

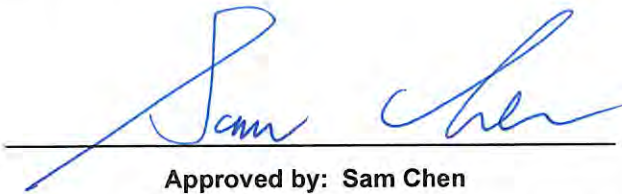


RADIO TEST REPORT

FCC ID : 2AYRA-03791
Equipment : Linksys Velop Micro-Router 6
Brand Name : LINKSYS
Model Name : LN1100, LN1110, LN1115
Applicant : Linksys USA, Inc.
121 Theory, Irvine, CA. 92617, USA
Standard : 47 CFR FCC Part 15.247

The product was received on Aug. 10, 2023, and testing was started from Aug. 14, 2023 and completed on Sep. 26, 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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Photographs of EUT v01

**History of this test report**

Report No.	Version	Description	Issued Date
FR380925AD	01	Initial issue of report	Nov. 29, 2023



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/manufacture 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: Cathy Chiu**



1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1.0	1TX

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	Galtronics	02102140-07935E1(DB1)	PCB Antenna	I-PEX	Note1
2	Galtronics	02102140-07935E2(DB2)	PCB Antenna	I-PEX	
3	Gemtek	WRTQ-388AX	Printed Antenna	N/A	

Note1:

Ant.	Port			Antenna Gain (dBi)					
				WLAN 2.4GHz	WLAN 5GHz			Bluetooth	
	2.4GHz	5GHz	Bluetooth		UNII 1	UNII 2A	UNII 2C		UNII 3
1	2	1	-	4.69	3.86	3.86	4.05	4.05	-
2	1	2	-	4.69	4.88	5.01	4.88	4.89	-
3	-	-	1	-	-	-	-	-	2.86

Note2: The above information was declared by manufacturer.

Note3: Directional gain information

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

Ex.

Directional Gain (NSS1) formula :

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{ANT}} \left(\sum_{k=1}^{N_{ANT}} \xi_{j,k} \right)^2}{N_{ANT}} \right]$$

$$NSS1(g1,1) = 10^{G1/20} ; NSS1(g1,2) = 10^{G2/20} ; NSS1(g1,3) = 10^{G3/20} ; NSS1(g1,4) = 10^{G4/20}$$

$$g_{j,k} = (NSS1(g1,1) + NSS1(g1,2) + NSS1(g1,3) + NSS1(g1,4))^2$$

$$DG = 10 \log[(NSS1(g1,1) + NSS1(g1,2) + NSS1(g1,3) + NSS1(g1,4))^2 / N_{ANT}] \Rightarrow 10$$

$$\log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / N_{ANT}]$$

Where ;

$$2.4G \ G1 = 4.69 \text{ dBi} ; G2 = 4.69 \text{ dBi} ;$$

$$5G \ \text{UNII-1} \ G1 = 3.86 \text{ dBi} ; G2 = 4.88 \text{ dBi} ;$$

$$5G \ \text{UNII-2A} \ G1 = 3.86 \text{ dBi} ; G2 = 5.01 \text{ dBi} ;$$

$$5G \ \text{UNII-2C} \ G1 = 4.05 \text{ dBi} ; G2 = 4.88 \text{ dBi} ;$$

$$5G \ \text{UNII-3} \ G1 = 4.05 \text{ dBi} ; G2 = 4.89 \text{ dBi} ;$$

$$2.4G \ DG = 7.70 \text{ dBi}$$

$$5G \ \text{UNII-1} \ DG = 7.40 \text{ dBi}$$

$$5G \ \text{UNII-2A} \ DG = 7.46 \text{ dBi}$$

$$5G \ \text{UNII-2C} \ DG = 7.49 \text{ dB}$$

$$5G \ \text{UNII-3} \ DG = 7.49 \text{ dBi}$$



For 2.4GHz function:

For IEEE 802.11b/g/n/VHT/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.
Port 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.
Port 1 and Port 2 could transmit/receive simultaneously.

For Bluetooth function (1TX/1RX):

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

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.855	0.68	2.136m	1k

Note:

- ◆ DC is Duty Cycle.
- ◆ DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter		
Function	<input checked="" type="checkbox"/> Point-to-multipoint	<input type="checkbox"/> Point-to-point	
Test Software Version	QPSR Version 5.0-00202		
Support Mode	<input checked="" type="checkbox"/> LE 1M PHY: 1 Mb/s		
	<input type="checkbox"/> LE Coded PHY (S=2): 500 Kb/s		
	<input type="checkbox"/> LE Coded PHY (S=8): 125 Kb/s		
	<input type="checkbox"/> LE 2M PHY: 2 Mb/s		

Note: The above information was declared by manufacturer.

1.1.5 Table for Multiple Listing

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

Model Name	Description
LN1100	All the models are identical, the difference model served as marketing strategy.
LN1110	
LN1115	

Note 1: From the above models, model: LN110 was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.



1.1.6 Table for EUT support function

Function
AP Router
Mesh

Note1: For above table list, only AP Router mode was tested and recorded in this test.

Note2: 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 (TAF: 3787)	ADD: 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 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	TH03-CB	Owen Hsu	24.3-25.2 / 56-67	Aug. 21, 2023~ Sep. 26, 2023
Radiated (Below 1GHz)	03CH04-CB	Roy Mai	23-24 / 56-59	Aug. 15, 2023~ Sep. 21, 2023
Radiated (Above 1GHz)	03CH02-CB	Roy Mai	22.4-23.5 / 55-58	Aug. 15, 2023~ Sep. 21, 2023
AC Conduction	CO01-CB	Ryan Huang	21~22 / 61~62	Aug. 14, 2023~ Aug. 28, 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
BT-LE(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Normal Link
1	EUT + Adapter 1
2	EUT + Adapter 2
3	EUT + Adapter 3

For operating mode 2 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 Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains



The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	CTX
For WLAN 2.4GHz/5GHz: After evaluating, the worst case was found at Y axis from Emissions in Restricted Frequency Bands above 1GHz. So the measurement will follow this same test configuration. For Bluetooth: After evaluating, the worst case was found at Z axis from Emissions in Restricted Frequency Bands above 1GHz. So the measurement will follow this same test configuration.	
1	EUT in Y axis + WLAN 2.4GHz + Adapter 1
2	EUT in Y axis + WLAN 2.4GHz + Adapter 2
3	EUT in Y axis + WLAN 2.4GHz + Adapter 3
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 + WLAN 5GHz + Adapter 3
5	EUT in Z axis + Bluetooth + Adapter 3
For operating mode 3 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
After evaluating, the worst case was found at Z axis, thus the measurement will follow this same test configuration.	
1	EUT in Z 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 + WLAN 5GHz + Bluetooth
Refer to Sporton Test Report No.: FA380925 for Co-location RF Exposure Evaluation.	

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			
Equipment Name	Brand Name	Model Name	Rating
Adapter 1	Ktec	KSA-18W-120150VU	INPUT: 100-240V ~ 50/60Hz, 0.5A OUTPUT: 12V, 1.5A
Adapter 2	MOSO	MS-V1500R120-018H0-US	INPUT: 100-240V ~ 50/60Hz, 0.6A, max. OUTPUT: 12.0V, 1.5A
Adapter 3	Ktec	KSA-18W-120150D5	INPUT: 100-240V ~ 50/60Hz, 0.5A OUTPUT: 12.0V, 1.5A, 18.0W
Others			
RJ-45 cable 1*1, non-shielded, 1m (Black)			
RJ-45 cable 2*1, non-shielded, 1m (White)			
Plug*1 (Only for adapter 3 use)			

Note: From the above, RJ-45 cable 2 was selected as representative cable for the test and its data was recorded in this report.

2.5 Support Equipment

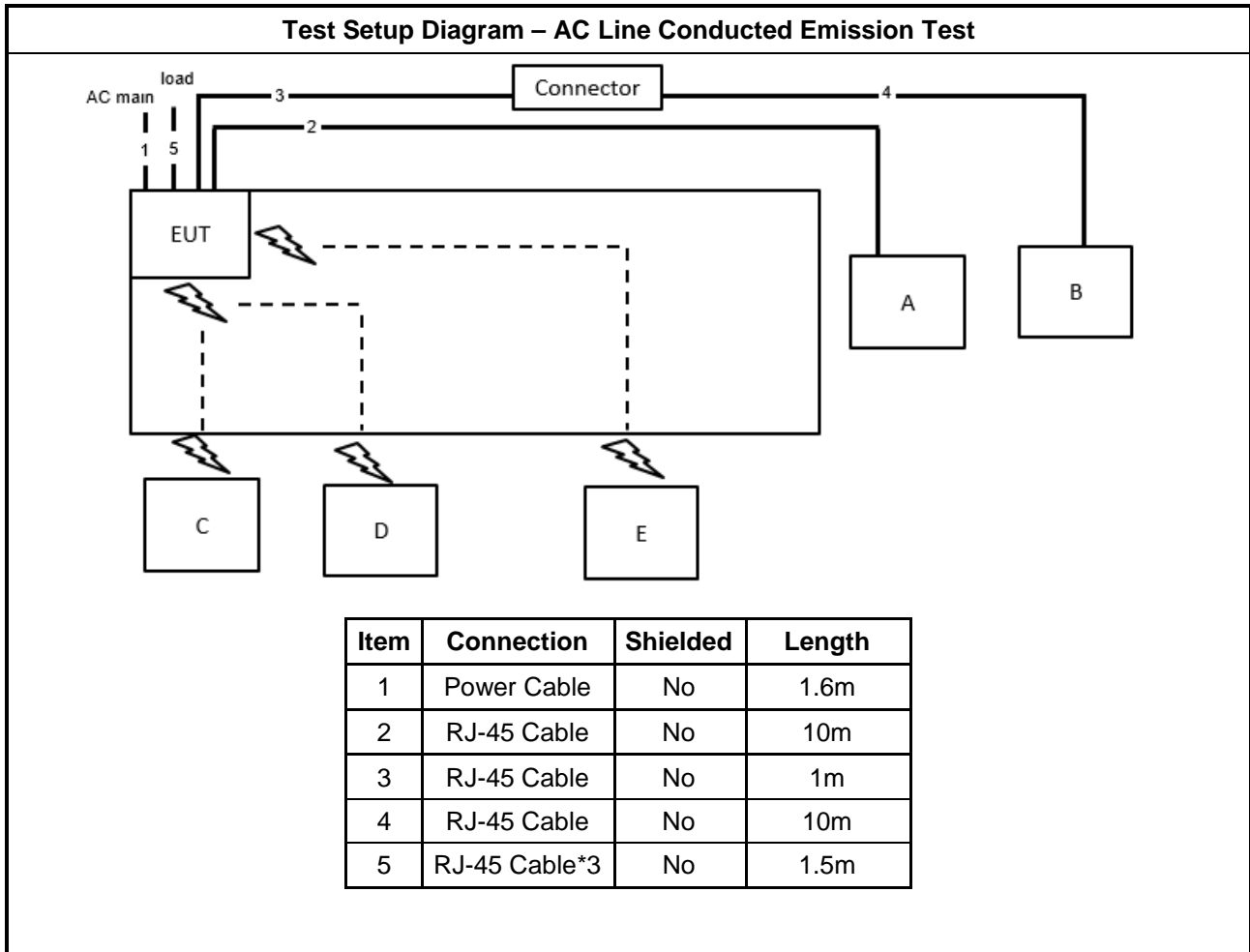
For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	LAN NB	DELL	E6430	N/A
B	WAN NB	DELL	E6430	N/A
C	2.4G NB	DELL	E6430	N/A
D	5G NB	DELL	E6430	N/A
E	Smart Phone	Samsung	Galaxy J2	N/A

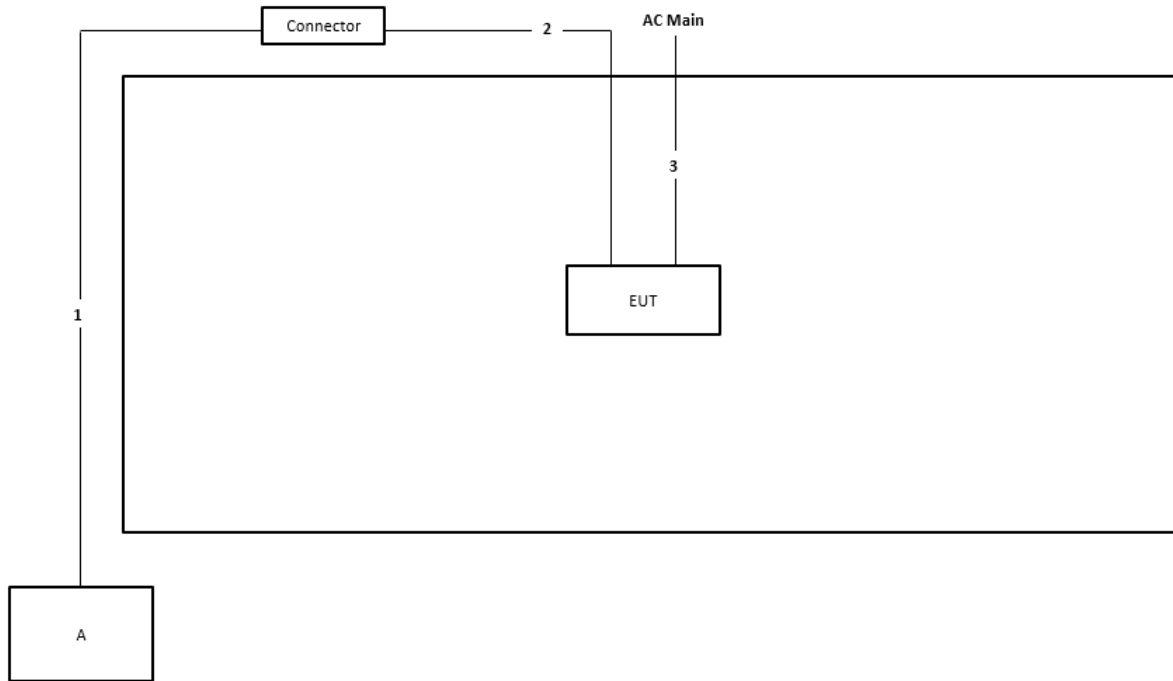
For Radiated (below 1GHz), Radiated (above 1GHz) and RF Conducted:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A

2.6 Test Setup Diagram



Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1m
3	Power Cable	No	1.6m



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

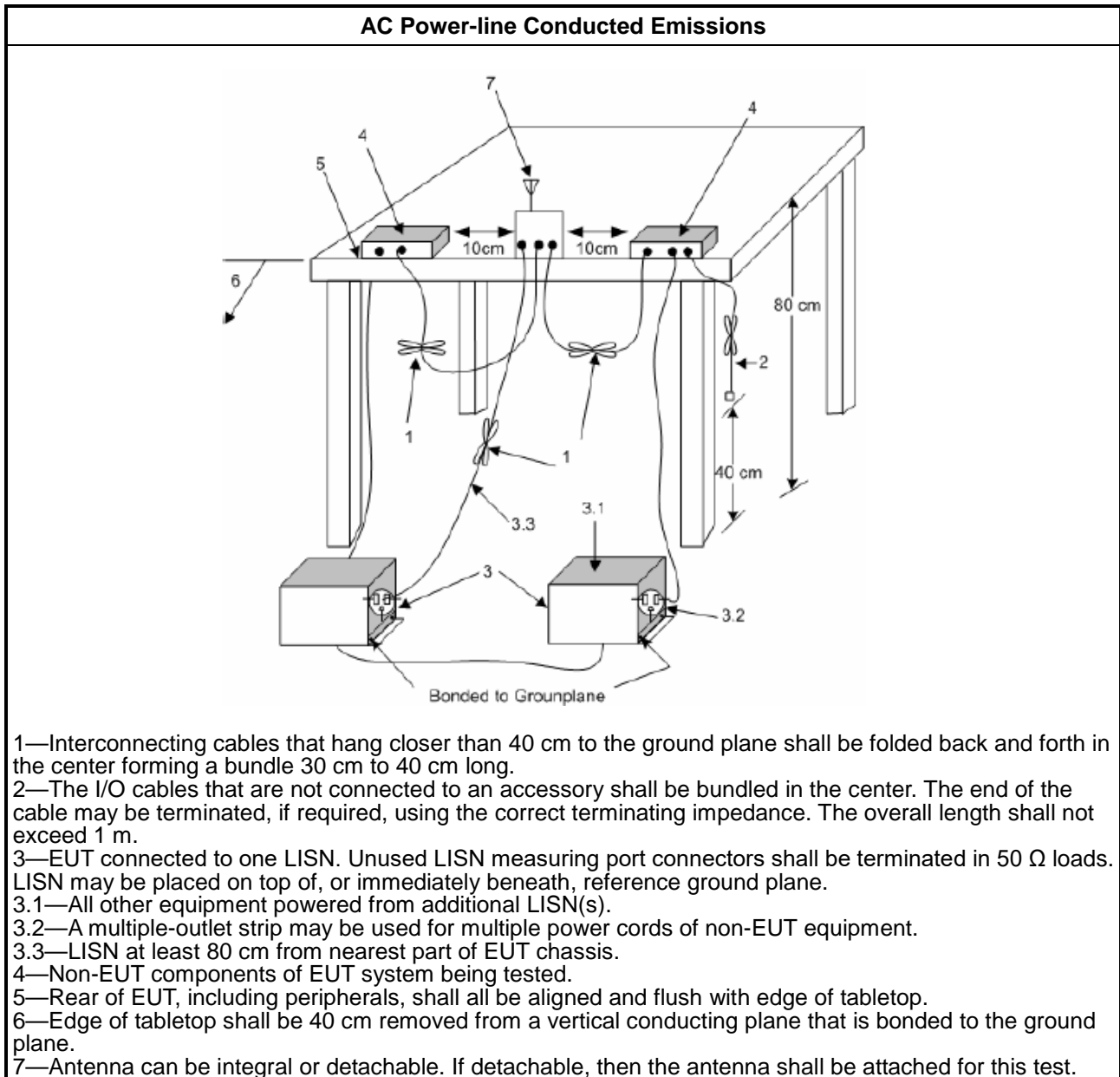
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 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:
<ul style="list-style-type: none"> ▪ 6 dB bandwidth \geq 500 kHz.

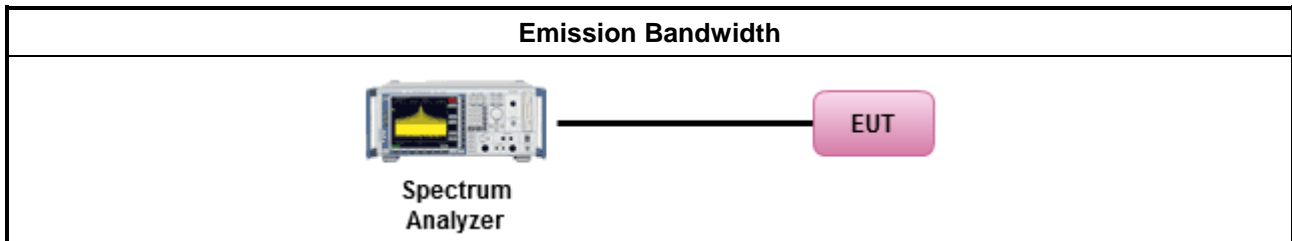
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method
<ul style="list-style-type: none"> ▪ For the emission bandwidth shall be measured using one of the options below:
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B



3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
	<ul style="list-style-type: none"> ▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
	<ul style="list-style-type: none"> ▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
	<ul style="list-style-type: none"> ▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<ul style="list-style-type: none"> ▪ Smart antenna system (SAS):
	<ul style="list-style-type: none"> - Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<ul style="list-style-type: none"> - Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	<ul style="list-style-type: none"> - Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm
<p>P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.</p>	

3.3.2 Measuring Instruments

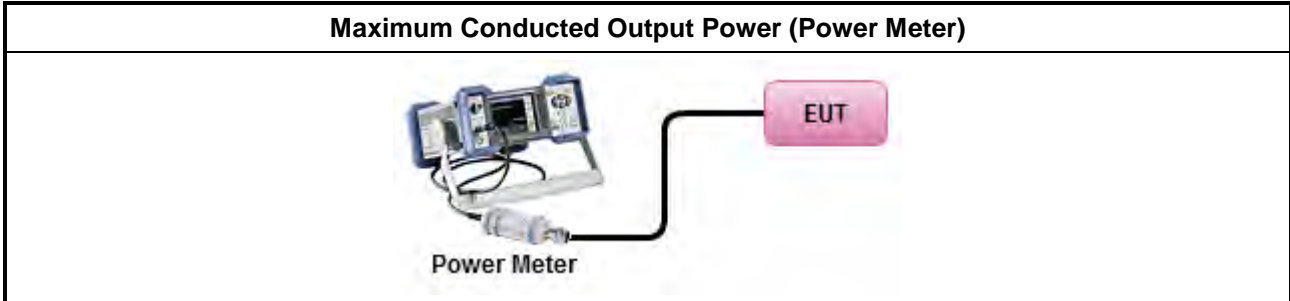
Refer a test equipment and calibration data table in this test report.



3.3.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ Maximum Peak Conducted Output Power 	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
<ul style="list-style-type: none"> ▪ Maximum Conducted Output Power 	
[duty cycle ≥ 98% or external video / power trigger]	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
	<input type="checkbox"/> 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	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
	<input type="checkbox"/> 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)	
	<input type="checkbox"/> 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).
	<input checked="" type="checkbox"/> 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).
<ul style="list-style-type: none"> ▪ For conducted measurement. 	
<ul style="list-style-type: none"> ▪ 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. 	
<ul style="list-style-type: none"> ▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$ 	

3.3.4 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
<ul style="list-style-type: none"> Power Spectral Density (PSD) ≤ 8 dBm/3kHz

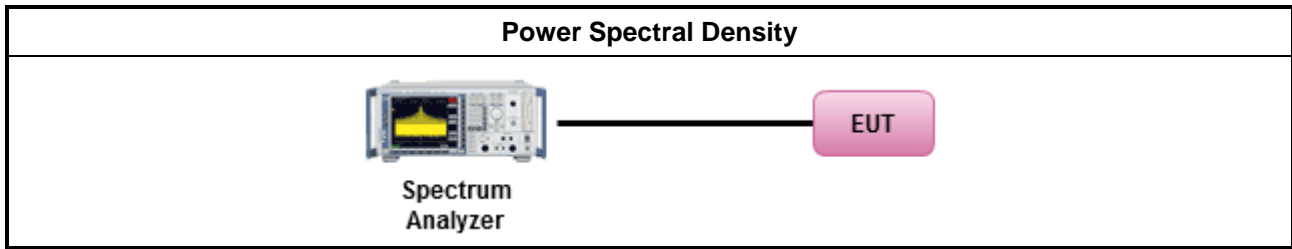
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method
<ul style="list-style-type: none"> 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).
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD. [duty cycle ≥ 98% or external video / power trigger]
<ul style="list-style-type: none"> For conducted measurement.
<ul style="list-style-type: none"> If The EUT supports multiple transmit chains using options given below: <ul style="list-style-type: none"> <input type="checkbox"/> 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. <input type="checkbox"/> 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, <input type="checkbox"/> 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.

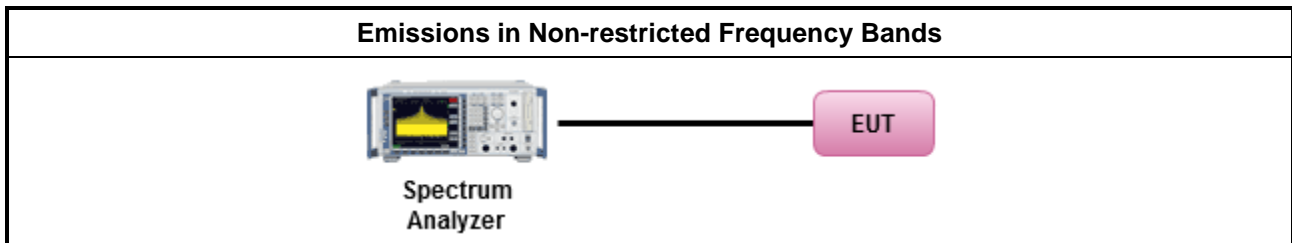
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method
<ul style="list-style-type: none"> 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	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

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

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

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

3.6.2 Measuring Instruments

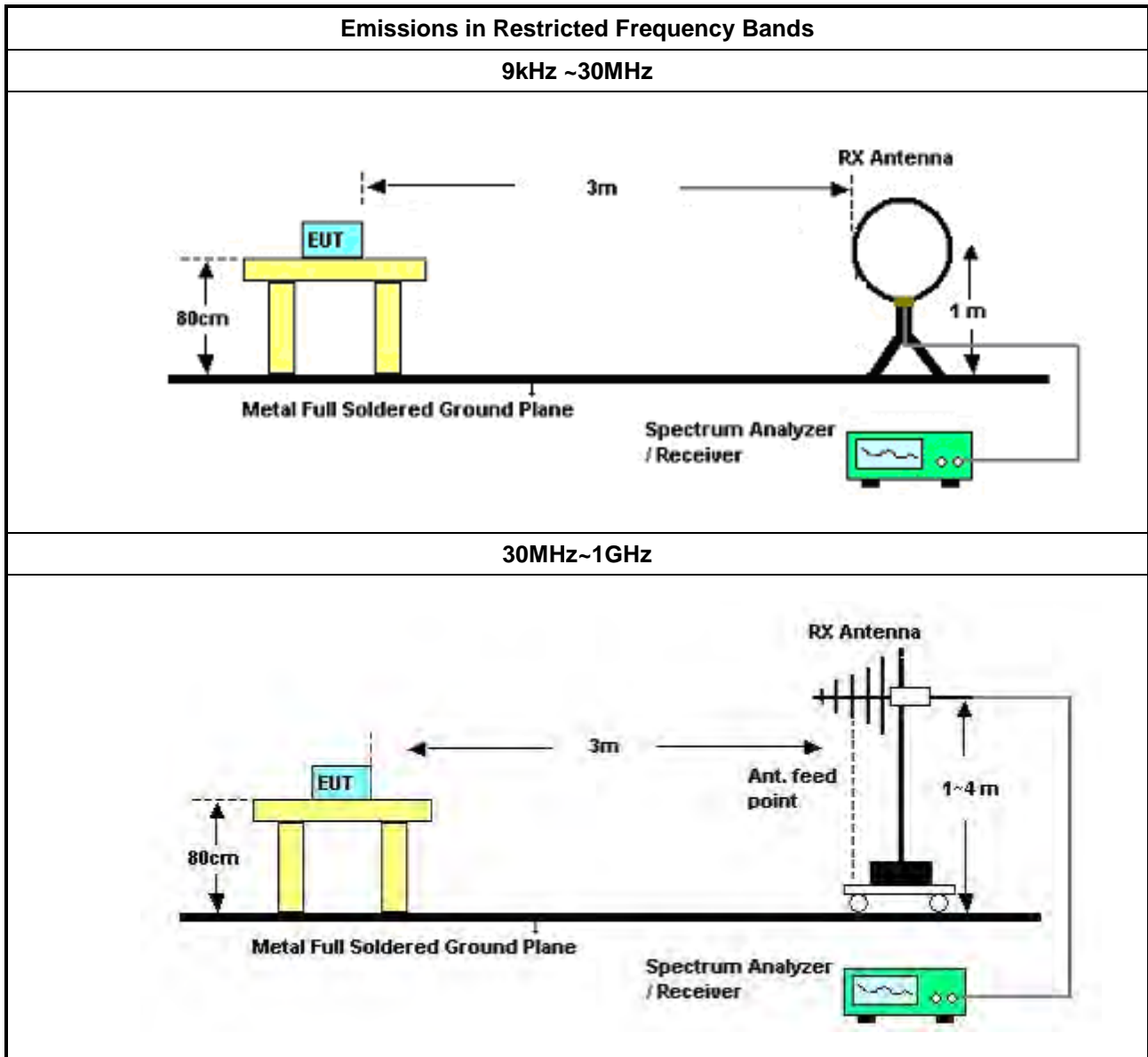
Refer a test equipment and calibration data table in this test report.

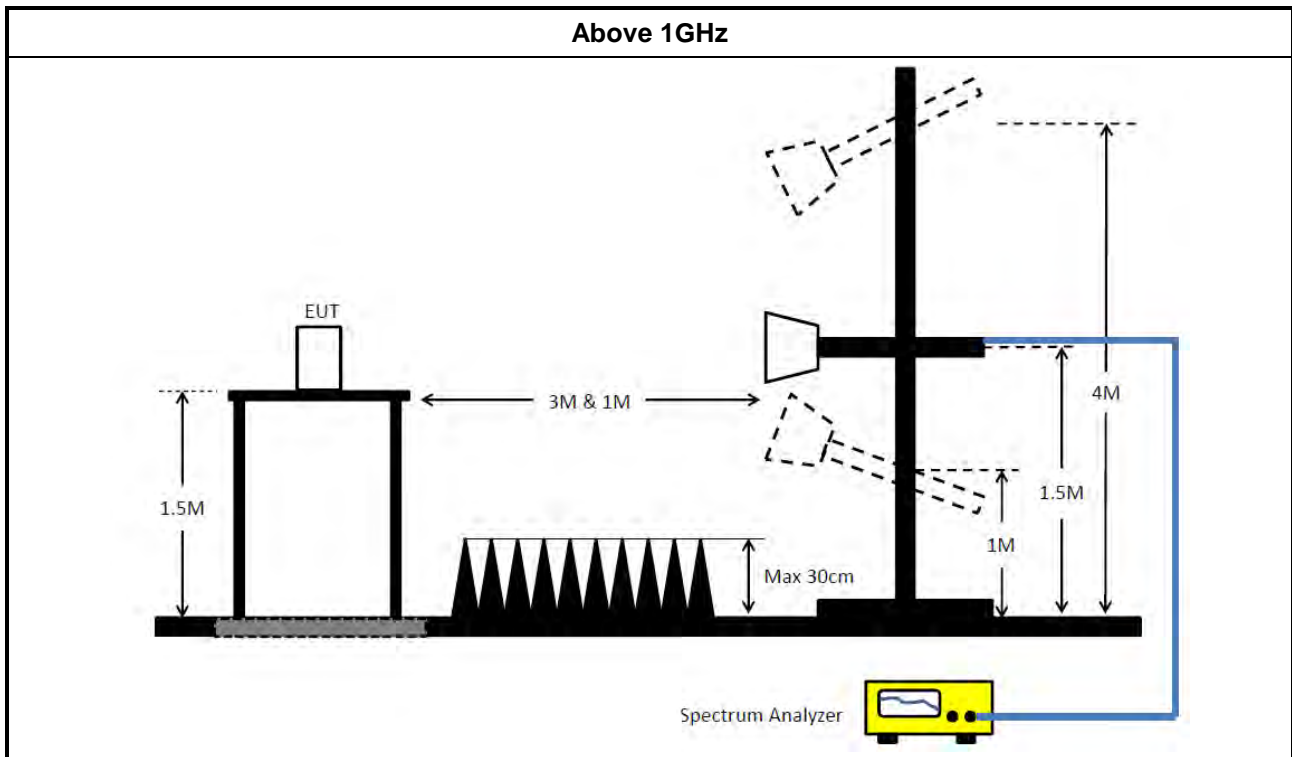


3.6.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ The average emission levels shall be measured in [duty cycle \geq 98 or duty factor]. 	
<ul style="list-style-type: none"> ▪ 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. 	
<ul style="list-style-type: none"> ▪ For the transmitter unwanted emissions shall be measured using following options below: 	
	<ul style="list-style-type: none"> ▪ Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle \geq 98%).
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
	<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW \geq 1/T).
	<input type="checkbox"/> Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW \geq 1/T, where T is pulse time.
	<input type="checkbox"/> Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
	<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
<ul style="list-style-type: none"> ▪ For the transmitter band-edge emissions shall be measured using following options below: 	
	<ul style="list-style-type: none"> ▪ 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.
	<ul style="list-style-type: none"> ▪ Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
	<ul style="list-style-type: none"> ▪ 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).
	<ul style="list-style-type: none"> ▪ 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
	<ul style="list-style-type: none"> ▪ 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	My52260123	9kHz ~ 8.4GHz	Feb. 20, 2023	Feb. 19, 2024	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-5 0-16-2	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 (03CH04-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH04-CB	30 MHz ~ 1 GHz	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. 08, 2022	Oct. 07, 2023	Radiation (03CH04-CB)
Pre-Amplifier	EMCI	EMC330N	980391	20MHz ~ 3GHz	May 23, 2023	May 22, 2024	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Mar. 21, 2023	Mar. 20, 2024	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. 03, 2022	Oct. 02, 2023	Radiation (03CH04-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH04-CB)
3m Semi Anechoic Chamber VSWR	RIKEN	SAC-3M	03CH02-CB	1GHz ~18GHz	Mar. 25, 2023	Mar. 24, 2024	Radiation (03CH02-CB)
Horn Antenna	EMCO	3115	9610-4976	1GHz ~ 18GHz	Apr. 18, 2023	Apr. 17, 2024	Radiation (03CH02-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 28, 2023	Jun. 27, 2024	Radiation (03CH02-CB)
Pre-Amplifier	Agilent	83017A	MY39501305	1GHz ~ 26.5GHz	Jun. 30, 2023	Jun. 29, 2024	Radiation (03CH02-CB)
Spectrum analyzer	R&S	FSU	100015	9kHz~26GHz	Dec. 05, 2022	Dec. 04, 2023	Radiation (03CH02-CB)
RF Cable-high	Woken	RG402	High Cable-18	1GHz ~ 18GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH02-CB)



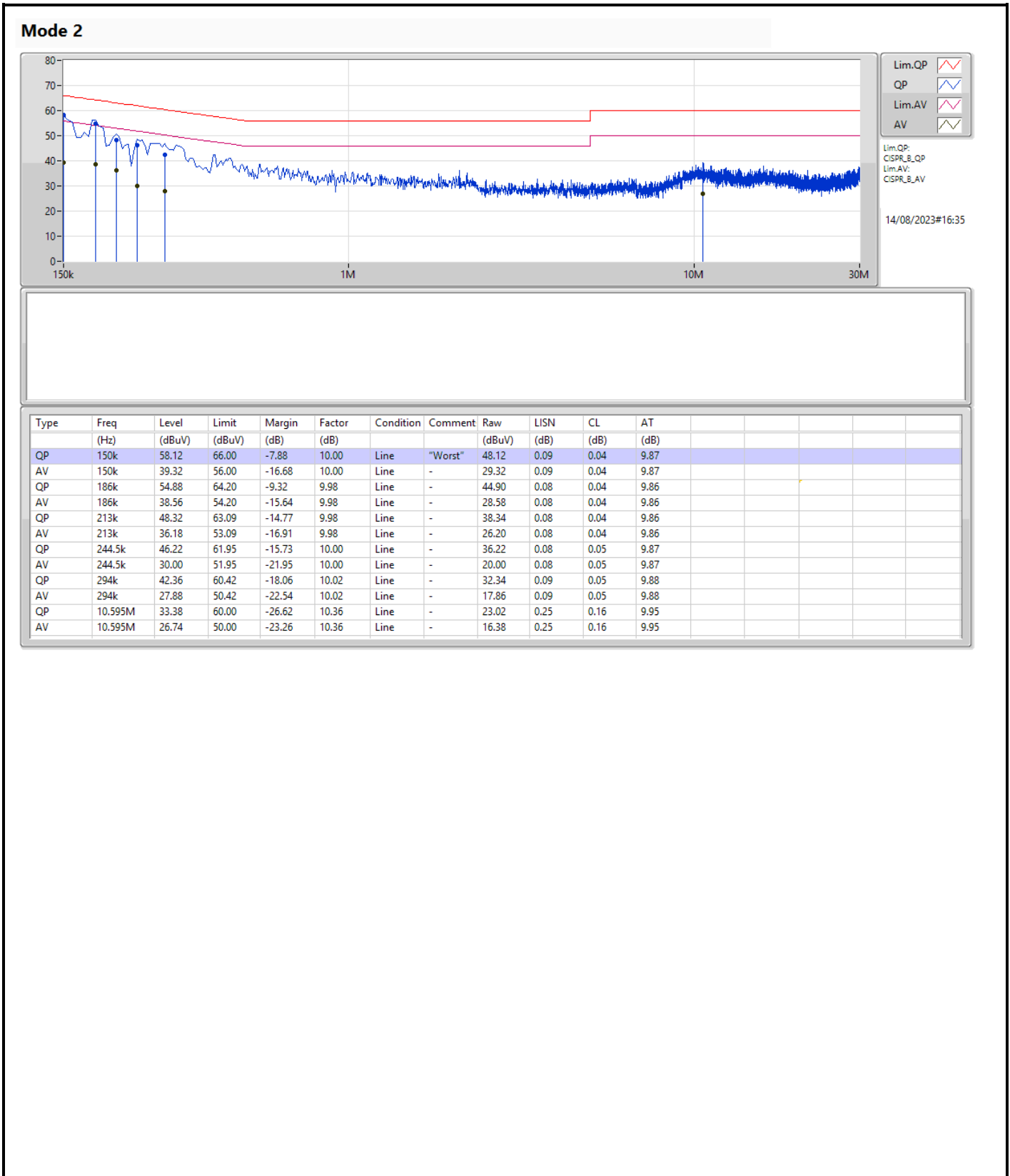
Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-18+19	1GHz ~ 18GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH02-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH02-CB)
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH02-CB)
High Cable	Woken	WCA0929M	40G#6	1GHz ~ 40 GHz	Dec. 07, 2022	Dec. 06, 2023	Radiation (03CH02-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH02-CB)
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Dec. 30, 2022	Dec. 29, 2023	Conducted (TH03-CB)
Power Sensor	Anritsu	MA2411B	1531344	300MHz~40GHz	Aug. 01, 2023	Jul. 31, 2024	Conducted (TH03-CB)
Power Meter	Anritsu	ML2495A	1728002	300MHz~40GHz	Aug. 01, 2023	Jul. 31, 2024	Conducted (TH03-CB)
RF Cable	Woken	RG402	High Cable-11	30MHz ~18 GHz	Feb. 14, 2023	Feb. 13, 2024	Conducted (TH03-CB)
RF Cable	Woken	RG402	High Cable-12	30MHz ~18 GHz	Feb. 14, 2023	Feb. 13, 2024	Conducted (TH03-CB)
RF Cable	Woken	RG402	High Cable-13	30MHz ~18 GHz	Feb. 14, 2023	Feb. 13, 2024	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz ~18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz ~18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH03-CB)
Switch	SPTCB	SP-SWI	SWI-03	1 GHz ~26.5 GHz	Oct. 04, 2022	Oct. 03, 2023	Conducted (TH03-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH03-CB)

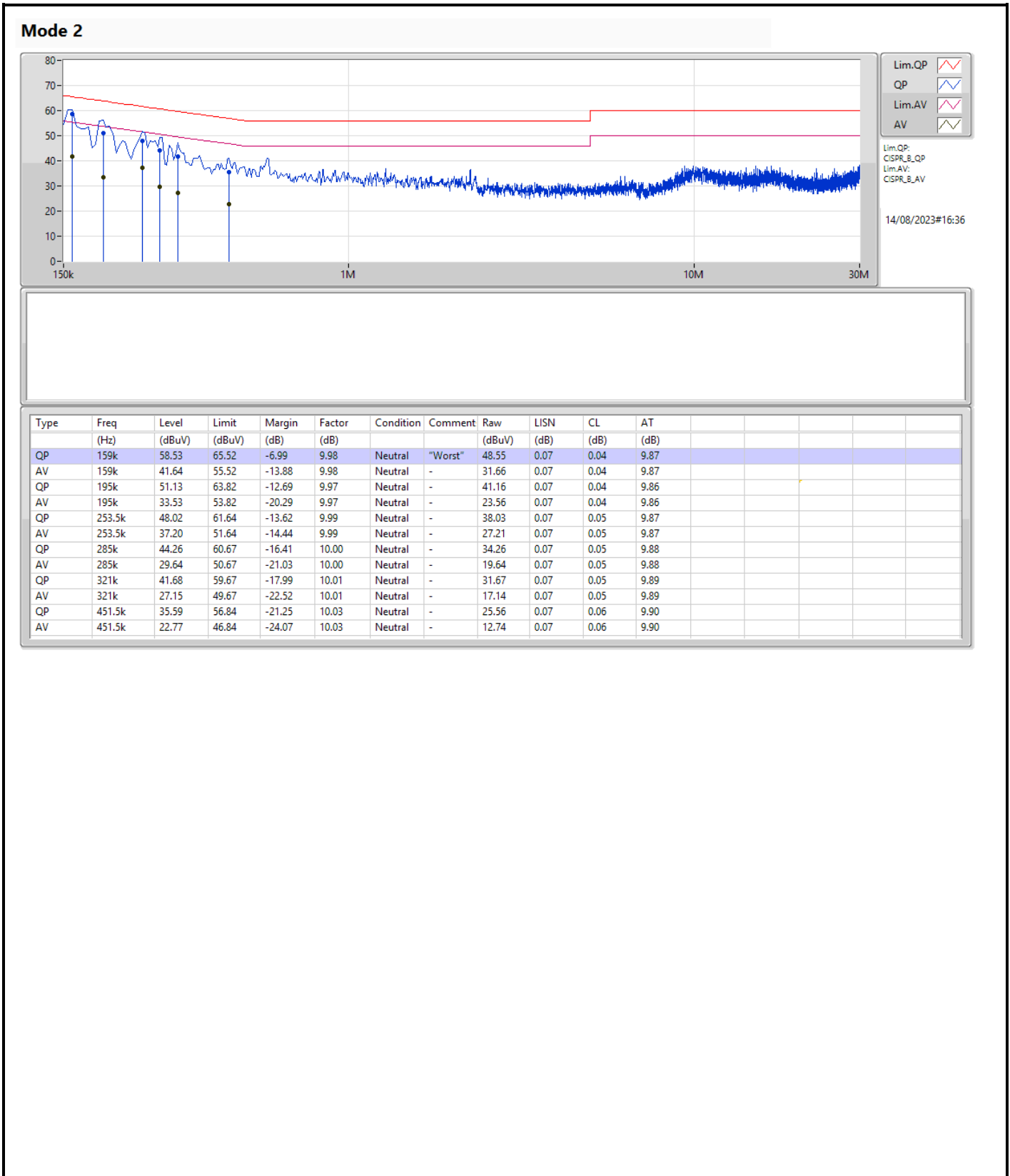
Note: Calibration Interval of instruments listed above is one year.
NCR means Non-Calibration required.



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 2	Pass	QP	159k	58.53	65.52	-6.99	Neutral







Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	663.75k	1.024M	1M02F1D	661.25k	1.02M

Max-N dB = Maximum 6dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth



Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	663.75k	1.024M
2440MHz	Pass	500k	663.75k	1.022M
2480MHz	Pass	500k	661.25k	1.02M

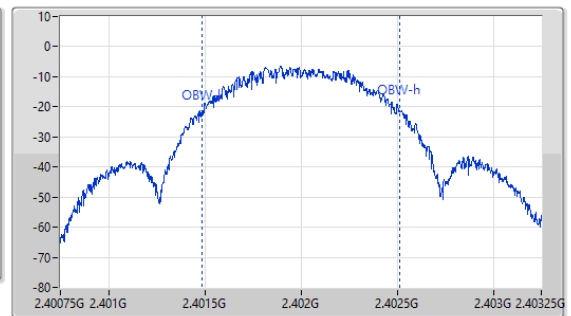
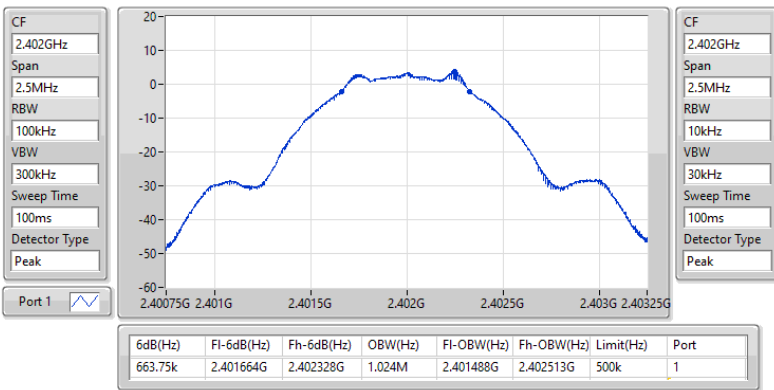
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

2.4-2.4835GHz_BT-LE(1Mbps)

EBW-DTS

2402MHz

29/08/2023

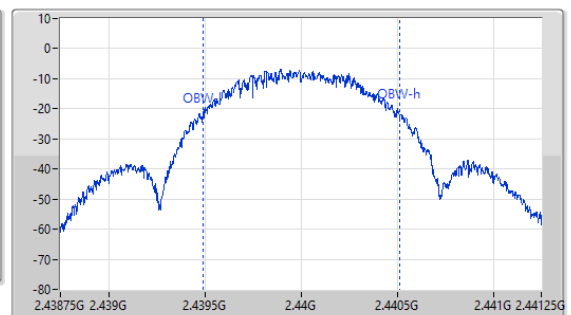
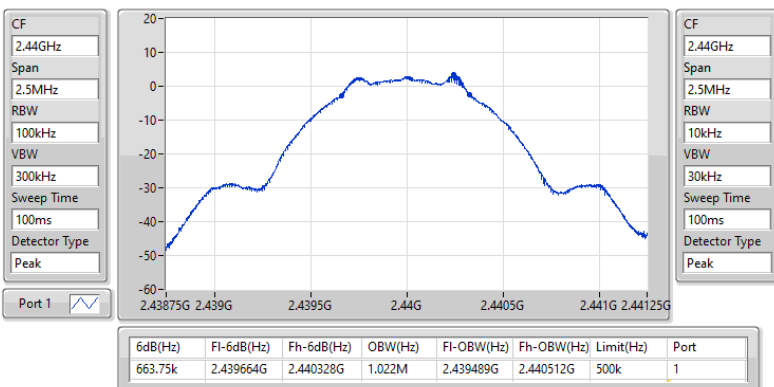


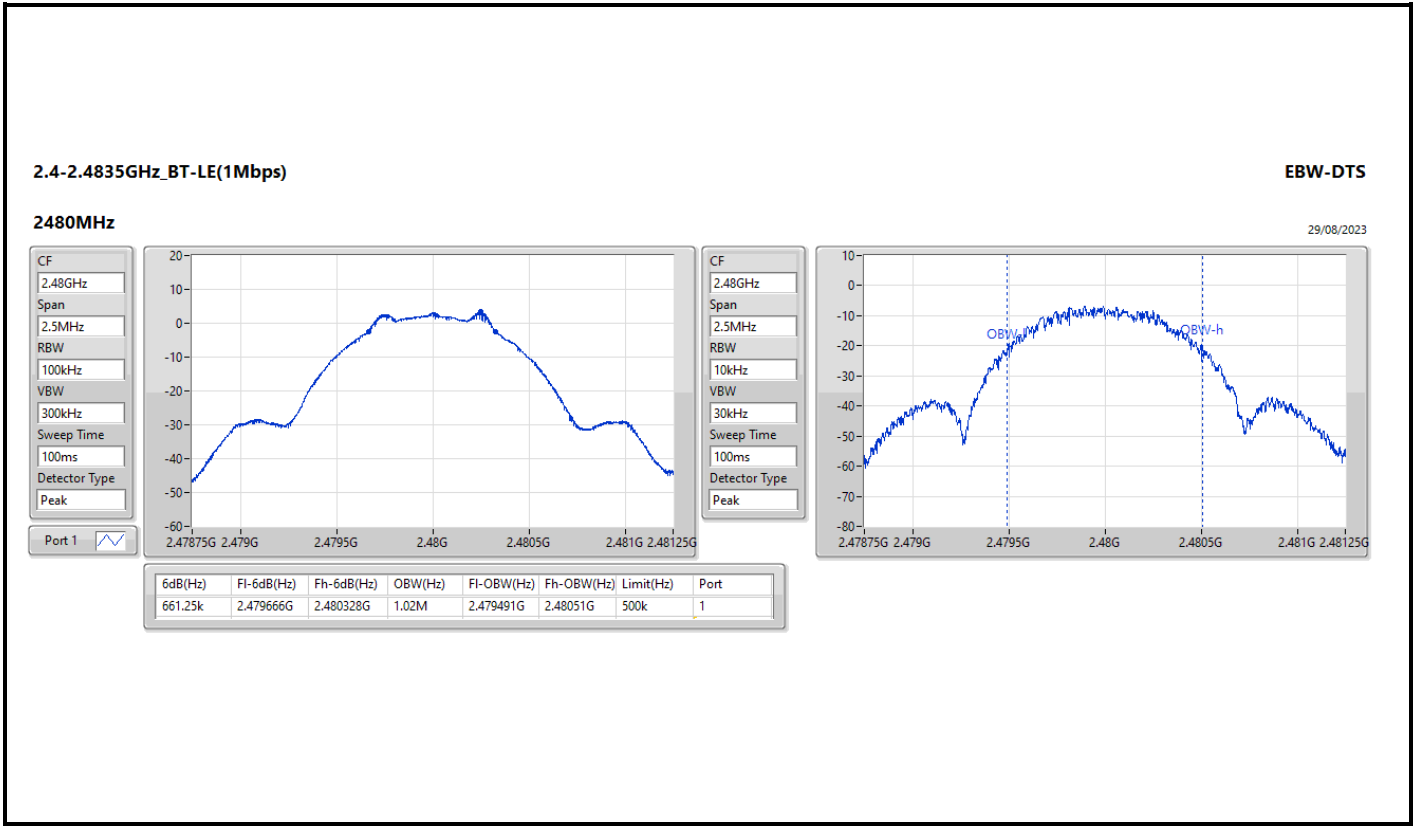
2.4-2.4835GHz_BT-LE(1Mbps)

EBW-DTS

2440MHz

29/08/2023







Summary

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	3.35	0.00216



Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	2.86	3.35	30.00
2440MHz	Pass	2.86	3.10	30.00
2480MHz	Pass	2.86	3.15	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-12.80

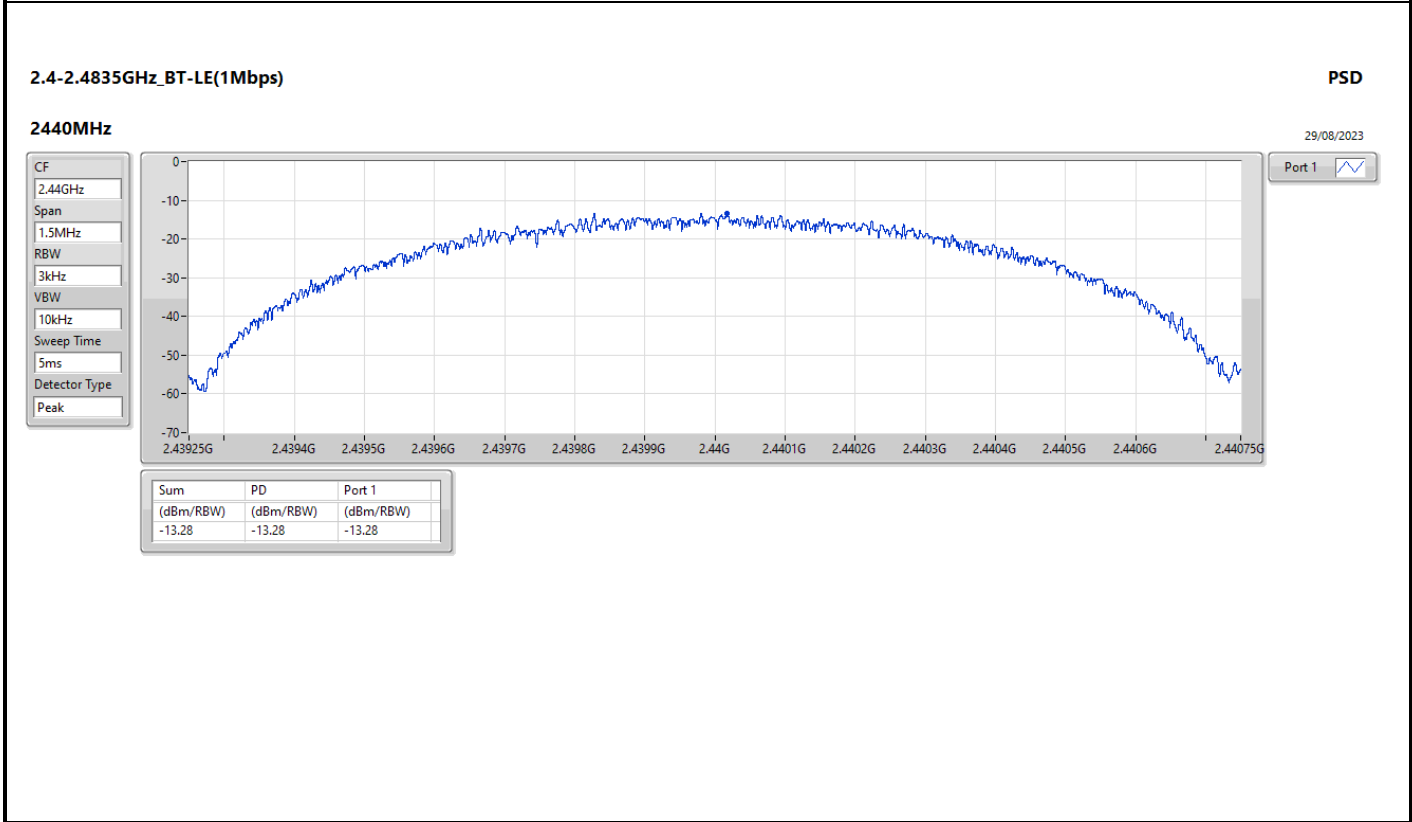
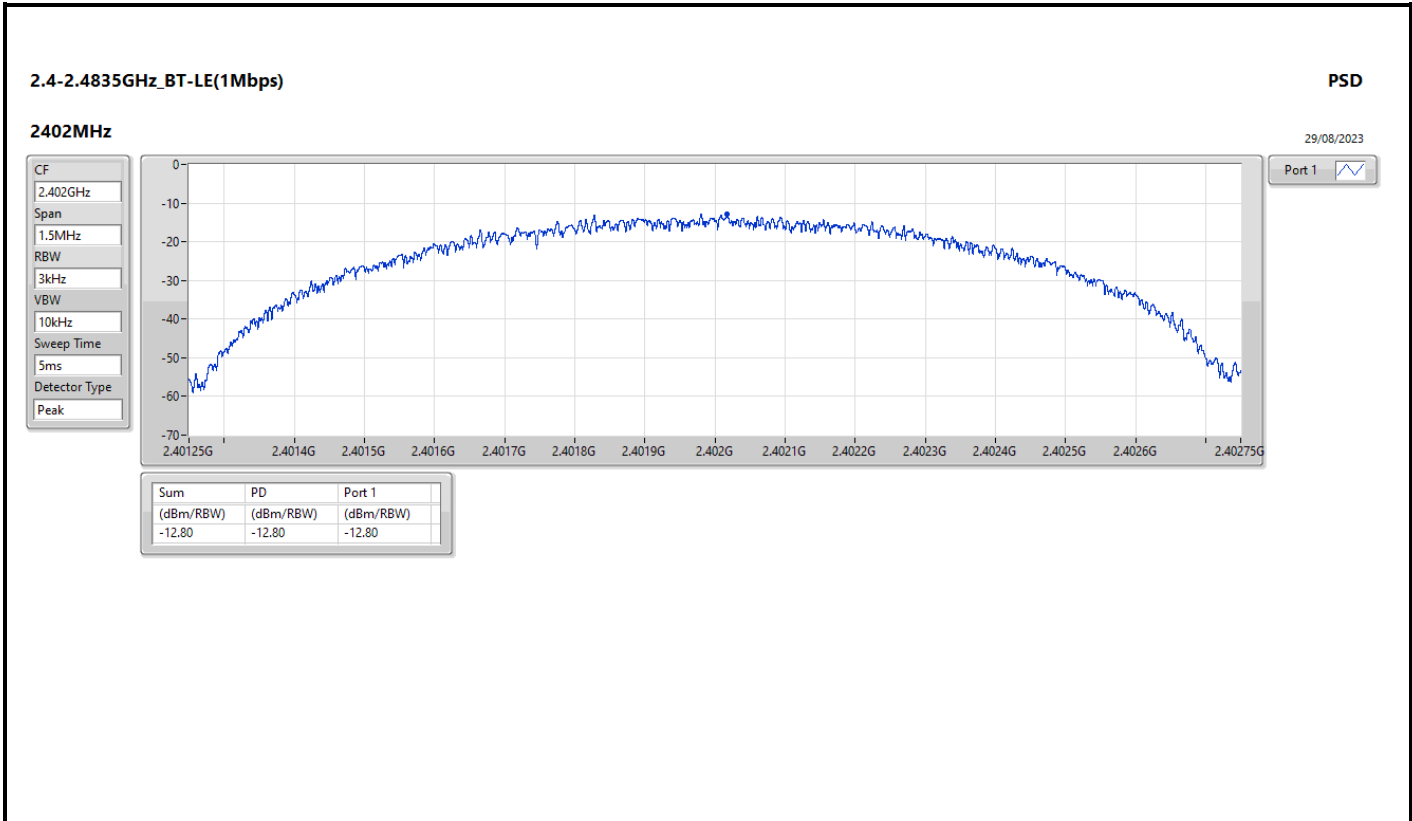
RBW = 3kHz;

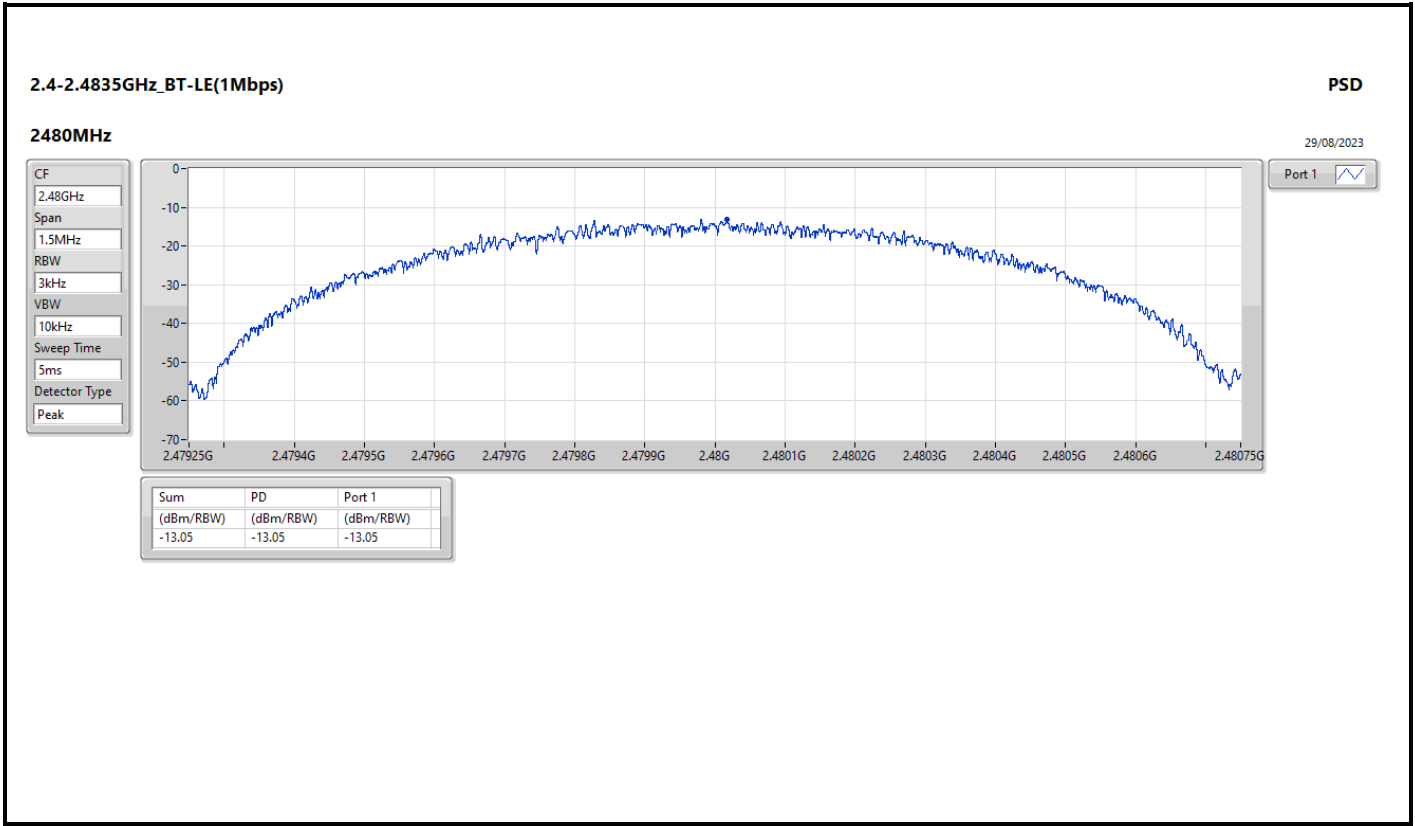


Result

Mode	Result	DG (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	2.86	-12.80	8.00
2440MHz	Pass	2.86	-13.28	8.00
2480MHz	Pass	2.86	-13.05	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;







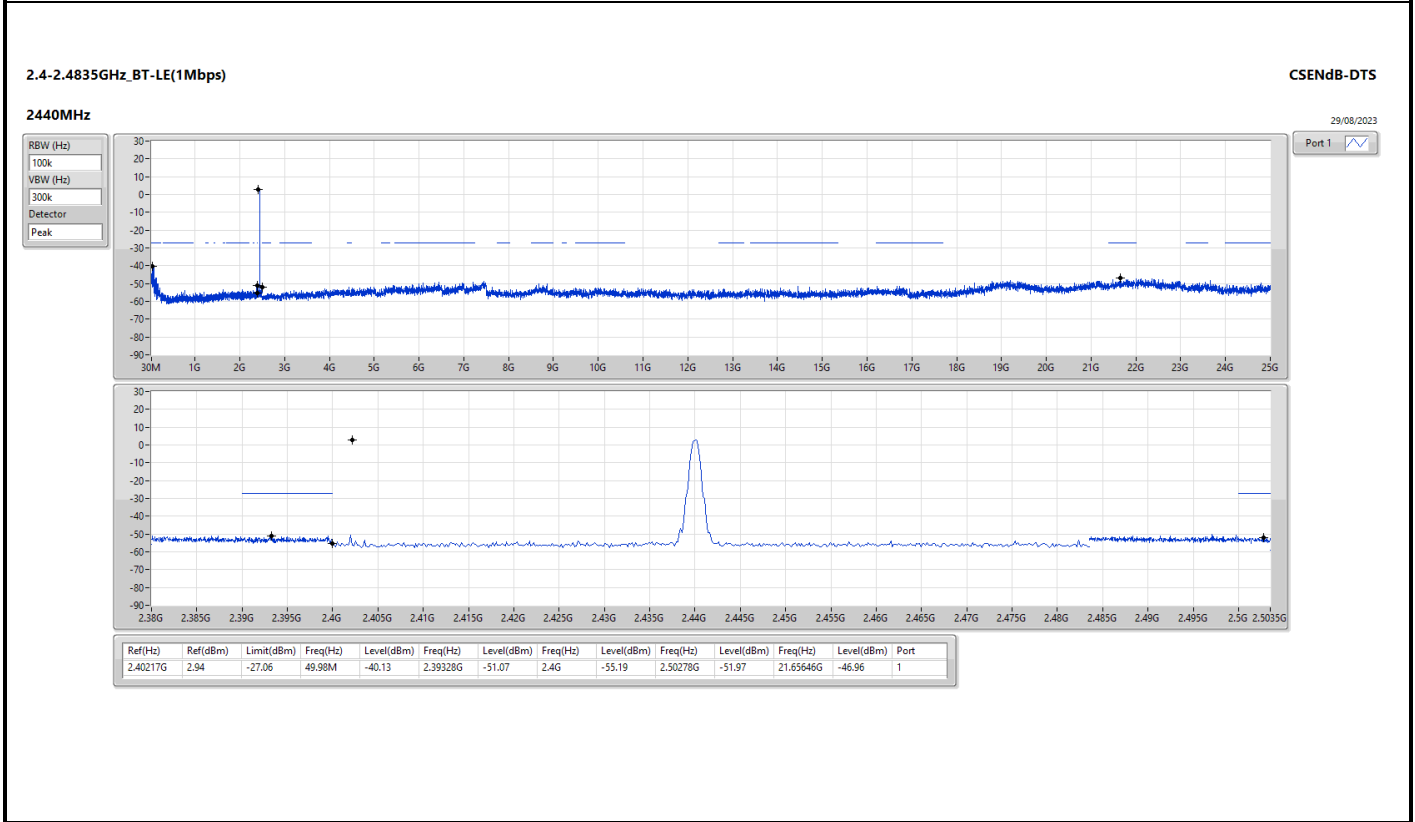
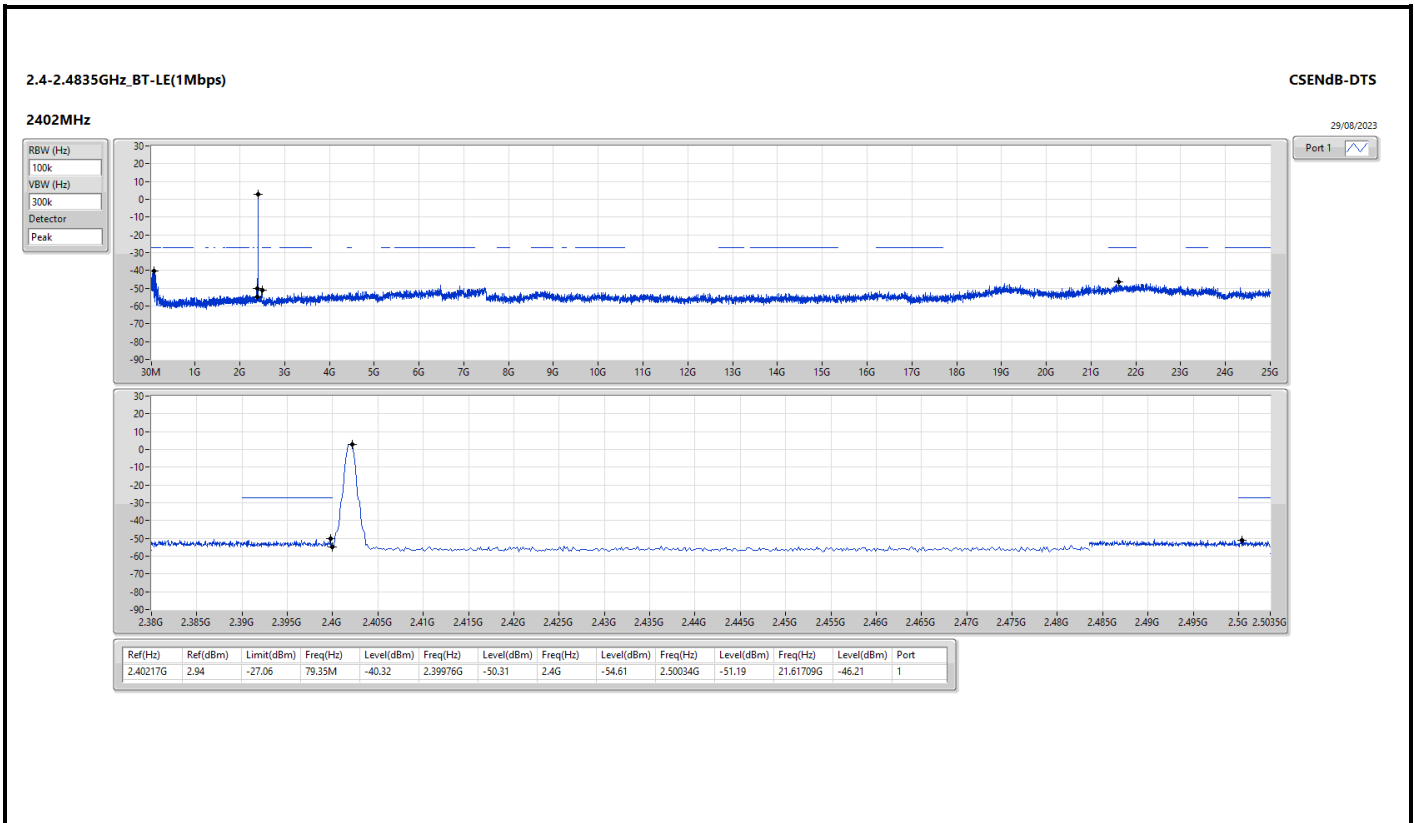
Summary

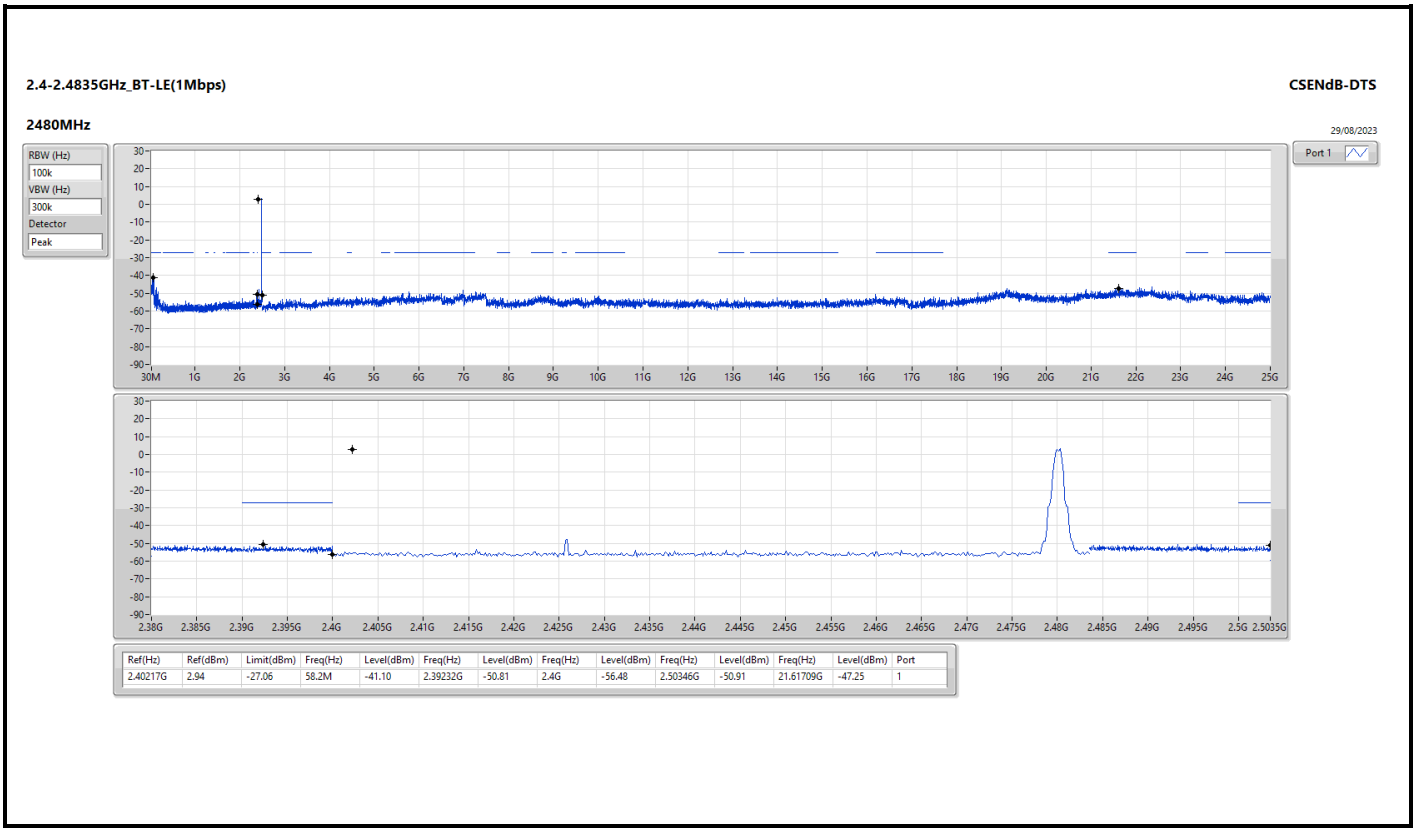
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.40217G	2.94	-27.06	49.98M	-40.13	2.39328G	-51.07	2.4G	-55.19	2.50278G	-51.97	21.65646G	-46.96	1



Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40217G	2.94	-27.06	79.35M	-40.32	2.39976G	-50.31	2.4G	-54.61	2.50034G	-51.19	21.61709G	-46.21	1
2440MHz	Pass	2.40217G	2.94	-27.06	49.98M	-40.13	2.39328G	-51.07	2.4G	-55.19	2.50278G	-51.97	21.65646G	-46.96	1
2480MHz	Pass	2.40217G	2.94	-27.06	58.2M	-41.10	2.39232G	-50.81	2.4G	-56.48	2.50346G	-50.91	21.61709G	-47.25	1



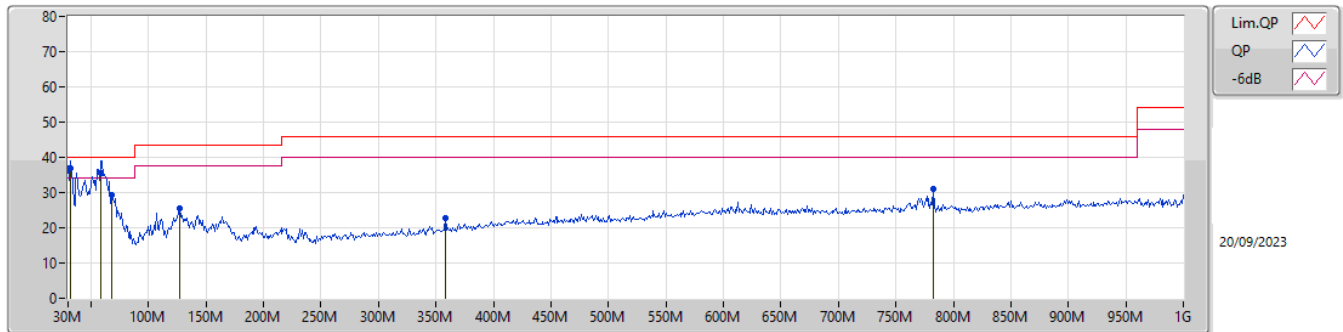




Summary

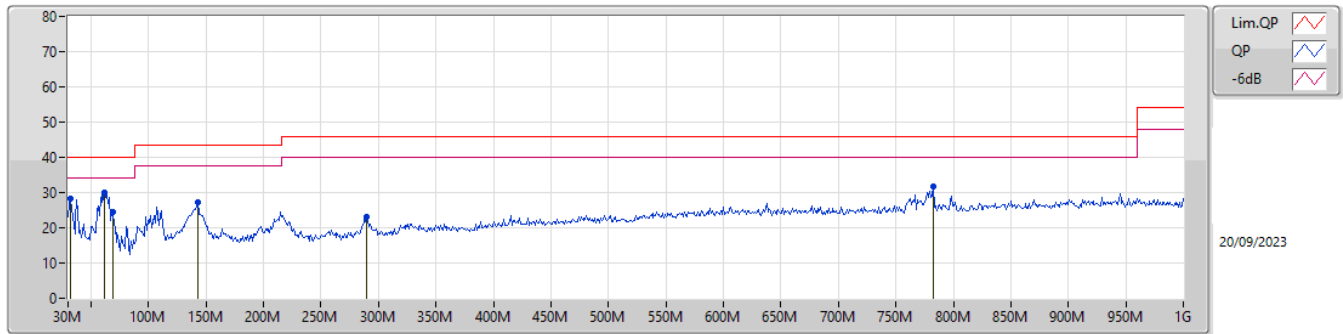
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 3	Pass	QP	31.94M	36.99	40.00	-3.01	Vertical

Mode 3



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
QP	31.94M	36.99	40.00	-3.01	-7.31	3	Vertical	162	2.00	"Worst"	44.30	23.26	0.65	31.22
QP	58.13M	35.43	40.00	-4.57	-17.84	3	Vertical	349	1.25	-	53.27	13.02	0.86	31.72
PK	67.83M	29.22	40.00	-10.78	-17.94	3	Vertical	197	1.00	-	47.16	12.89	0.91	31.74
PK	127M	25.57	43.50	-17.93	-12.40	3	Vertical	103	1.00	-	37.97	18.08	1.23	31.71
PK	357.86M	22.64	46.00	-23.36	-9.27	3	Vertical	2	1.25	-	31.91	20.48	2.07	31.82
PK	782.72M	30.95	46.00	-15.05	-3.48	3	Vertical	262	3.00	-	34.43	25.78	3.04	32.30

Mode 3



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
PK	31.94M	28.26	40.00	-11.74	-7.31	3	Horizontal	213	2.00	-	35.57	23.26	0.65	31.22
PK	62.01M	30.17	40.00	-9.83	-17.93	3	Horizontal	264	2.00	"Worst"	48.10	12.94	0.88	31.75
PK	68.8M	24.63	40.00	-15.37	-17.90	3	Horizontal	256	2.00	-	42.53	12.92	0.91	31.73
PK	142.52M	27.08	43.50	-16.42	-13.44	3	Horizontal	86	3.00	-	40.52	17.08	1.30	31.82
PK	289.96M	23.21	46.00	-22.79	-11.08	3	Horizontal	0	1.00	-	34.29	18.88	1.87	31.83
PK	782.72M	31.66	46.00	-14.34	-3.48	3	Horizontal	288	1.25	-	35.14	25.78	3.04	32.30

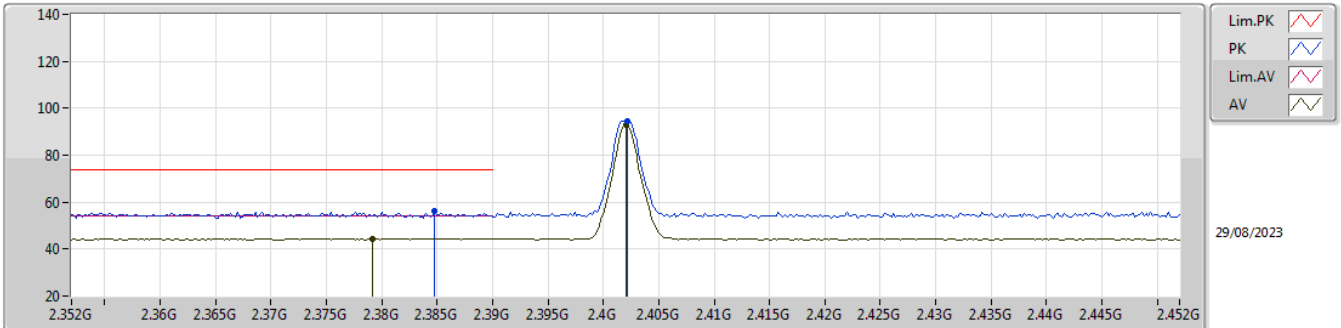


Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.4835G	45.62	54.00	-8.38	3	Horizontal	301	1.51	-

2.4-2.4835GHz_BT-LE(1Mbps)

2402MHz_TX

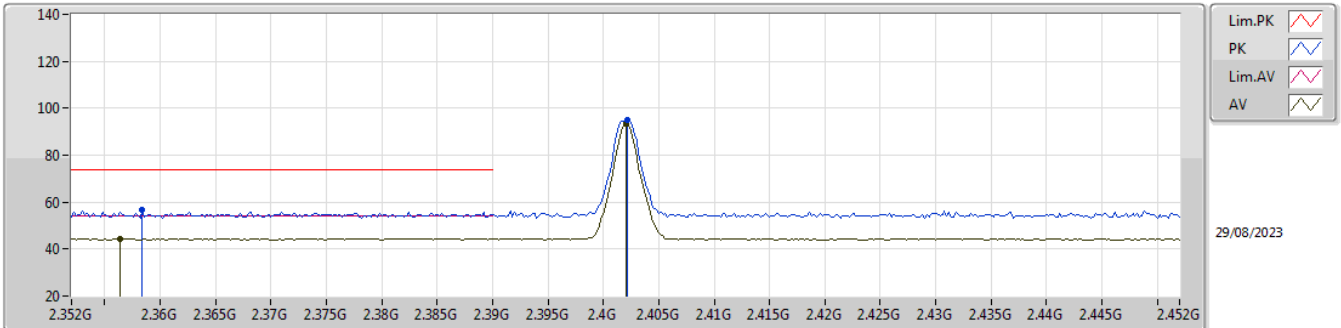


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3848G	56.01	74.00	-17.99	24.42	3	Vertical	109	3.00	-	28.40	3.19	-
AV	2.3792G	44.44	54.00	-9.56	12.86	3	Vertical	109	3.00	-	28.39	3.19	-
PK	2.4022G	94.73	Inf	-Inf	63.13	3	Vertical	109	3.00	-	28.40	3.20	-
AV	2.402G	93.17	Inf	-Inf	61.57	3	Vertical	109	3.00	-	28.40	3.20	-

2.4-2.4835GHz_BT-LE(1Mbps)

2402MHz_TX

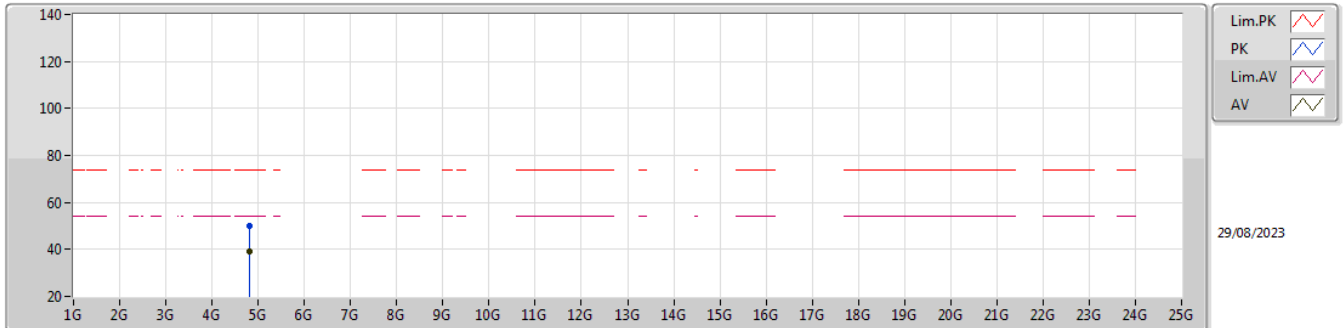


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3584G	56.68	74.00	-17.32	25.30	3	Horizontal	299	1.16	-	28.20	3.18	-
AV	2.3564G	44.39	54.00	-9.61	13.01	3	Horizontal	299	1.16	-	28.20	3.18	-
PK	2.4022G	94.79	Inf	-Inf	63.19	3	Horizontal	299	1.16	-	28.40	3.20	-
AV	2.402G	93.27	Inf	-Inf	61.67	3	Horizontal	299	1.16	-	28.40	3.20	-

2.4-2.4835GHz_BT-LE(1Mbps)

2402MHz_TX

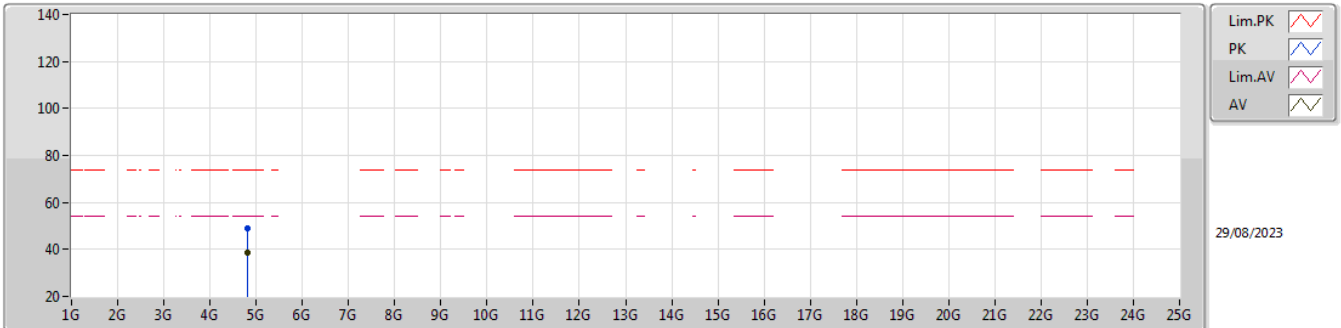


EUT_Z_1TX
Setting Default
02-D-P-5

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	4.80439G	50.07	74.00	-23.93	42.33	3	Vertical	28	2.59	-	32.83	5.60	30.69			
AV	4.80391G	38.94	54.00	-15.06	31.21	3	Vertical	28	2.59	-	32.82	5.60	30.69			

2.4-2.4835GHz_BT-LE(1Mbps)

2402MHz_TX

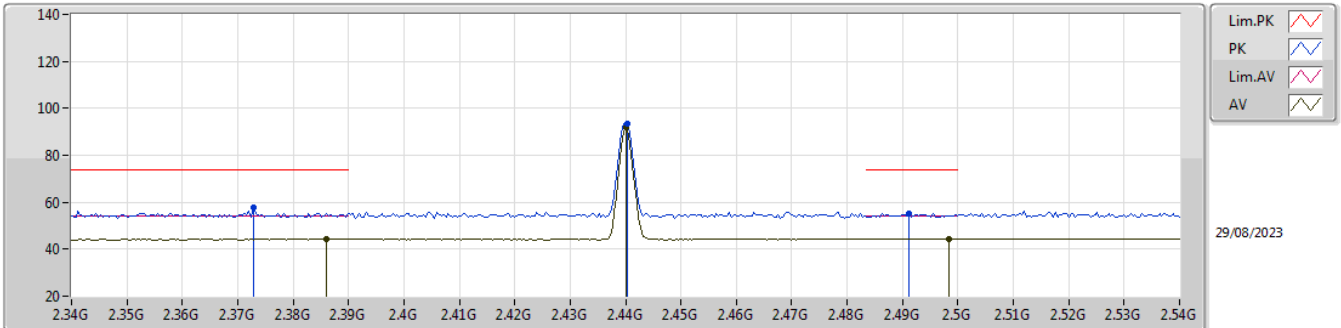


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.80401G	49.19	74.00	-24.81	41.46	3	Horizontal	288	1.08	-	32.82	5.60	30.69
AV	4.80383G	38.72	54.00	-15.28	30.99	3	Horizontal	288	1.08	-	32.82	5.60	30.69

2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX

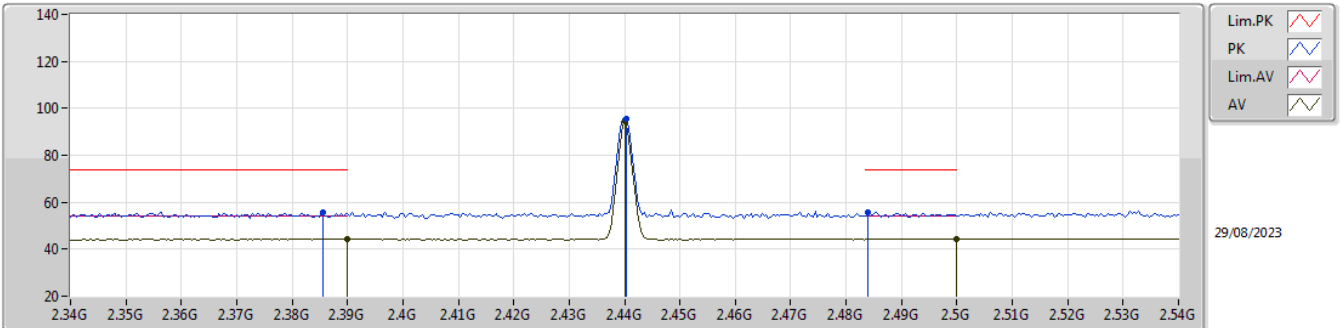


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3728G	57.53	74.00	-16.47	26.01	3	Vertical	99	2.96	-	28.33	3.19	-
AV	2.386G	44.33	54.00	-9.67	12.74	3	Vertical	99	2.96	-	28.40	3.19	-
PK	2.4404G	93.51	Inf	-Inf	61.89	3	Vertical	99	2.96	-	28.40	3.22	-
AV	2.44G	92.07	Inf	-Inf	60.45	3	Vertical	99	2.96	-	28.40	3.22	-
PK	2.4912G	55.19	74.00	-18.81	23.43	3	Vertical	99	2.96	-	28.51	3.25	-
AV	2.4984G	44.37	54.00	-9.63	12.54	3	Vertical	99	2.96	-	28.58	3.25	-

2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX

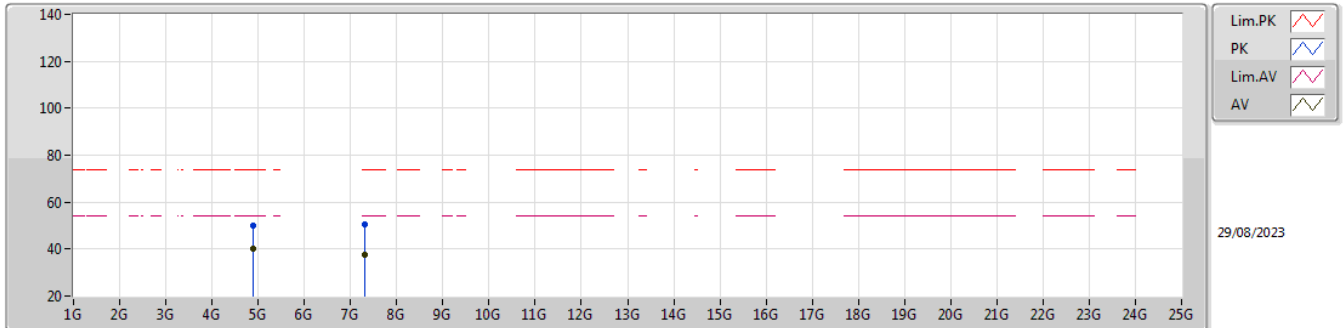


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3856G	55.81	74.00	-18.19	24.22	3	Horizontal	309	1.00	-	28.40	3.19	-
AV	2.39G	44.35	54.00	-9.65	12.75	3	Horizontal	309	1.00	-	28.40	3.20	-
PK	2.4404G	95.77	Inf	-Inf	64.15	3	Horizontal	309	1.00	-	28.40	3.22	-
AV	2.44G	94.27	Inf	-Inf	62.65	3	Horizontal	309	1.00	-	28.40	3.22	-
PK	2.484G	55.66	74.00	-18.34	23.92	3	Horizontal	309	1.00	-	28.50	3.24	-
AV	2.5G	44.40	54.00	-9.60	12.55	3	Horizontal	309	1.00	-	28.60	3.25	-

2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX

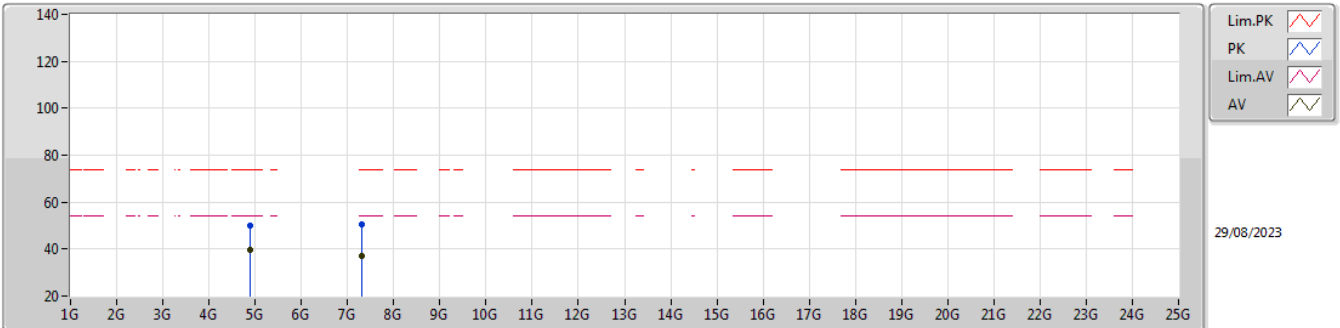


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.88048G	49.90	74.00	-24.10	41.74	3	Vertical	29	2.43	-	33.16	5.64	30.64
AV	4.88014G	40.12	54.00	-13.88	31.96	3	Vertical	29	2.43	-	33.16	5.64	30.64
PK	7.32143G	50.28	74.00	-23.72	38.92	3	Vertical	303	1.73	-	36.64	6.84	32.12
AV	7.31933G	37.33	54.00	-16.67	25.97	3	Vertical	303	1.73	-	36.64	6.84	32.12

2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX

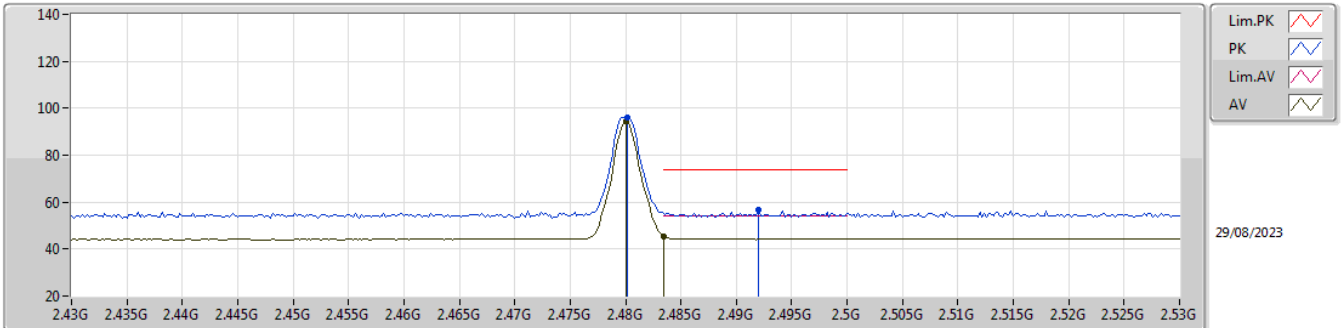


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.88064G	49.80	74.00	-24.20	41.64	3	Horizontal	287	1.00	-	33.16	5.64	30.64
AV	4.87979G	39.70	54.00	-14.30	31.54	3	Horizontal	287	1.00	-	33.16	5.64	30.64
PK	7.31863G	50.45	74.00	-23.55	39.09	3	Horizontal	237	1.16	-	36.64	6.84	32.12
AV	7.31978G	37.31	54.00	-16.69	25.95	3	Horizontal	237	1.16	-	36.64	6.84	32.12

2.4-2.4835GHz_BT-LE(1Mbps)

2480MHz_TX

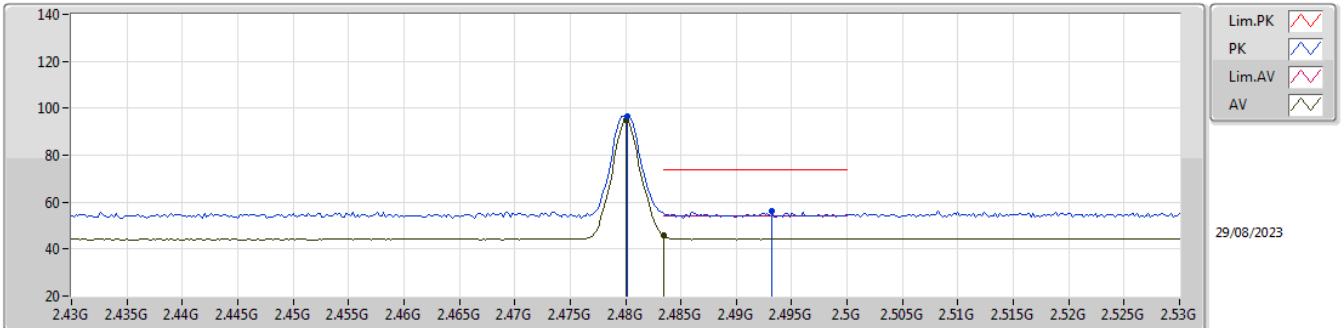


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4802G	96.12	Inf	-Inf	64.38	3	Vertical	243	2.87	-	28.50	3.24	-
AV	2.48G	94.61	Inf	-Inf	62.87	3	Vertical	243	2.87	-	28.50	3.24	-
PK	2.492G	56.61	74.00	-17.39	24.84	3	Vertical	243	2.87	-	28.52	3.25	-
AV	2.4835G	45.37	54.00	-8.63	13.63	3	Vertical	243	2.87	-	28.50	3.24	-

2.4-2.4835GHz_BT-LE(1Mbps)

2480MHz_TX

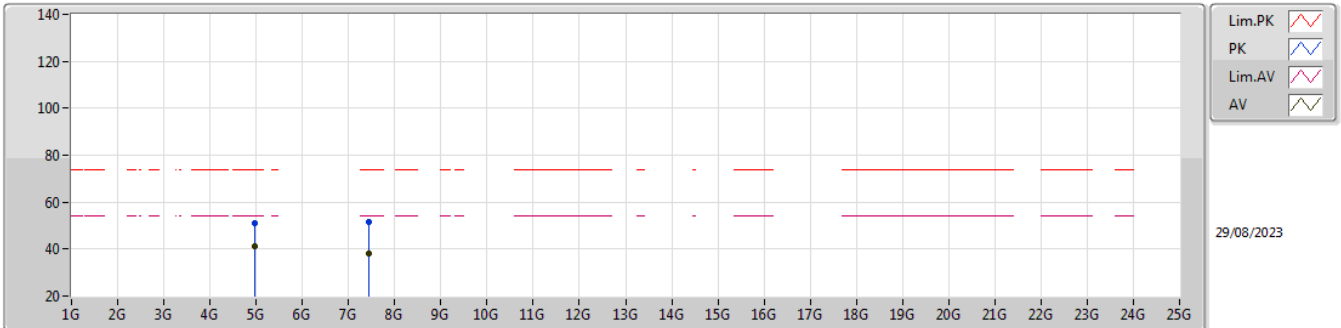


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4802G	96.46	Inf	-Inf	64.72	3	Horizontal	301	1.51	-	28.50	3.24	-
AV	2.48G	94.98	Inf	-Inf	63.24	3	Horizontal	301	1.51	-	28.50	3.24	-
PK	2.4932G	55.98	74.00	-18.02	24.20	3	Horizontal	301	1.51	-	28.53	3.25	-
AV	2.4835G	45.62	54.00	-8.38	13.88	3	Horizontal	301	1.51	-	28.50	3.24	-

2.4-2.4835GHz_BT-LE(1Mbps)

2480MHz_TX

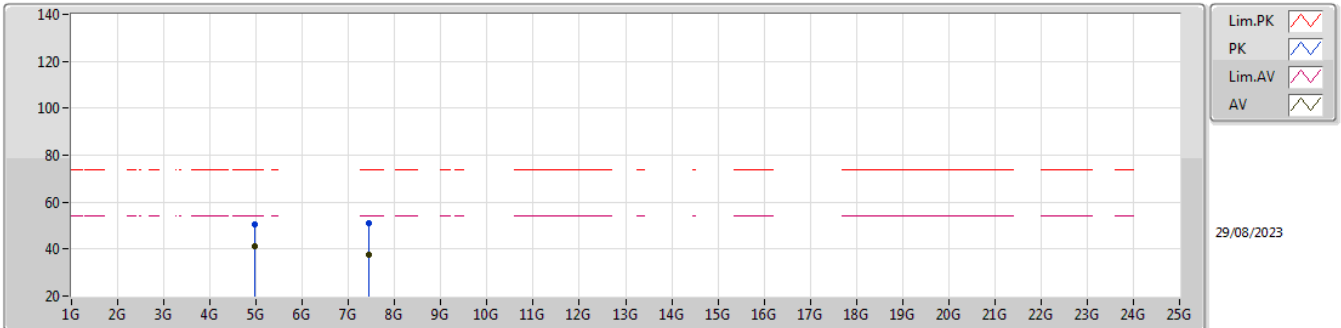


EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.95969G	50.94	74.00	-23.06	42.53	3	Vertical	32	2.91	-	33.32	5.68	30.59
AV	4.9599G	41.11	54.00	-12.89	32.70	3	Vertical	32	2.91	-	33.32	5.68	30.59
PK	7.43998G	51.55	74.00	-22.45	40.20	3	Vertical	283	1.80	-	36.70	6.84	32.19
AV	7.43878G	37.96	54.00	-16.04	26.61	3	Vertical	283	1.80	-	36.70	6.84	32.19

2.4-2.4835GHz_BT-LE(1Mbps)

2480MHz_TX



EUT_Z_1TX
Setting Default
02-D-P-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.95995G	50.67	74.00	-23.33	42.26	3	Horizontal	121	2.63	-	33.32	5.68	30.59
AV	4.95994G	41.07	54.00	-12.93	32.66	3	Horizontal	121	2.63	-	33.32	5.68	30.59
PK	7.43974G	51.09	74.00	-22.91	39.74	3	Horizontal	174	1.22	-	36.70	6.84	32.19
AV	7.44091G	37.68	54.00	-16.32	26.33	3	Horizontal	174	1.22	-	36.70	6.84	32.19