Testing Laboratory 3787

RADIO TEST REPORT

FCC ID	:	HEDOAP101
Equipment	:	Outdoor Access Point
Brand Name	:	Edgecore
Model Name	:	OAP101XYYYZ, OAP101eXYYYZ (Please refer to section 1.1.5 for detail information.)
Applicant	:	Accton Technology Corporation No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.
Manufacturer	:	Accton Technology Corporation No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.
Standard	:	47 CFR FCC Part 15.247

The product was received on Jun. 26, 2023, and testing was started from Jul. 10, 2023 and completed on Sep. 06, 2023. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

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

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History of this test report

Report No.	Version	Description	Issued Date
FR361450-02AC	01	Initial issue of report	Oct. 11, 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	-
Note: Reference to Sporton Project No.: 361450				

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:

1. 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.
2. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.

Reviewed by: Sam Chen
Report Producer: Vicky Huang

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(2Mbps)	2	1TX

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

1.1.2 Antenna Information

For EUT 1:

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Remark	Gain (dBi)
	Bluetooth	2.4GHz	5GHz						
1	1	-	-	Accton	KG458-160Y17U7X	PCB	I-PEX	Internal Ant.	Note1
2	-	1	-	Accton	KG458-150L17U7X	PCB	I-PEX	Internal Ant.	
3	-	2	-	Accton	KG458-250F17U7X	PCB	I-PEX	Internal Ant.	
4	-	-	1	Accton	KG459-200G17U7X	PCB	I-PEX	Internal Ant.	
5	-	-	2	Accton	KG459-405W17U7X	PCB	I-PEX	Internal Ant.	

Note1:

Ant.	Gain (dBi)		
	Bluetooth	2.4GHz	5GHz
1	5.91	-	-
2	-	5.67	-
3	-	5.99	-
4	-	-	6.91
5	-	-	6.29

Note 2: 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	$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{sp}}\left[\sum_{k=1}^{N_{ant}} g_{j,k}\right]^2}{N_{ANT}}\right]$
BF	$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{sp}}\left[\sum_{k=1}^{N_{ant}} g_{j,k}\right]^2}{N_{ANT}}\right]$	$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{sp}}\left[\sum_{k=1}^{N_{ant}} g_{j,k}\right]^2}{N_{ANT}}\right]$

Ex.

Directional Gain (NSS1) formula : $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{sp}}\left[\sum_{k=1}^{N_{ant}} g_{j,k}\right]^2}{N_{ANT}}\right]$

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

$gj,k = (Nss1(g1,1) + Nss1(g1,2))^2$

$DG = 10 \log[(Nss1(g1,1) + Nss1(g1,2))^2 / N_{ANT}] => 10 \log[(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}]$

Where ;

2.4G G1= 5.67 dBi ; G2= 5.99 dBi ;DG= 8.84dBi

5G G1= 6.91 dBi ; G2= 6.29 dBi ;DG= 9.62dBi

For EUT 2:

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Remark	Gain (dBi)
	Bluetooth	2.4GHz	5GHz						
1	1	-	-	Accton	KG458-160Y17U7X	PCB	I-PEX	Internal Ant.	Note3
2	-	1	-	Accton	KG458-150L17U7X	PCB	I-PEX	Internal Ant.	
3	-	2	-	Accton	KG458-250F17U7X	PCB	I-PEX	Internal Ant.	
4	-	-	1	Master Wave	98110UNXX001	Omni Dipole	I-PEX	External Ant.	
5	-	-	2	Master Wave	98110UNXX001	Omni Dipole	I-PEX	External Ant.	

Note3:

Ant.	Gain (dBi)			Cable Loss (dB)			Net Gain (dBi)		
	Bluetooth	2.4GHz	5GHz	Bluetooth	2.4GHz	5GHz	Bluetooth	2.4GHz	5GHz
1	5.91	-	-	-	-	-	-	-	-
2	-	5.67	-	-	-	-	-	-	-
3	-	5.99	-	-	-	-	-	-	-
4	-	-	6.54	-	-	1.1	-	-	5.44
5	-	-	6.54	-	-	2.13	-	-	4.41

Note4: 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	$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$
BF	$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$	$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

Ex.

Directional Gain (NSS1) formula : $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

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

$g_{j,k} = (Nss1(g1,1) + Nss1(g1,2))^2$

$DG = 10 \log[(Nss1(g1,1) + Nss1(g1,2))^2 / N_{ANT}] => 10 \log[(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}]$

Where ;

2.4G G1= 5.67 dBi ; G2= 5.99 dBi ;DG= 8.84dBi

5G G1= 5.44 dBi ; G2= 4.41 dBi ;DG= 7.95dBi

Note5: The above information was declared by manufacturer.
Note6: **For WLAN 2.4GHz function:**
For IEEE 802.11b/g/n/VHT/ax mode (2TX/2RX):
Port 1 and Port 2 can be use as transmitting/receiving antenna.
Port 1 and Port 2 could transmit/receive simultaneously.
For WLAN 5GHz function:
For IEEE 802.11a/n/ac/ax mode (2TX/2RX):
Port 1 and Port 2 can be use as transmitting/receiving antenna.
Port 1 and Port 2 could transmit/receive simultaneously
For Bluetooth function:
For Bluetooth mode (1TX/1RX):
Only Port 1 can be used as transmitting/receiving antenna.

1.1.3 Mode Test Duty Cycle

For EUT 1:

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(2Mbps)	0.341	4.67	212.813u	10k

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

1.1.4 EUT Operational Condition

EUT Power Type	From PoE or DC 48V			
Function	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	QRCT Version 4.0.00192.0			
Support Mode	☐	LE 1M PHY: 1 Mb/s		
	☐	LE Coded PHY (S=2): 500 Kb/s		
	☐	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 model names which are identical to each other in all aspects except for the following table:

EUT	Model Name	BT	2.4GHz	5GHz
1	OAP101XYYYZ (Note 1)	V	V	V (Internal Antenna)
2	OAP101eXYYYZ (Note 1)	V	V	V (External Antenna)

Note 1: The difference of "XYYYZ" would be marketing strategy X can be symbol “(”or “blank“Y can be “A~Z, a~z, 1~9 or blank and -“Z can be symbol “)”or “blank“

Note 2: The above information was declared by manufacturer.

Note 3: From the above models, model: OAP101(EUT 1) and OAP101e(EUT 2) was selected as representative model for the test and its data was recorded in this report for Emissions in Restricted Frequency Bands below 1GHz test.

Note 4: From the above models, model: OAP101e(EUT 2) was selected as representative model for the test and its data was recorded in this report for AC power-line conducted emissions test.

Note 5: From the above models, model: OAP101(EUT 1) was selected as representative model for the test and its data was recorded in this report for other test items.

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	Kevin Huang	23.2-24.6 / 62-74	Jul. 21, 2023~ Aug. 23, 2023
Radiated (Below 1GHz)	03CH06-CB	Stim Sung	23.7-24.8 / 56-59	Aug. 25, 2023
Radiated (Above 1GHz)	03CH02-CB	Ederson Huang	22-23 / 55-58	Jul. 11, 2023~ Sep. 06, 2023
AC Conduction	CO01-CB	Allen Chung	22~23 / 50~51	Jul. 10, 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%

2 Test Configuration of EUT

2.1 Test Channel Mode

For EUT 1:

Mode	Power Setting
BT-LE(2Mbps)	-
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 (Vout=48VDC)
Operating Mode	Normal Link
1	EUT 2 + Power from PoE
2	EUT 2 + Power from DC power supply (48V)
For operating mode 1 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	
Operating Mode	1	EUT 1

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
After evaluating, and the worst case was found at Y axis, so it was selected to perform test and its test result was written in the report.	
1	EUT 2 in Y axis + CTX-2.4GHz + Power from PoE
2	EUT 2 in Y axis + CTX-2.4GHz + Power from DC power supply (48V)
Mode 1 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 ~ 4 will follow this same test mode.	
3	EUT 2 in Y axis + CTX-5GHz + Power from PoE
4	EUT 2 in Y axis + CTX-Bluetooth + Power from PoE
Mode 1 has been evaluated to be the worst case among Mode 1~4, thus measurement for Mode 5 will follow this same test mode.	
5	EUT 1 in Y axis + CTX-2.4GHz + Power from PoE
For operating mode 1 is the worst case and it was record in this test report.	

Operating Mode > 1GHz	CTX
After evaluating, and the worst case was found at Y axis, so it was selected to perform test and its test result was written in the report.	
1	EUT 1 in Y axis

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	EUT 1-WLAN 2.4GHz+WLAN 5GHz+Bluetooth
2	EUT 2-WLAN 2.4GHz+WLAN 5GHz+Bluetooth
Refer to Sporton Test Report No.: FA361450-02 for Co-location RF Exposure Evaluation.	

Note: The PoEs are for measurement only, would not be marketed.

PoEs information as below:

Power	Brand	Model
PoE 1	CISCO	MA-INJ-4
PoE 2	GOSpower	G0720-480-050

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
DC Jack*1
Sealing Collar*3

2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	PoE 1	CISCO	MA-INJ-4	N/A
B	PoE NB	DELL	E6430	N/A
C	LAN NB	DELL	E6430	N/A
D	2.4G NB	DELL	E6430	N/A
E	5G NB	DELL	E6430	N/A
F	Smart Phone	Samsung	Galaxy J7	N/A

For Radiated (below 1GHz):

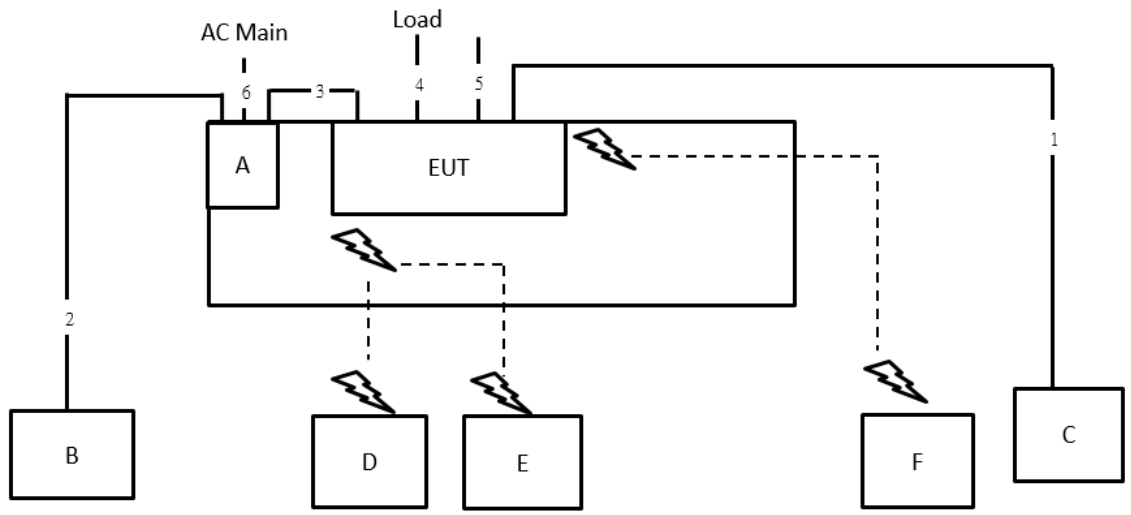
Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A
B	PoE 2	GOSpower	G0720-480-050	N/A

For Radiated (above 1GHz) and RF Conducted:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	NB	DELL	E4300	N/A
B	PoE	CISCO	MA-INJ-4	N/A

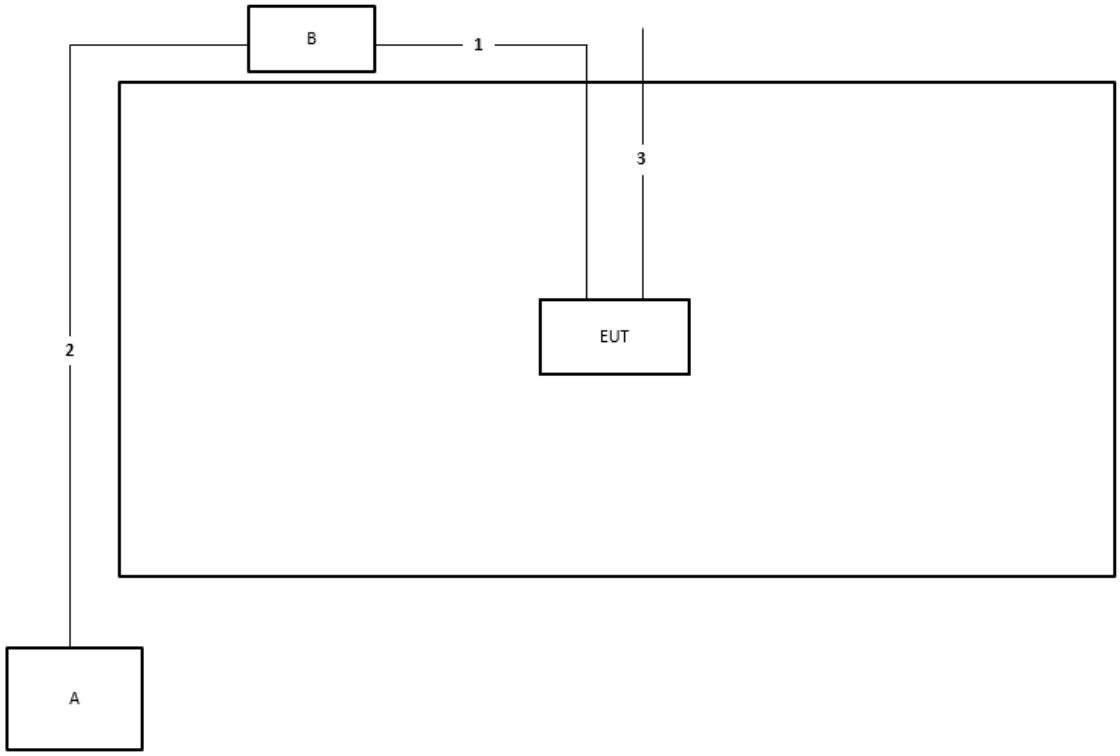
2.6 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



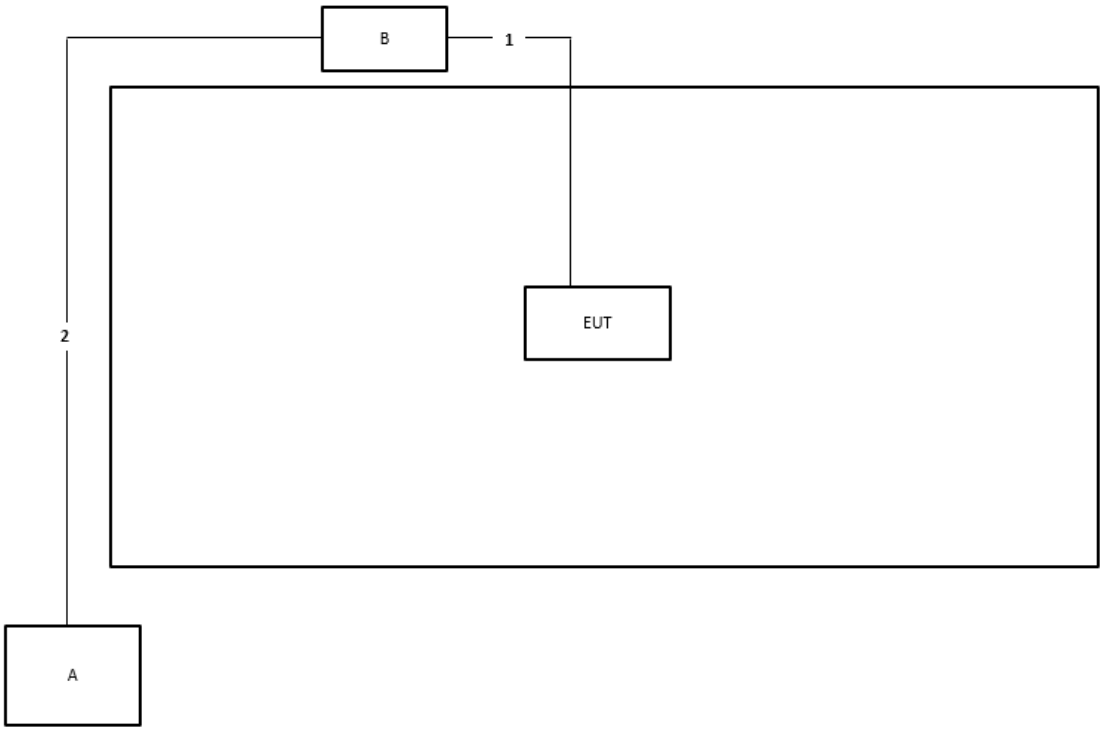
Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	3m
4	Console cable	No	1.8m
5	Ground cable	No	1.8m
6	Power cable	No	0.8m

Test Setup Diagram - Radiated Test < 1GHz



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Ground cable	No	1.8m

Test Setup Diagram - Radiated Test > 1GHz



Item	Connection	Shielded	Length
1	RJ-45 cable	No	1.5m
2	RJ-45 cable	No	10m

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

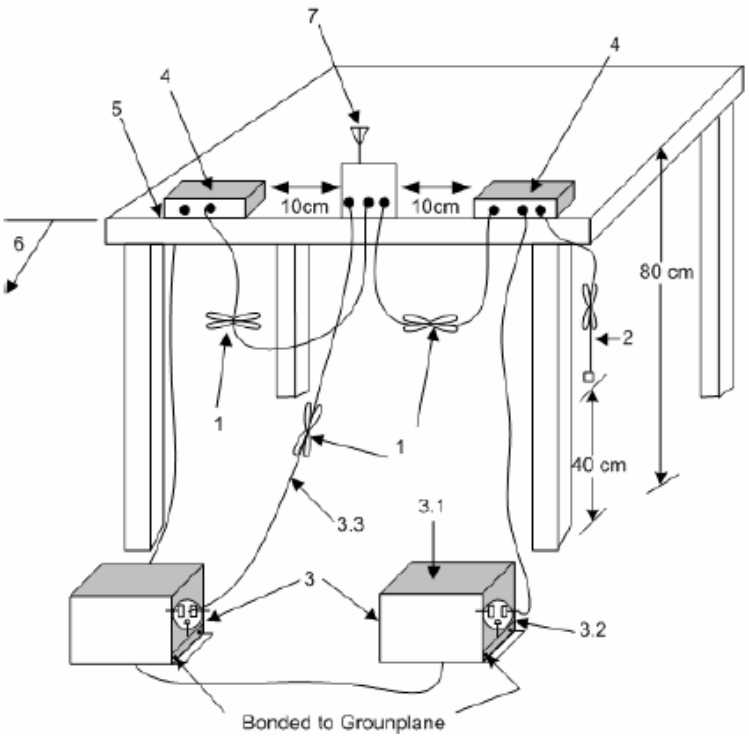
Refer a test equipment and calibration data table in this test report.

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

AC Power-line Conducted Emissions



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

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.

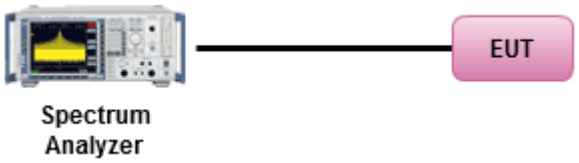
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
▪ 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.

3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)	
	▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)$ dBm	
	▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm	
	▪ Smart antenna system (SAS):	
		- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3 + 8$dB dBm
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-1A. (alternative)
	duty cycle < 98% and average over on/off periods with duty factor
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
	☐ Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
	Measurement using a power meter (PM)
	☐ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
	☒ Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)


3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

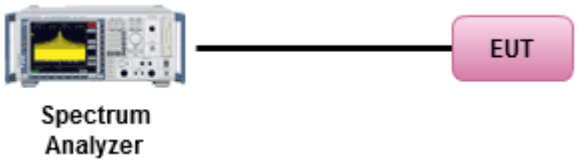
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method		
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).		
	☒ Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD.	
	[duty 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

Power Spectral Density


3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (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

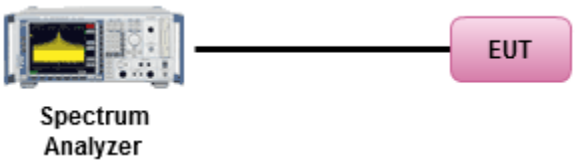
Refer a test equipment and calibration data table in this test report.

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

Emissions in Non-restricted Frequency Bands



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

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

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

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

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

3.6.2 Measuring Instruments

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

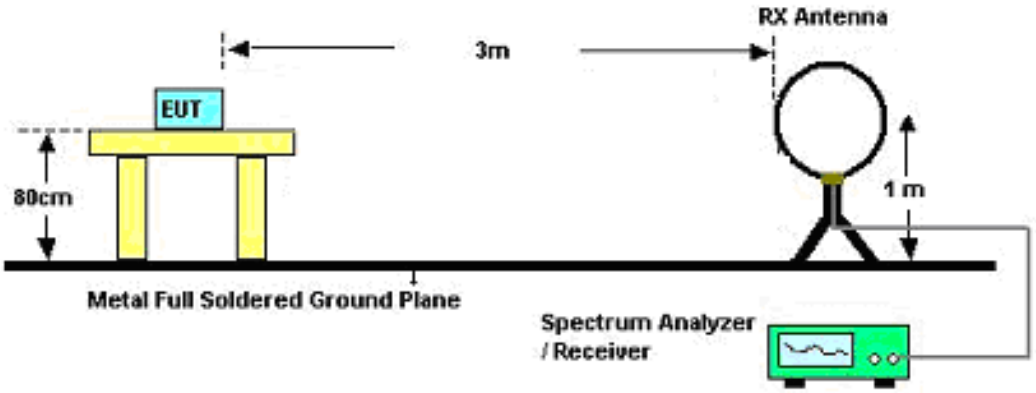
3.6.3 Test Procedures

Test Method		
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
▪ Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.		
▪ For the transmitter unwanted emissions shall be measured using following options below:		
	▪ Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.	
		☐ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle ≥98%).
		☐ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
		☒ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW≥1/T).
		☐ Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐ Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
		☒ Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
▪ For the transmitter band-edge emissions shall be measured using following options below:		
	▪ Refer as FCC KDB 558074 clause 8.7 & c63.10 clause 11.13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.	
	▪ Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.	
	▪ Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).	
	▪ For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB	
	▪ For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.	

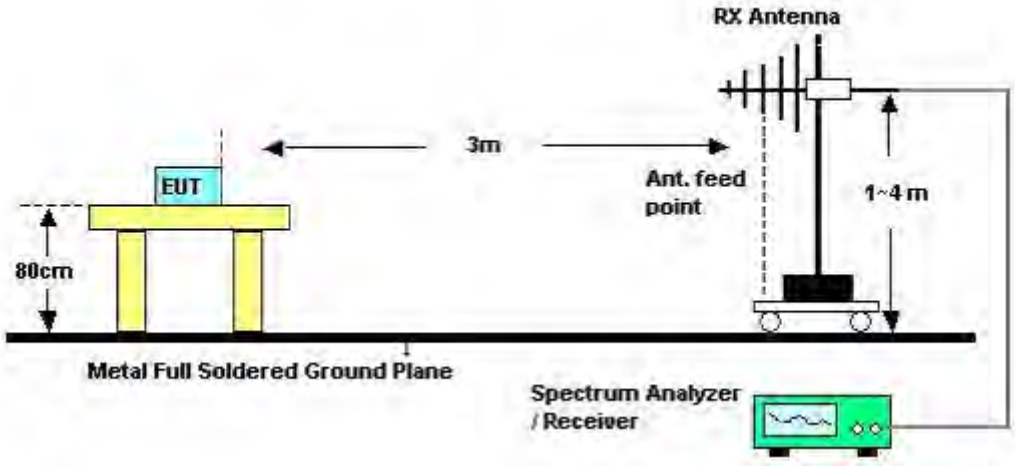
3.6.4 Test Setup

Emissions in Restricted Frequency Bands

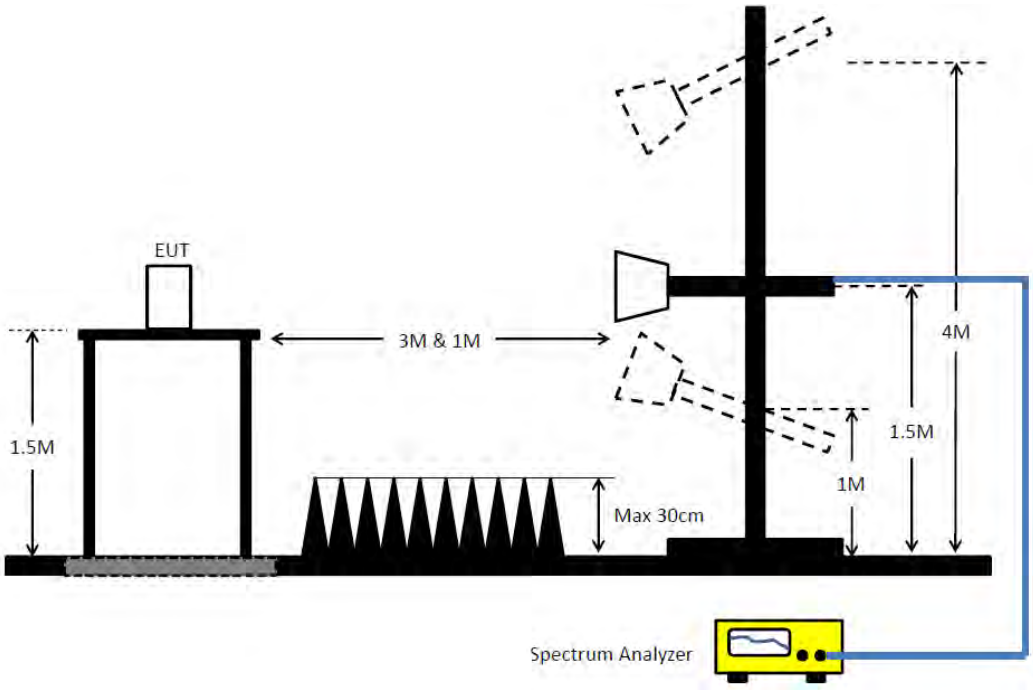
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



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-50-16-2	04083	150kHz ~ 100MHz	Feb. 16, 2023	Feb. 15, 2024	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Apr. 27, 2023	Apr. 26, 2024	Conduction (CO01-CB)
Pulse Limiter	Rohde& Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Feb. 09, 2023	Feb. 08, 2024	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	Oct. 18, 2022	Oct. 17, 2023	Conduction (CO01-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6120	31244	9kHz - 30 MHz	Mar. 23, 2023	Mar. 22, 2024	Radiation (03CH06-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH06-CB	30 MHz ~ 1 GHz	Aug. 03, 2023	Aug. 02. 2024	Radiation (03CH06-CB)
Bilog Antenna with 6 dB attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37878 & AT-N0606	20MHz ~ 2GHz	Jul. 30, 2023	Jul. 29, 2024	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	310N	187290	0.1MHz ~ 1GHz	Nov. 04, 2022	Nov. 03, 2023	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Dec. 21, 2022	Dec. 20, 2023	Radiation (03CH06-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 13, 2023	Jun. 12, 2024	Radiation (03CH06-CB)
RF Cable-low	Woken	RG402	Low Cable-24+68	30MHz~1GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH06-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH06-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)
Pre-Amplifier	SGH	SGH184	20221107-3	18GHz ~ 40GHz	Nov. 16, 2022	Nov. 15, 2023	Radiation (03CH02-CB)
Spectrum analyzer	R&S	FSU	100015	9kHz~26GHz	Dec. 05, 2022	Dec. 04, 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	1GHz ~ 18GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH02-CB)
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	1726195	300MHz~40GHz	Sep. 04, 2022	Sep. 03, 2023	Conducted (TH03-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 04, 2022	Sep. 03, 2023	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)

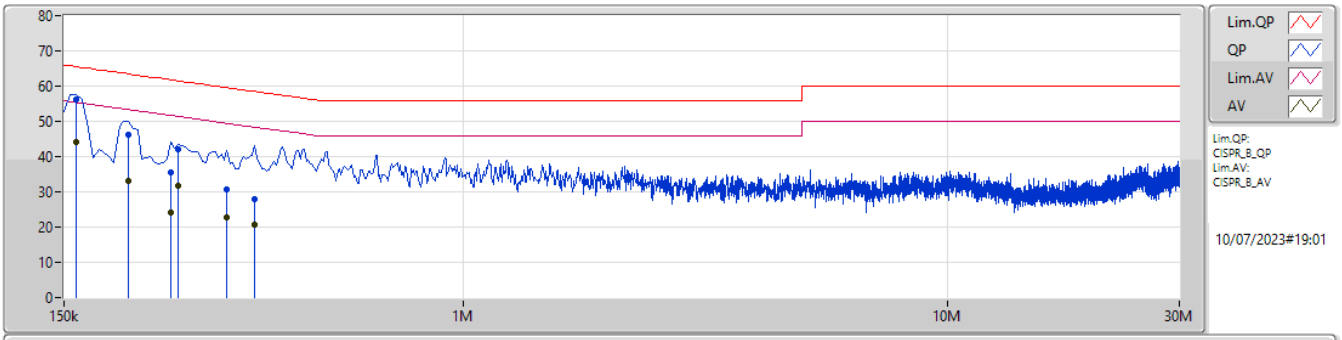
Note: Calibration Interval of instruments listed above is one year.

NCR means Non-Calibration required.

Summary

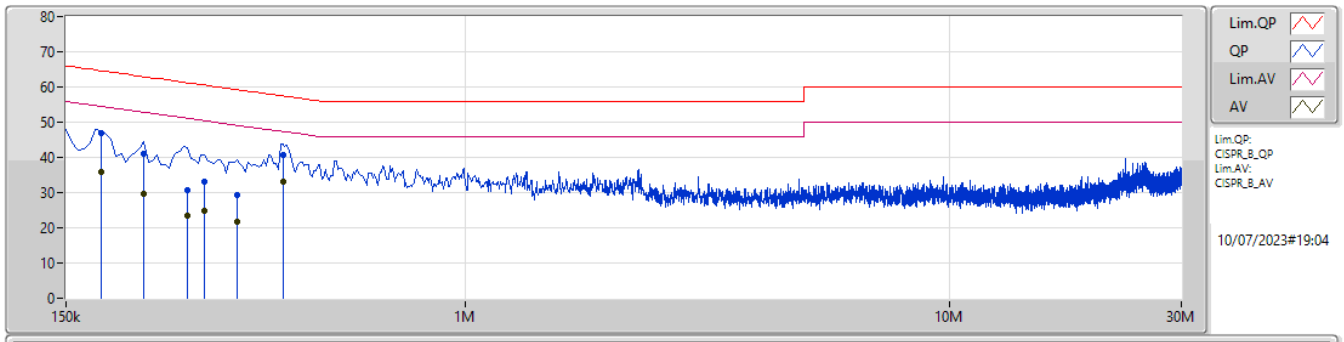
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	159k	56.08	65.52	-9.44	Line

Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	159k	56.08	65.52	-9.44	10.00	Line	"Worst"	46.08	0.09	0.04	9.87
AV	159k	44.08	55.52	-11.44	10.00	Line	-	34.08	0.09	0.04	9.87
QP	204k	46.13	63.44	-17.31	9.98	Line	-	36.15	0.08	0.04	9.86
AV	204k	33.19	53.44	-20.25	9.98	Line	-	23.21	0.08	0.04	9.86
QP	249k	35.42	61.79	-26.37	10.00	Line	-	25.42	0.08	0.05	9.87
AV	249k	24.15	51.79	-27.64	10.00	Line	-	14.15	0.08	0.05	9.87
QP	258k	42.00	61.49	-19.49	10.00	Line	-	32.00	0.08	0.05	9.87
AV	258k	31.57	51.49	-19.92	10.00	Line	-	21.57	0.08	0.05	9.87
QP	325.5k	30.55	59.56	-29.01	10.03	Line	-	20.52	0.09	0.05	9.89
AV	325.5k	22.69	49.56	-26.87	10.03	Line	-	12.66	0.09	0.05	9.89
QP	370.5k	28.00	58.49	-30.49	10.05	Line	-	17.95	0.09	0.06	9.90
AV	370.5k	20.59	48.49	-27.90	10.05	Line	-	10.54	0.09	0.06	9.90

Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	177k	46.82	64.62	-17.80	9.98	Neutral	-	36.84	0.07	0.04	9.87
AV	177k	36.00	54.62	-18.62	9.98	Neutral	-	26.02	0.07	0.04	9.87
QP	217.5k	41.00	62.92	-21.92	9.97	Neutral	-	31.03	0.07	0.04	9.86
AV	217.5k	29.57	52.92	-23.35	9.97	Neutral	-	19.60	0.07	0.04	9.86
QP	267k	30.58	61.20	-30.62	10.00	Neutral	-	20.58	0.07	0.05	9.88
AV	267k	23.46	51.20	-27.74	10.00	Neutral	-	13.46	0.07	0.05	9.88
QP	289.5k	32.95	60.53	-27.58	10.00	Neutral	-	22.95	0.07	0.05	9.88
AV	289.5k	24.86	50.53	-25.67	10.00	Neutral	-	14.86	0.07	0.05	9.88
QP	339k	29.41	59.23	-29.82	10.02	Neutral	-	19.39	0.07	0.06	9.89
AV	339k	21.87	49.23	-27.36	10.02	Neutral	-	11.85	0.07	0.06	9.89
QP	420k	40.83	57.45	-16.62	10.03	Neutral	-	30.80	0.07	0.06	9.90
AV	420k	33.20	47.45	-14.25	10.03	Neutral	"Worst"	23.17	0.07	0.06	9.90

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(2Mbps)	1.158M	2.039M	2M04F1D	1.143M	2.026M

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

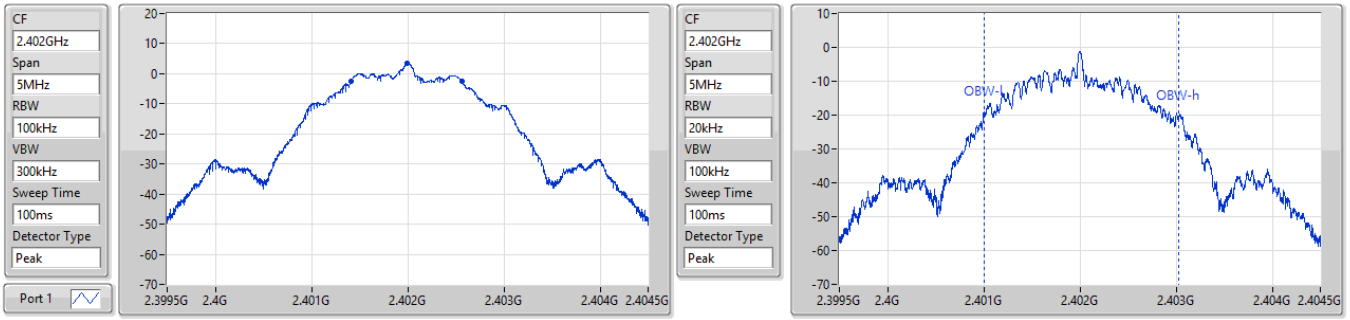
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.153M	2.026M
2440MHz	Pass	500k	1.158M	2.039M
2480MHz	Pass	500k	1.143M	2.026M

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

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

2402MHz

24/07/2023

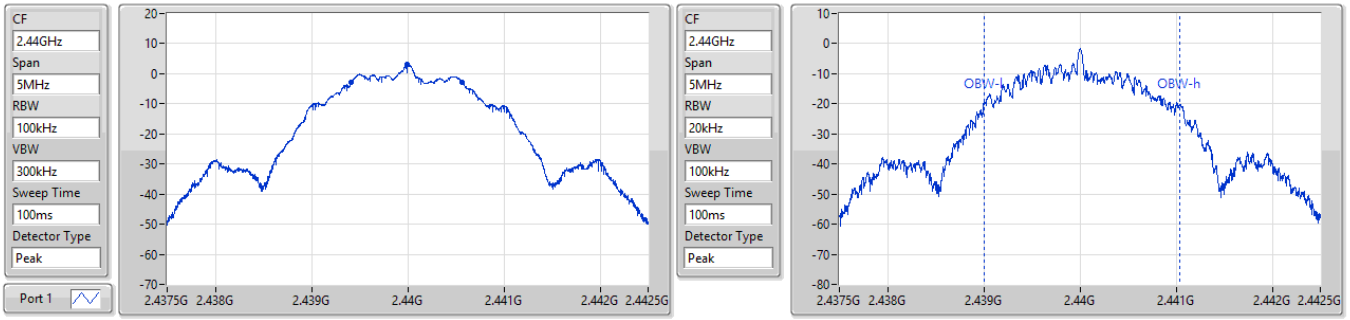


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.153M	2.40141G	2.402563G	2.026M	2.401005G	2.403032G	500k	1

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

2440MHz

24/07/2023

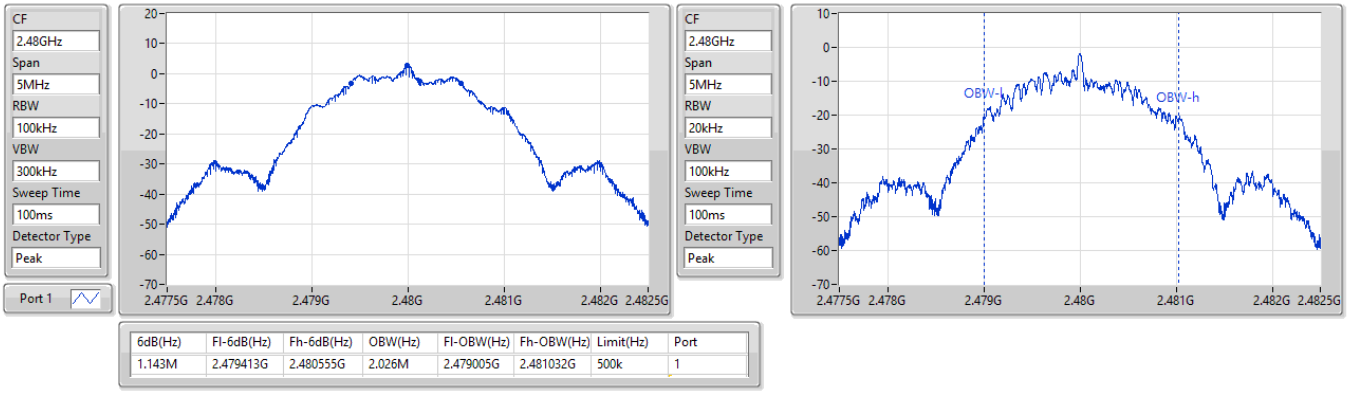


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.158M	2.439413G	2.44057G	2.039M	2.439G	2.441039G	500k	1

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

2480MHz

24/07/2023



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.143M	2.479413G	2.480555G	2.026M	2.479005G	2.481032G	500k	1

Summary

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(2Mbps)	3.13	0.00206

Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	5.91	3.13	30.00
2440MHz	Pass	5.91	2.81	30.00
2480MHz	Pass	5.91	2.52	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(2Mbps)	-14.42

RBW = 3kHz;

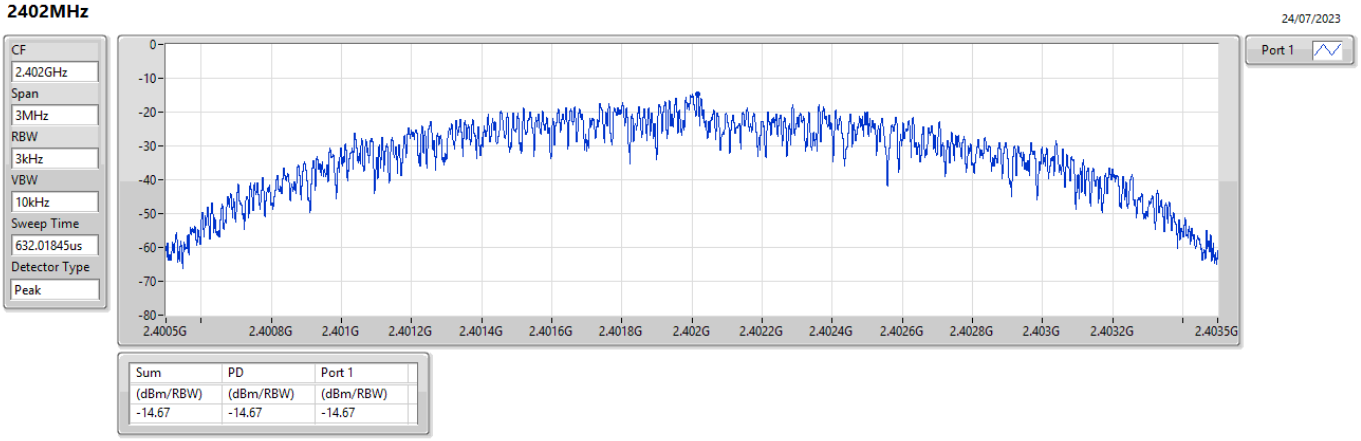
Result

Mode	Result	DG (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	5.91	-14.67	8.00
2440MHz	Pass	5.91	-14.42	8.00
2480MHz	Pass	5.91	-14.53	8.00

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

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

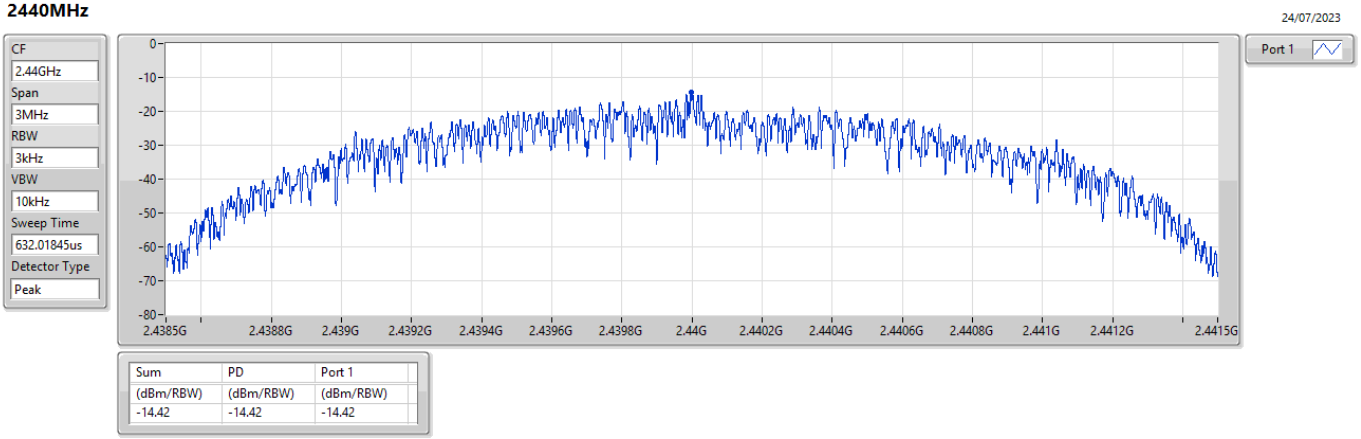
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.67	-14.67	-14.67

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

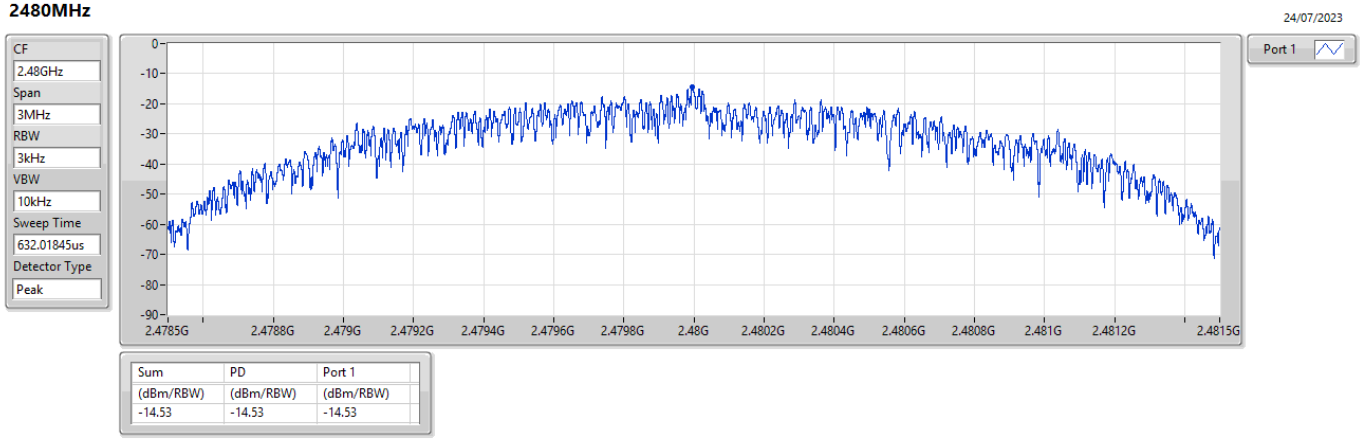
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.42	-14.42	-14.42

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

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.53	-14.53	-14.53

Summary

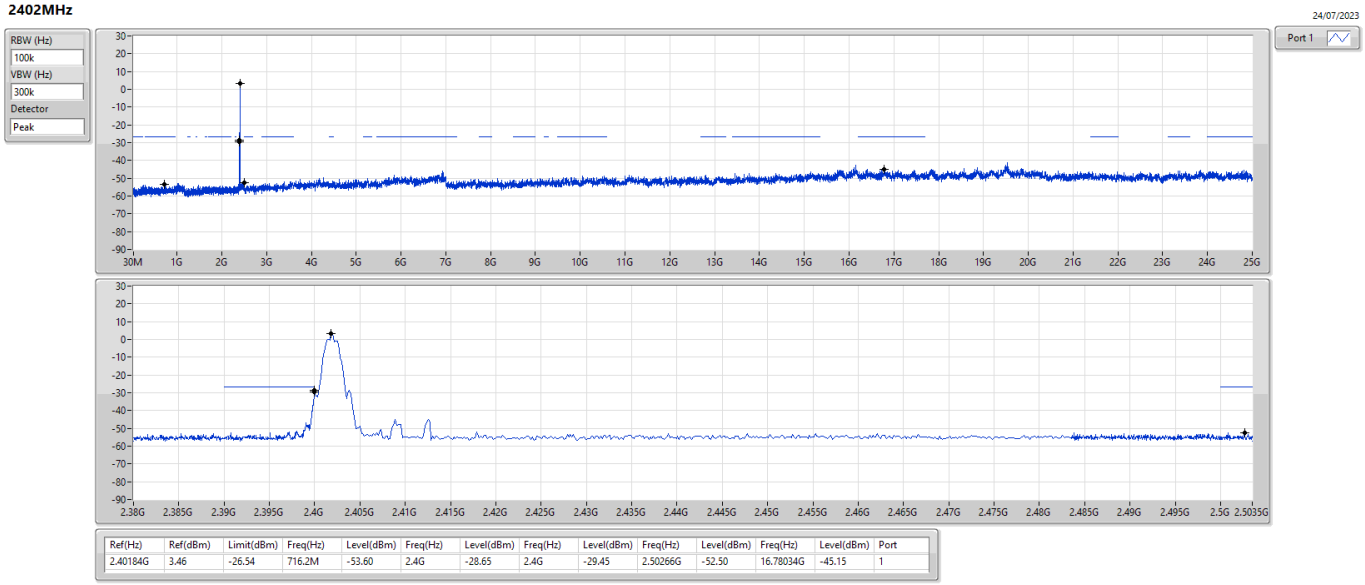
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(2Mbps)	Pass	2.40184G	3.46	-26.54	716.2M	-53.60	2.4G	-28.65	2.4G	-29.45	2.50266G	-52.50	16.78034G	-45.15	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(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40184G	3.46	-26.54	716.2M	-53.60	2.4G	-28.65	2.4G	-29.45	2.50266G	-52.50	16.78034G	-45.15	1
2440MHz	Pass	2.40184G	3.46	-26.54	848.98M	-53.10	2.39564G	-52.78	2.4G	-55.57	2.50058G	-53.86	16.40071G	-44.39	1
2480MHz	Pass	2.40184G	3.46	-26.54	1.92645G	-52.53	2.39532G	-53.22	2.4G	-54.21	2.50166G	-52.59	17.60146G	-43.38	1

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

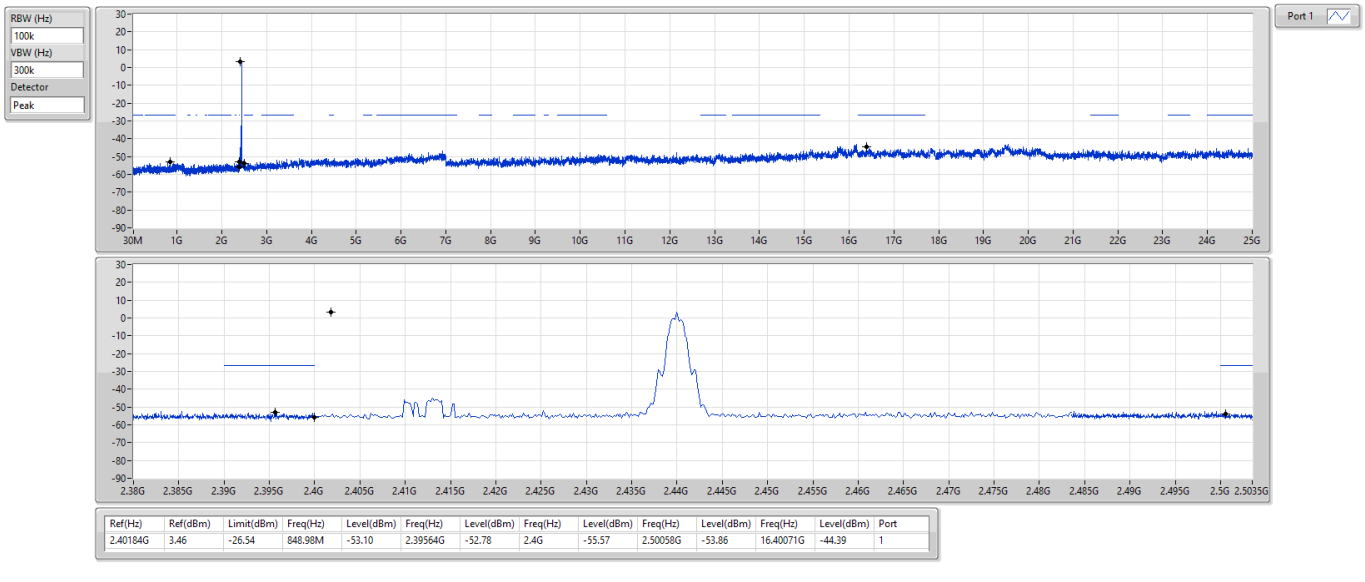
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40184G	3.46	-26.54	716.2M	-53.60	2.4G	-28.65	2.4G	-29.45	2.50266G	-52.50	16.78034G	-45.15	1

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

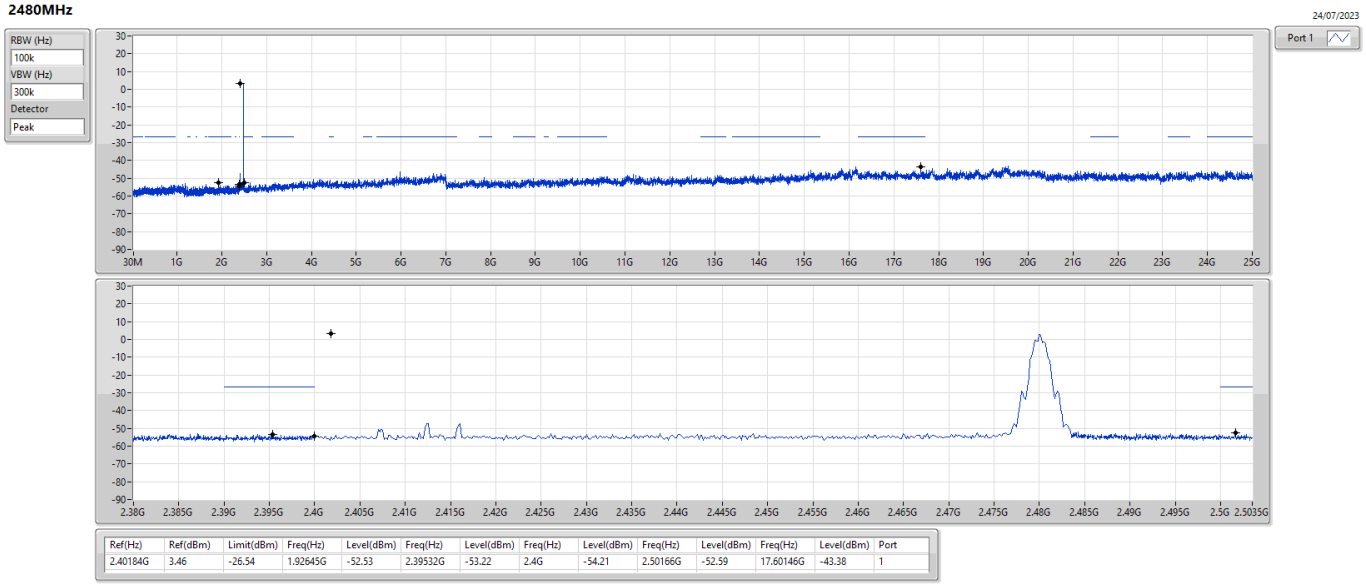
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40184G	3.46	-26.54	848.98M	-53.10	2.39564G	-52.78	2.4G	-55.57	2.50058G	-53.86	16.40071G	-44.39	1

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

2480MHz

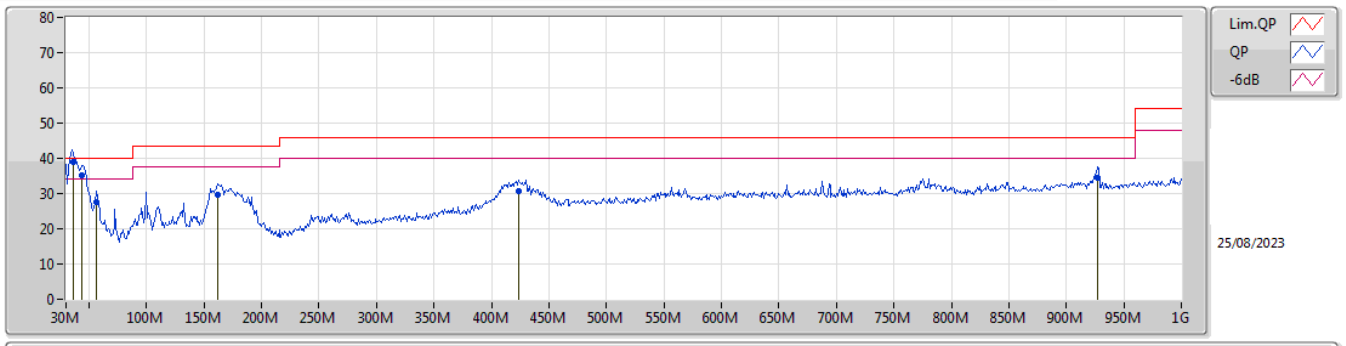


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40184G	3.46	-26.54	1.92645G	-52.53	2.39532G	-53.22	2.4G	-54.21	2.50166G	-52.59	17.60146G	-43.38	1

Summary

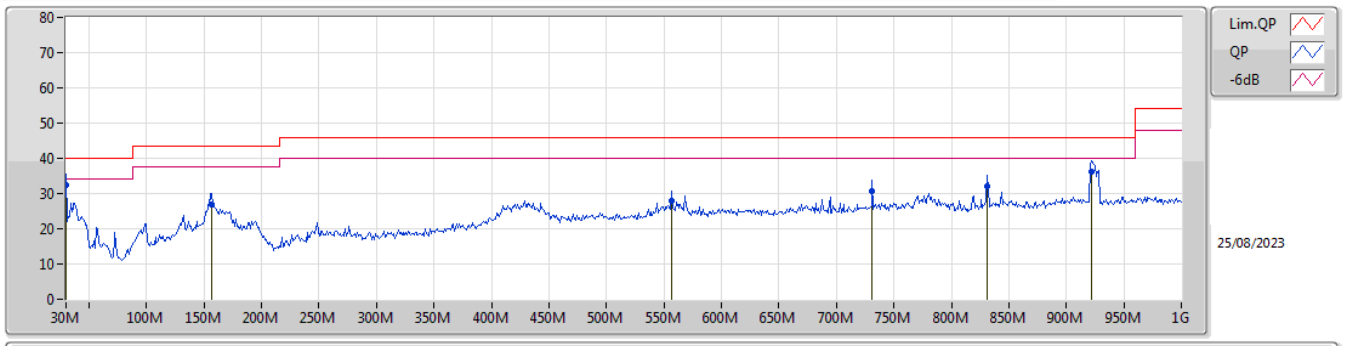
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	QP	36.40M	38.90	40.00	-1.10	Vertical

Mode 1



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV/m)	(dB/m)	(dB)	(dB)
QP	36.40M	38.90	40.00	-1.10	-10.21	3	Vertical	254	1.00	"Worst"	49.11	20.87	1.00	32.08
QP	43.58M	35.04	40.00	-4.96	-13.71	3	Vertical	272	1.00	-	48.75	17.38	1.07	32.16
QP	56.19M	27.65	40.00	-12.35	-18.01	3	Vertical	178	1.00	-	45.66	13.11	1.10	32.22
QP	161.92M	29.81	43.50	-13.69	-14.21	3	Vertical	174	1.25	-	44.02	16.14	1.71	32.06
QP	423.82M	30.72	46.00	-15.28	-6.09	3	Vertical	281	1.25	-	36.81	22.53	2.85	31.47
QP	927.25M	34.55	46.00	-11.45	-0.05	3	Vertical	15	2.00	-	34.60	26.45	4.25	30.75

Mode 1



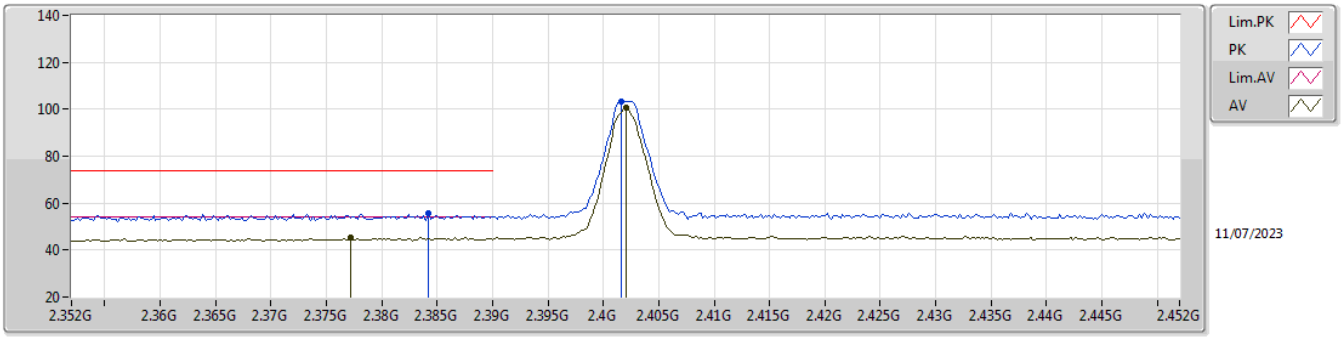
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV/m)	(dB/m)	(dB)	(dB)
QP	30M	32.50	40.00	-7.50	-7.24	3	Horizontal	332	1.25	"Worst"	39.74	23.80	0.90	31.94
QP	157.07M	26.90	43.50	-16.60	-14.14	3	Horizontal	180	1.25	-	41.04	16.24	1.69	32.07
QP	556.71M	27.79	46.00	-18.21	-3.53	3	Horizontal	184	1.50	-	31.32	24.93	3.21	31.67
QP	731.31M	30.72	46.00	-15.28	-2.47	3	Horizontal	130	1.00	-	33.19	25.41	3.73	31.61
QP	831.22M	32.02	46.00	-13.98	-1.37	3	Horizontal	224	1.00	-	33.39	25.93	3.96	31.26
QP	922.4M	36.33	46.00	-9.67	-0.00	3	Horizontal	358	1.50	-	36.33	26.56	4.24	30.80

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(2Mbps)	Pass	AV	2.4835G	49.77	54.00	-4.23	3	Vertical	298	1.67	-

2.4-2.4835GHz_BT-LE(2Mbps)

2402MHz_TX

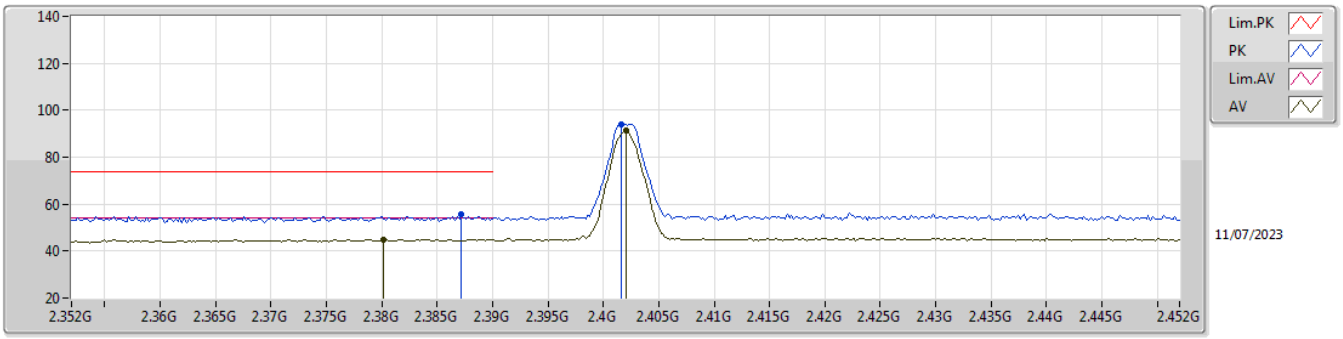


EUT Y_1TX
Setting Default
02-F-E-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3842G	55.68	74.00	-18.32	24.09	3	Vertical	282	1.29	-	28.40	3.19	-
AV	2.3772G	45.20	54.00	-8.80	13.64	3	Vertical	282	1.29	-	28.37	3.19	-
PK	2.4016G	103.50	Inf	-Inf	71.90	3	Vertical	282	1.29	-	28.40	3.20	-
AV	2.402G	100.65	Inf	-Inf	69.05	3	Vertical	282	1.29	-	28.40	3.20	-

2.4-2.4835GHz_BT-LE(2Mbps)

2402MHz_TX

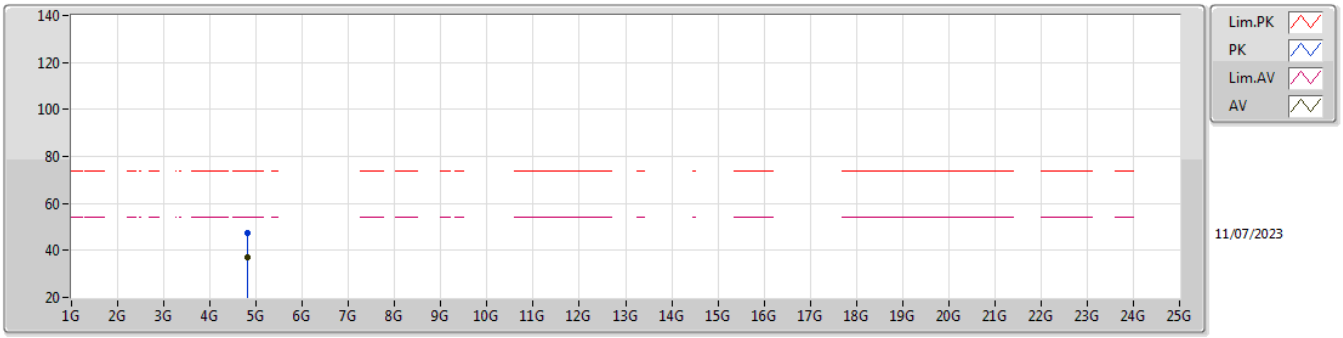


EUT Y_1TX
Setting Default
02-F-E-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3872G	55.69	74.00	-18.31	24.10	3	Horizontal	191	1.84	-	28.40	3.19	-
AV	2.3802G	45.00	54.00	-9.00	13.41	3	Horizontal	191	1.84	-	28.40	3.19	-
PK	2.4016G	94.13	Inf	-Inf	62.53	3	Horizontal	191	1.84	-	28.40	3.20	-
AV	2.402G	91.22	Inf	-Inf	59.62	3	Horizontal	191	1.84	-	28.40	3.20	-

2.4-2.4835GHz_BT-LE(2Mbps)

2402MHz_TX

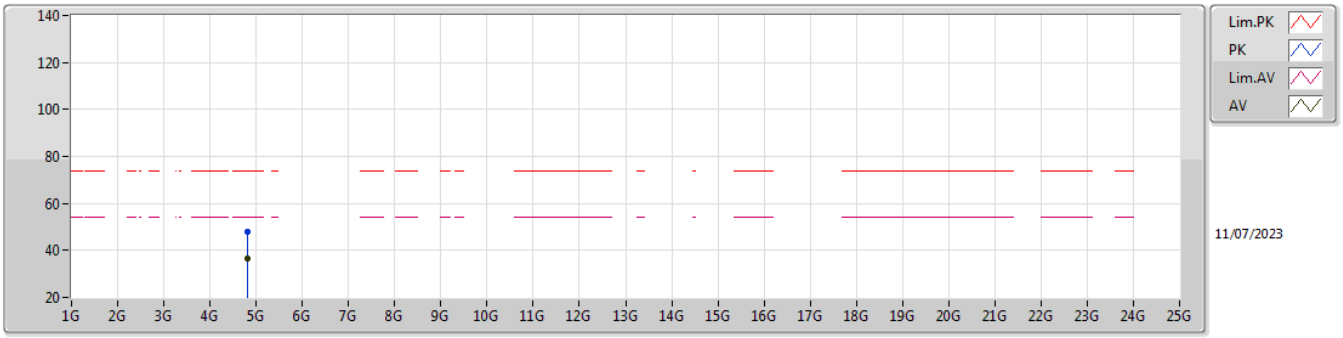


EUT Y_1TX
Setting Default
02-F-E-5

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	4.8096G	47.59	74.00	-26.41	39.82	3	Vertical	360	1.80	-	32.86	5.60	30.69
AV	4.8064G	37.25	54.00	-16.75	29.50	3	Vertical	360	1.80	-	32.84	5.60	30.69

2.4-2.4835GHz_BT-LE(2Mbps)

2402MHz_TX

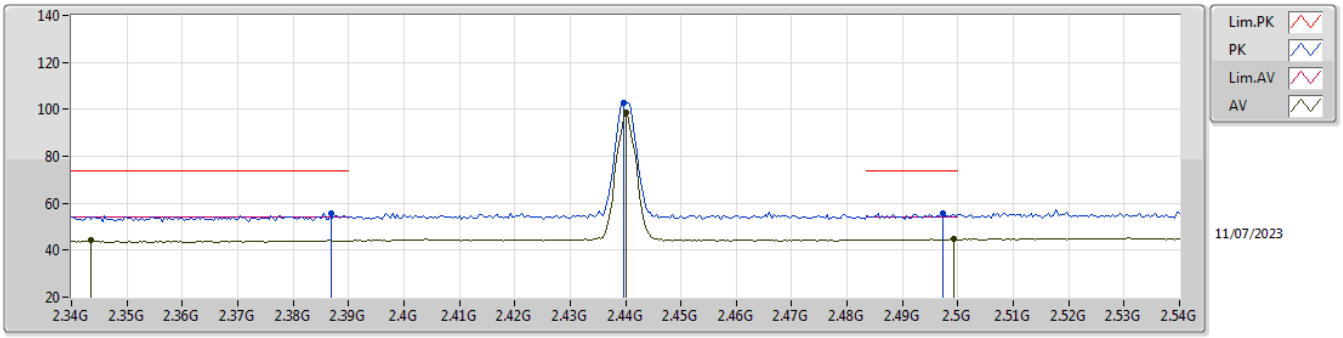


EUT Y_1TX
Setting Default
02-F-E-5

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	4.80968G	47.99	74.00	-26.01	40.22	3	Horizontal	27	1.72	-	32.86	5.60	30.69
AV	4.805G	36.68	54.00	-17.32	28.94	3	Horizontal	27	1.72	-	32.83	5.60	30.69

2.4-2.4835GHz_BT-LE(2Mbps)

2440MHz_TX

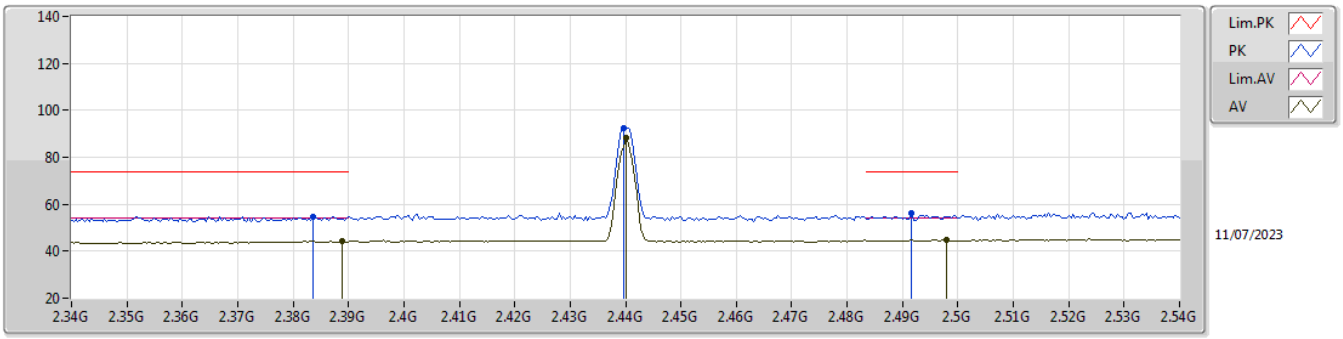


EUT Y_1TX
Setting Default
02-F-E-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3868G	55.78	74.00	-18.22	24.19	3	Vertical	288	1.80	-	28.40	3.19	-
AV	2.3436G	44.16	54.00	-9.84	12.85	3	Vertical	288	1.80	-	28.14	3.17	-
PK	2.4396G	102.73	Inf	-Inf	71.11	3	Vertical	288	1.80	-	28.40	3.22	-
AV	2.44G	98.49	Inf	-Inf	66.87	3	Vertical	288	1.80	-	28.40	3.22	-
PK	2.4972G	55.53	74.00	-18.47	23.71	3	Vertical	288	1.80	-	28.57	3.25	-
AV	2.4992G	44.81	54.00	-9.19	12.97	3	Vertical	288	1.80	-	28.59	3.25	-

2.4-2.4835GHz_BT-LE(2Mbps)

2440MHz_TX

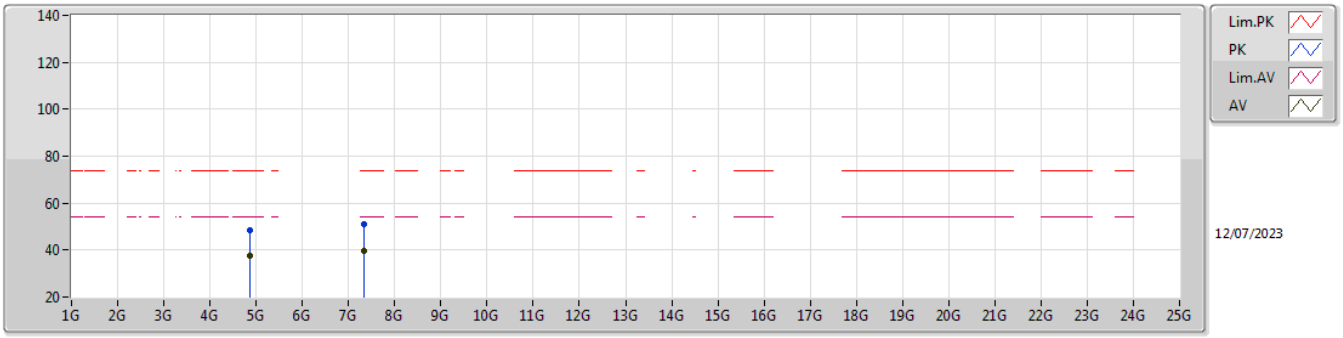


EUT Y_1TX
Setting Default
02-F-E-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.3836G	54.87	74.00	-19.13	23.28	3	Horizontal	193	2.46	-	28.40	3.19	-
AV	2.3888G	44.22	54.00	-9.78	12.63	3	Horizontal	193	2.46	-	28.40	3.19	-
PK	2.4396G	92.48	Inf	-Inf	60.86	3	Horizontal	193	2.46	-	28.40	3.22	-
AV	2.44G	88.29	Inf	-Inf	56.67	3	Horizontal	193	2.46	-	28.40	3.22	-
PK	2.4916G	56.10	74.00	-17.90	24.33	3	Horizontal	193	2.46	-	28.52	3.25	-
AV	2.498G	44.68	54.00	-9.32	12.85	3	Horizontal	193	2.46	-	28.58	3.25	-

2.4-2.4835GHz_BT-LE(2Mbps)

2440MHz_TX

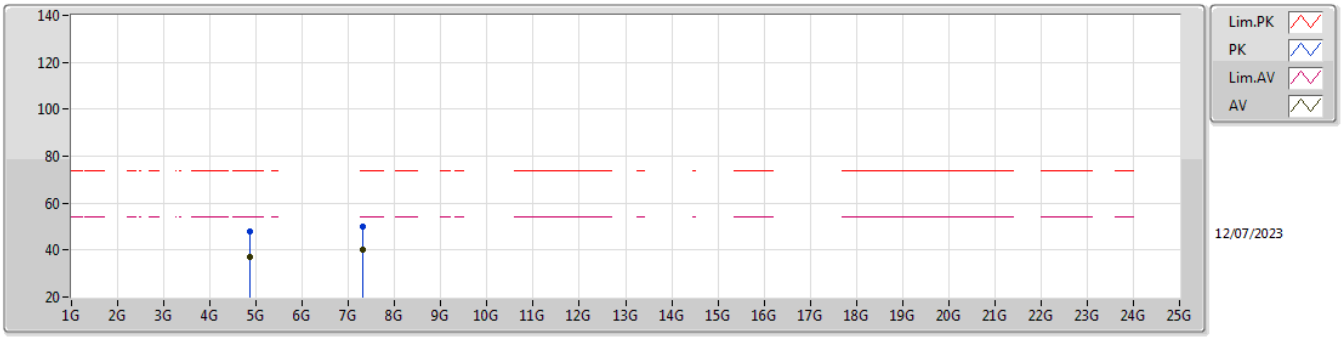


EUT Y_1TX
Setting Default
02-F-E-5

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	4.87044G	48.64	74.00	-25.36	40.51	3	Vertical	352	2.40	-	33.14	5.64	30.65
AV	4.87324G	37.38	54.00	-16.62	29.23	3	Vertical	352	2.40	-	33.15	5.64	30.64
PK	7.32644G	50.83	74.00	-23.17	39.46	3	Vertical	325	1.80	-	36.65	6.84	32.12
AV	7.32392G	39.88	54.00	-14.12	28.51	3	Vertical	325	1.80	-	36.65	6.84	32.12

2.4-2.4835GHz_BT-LE(2Mbps)

2440MHz_TX

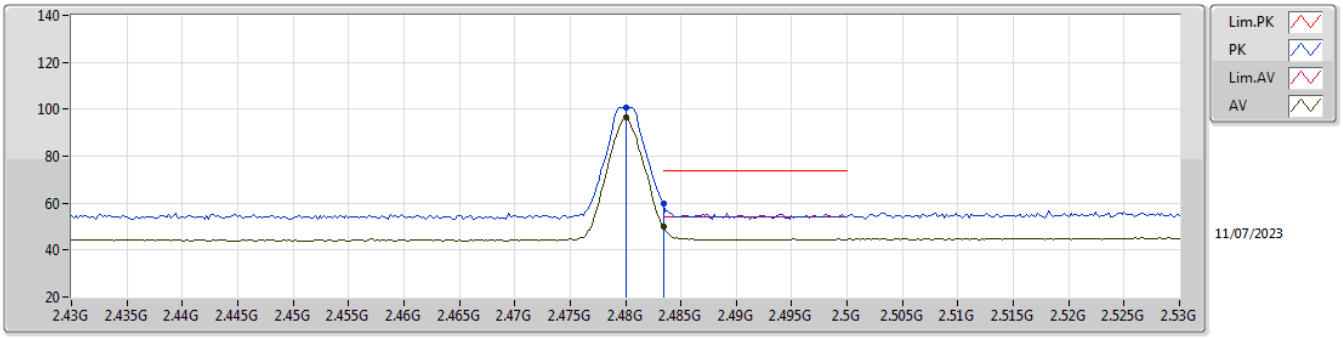


EUT Y_1TX
Setting Default
02-F-E-5

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	4.87644G	48.14	74.00	-25.86	39.99	3	Horizontal	12	2.48	-	33.15	5.64	30.64
AV	4.87652G	36.86	54.00	-17.14	28.71	3	Horizontal	12	2.48	-	33.15	5.64	30.64
PK	7.3172G	50.15	74.00	-23.85	38.80	3	Horizontal	169	1.86	-	36.63	6.84	32.12
AV	7.31452G	40.14	54.00	-13.86	28.79	3	Horizontal	169	1.86	-	36.63	6.84	32.12

2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX

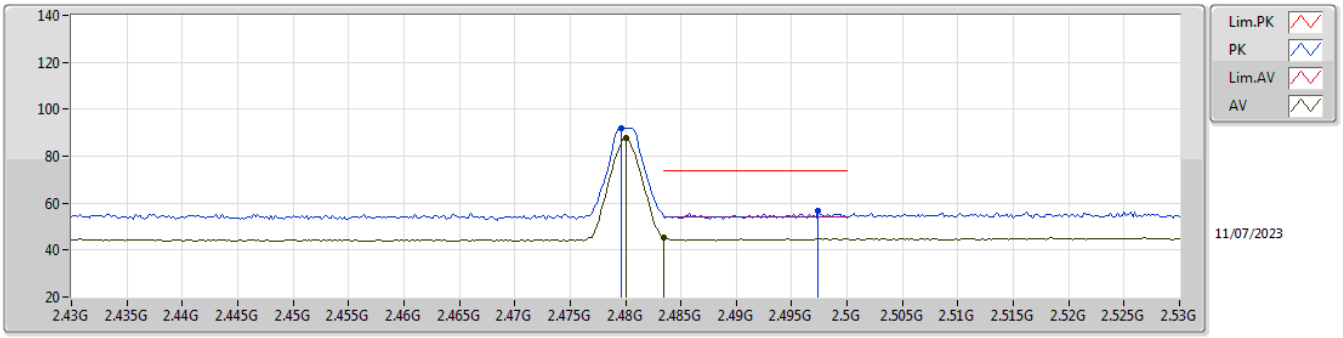


EUT Y_1TX
Setting Default
02-F-E-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.48G	100.82	Inf	-Inf	69.08	3	Vertical	298	1.67	-	28.50	3.24	-
AV	2.48G	96.37	Inf	-Inf	64.63	3	Vertical	298	1.67	-	28.50	3.24	-
PK	2.4835G	59.77	74.00	-14.23	28.03	3	Vertical	298	1.67	-	28.50	3.24	-
AV	2.4835G	49.77	54.00	-4.23	18.03	3	Vertical	298	1.67	-	28.50	3.24	-

2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX

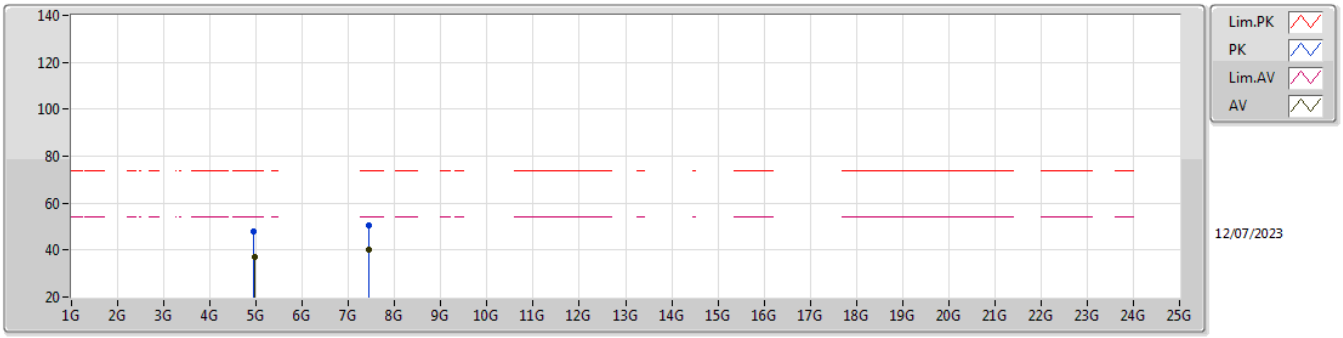


EUT Y_1TX
Setting Default
02-F-E-5

Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	2.4796G	92.11	Inf	-Inf	60.37	3	Horizontal	240	2.81	-	28.50	3.24	-
AV	2.48G	88.00	Inf	-Inf	56.26	3	Horizontal	240	2.81	-	28.50	3.24	-
PK	2.4974G	56.68	74.00	-17.32	24.86	3	Horizontal	240	2.81	-	28.57	3.25	-
AV	2.4835G	45.28	54.00	-8.72	13.54	3	Horizontal	240	2.81	-	28.50	3.24	-

2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX

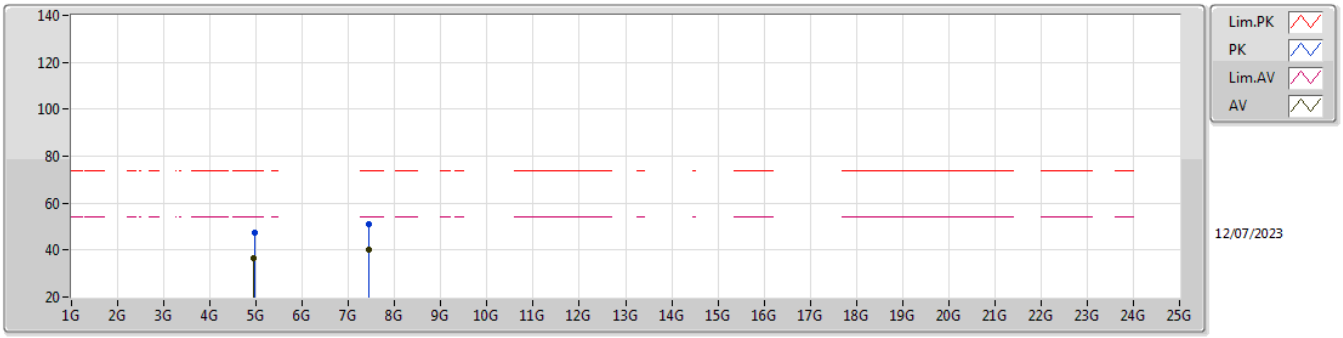


EUT Y_1TX
Setting Default
02-F-E-5

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	4.95368G	48.16	74.00	-25.84	39.76	3	Vertical	202	2.18	-	33.31	5.68	30.59
AV	4.95684G	36.94	54.00	-17.06	28.54	3	Vertical	202	2.18	-	33.31	5.68	30.59
PK	7.4372G	50.52	74.00	-23.48	39.16	3	Vertical	318	1.80	-	36.70	6.84	32.18
AV	7.43688G	40.43	54.00	-13.57	29.07	3	Vertical	318	1.80	-	36.70	6.84	32.18

2.4-2.4835GHz_BT-LE(2Mbps)

2480MHz_TX



EUT Y_1TX
Setting Default
02-F-E-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	4.96532G	47.51	74.00	-26.49	39.08	3	Horizontal	246	2.34	-	33.33	5.68	30.58
AV	4.95564G	36.62	54.00	-17.38	28.22	3	Horizontal	246	2.34	-	33.31	5.68	30.59
PK	7.43028G	50.80	74.00	-23.20	39.45	3	Horizontal	87	1.43	-	36.70	6.83	32.18
AV	7.43416G	40.05	54.00	-13.95	28.70	3	Horizontal	87	1.43	-	36.70	6.83	32.18