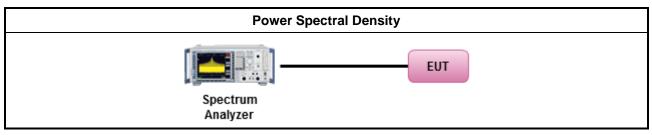
3.4.3 Test Procedures

•

		Test Method						
	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).							
	\square	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD.						
	[duty	v cycle ≥ 98% or external video / power trigger]						
•	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.						



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 (dBc)						
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.

3.5.2 Measuring Instruments

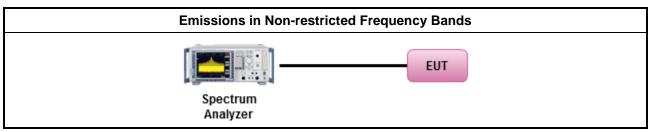
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method

Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted 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 30~88 100		29	30 3				
		40					
88~216 150		43.5	3				
216~960 200		46	3				
Above 960 500		54	3				

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

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

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

3.6.2 Measuring Instruments

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

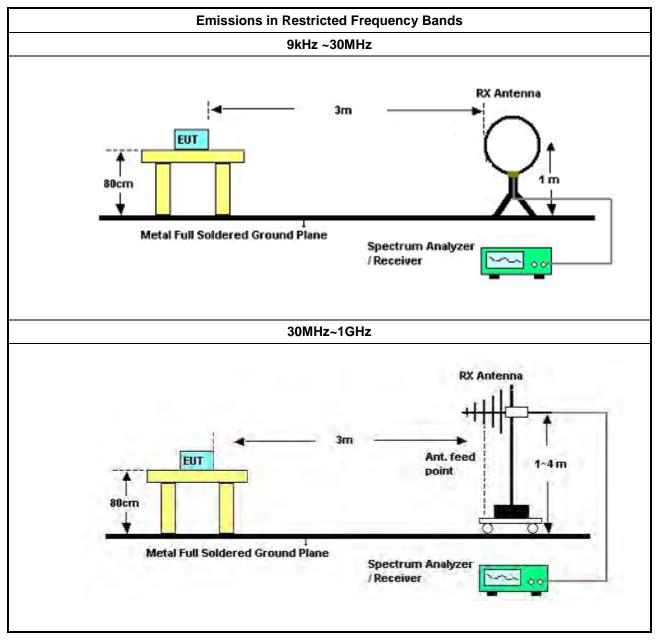


3.6.3 Test Procedures

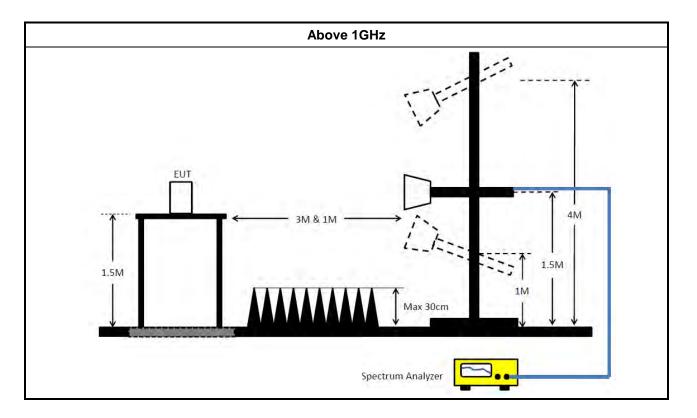
	Test Method									
•	The average emission levels shall be measured in [duty cycle \geq 98 or duty factor].									
•	Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.									
•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



3.6.4 Test Setup







3.6.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

3.6.6 Emissions in Restricted Frequency Bands (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

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

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10th harmonic or 40 GHz, whichever is appropriate.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F



4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	May 18, 2023	May 17, 2024	Conduction (CO01-CB)
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.4GHz	Mar. 01, 2024	Feb. 28, 2025	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Dec. 29, 2023	Dec. 28, 2024	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Apr. 27, 2023	Apr. 26, 2024	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Apr. 24, 2024	Apr. 23, 2025	Conduction (CO01-CB)
Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Feb. 08, 2024	Feb. 07, 2025	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	Oct. 17, 2023	Oct. 16, 2024	Conduction (CO01-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6121	65417	9kHz - 30MHz	Oct. 13, 2023	Oct. 12, 2024	Radiation (03CH01-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH01-CB	30MHz ~ 1GHz	Jan. 18, 2024	Jan. 17, 2025	Radiation (03CH01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Feb. 19, 2023	Feb. 18, 2024	Radiation (03CH01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Feb. 18, 2024	Feb. 17, 2025	Radiation (03CH01-CB)
Pre-Amplifier	SGH	SGH0301	20230109-2	10M~1GHz	Jun. 23, 2023	Jun. 22, 2024	Radiation (03CH01-CB)
Signal Analyzer	R&S	FSV3044	101437	10kHz ~ 44GHz	Nov. 28, 2023	Nov. 27, 2024	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 13, 2023	Jun. 12, 2024	Radiation (03CH01-CB)
RF Cable-low	Woken	RG402	Low Cable-31+32	30MHz ~ 1GHz	Nov. 06, 2023	Nov. 05, 2024	Radiation (03CH01-CB)
3m Semi Anechoic Chamber VSWR	ТDК	SAC-3M	03CH01-CB	1GHz ~18GHz 3m	May 05, 2023	May 04, 2024	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120D-01816	1GHz~18GHz	Dec. 20, 2023	Dec. 19, 2024	Radiation (05CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Sep. 04, 2023	Sep. 03, 2024	Radiation (03CH01-CB)

Page Number: 28 of 30Issued Date: Jun. 28, 2024Report Version: 01



Report No. : FR3N2709AC

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Pre-Amplifier	Agilent	8449B	3008A02121	1GHz ~ 26.5GHz	May 18, 2023	May 17, 2024	Radiation (03CH01-CB)
Pre-Amplifier	SGH	SGH184	20221107-3	18GHz ~ 40GHz	Nov. 24, 2023	Nov. 23, 2024	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1GHz ~ 18GHz	Nov. 06, 2023	Nov. 05, 2024	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1GHz ~ 18GHz	Nov. 06, 2023	Nov. 05, 2024	Radiation (03CH01-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40GHz	Dec. 06, 2023	Dec. 05, 2024	Radiation (03CH01-CB)
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH01-CB)
High Cable	Woken	WCA0929M	40G#6	1GHz ~ 40GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH01-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6121	65417	9kHz - 30MHz	Oct. 13, 2023	Oct. 12, 2024	Radiation (03CH04-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH04-CB	30MHz ~ 1GHz	Aug. 01, 2023	Jul. 31, 2024	Radiation (03CH04-CB)
BILOG ANTENNA with 6 dB attenuator	Schaffner & EMCI	CBL6112B & N-6-06	22021&AT-N06 07	30MHz ~ 1GHz	Oct. 07, 2023	Oct. 06, 2024	Radiation (03CH04-CB)
Pre-Amplifier	EMCI	EMC330N	980391	20MHz ~ 3GHz	May 23, 2023	May 22, 2024	Radiation (03CH04-CB)
Pre-Amplifier	EMCI	EMC330N	980391	20MHz ~ 3GHz	May 22, 2024	May 21, 2025	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Mar. 21, 2023	Mar. 20, 2024	Radiation (03CH04-CB
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Mar. 19, 2024	Mar. 18, 2025	Radiation (03CH04-CB
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 13, 2023	Jun. 12, 2024	Radiation (03CH04-CB)
RF Cable-low	Woken	RG402	Low Cable-03+67	30MHz – 1GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH04-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH04-CB)
3m Semi Anechoic Chamber VSWR	трк	SAC-3M	03CH06-CB	1GHz ~18GHz 3m	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1292	1GHz~18GHz	Jul. 31, 2023	Jul. 30, 2024	Radiation (03CH06-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Sep. 04, 2023	Sep. 03, 2024	Radiation (03CH06-CB)

TEL : 886-3-656-9065 FAX : 886-3-656-9085 Report Template No.: CB-A10_6 Ver1.3 Page Number: 29 of 30Issued Date: Jun. 28, 2024Report Version: 01



Report No. : FR3N2709AC

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	Aug. 01, 2023	Jul. 31, 2024	Radiation (03CH06-CB)
Pre-Amplifier	SGH	SGH184	20221107-3	18GHz ~ 40GHz	Nov. 24, 2023	Nov. 23, 2024	Radiation (03CH06-CB)
Signal Analyzer	R&S	FSV40	101904	9kHz ~ 40GHz	Apr. 21, 2023	Apr. 20, 2024	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-05+68	1GHz~18GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40GHz	Dec. 06, 2023	Dec. 05, 2024	Radiation (03CH06-CB)
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
High Cable	Woken	WCA0929M	40G#6	1GHz ~ 40GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Aug. 14, 2023	Aug. 13, 2024	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Oct. 19, 2023	Oct. 18, 2024	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Oct. 19, 2023	Oct. 18, 2024	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-01	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-03	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1GHz – 18GHz	Oct. 02, 2023	Oct. 01, 2024	Conducted (TH02-CB)
Switch	SPTCB	SP-SWI	SWI-02	1–26.5GHz	Oct. 03, 2023	Oct. 02, 2024	Conducted (TH02-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH02-CB)

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

NCR means Non-Calibration required.



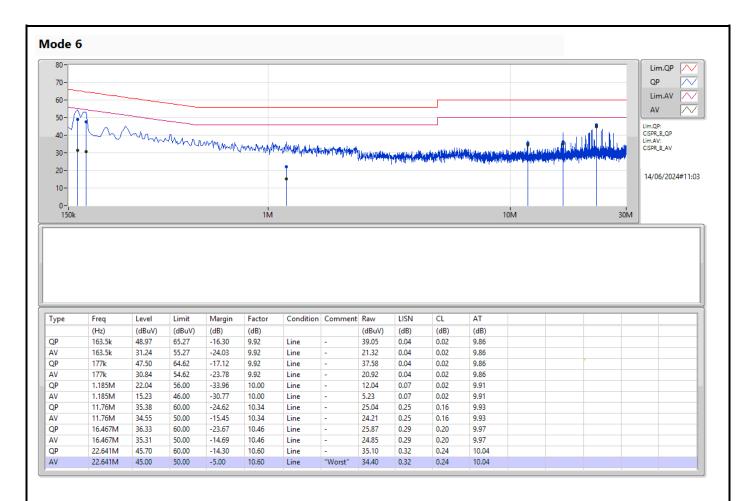
Conducted Emissions at Powerline

Appendix A

Summary								
Mode	Result	Туре	Freq	Level	Limit	Margin	Condition	
			(Hz)	(dBuV)	(dBuV)	(dB)		
Mode 6	Pass	AV	22.641M	45.00	50.00	-5.00	Line	

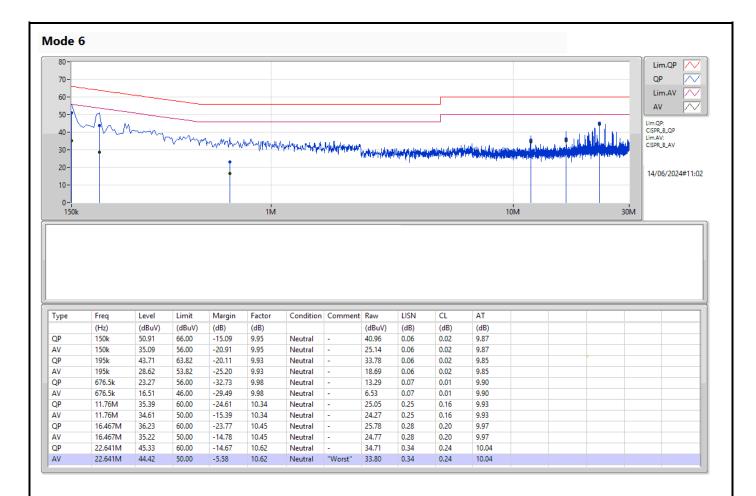














EBW-DTS

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	703.75k	1.029M	1M03F1D	648.75k	1.028M
BT-LE(2Mbps)	1.455M	2.084M	2M08F1D	1.195M	2.064M

 $\label{eq:max-NdB} Max\cdot N\, dB = Maximum 6dB \ down \ bandwidth; \ Max-OBW = Maximum 99\% \ occupied \ bandwidth; \ Min-OBW = Minimum 99\% \ occupied \ bandwidth; \ bandwidth \ bandwidth; \ bandwidth \ bandwidth$



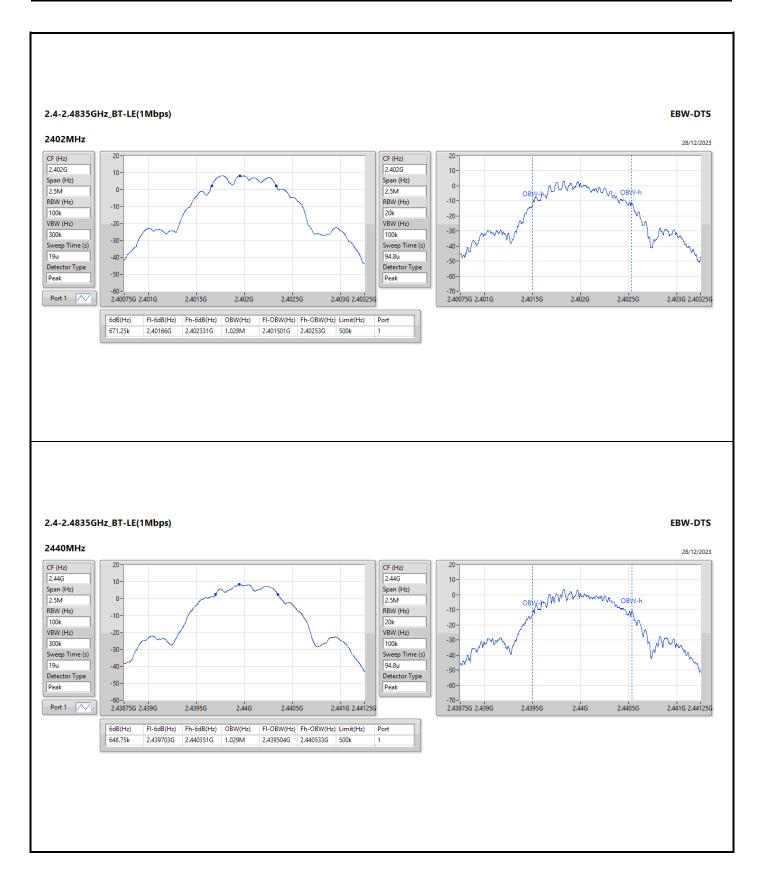
EBW-DTS

Result

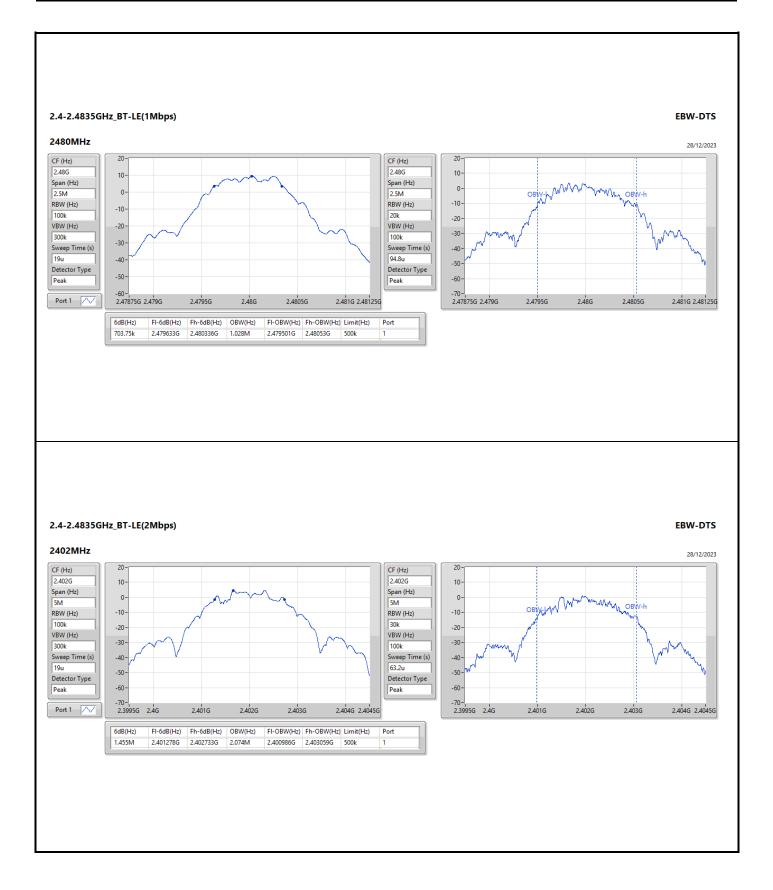
Mode	Result	Limit	Port 1-N dB	Port 1-OBW
		(Hz)	(Hz)	(Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	671.25k	1.028M
2440MHz	Pass	500k	648.75k	1.029M
2480MHz	Pass	500k	703.75k	1.028M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.455M	2.074M
2440MHz	Pass	500k	1.195M	2.064M
2480MHz	Pass	500k	1.365M	2.084M

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

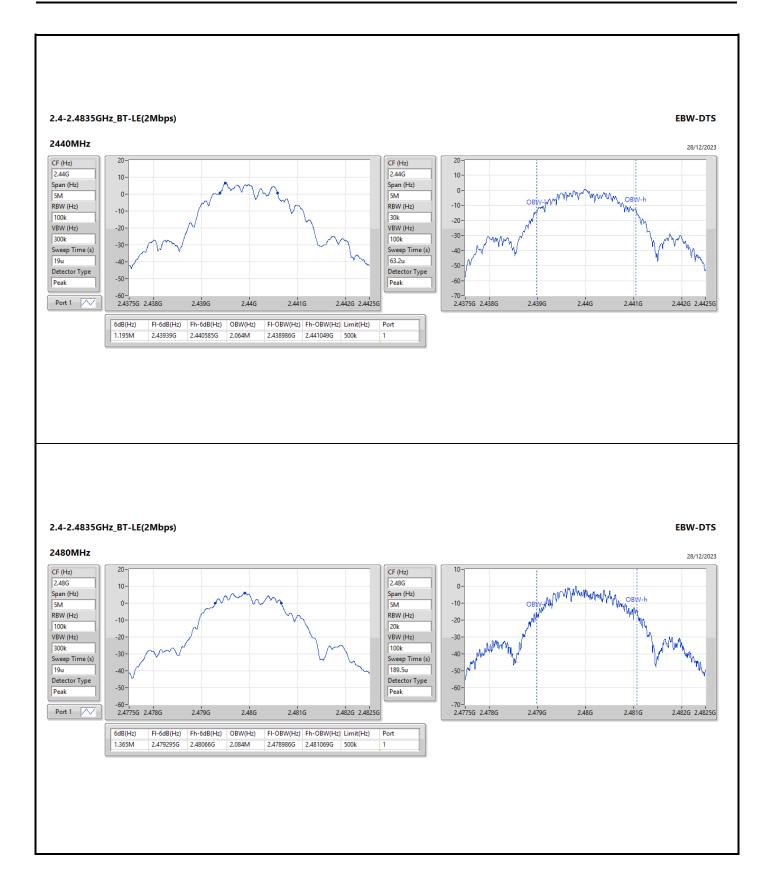














Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	9.86	0.00968
BT-LE(2Mbps)	9.71	0.00935



Average Power-DTS

Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	4.96	9.31	30.00
2440MHz	Pass	4.96	9.56	30.00
2480MHz	Pass	4.96	9.86	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	4.96	9.08	30.00
2440MHz	Pass	4.96	9.15	30.00
2480MHz	Pass	4.96	9.71	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-5.70
BT-LE(2Mbps)	-8.35

RBW = 3kHz;



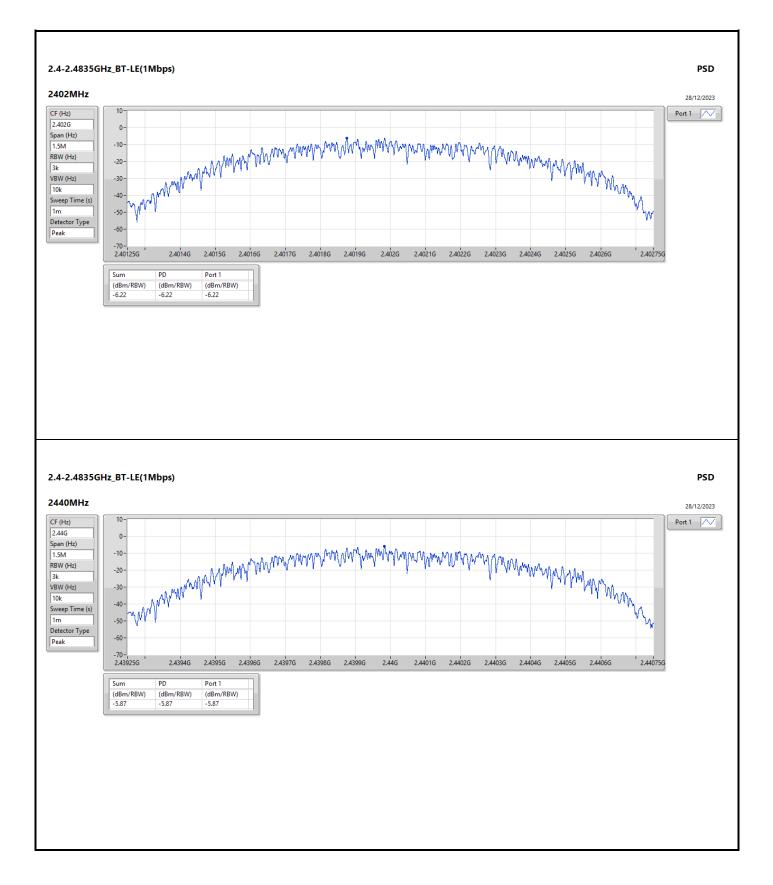
PSD-DTS

Result

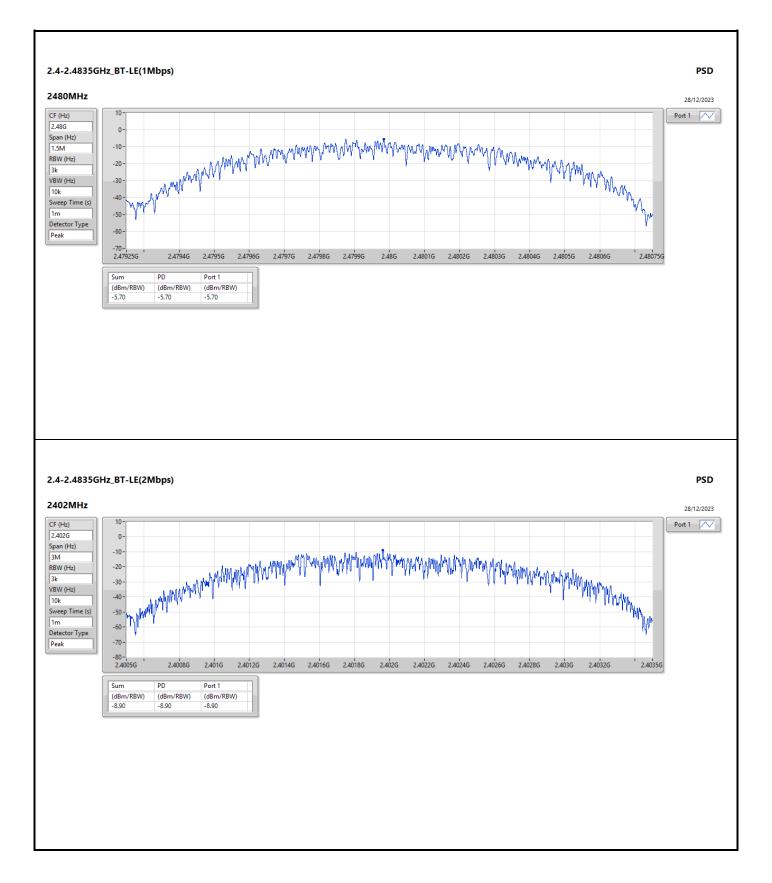
Mode	Result	DG (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	4.96	-6.22	8.00
2440MHz	Pass	4.96	-5.87	8.00
2480MHz	Pass	4.96	-5.70	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	4.96	-8.90	8.00
2440MHz	Pass	4.96	-8.55	8.00
2480MHz	Pass	4.96	-8.35	8.00

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;

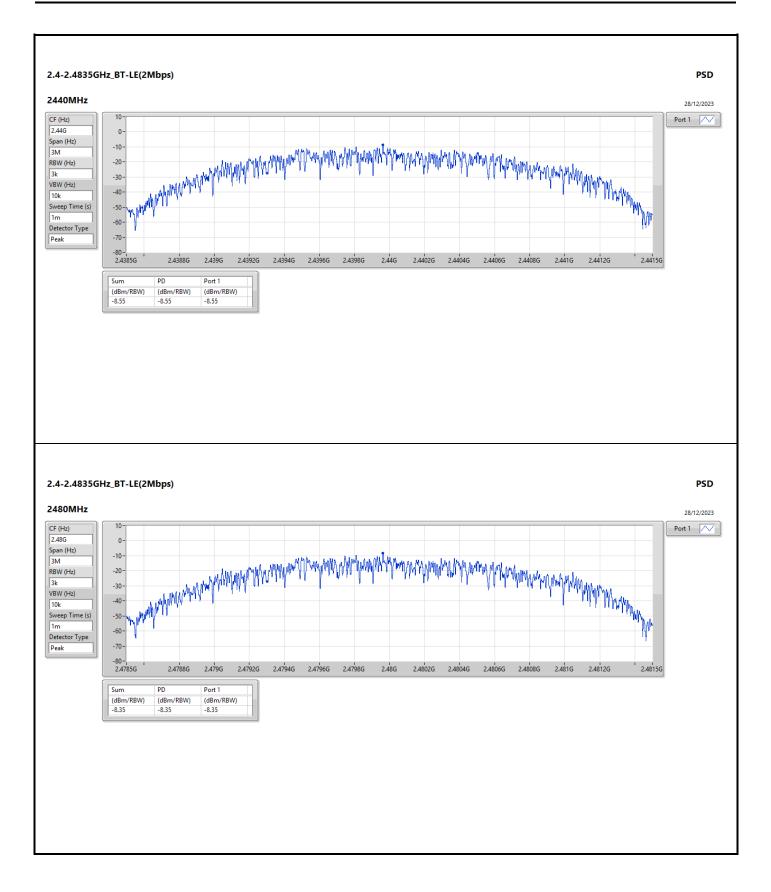














CSE NdB-DTS

Appendix E

Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Port								
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.48016G	9.55	-20.45	2.17908G	-53.99	2.4G	-48.25	2.4G	-47.79	2.50182G	-51.48	23.51242G	-45.00	1
BT-LE(2Mbps)	Pass	2.47949G	9.52	-20.48	603.4M	-53.84	2.4G	-23.03	2.4G	-22.95	2.50118G	-54.05	16.45977G	-45.90	1



CSE NdB-DTS

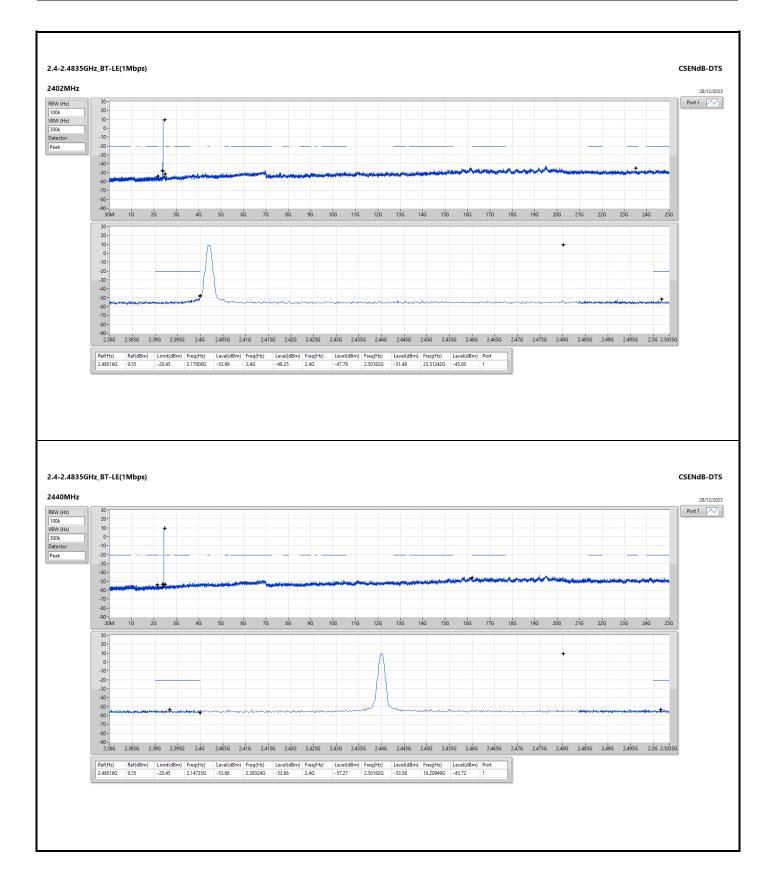
Appendix E

Result

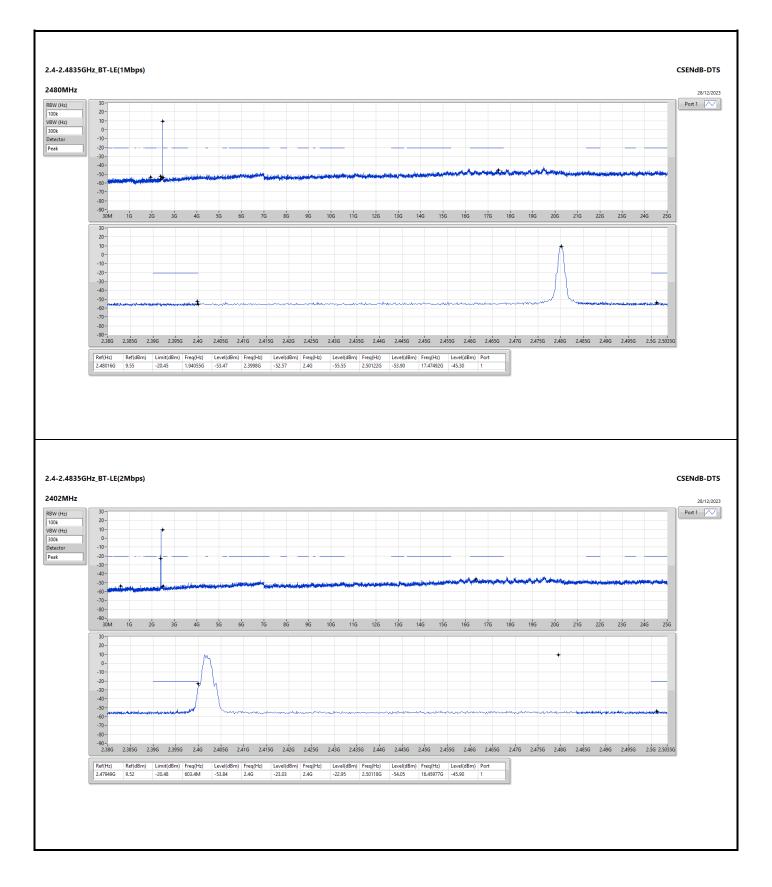
Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
BT-LE(1Mbps)	-	-	-	-		-	-	-	-	-	-	-	-		-
2402MHz	Pass	2.48016G	9.55	-20.45	2.17908G	-53.99	2.4G	-48.25	2.4G	-47.79	2.50182G	-51.48	23.51242G	-45.00	1
2440MHz	Pass	2.48016G	9.55	-20.45	2.14735G	-53.68	2.39324G	-53.66	2.4G	-57.27	2.50162G	-53.58	16.20949G	-45.72	1
2480MHz	Pass	2.48016G	9.55	-20.45	1.94055G	-53.47	2.3998G	-52.57	2.4G	-55.55	2.50122G	-53.90	17.47492G	-45.30	1
BT-LE(2Mbps)	-		-	-	-	-		-	-	-	-	-	-	-	
2402MHz	Pass	2.47949G	9.52	-20.48	603.4M	-53.84	2.4G	-23.03	2.4G	-22.95	2.50118G	-54.05	16.45977G	-45.90	1
2440MHz	Pass	2.47949G	9.52	-20.48	2.13443G	-54.44	2.39532G	-53.58	2.4G	-55.40	2.5021G	-53.98	16.44008G	-45.30	1
2480MHz	Pass	2.47949G	9.52	-20.48	890.1M	-54.44	2.39084G	-53.59	2.4G	-56.52	2.50066G	-53.59	16.44289G	-44.52	1



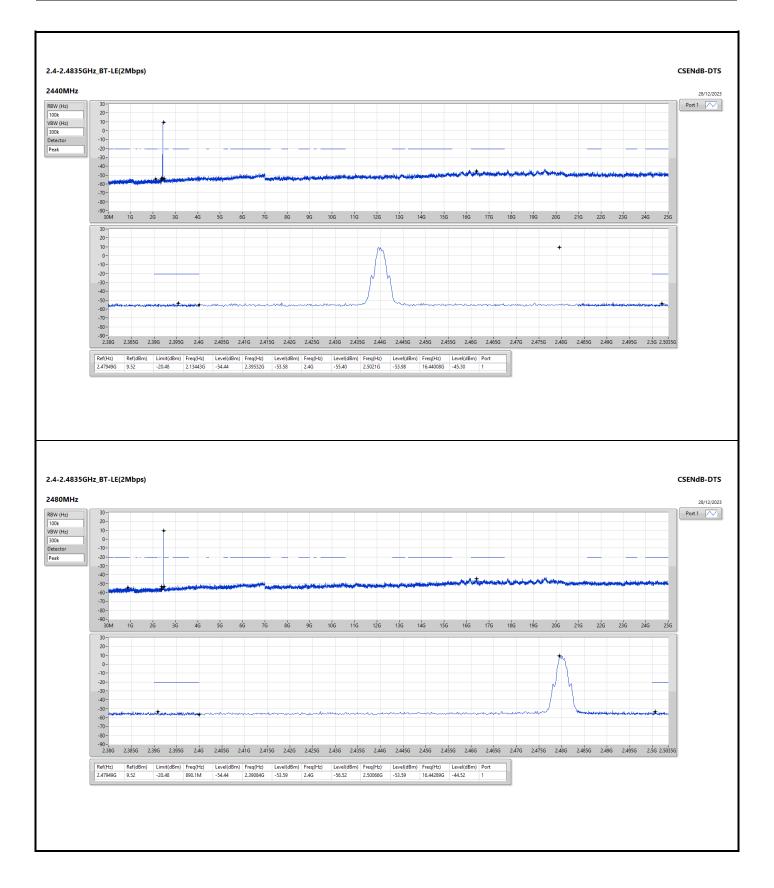
Appendix E













Radiated Emissions below 1GHz

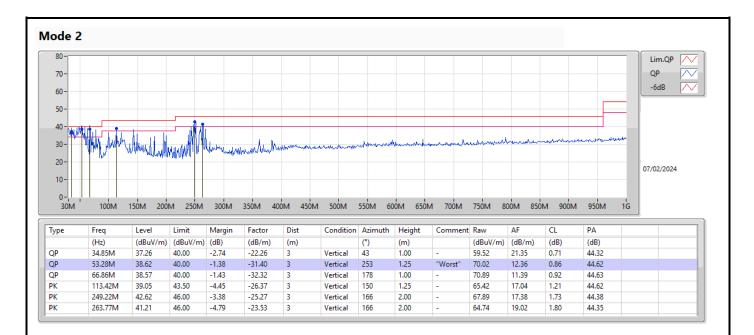
Appendix F.1

Summary							
Mode	Result	Туре	Freq	Level	Limit	Margin	Condition
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	
Mode 2	Pass	QP	53.28M	38.62	40.00	-1.38	Vertical



Radiated Emissions below 1GHz

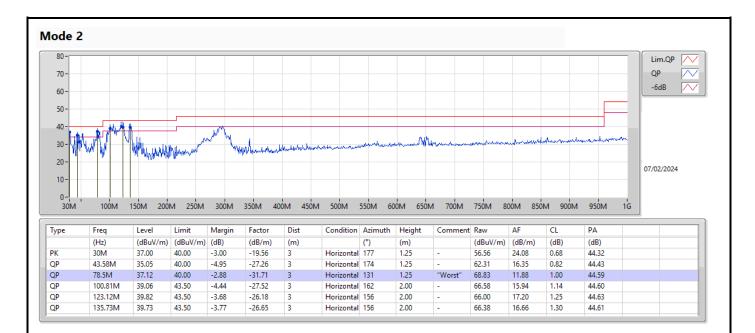
Appendix F.1





Radiated Emissions below 1GHz

Appendix F.1





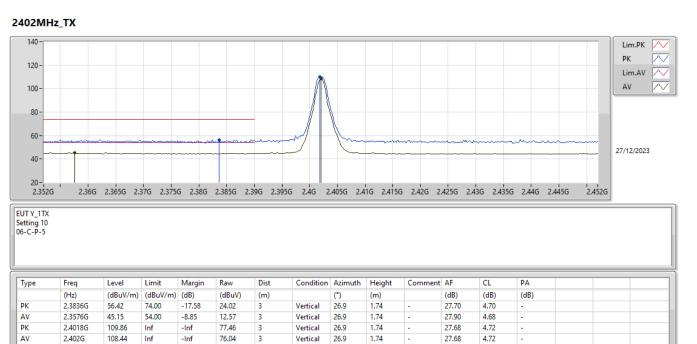
RSE TX above 1GHz_Dipole Antenna

Appendix F.2

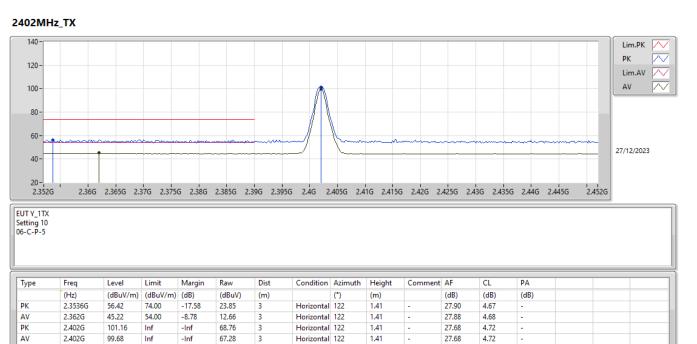
Summary

eannary											
Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-		-
BT-LE(2Mbps)	Pass	AV	2.4835G	52.90	54.00	-1.10	3	Vertical	330	2.14	-





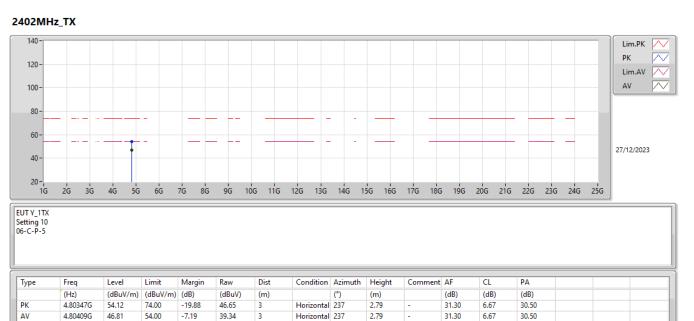




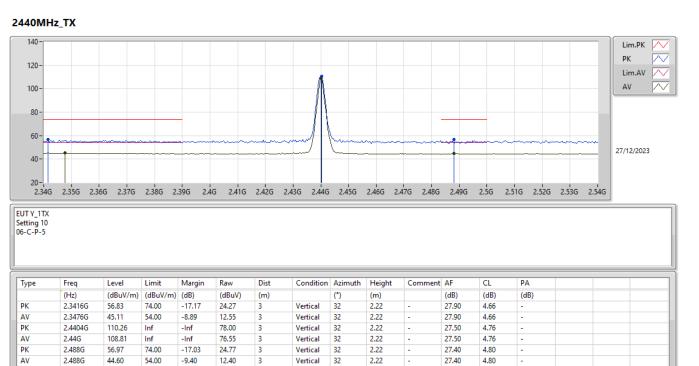




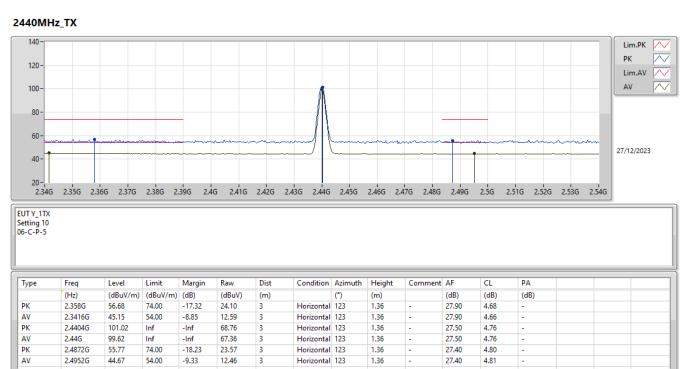




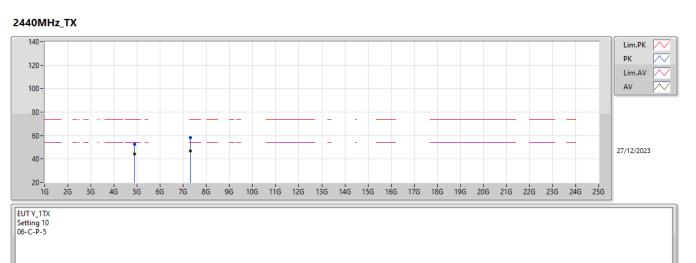






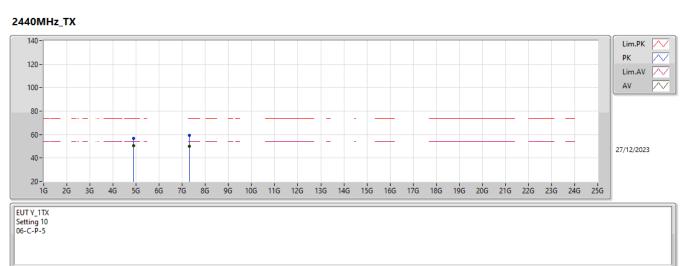






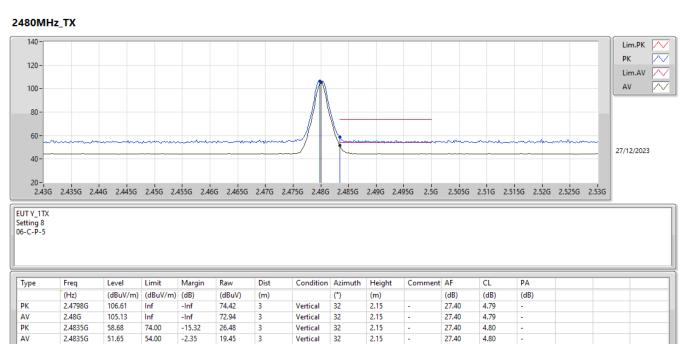
Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
РК	4.88028G	52.48	74.00	-21.52	44.88	3	Vertical	359.9	2.08	-	31.30	6.74	30.44		
AV	4.87992G	44.42	54.00	-9.58	36.82	3	Vertical	359.9	2.08	-	31.30	6.74	30.44		
PK	7.32011G	58.09	74.00	-15.91	44.53	3	Vertical	217	3.00	-	36.60	8.34	31.38		
AV	7.31938G	46.91	54.00	-7.09	33.35	3	Vertical	217	3.00	-	36.60	8.34	31.38		



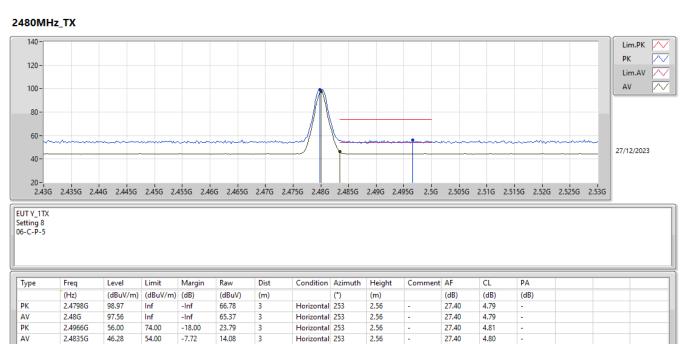


Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
PK	4.88038G	56.90	74.00	-17.10	49.30	3	Horizontal	234	1.95	-	31.30	6.74	30.44		
AV	4.88004G	50.26	54.00	-3.74	42.66	3	Horizontal	234	1.95	-	31.30	6.74	30.44		
PK	7.31938G	59.40	74.00	-14.60	45.84	3	Horizontal	243	1.85	-	36.60	8.34	31.38		
AV	7.31946G	49.76	54.00	-4.24	36.20	3	Horizontal	243	1.85	-	36.60	8.34	31.38		







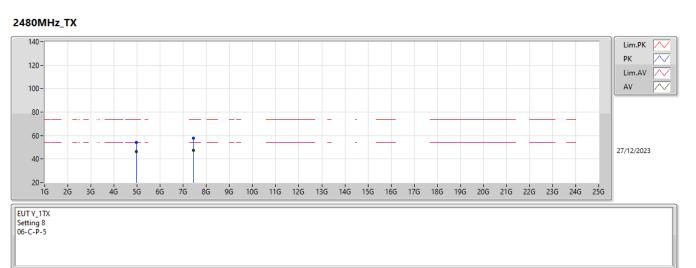






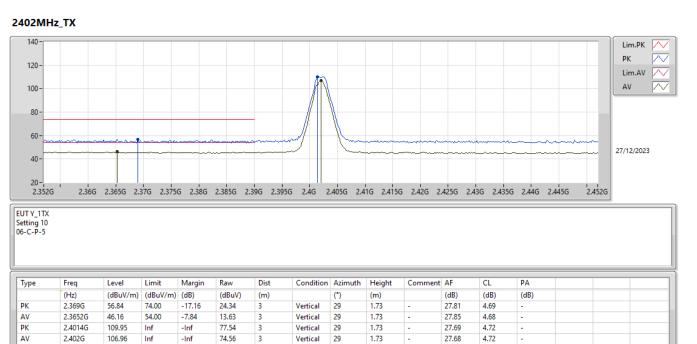
Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
РК	4.96027G	51.94	74.00	-22.06	43.95	3	Vertical	14	2.37	-	31.54	6.81	30.36		
AV	4.96G	43.70	54.00	-10.30	35.72	3	Vertical	14	2.37	-	31.54	6.81	30.37		
PK	7.44022G	57.32	74.00	-16.68	43.50	3	Vertical	206	2.48	-	36.68	8.38	31.24		
AV	7.43947G	44.55	54.00	-9.45	30.73	3	Vertical	206	2.48	-	36.68	8.38	31.24		



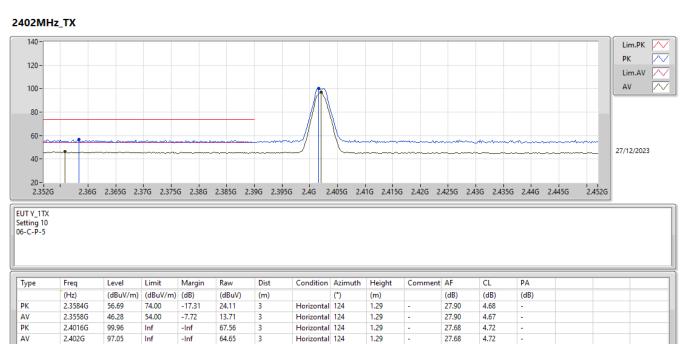


Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
РК	4.95963G	54.33	74.00	-19.67	46.35	3	Horizontal	233	1.86	-	31.54	6.81	30.37		
AV	4.95994G	46.60	54.00	-7.40	38.62	3	Horizontal	233	1.86	-	31.54	6.81	30.37		
PK	7.44058G	57.97	74.00	-16.03	44.15	3	Horizontal	225	2.90	-	36.68	8.38	31.24		
AV	7.43938G	47.36	54.00	-6.64	33.54	3	Horizontal	225	2.90	-	36.68	8.38	31.24		















AV

4.80304G

46.74

54.00

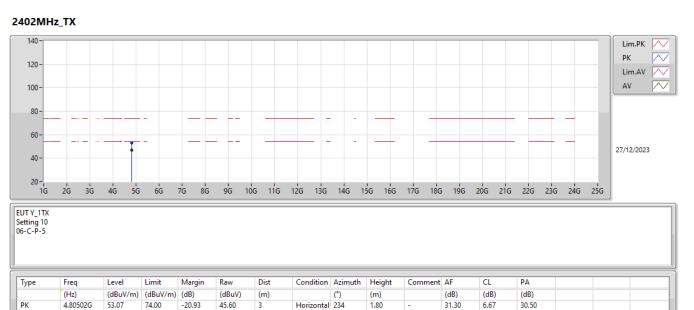
-7.26

39.27

3

Appendix F.2

2.4-2.4835GHz_BT-LE(2Mbps)



Horizontal 234

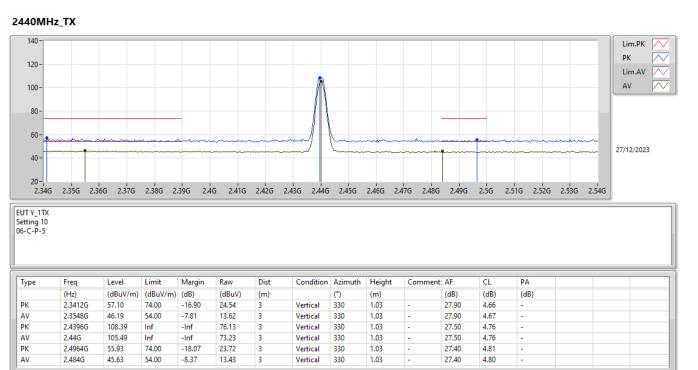
1.80

31.30

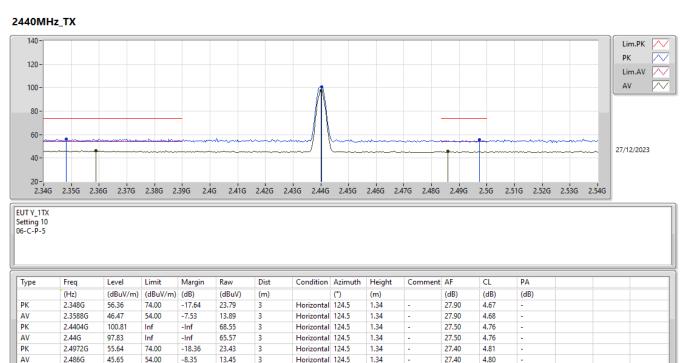
6.67

30.50

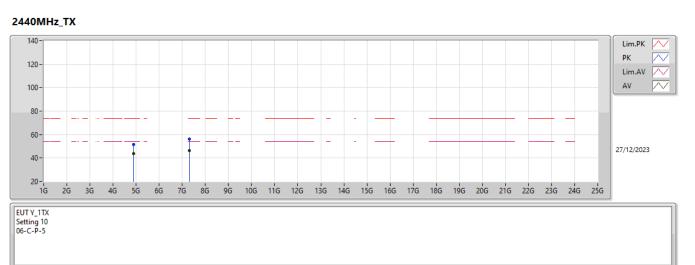






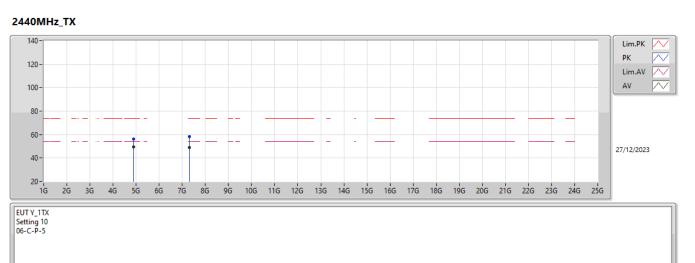






Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
РК	4.88102G	51.38	74.00	-22.62	43.77	3	Vertical	7	2.42	-	31.30	6.74	30.43		
AV	4.87898G	43.93	54.00	-10.07	36.33	3	Vertical	7	2.42	-	31.30	6.74	30.44		
PK	7.31852G	55.98	74.00	-18.02	42.42	3	Vertical	223	3.00	-	36.60	8.34	31.38		
AV	7.31866G	46.48	54.00	-7.52	32.92	3	Vertical	223	3.00	-	36.60	8.34	31.38		





Туре	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	4.881G	56.25	74.00	-17.75	48.64	3	Horizontal	240	2.01	-	31.30	6.74	30.43		
AV	4.87906G	49.58	54.00	-4.42	41.98	3	Horizontal	240	2.01	-	31.30	6.74	30.44		
PK	7.3185G	58.52	74.00	-15.48	44.96	3	Horizontal	238	1.80	-	36.60	8.34	31.38		
AV	7.3185G	48.95	54.00	-5.05	35.39	3	Horizontal	238	1.80	-	36.60	8.34	31.38		



AV

PK

AV

2.48G

2.4835G

2.4835G

102.78

60.61

52.90

Inf

74.00

54.00

-Inf

-13.39

-1.10

70.59

28.41

20.70

3

3

3

Vertical

Vertical

Vertical

330

330

330

2.14

2.14

2.14

27.40

27.40

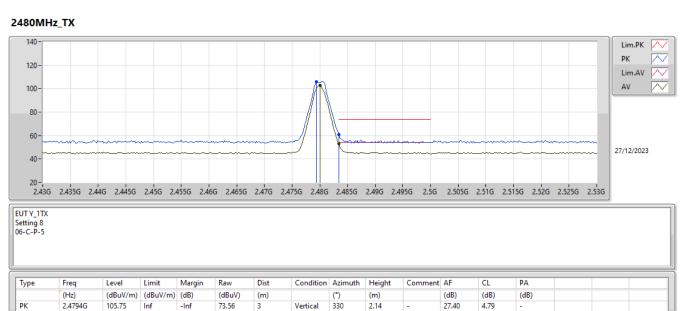
27.40

4.79

4.80

4.80

Appendix F.2





AV

2.4835G

47.64

54.00

-6.36

15.44

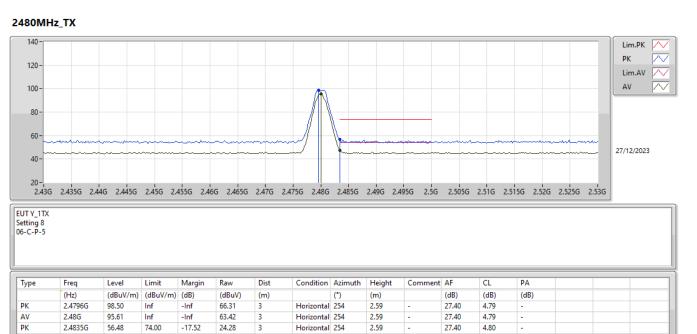
3

Horizontal 254

2.59

Appendix F.2

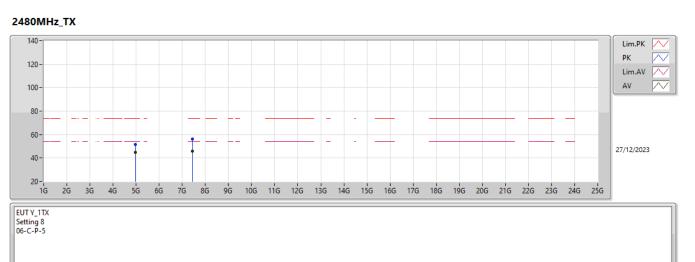
2.4-2.4835GHz_BT-LE(2Mbps)



27.40

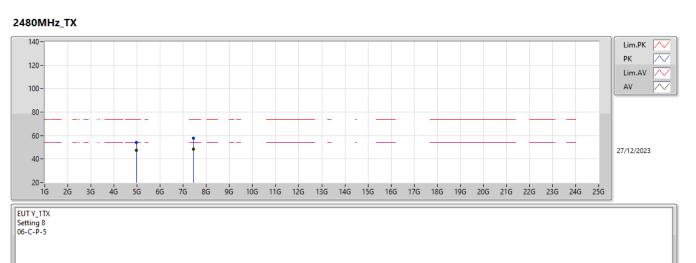
4.80





Туре	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)		
РК	4.96099G	51.80	74.00	-22.20	43.81	3	Vertical	13	1.99	-	31.54	6.81	30.36		
AV	4.95905G	44.76	54.00	-9.24	36.78	3	Vertical	13	1.99	-	31.54	6.81	30.37		
PK	7.43902G	56.24	74.00	-17.76	42.42	3	Vertical	227	3.00	-	36.68	8.38	31.24		
AV	7.43896G	45.73	54.00	-8.27	31.91	3	Vertical	227	3.00	-	36.68	8.38	31.24		





Туре	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)		
РК	4.96109G	54.00	74.00	-20.00	46.01	3	Horizontal	234	1.80	-	31.54	6.81	30.36		
AV	4.959G	47.42	54.00	-6.58	39.44	3	Horizontal	234	1.80	-	31.54	6.81	30.37		
PK	7.43866G	57.53	74.00	-16.47	43.72	3	Horizontal	227	3.00	-	36.68	8.37	31.24		
AV	7.4384G	48.30	54.00	-5.70	34.49	3	Horizontal	227	3.00	-	36.68	8.37	31.24		



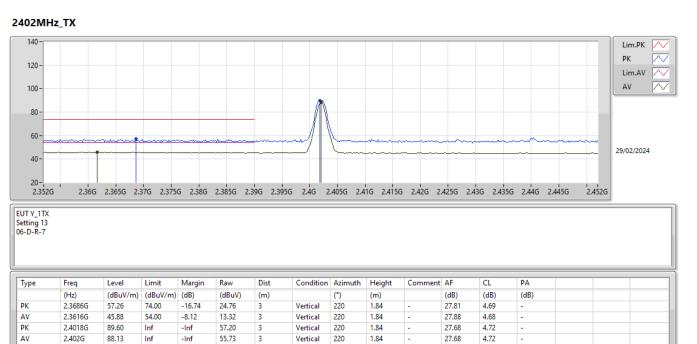
RSE TX above 1GHz_PCB Antenna

Appendix F.3

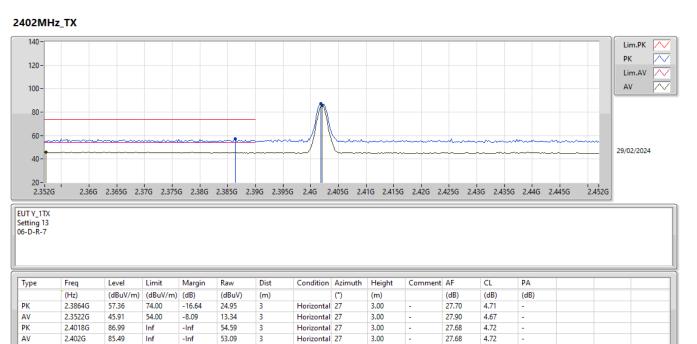
Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
2.4-2.4835GHz	-	-	-	-	-		-	-	-	-	-
BT-LE(2Mbps)	Pass	AV	4.95904G	48.53	54.00	-5.47	3	Horizontal	302	1.00	-





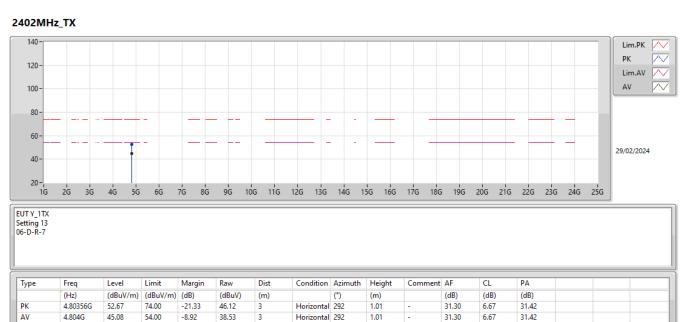




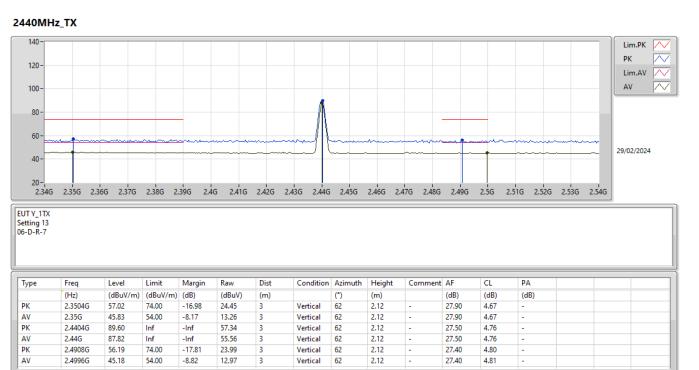




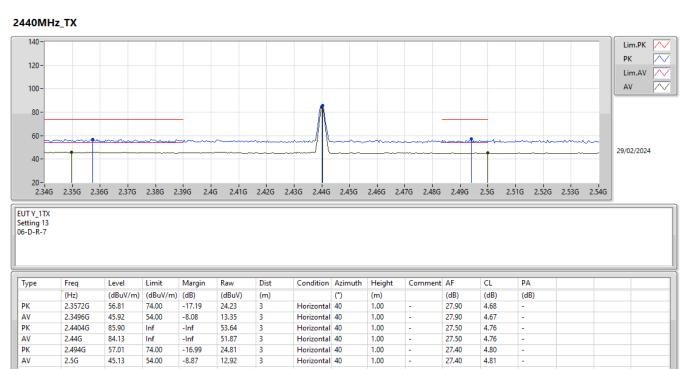




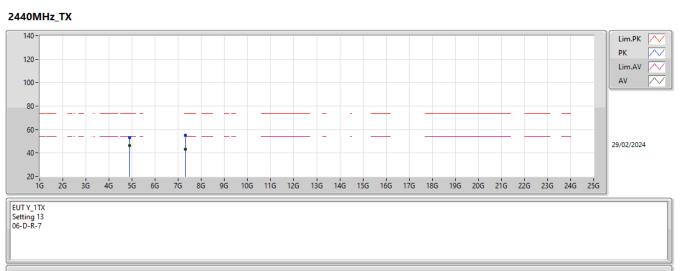






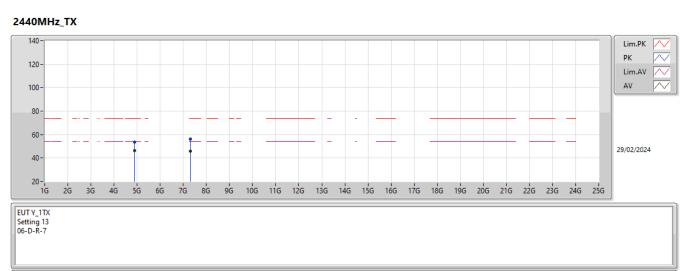






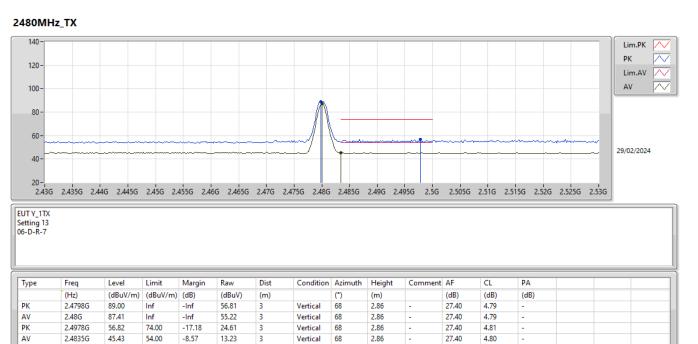
Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
РК	4.87944G	53.28	74.00	-20.72	46.60	3	Vertical	321	2.90	-	31.30	6.74	31.36		
AV	4.88G	46.33	54.00	-7.67	39.65	3	Vertical	321	2.90	-	31.30	6.74	31.36		
РК	7.3194G	55.06	74.00	-18.94	42.73	3	Vertical	342	2.41	-	36.60	8.34	32.61		
AV	7.31948G	43.06	54.00	-10.94	30.73	3	Vertical	342	2.41	-	36.60	8.34	32.61		





Туре	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	4.88048G	53.50	74.00	-20.50	46.82	3	Horizontal	300	3.00	-	31.30	6.74	31.36		
AV	4.88004G	46.21	54.00	-7.79	39.53	3	Horizontal	300	3.00	-	31.30	6.74	31.36		
PK	7.32068G	56.34	74.00	-17.66	44.02	3	Horizontal	309	1.04	-	36.60	8.34	32.62		
AV	7.31936G	46.00	54.00	-8.00	33.67	3	Horizontal	309	1.04	-	36.60	8.34	32.61		







AV

2.4878G

45.39

54.00

-8.61

13.19

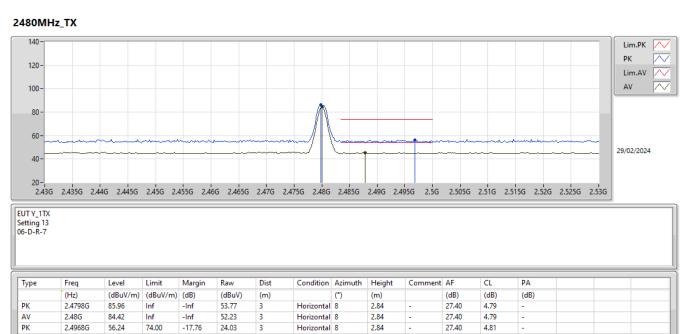
3

Horizontal 8

2.84

Appendix F.3

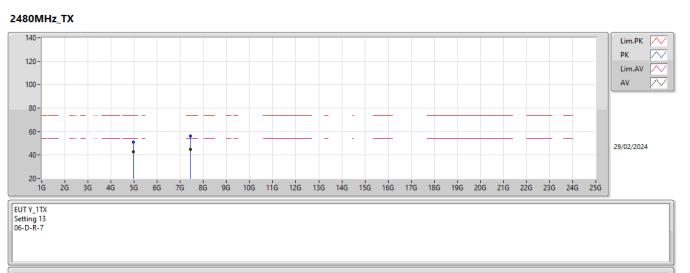
2.4-2.4835GHz_BT-LE(1Mbps)



27.40

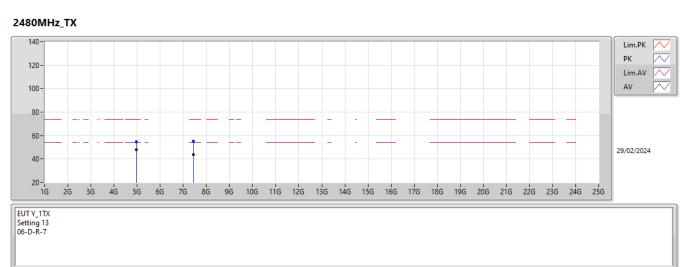
4.80





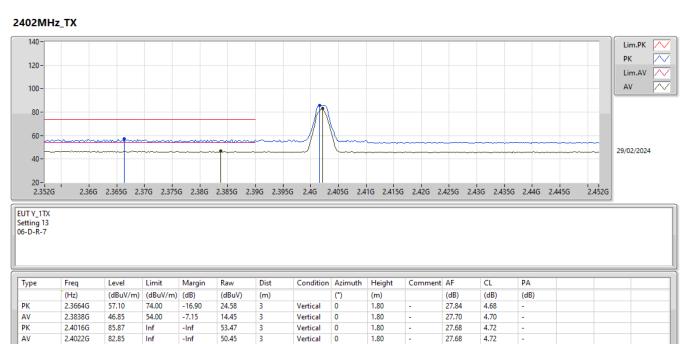
Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
РК	4.95956G	51.03	74.00	-22.97	43.99	3	Vertical	196	1.28	-	31.54	6.81	31.31		
AV	4.95992G	42.90	54.00	-11.10	35.86	3	Vertical	196	1.28	-	31.54	6.81	31.31		
PK	7.43908G	56.02	74.00	-17.98	43.74	3	Vertical	347	2.92	-	36.68	8.38	32.78		
AV	7.4394G	44.59	54.00	-9.41	32.31	3	Vertical	347	2.92	-	36.68	8.38	32.78		





Туре	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)		
РК	4.95956G	54.41	74.00	-19.59	47.37	3	Horizontal	311	2.95	-	31.54	6.81	31.31		
AV	4.95996G	47.99	54.00	-6.01	40.95	3	Horizontal	311	2.95	-	31.54	6.81	31.31		
PK	7.43928G	55.13	74.00	-18.87	42.85	3	Horizontal	324	2.36	-	36.68	8.38	32.78		
AV	7.44056G	43.94	54.00	-10.06	31.67	3	Horizontal	324	2.36	-	36.68	8.38	32.79		







РК

AV

2.4026G

2.402G

85.10

81.92

Inf

Inf

-Inf

-Inf

52.71

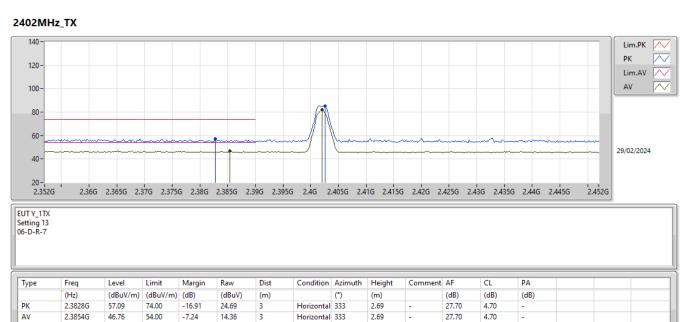
49.52

3

3

Appendix F.3

2.4-2.4835GHz_BT-LE(2Mbps)



Horizontal 333

Horizontal 333

2.69

2.69

27.67

27.68

4.72

4.72

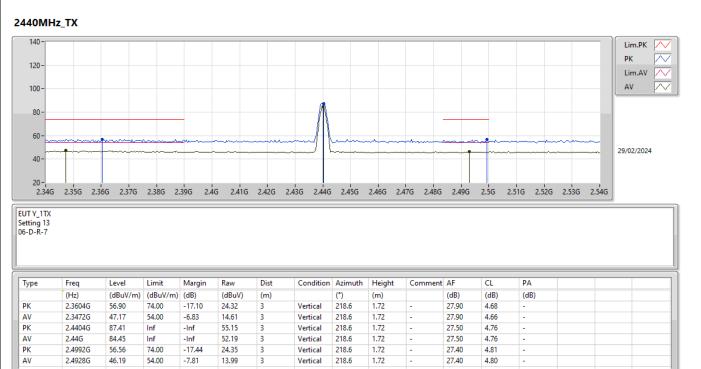




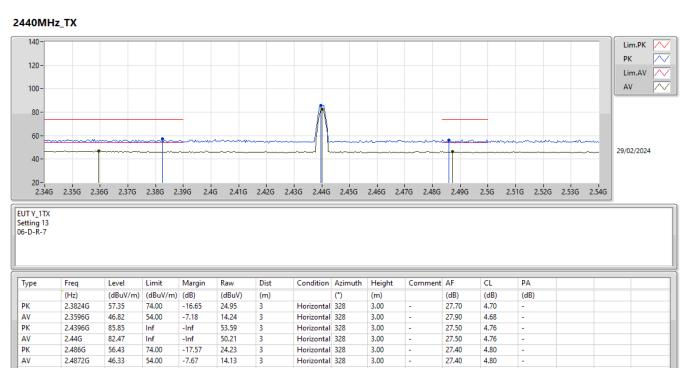




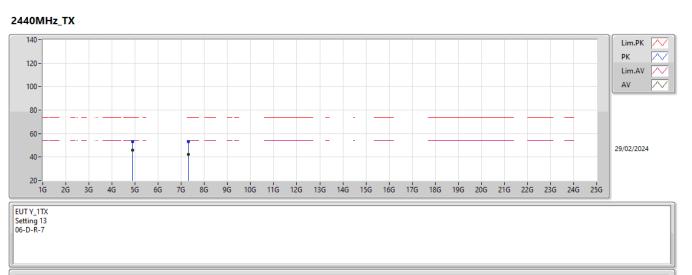






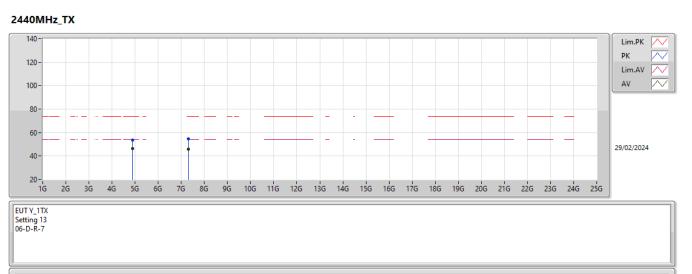






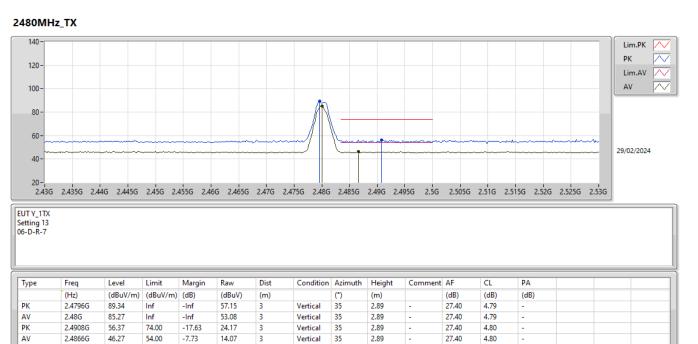
Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
РК	4.87898G	53.25	74.00	-20.75	46.57	3	Vertical	321	2.91	-	31.30	6.74	31.36		
AV	4.87904G	45.96	54.00	-8.04	39.28	3	Vertical	321	2.91	-	31.30	6.74	31.36		
PK	7.3086G	53.23	74.00	-20.77	40.89	3	Vertical	88	1.80	-	36.60	8.34	32.60		
AV	7.31004G	42.48	54.00	-11.52	30.14	3	Vertical	88	1.80	-	36.60	8.34	32.60		



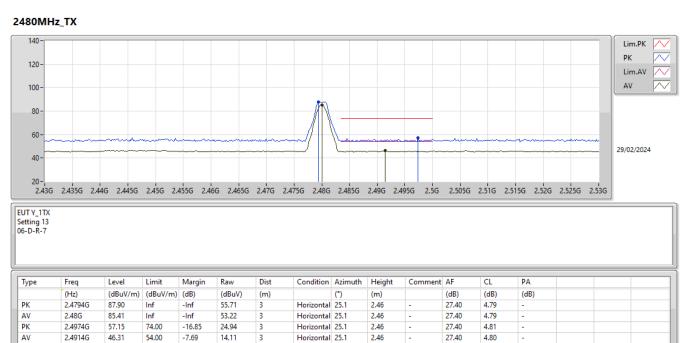


Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
РК	4.88102G	53.50	74.00	-20.50	46.82	3	Horizontal	292	1.04	-	31.30	6.74	31.36		
AV	4.87892G	46.50	54.00	-7.50	39.82	3	Horizontal	292	1.04	-	31.30	6.74	31.36		
PK	7.3215G	54.53	74.00	-19.47	42.21	3	Horizontal	300	2.08	-	36.60	8.34	32.62		
AV	7.31862G	45.86	54.00	-8.14	33.53	3	Horizontal	300	2.08	-	36.60	8.34	32.61		

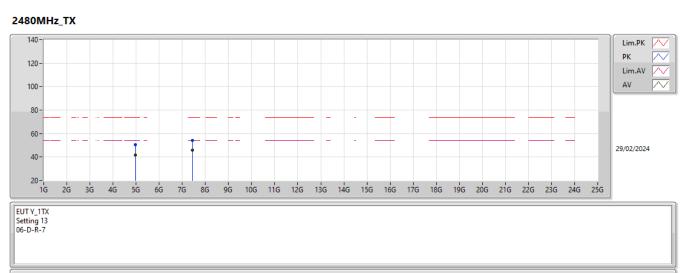






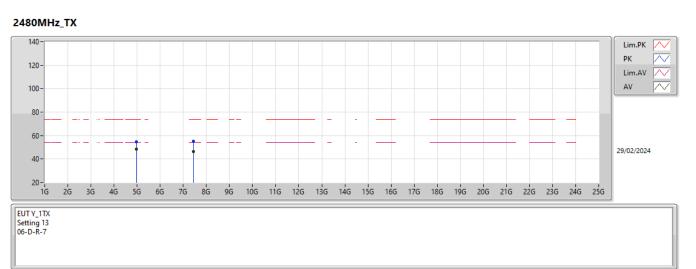






Туре	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)		
РК	4.9591G	50.29	74.00	-23.71	43.25	3	Vertical	210	2.92	-	31.54	6.81	31.31		
AV	4.95904G	41.91	54.00	-12.09	34.87	3	Vertical	210	2.92	-	31.54	6.81	31.31		
PK	7.43856G	53.98	74.00	-20.02	41.71	3	Vertical	340	3.00	-	36.68	8.37	32.78		
AV	7.43844G	45.68	54.00	-8.32	33.41	3	Vertical	340	3.00	-	36.68	8.37	32.78		





Туре	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	4.96108G	54.78	74.00	-19.22	47.74	3	Horizontal	302	1.00	-	31.54	6.81	31.31		
AV	4.95904G	48.53	54.00	-5.47	41.49	3	Horizontal	302	1.00	-	31.54	6.81	31.31		
PK	7.43862G	55.22	74.00	-18.78	42.95	3	Horizontal	309	1.00	-	36.68	8.37	32.78		
AV	7.43844G	46.47	54.00	-7.53	34.20	3	Horizontal	309	1.00	-	36.68	8.37	32.78		