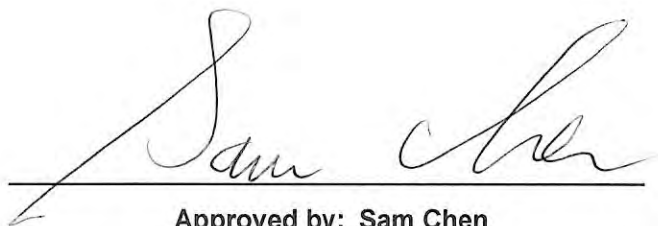


RADIO TEST REPORT

FCC ID : O6ZP21KW
Equipment : Wireless Streaming Device
Brand Name : DIRECTV
Model Name : P21KW-500
Applicant : HUMAX Co., Ltd.
HUMAX BLDG., 2, Yeongmun-ro, Cheoin-gu ,
Yongin-si, Gyeonggi-do, South Korea
Manufacturer : HUMAX Co., Ltd.
HUMAX BLDG., 2, Yeongmun-ro, Cheoin-gu ,
Yongin-si, Gyeonggi-do, South Korea
Standard : 47 CFR FCC Part 15.247

The product was received on Oct. 11, 2022, and testing was started from Oct. 13, 2022 and completed on Nov. 30, 2022. 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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TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A10_6 Ver1.3



Summary of Test Result

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

Declaration of Conformity:

1. The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to report "Measurement Uncertainty".

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

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(1Mbps)	1.0	1TX

Note:

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

1.1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	2.4GHz	5GHz	Bluetooth					
0	1	1	1	Galtronics	DB1	PCB	N/A	Note1
1	2	2	-	Galtronics	DB2	PCB	N/A	

Note1:

Ant.	Antenna Gain (dBi)					
	WLAN 2.4GHz	WLAN 5GHz UNII 1	WLAN 5GHz UNII 2A	WLAN 5GHz UNII 2C	WLAN 5GHz UNII 3	Bluetooth
1	4.471	3.208	3.208	3.937	3.684	4.471
2	2.976	3.4	3.783	4.269	3.872	-

Note1: The above information was declared by manufacturer.

Note2: Directional gain information

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

Ex.

Directional Gain (NSS1) formula :

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

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

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

$$DG = 10 \log[(NSS1(g1,1) + NSS1(g1,2))^2 / N_{ANT}] \Rightarrow 10 \log[(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}]$$

Where ;

G1 = Ant 1 Gain ; G2 = Ant 2 Gain

(NSS1)

2.4GHz DG = 6.766 dBi

5 GHz U-NII-1 DG = 6.315 dBi

5 GHz U-NII-2A DG = 6.511 dBi

5 GHz U-NII-2C DG = 7.115 dBi

5 GHz U-NII-3 DG = 6.789 dBi

For 2.4GHz function:

For IEEE 802.11b/g/n/ax mode (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 mode (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

For Bluetooth mode (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) $\geq 1/T$
BT-LE(1Mbps)	0.85	0.71	2.124m	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	TeraTerm v4.75			
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.

1.2 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	23.5~24.1 / 52~59	Oct. 15, 2022~ Oct. 17, 2022
Radiated (below 1GHz)	03CH05-CB	RJ Huang	22.4~24.4 / 56~60	Oct. 27, 2022~ Nov. 30, 2022
Radiated (above 1GHz)	03CH03-CB	RJ Huang	23.1~23.6 / 56~60	Oct. 13, 2022~ Oct. 27, 2022
Radiated (co-location)	03CH05-CB	RJ Huang	22.4~24.4 / 56~60	Oct. 13, 2022~ Oct. 27, 2022
AC Conduction	CO02-CB	Elvin Yeh	22~24 / 58~61	Oct. 28, 2022



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)	3.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	5.2 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.7 dB	Confidence levels of 95%
Conducted Emission	3.2 dB	Confidence levels of 95%
Output Power Measurement	0.8 dB	Confidence levels of 95%
Power Density Measurement	3.2 dB	Confidence levels of 95%
Bandwidth Measurement	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	CTX
1	WLAN 2.4G
2	WLAN 5G
3	Bluetooth
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

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
The EUT was performed at X axis, Y axis and Z axis position, and 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 at Z-axis+WLAN 2.4G
2	EUT at Z-axis+WLAN 5G
3	EUT at Z-axis+Bluetooth
For operating mode 3 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
The EUT was performed at X axis, Y axis and Z axis position. The worst case was found at X axis for bandedge, Z axis for harmonic, so it was selected to perform test and its test result was written in the report.	
1	EUT in X axis for bandedge / EUT in Z axis for harmonic

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Radiated Emission Co-location
Test Condition	Radiated measurement
Operating Mode	CTX
1	WLAN 5GHz+Bluetooth
Refer to Appendix G for Radiated Emission Co-location.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 5GHz+Bluetooth
Refer to Sporton Test Report No.: FA2O0619 for Co-location RF Exposure Evaluation.	

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode

2.4 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	HONOTO	EPS21R0-500	INPUT: 100-240V ~ 50/60Hz, Max.0.3A OUTPUT: 5V, 1.5A, 7.5W



2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Test fixture	HUMAX	N/A	N/A
B	Test fixture	HUMAX	N/A	N/A
C	SIO BOX	HUMAX	N/A	N/A
D	USB TO LAN Dongle	ASUSTOR	AS-U2.5G2	N/A
E	LAN & RS232 NB	DELL	FS-108	N/A

For Radiated below 1GHz:

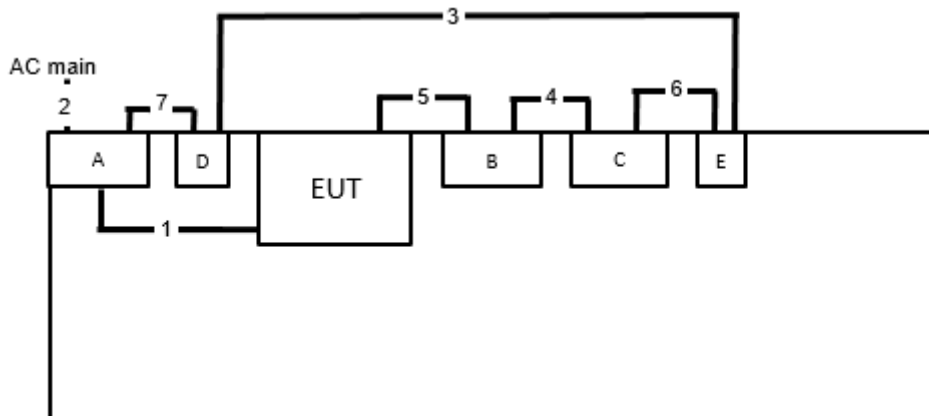
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Fixture	HUMAX	P21KW USB Adapter B/D REV.:02	N/A

For Radiated above 1GHz and RF Conducted:

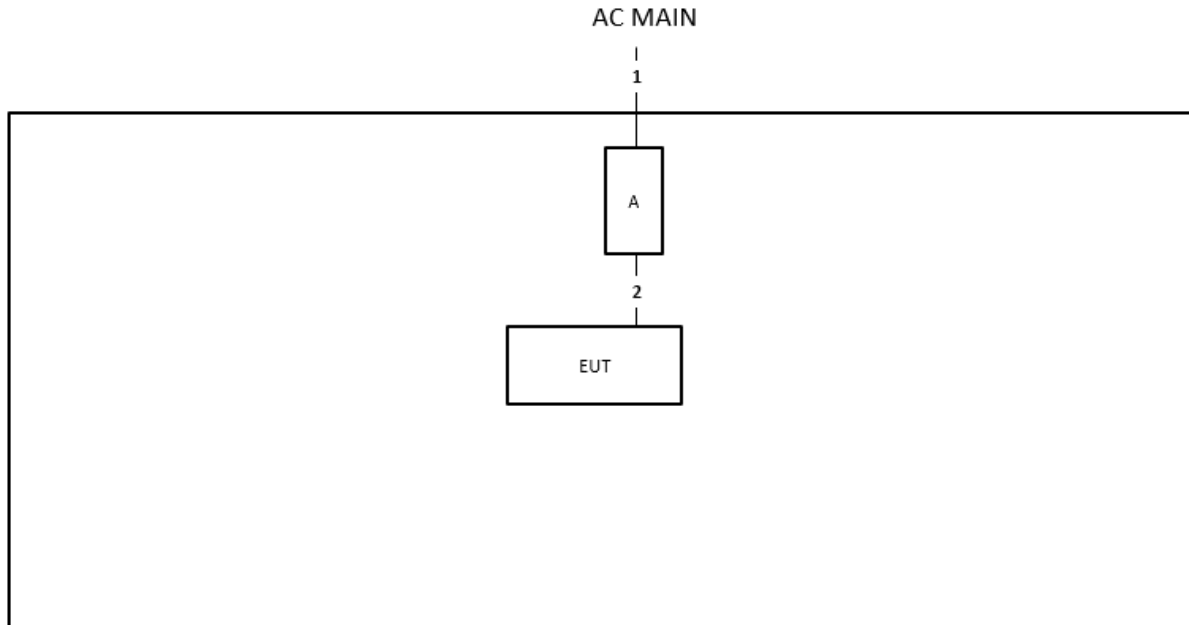
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Fixture	HUMAX	P21KW USB Adapter B/D REV.:02	N/A
B	USB to LAN HUB	TOTOLINK	U1003	N/A
C	NB	DELL	E4300	N/A

2.6 Test Setup Diagram

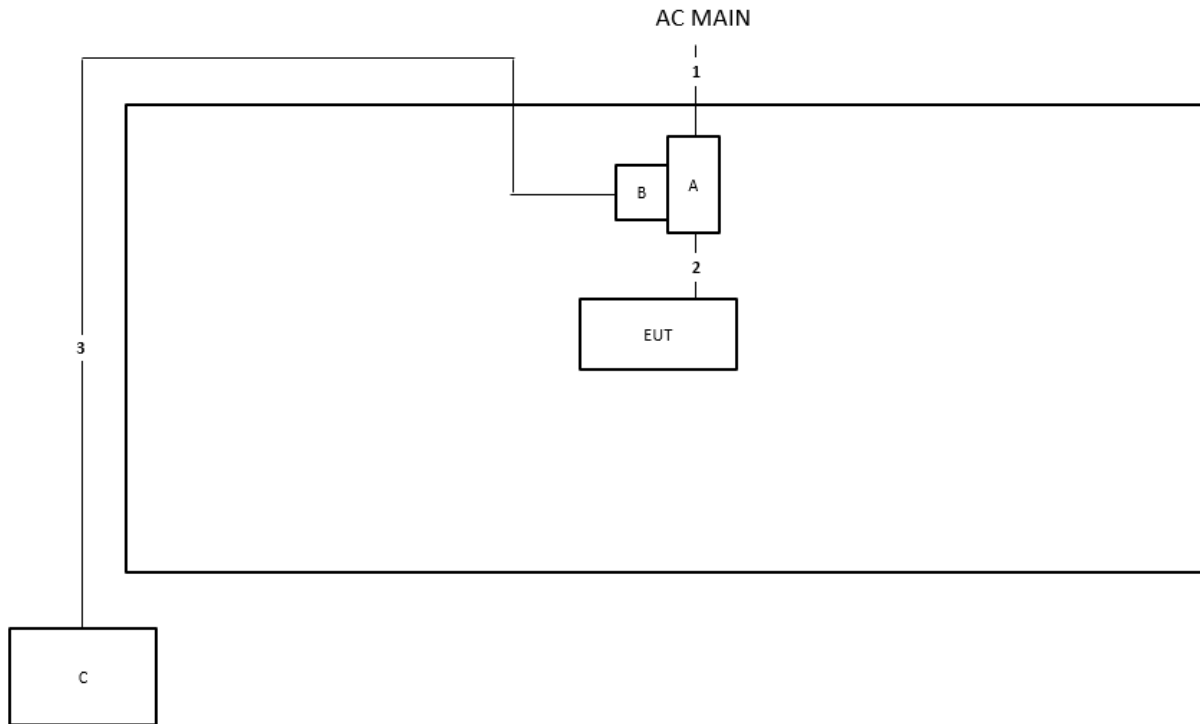
Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length
1	USB Cable(Type C) cable	Yes	0.25m
2	AC power cable	Yes	1.8m
3	Cat5e RJ-45 cable	No	1.5m
4	Flexible flat cable	No	0.5m
5	Flexible flat cable	No	0.25m
6	RS232 cable	No	1.7m
7	USB Cable(Type C) cable	Yes	0.1m

Test Setup Diagram - Radiated Test < 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	Type-C cable	Yes	0.3m

Test Setup Diagram - Radiated Test > 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	Type-C cable	Yes	0.3m
3	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.		

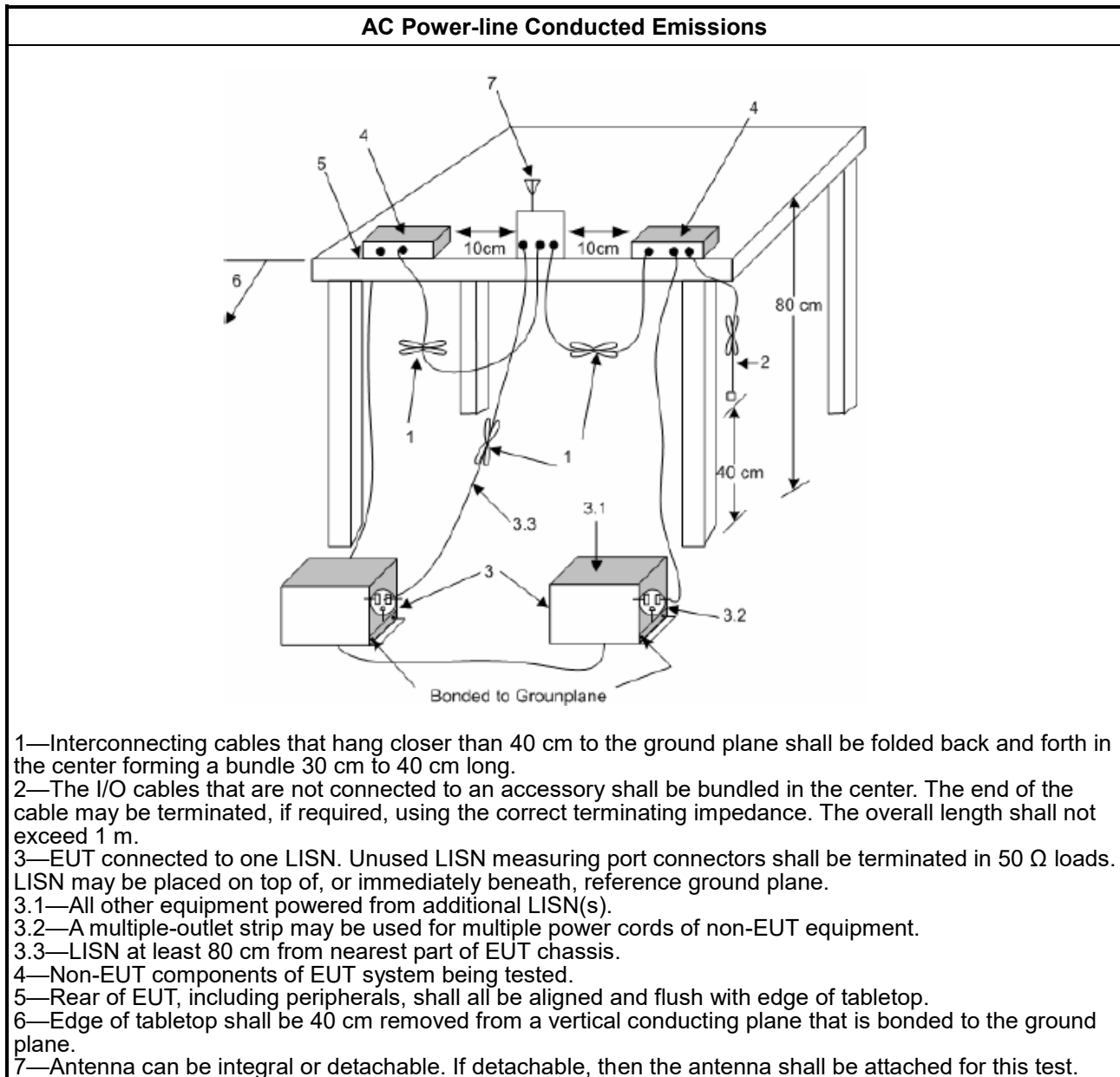
3.1.2 Measuring Instruments

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



1.1.1. Measurement Results Calculation

The measured Level is calculated using:

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

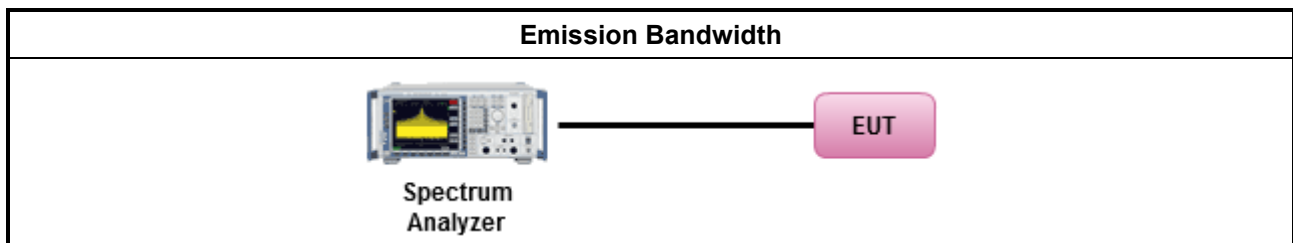
3.2.2 Measuring Instruments

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	
	▪ 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.	

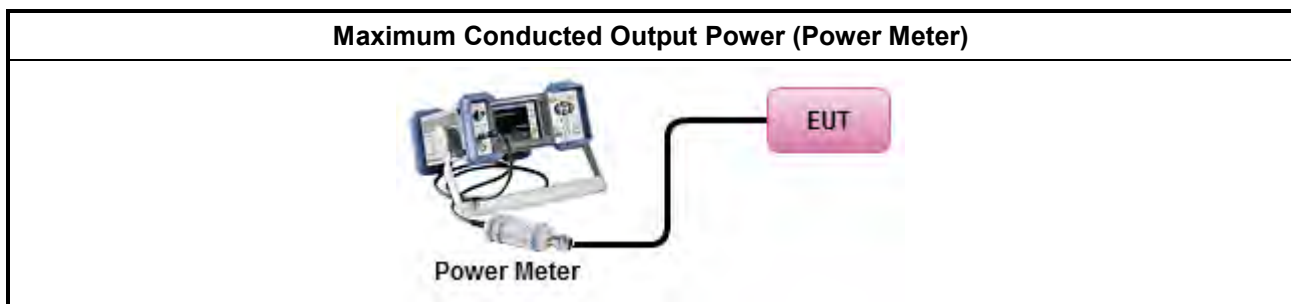
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
<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
▪ Power Spectral Density (PSD) ≤ 8 dBm/3kHz

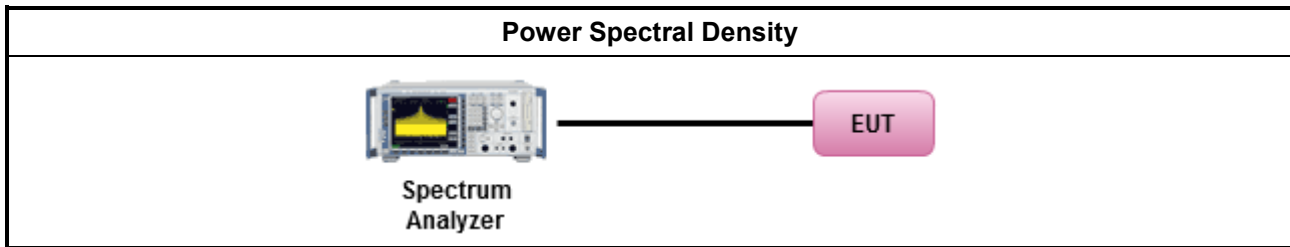
3.4.2 Measuring Instruments

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).	
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD. [duty cycle $\geq 98\%$ or external video / power trigger]
▪ For conducted measurement.	
▪ If The EUT supports multiple transmit chains using options given below:	
<input checked="" 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
<p>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.</p> <p>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.</p>	

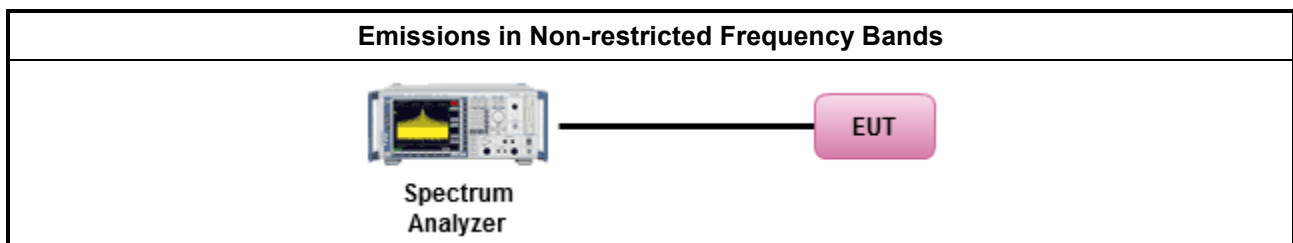
3.5.2 Measuring Instruments

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

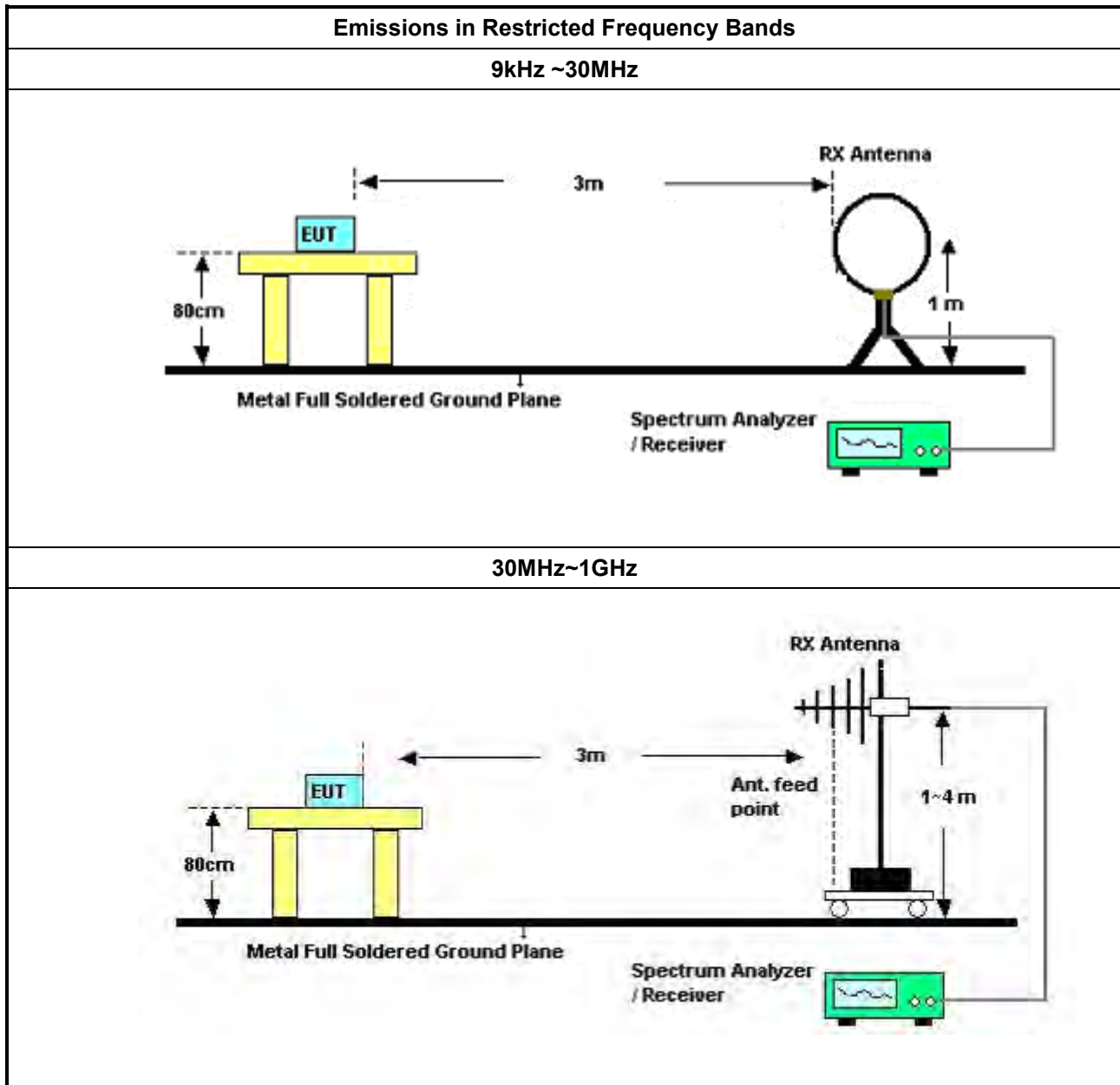
Refer a test equipment and calibration data table in this test report.

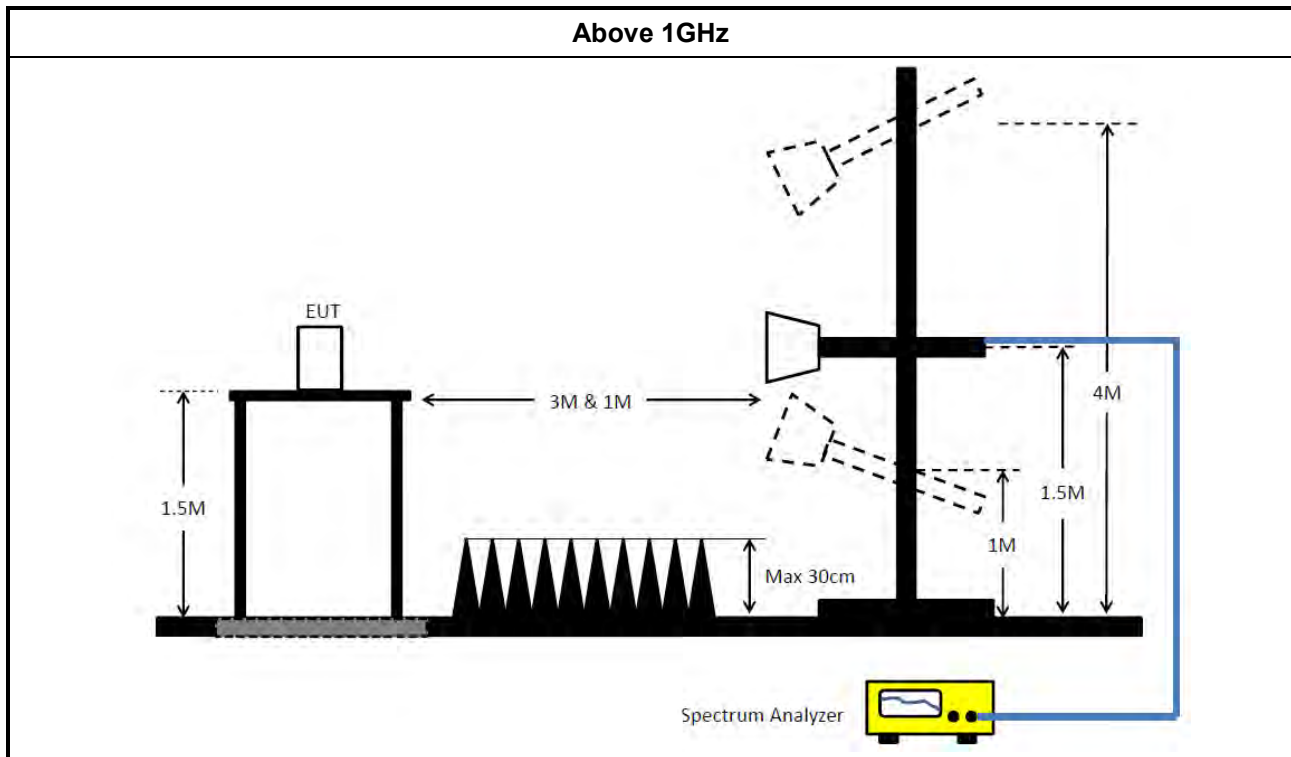


3.6.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> The average emission levels shall be measured in [duty cycle ≥ 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
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Jan. 07, 2022	Jan. 06, 2023	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Dec. 22, 2021	Dec. 21, 2022	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	May 06, 2022	May 05, 2023	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Oct. 18, 2022	Oct. 17, 2023	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F-N	00378	9kHz ~ 30MHz	Oct. 18, 2022	Oct. 17, 2023	Conduction (CO02-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 03, 2022	Aug. 02, 2023	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	May 14, 2022	May 13, 2023	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCi	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 25, 2022	Mar. 24, 2023	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	Apr. 26, 2022	Apr. 25, 2023	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Mar. 14, 2022	Mar. 13, 2023	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 17, 2022	Jun. 16, 2023	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH05-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH05-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH03-CB	1GHz ~18GHz 3m	May 05, 2022	May 04, 2023	Radiation (03CH03-CB)
Horn Antenna	ETS-Lindgren	3115	6821	750MHz~18GHz	Jan. 21, 2022	Jan. 20, 2023	Radiation (03CH03-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 22, 2022	Aug. 21, 2023	Radiation (03CH03-CB)
Pre-Amplifier	Agilent	8449B	3008A02097	1GHz ~ 26.5GHz	Jul. 01, 2022	Jun. 30, 2023	Radiation (03CH03-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 20, 2022	Jul. 19, 2023	Radiation (03CH03-CB)
Spectrum Analyzer	R&S	FSP40	100019	9kHz ~ 40GHz	Jun. 10, 2022	Jun. 09, 2023	Radiation (03CH03-CB)



Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-20+29	1GHz ~ 18GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-29	1GHz ~ 18GHz	Oct. 03, 2022	Oct. 02, 2023	Radiation (03CH03-CB)
High Cable	Woken	WCA0929M	40G#5+7	1GHz ~ 40 GHz	Dec. 14, 2021	Dec. 13, 2022	Radiation (03CH03-CB)
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40 GHz	Dec. 08, 2021	Dec. 07, 2022	Radiation (03CH03-CB)
High Cable	Woken	WCA0929M	40G#7	1GHz ~ 40 GHz	Dec. 14, 2021	Dec. 13, 2022	Radiation (03CH03-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH03-CB)
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Jan. 07, 2022	Jan. 06, 2023	Conducted (TH03-CB)
Power Sensor	Anritsu	MA2411B	1531344	300MHz~40GHz	Jul. 31, 2022	Jul. 30, 2023	Conducted (TH03-CB)
Power Meter	Anritsu	ML2495A	1728002	300MHz~40GHz	Jul. 31, 2022	Jul. 30, 2023	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-11	1 GHz –18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-12	1 GHz –18 GHz	Oct. 03, 2022	Oct. 02, 2023	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-13	1 GHz –18 GHz	Oct. 03, 2022	Oct. 02, 2023	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.



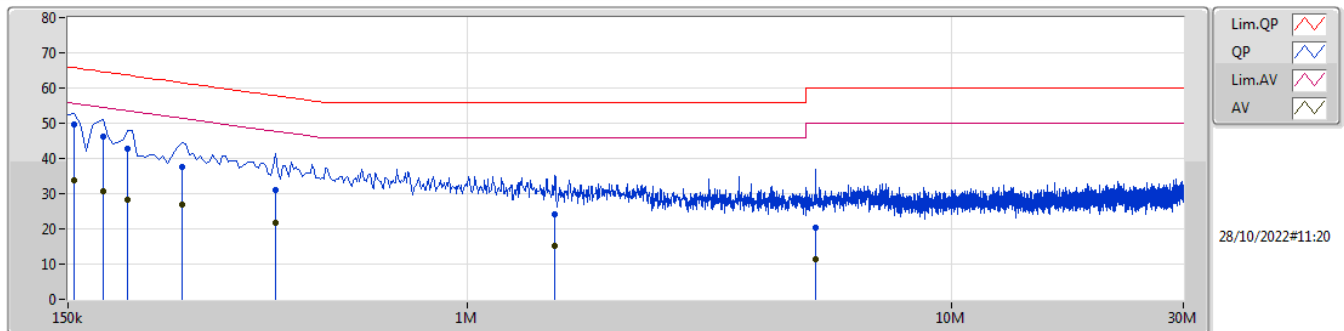
Conducted Emissions at Powerline

Appendix A

Summary

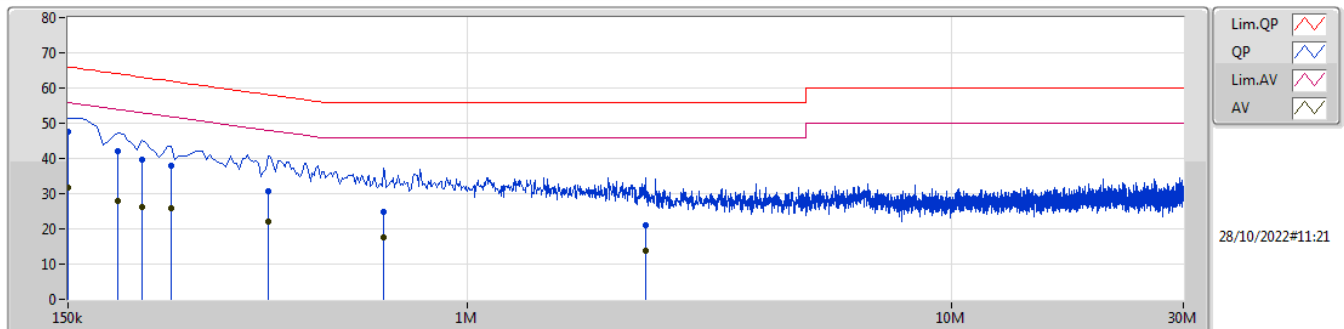
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	154.5k	49.76	65.75	-15.99	Line

Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)						
QP	154.5k	49.76	65.75	-15.99	10.29	Line	"Worst"	39.47	0.12	0.08	10.09						
AV	154.5k	33.72	55.75	-22.03	10.29	Line	-	23.43	0.12	0.08	10.09						
QP	177k	46.22	64.62	-18.40	10.29	Line	-	35.93	0.12	0.10	10.07						
AV	177k	30.80	54.62	-23.82	10.29	Line	-	20.51	0.12	0.10	10.07						
QP	199.5k	42.90	63.63	-20.73	10.29	Line	-	32.61	0.12	0.11	10.06						
AV	199.5k	28.30	53.63	-25.33	10.29	Line	-	18.01	0.12	0.11	10.06						
QP	258k	37.68	61.49	-23.81	10.28	Line	-	27.40	0.12	0.12	10.04						
AV	258k	26.79	51.49	-24.70	10.28	Line	-	16.51	0.12	0.12	10.04						
QP	402k	31.12	57.82	-26.70	10.28	Line	-	20.84	0.12	0.15	10.01						
AV	402k	21.88	47.82	-25.94	10.28	Line	-	11.60	0.12	0.15	10.01						
QP	1.518M	23.99	56.00	-32.01	10.21	Line	-	13.78	0.16	0.19	9.86						
AV	1.518M	15.29	46.00	-30.71	10.21	Line	-	5.08	0.16	0.19	9.86						
QP	5.24M	20.29	60.00	-39.71	10.32	Line	-	9.97	0.26	0.20	9.86						
AV	5.24M	11.34	50.00	-38.66	10.32	Line	-	1.02	0.26	0.20	9.86						

Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)						
QP	150k	47.49	66.00	-18.51	10.33	Neutral	"Worst"	37.16	0.16	0.08	10.09						
AV	150k	31.76	56.00	-24.24	10.33	Neutral	-	21.43	0.16	0.08	10.09						
QP	190.5k	42.12	64.01	-21.89	10.34	Neutral	-	31.78	0.16	0.11	10.07						
AV	190.5k	27.76	54.01	-26.25	10.34	Neutral	-	17.42	0.16	0.11	10.07						
QP	213k	39.58	63.09	-23.51	10.33	Neutral	-	29.25	0.16	0.11	10.06						
AV	213k	26.15	53.09	-26.94	10.33	Neutral	-	15.82	0.16	0.11	10.06						
QP	244.5k	38.00	61.95	-23.95	10.33	Neutral	-	27.67	0.16	0.12	10.05						
AV	244.5k	25.74	51.95	-26.21	10.33	Neutral	-	15.41	0.16	0.12	10.05						
QP	388.5k	30.78	58.10	-27.32	10.32	Neutral	-	20.46	0.16	0.15	10.01						
AV	388.5k	22.10	48.10	-26.00	10.32	Neutral	-	11.78	0.16	0.15	10.01						
QP	672k	24.71	56.00	-31.29	10.29	Neutral	-	14.42	0.17	0.17	9.95						
AV	672k	17.73	46.00	-28.27	10.29	Neutral	-	7.44	0.17	0.17	9.95						
QP	2.328M	21.14	56.00	-34.86	10.22	Neutral	-	10.92	0.20	0.19	9.83						
AV	2.328M	13.94	46.00	-32.06	10.22	Neutral	-	3.72	0.20	0.19	9.83						

**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)	665k	1.054M	1M05F1D	661.25k	1.051M

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

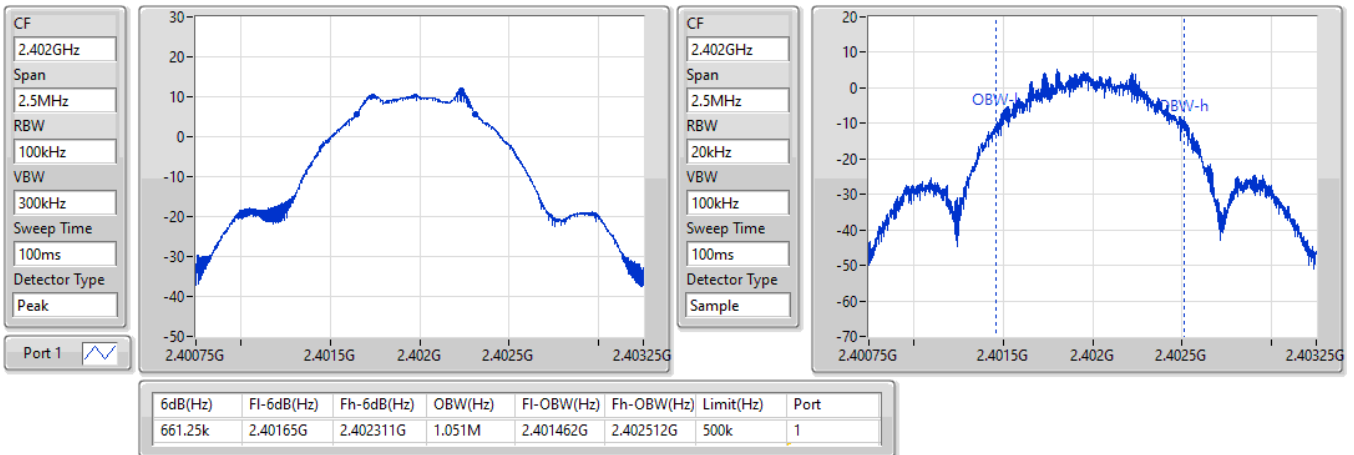
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	661.25k	1.051M
2440MHz	Pass	500k	663.75k	1.051M
2480MHz	Pass	500k	665k	1.054M

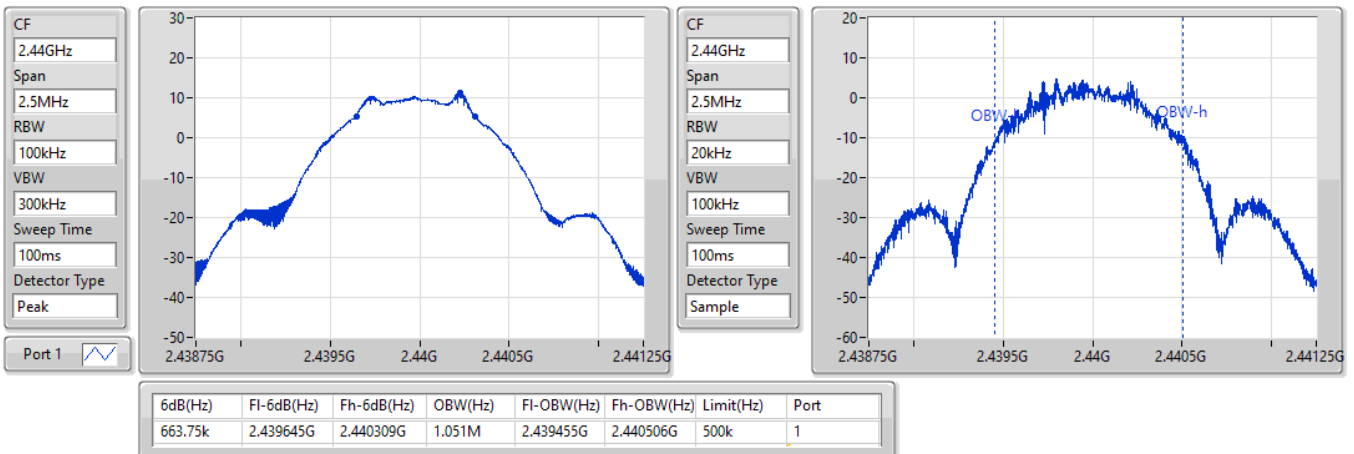
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

BT-LE(1Mbps)
2402MHz
EBW-DTS

17/10/2022

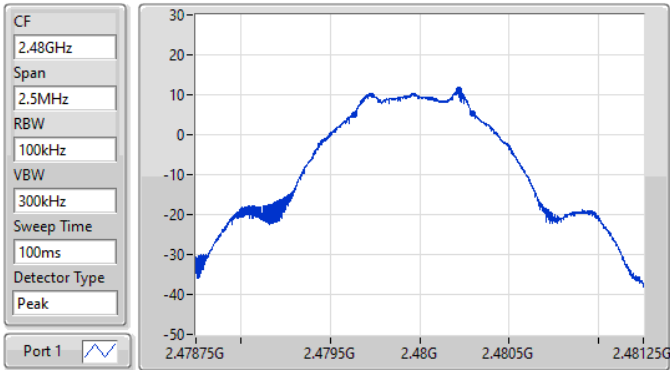

BT-LE(1Mbps)
2440MHz
EBW-DTS

17/10/2022



BT-LE(1Mbps)

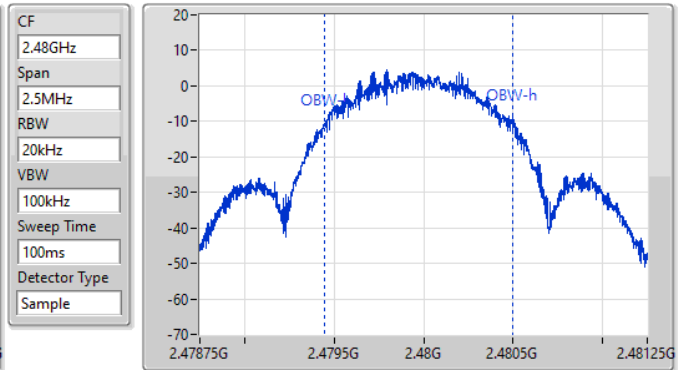
2480MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
665k	2.479634G	2.480299G	1.054M	2.479445G	2.4805G	500k	1

EBW-DTS

17/10/2022





Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	11.02	0.01265



Average Power-DTS

Appendix C

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	4.471	11.02	30.00
2440MHz	Pass	4.471	10.83	30.00
2480MHz	Pass	4.471	10.63	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-5.61

RBW = 3kHz;

Result

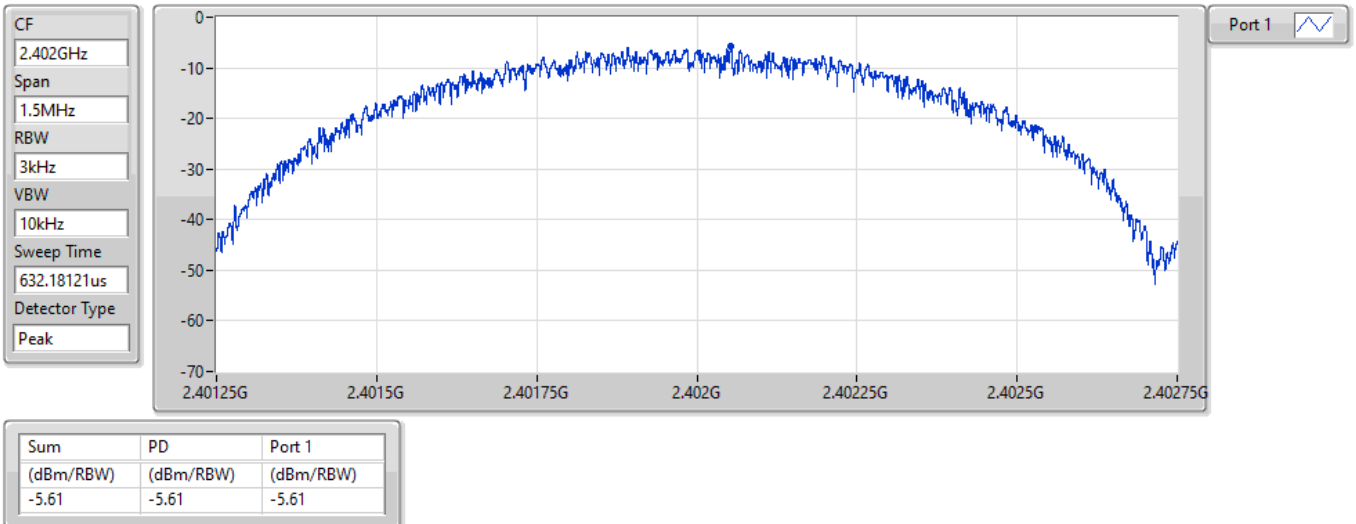
Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	4.471	-5.61	8.00
2440MHz	Pass	4.471	-6.25	8.00
2480MHz	Pass	4.471	-6.36	8.00

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;

BT-LE(1Mbps)

2402MHz

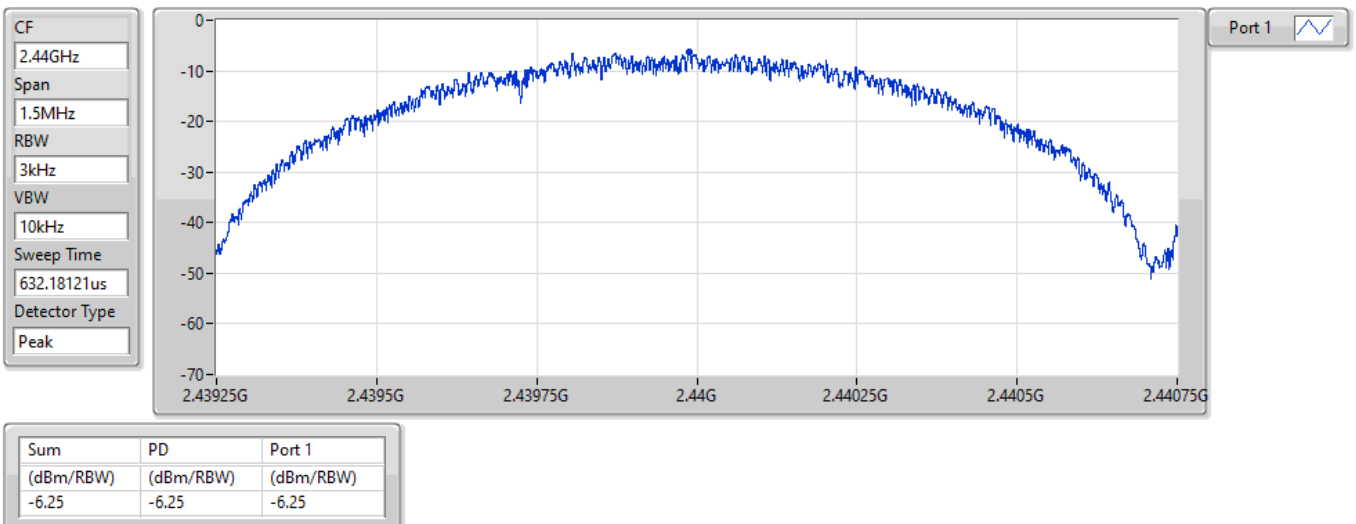
17/10/2022



BT-LE(1Mbps)

2440MHz

17/10/2022

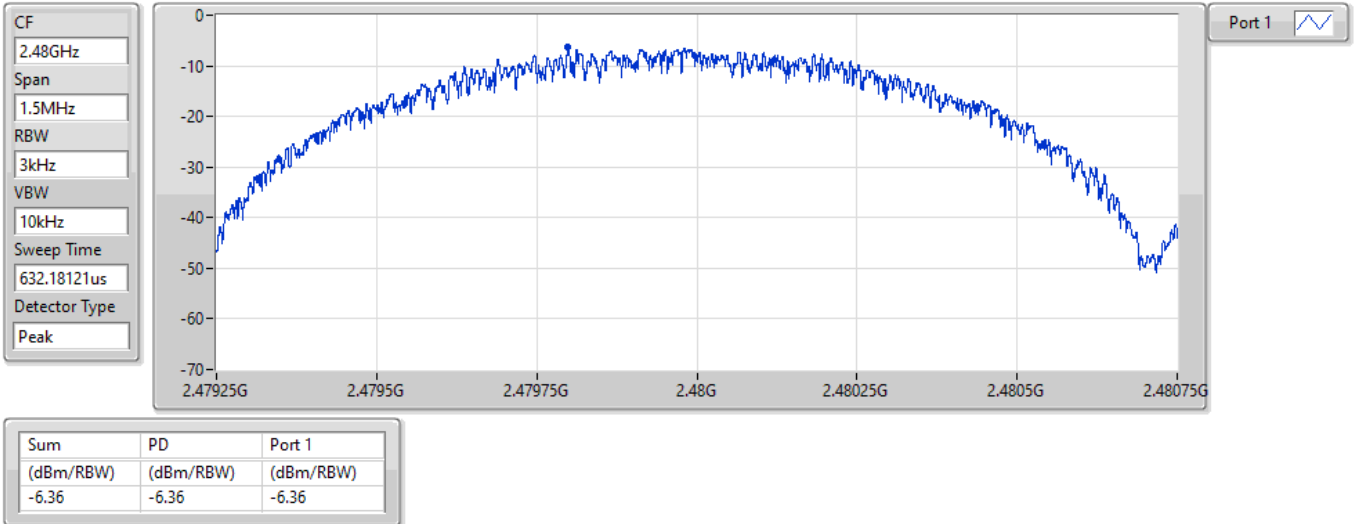


BT-LE(1Mbps)

2480MHz

PSD

17/10/2022





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	2.40221G	11.05	-18.95	666.85M	-51.86	2.39994G	-39.87	2.4G	-38.44	2.49966G	-50.16	17.69426G	-43.77	1

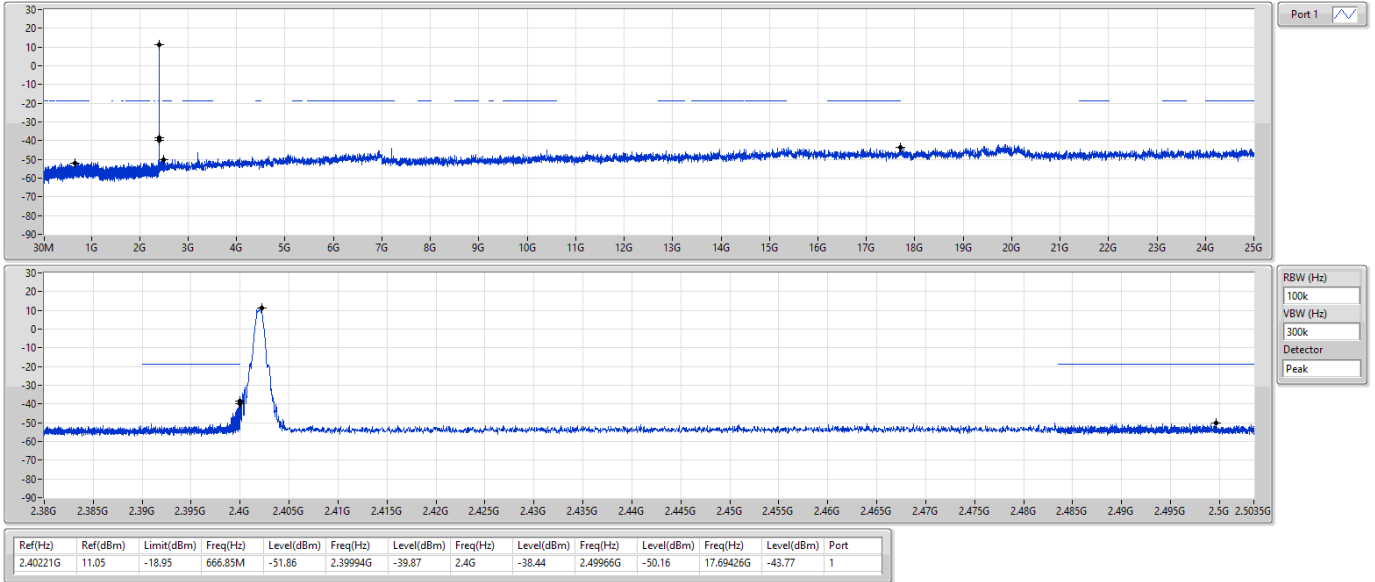
Result

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	2.40221G	11.05	-18.95	666.85M	-51.86	2.39994G	-39.87	2.4G	-38.44	2.49966G	-50.16	17.69426G	-43.77	1
2440MHz	Pass	2.40221G	11.05	-18.95	710.91M	-50.72	2.39401G	-51.41	2.4835G	-53.26	2.48739G	-49.86	24.56132G	-42.88	1
2480MHz	Pass	2.40221G	11.05	-18.95	705.92M	-51.42	2.3966G	-49.81	2.4G	-53.64	2.48392G	-50.31	21.71832G	-43.35	1

BT-LE(1Mbps)

CSEndB-DTS

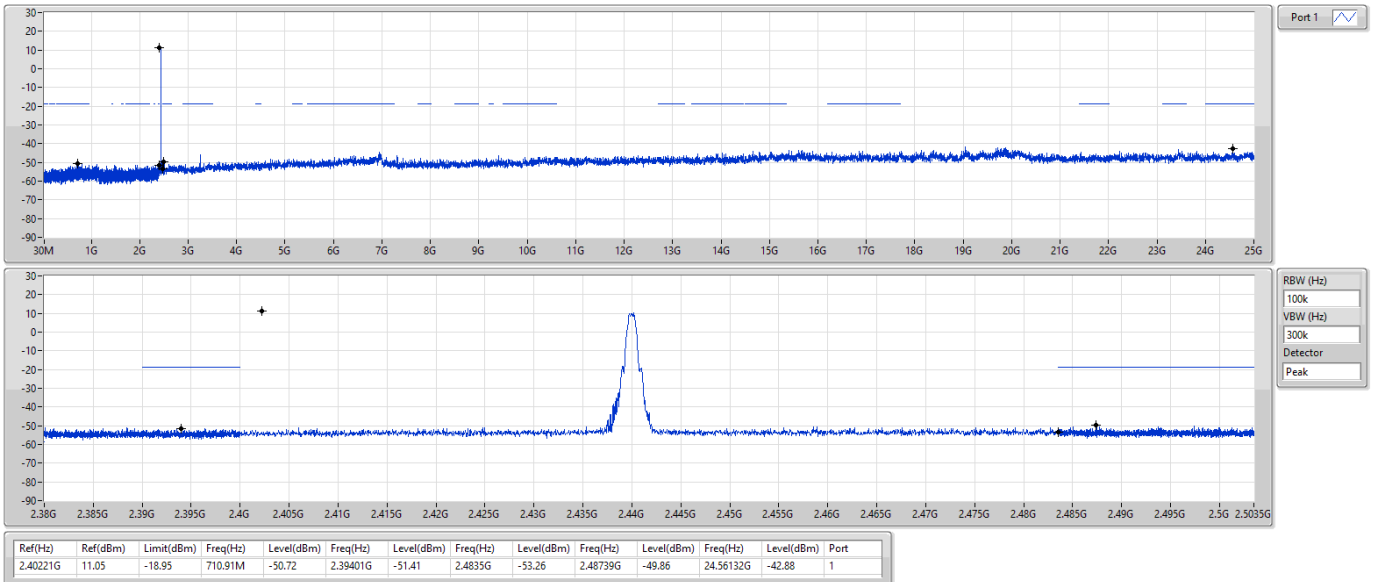
2402MHz



BT-LE(1Mbps)

CSEndB-DTS

2440MHz

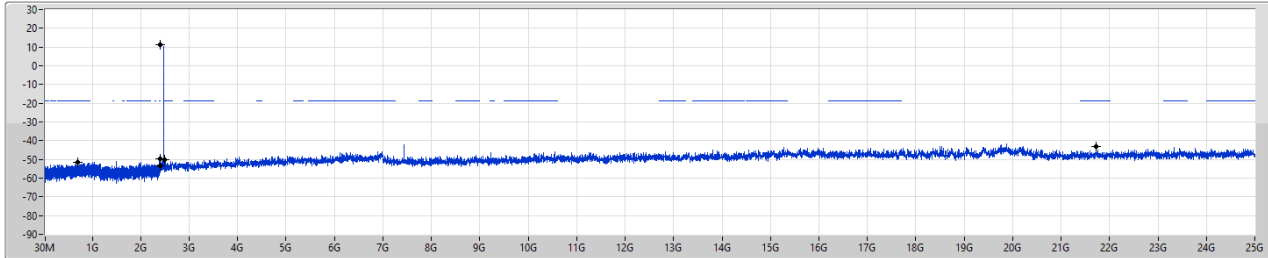


BT-LE(1Mbps)

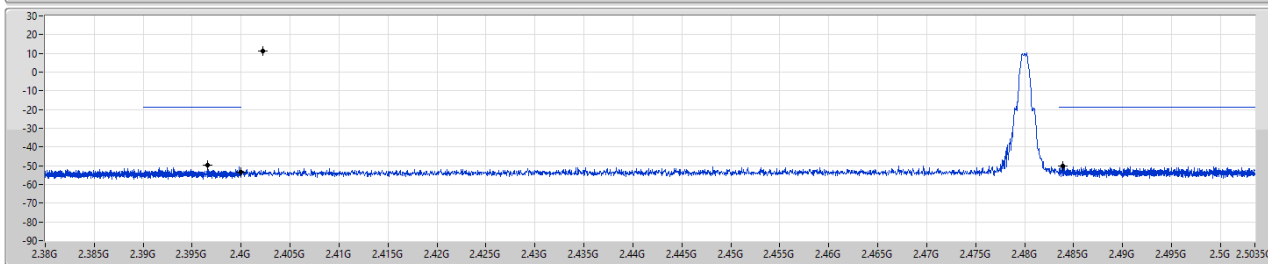
CSEndB-DTS

2480MHz

17/10/2022



Port 1



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

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40221G	11.05	-18.95	705.92M	-51.42	2.3966G	-49.81	2.4G	-53.64	2.48392G	-50.31	21.71832G	-43.35	1



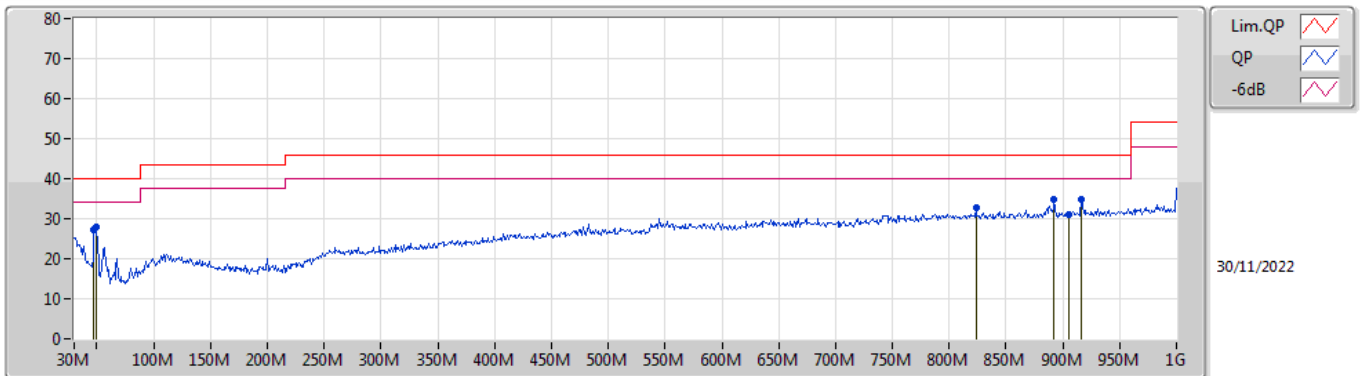
Radiated Emissions below 1GHz

Appendix F.1

Summary

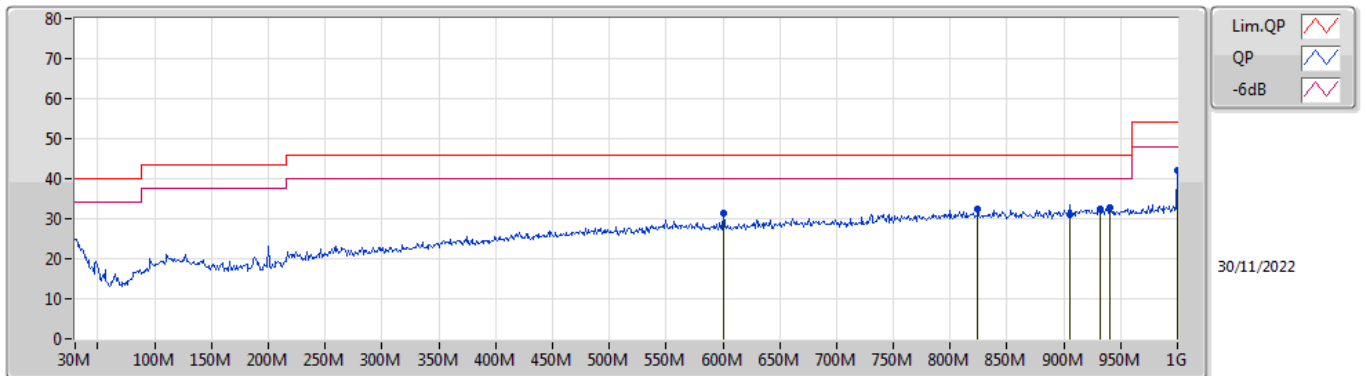
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 3	Pass	PK	892.33M	35.00	46.00	-11.00	Vertical

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)
PK	47.46M	27.24	40.00	-12.76	-16.29	3	Vertical	0	1.50	-	43.53	14.91	0.64	31.84
PK	49.4M	27.90	40.00	-12.10	-16.92	3	Vertical	23	1.50	-	44.82	14.28	0.66	31.86
PK	823.46M	32.82	46.00	-13.18	-2.93	3	Vertical	210	1.00	-	35.75	25.58	3.99	32.50
PK	892.33M	35.00	46.00	-11.00	-2.19	3	Vertical	351	1.50	"Worst"	37.19	26.16	4.14	32.49
PK	904.94M	30.91	46.00	-15.09	-2.11	3	Vertical	297	1.50	-	33.02	26.20	4.18	32.49
PK	916.58M	34.99	46.00	-11.01	-2.09	3	Vertical	276	1.00	-	37.08	26.19	4.21	32.49

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	600.36M	31.34	46.00	-14.66	-4.98	3	Horizontal	49	1.50	-	36.32	24.24	3.29	32.51
PK	824.43M	32.29	46.00	-13.71	-2.92	3	Horizontal	139	1.25	-	35.21	25.59	3.99	32.50
PK	904.94M	31.11	46.00	-14.89	-2.11	3	Horizontal	0	1.50	-	33.22	26.20	4.18	32.49
PK	932.1M	32.34	46.00	-13.66	-1.94	3	Horizontal	242	1.00	-	34.28	26.28	4.26	32.48
PK	940.83M	32.60	46.00	-13.40	-1.81	3	Horizontal	160	1.50	"Worst"	34.41	26.38	4.29	32.48
PK	1G	42.14	74.00	-31.86	-0.89	3	Horizontal	134	1.50	-	43.03	27.06	4.39	32.34

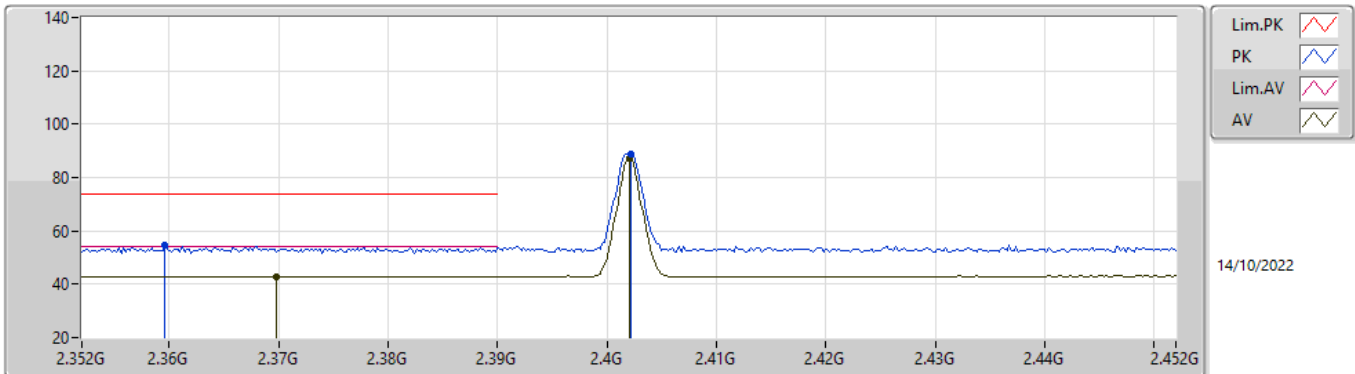


Summary

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	7.31933G	53.17	54.00	-0.83	3	Vertical	191	2.31	-

BT-LE(1Mbps)

2402MHz_TX

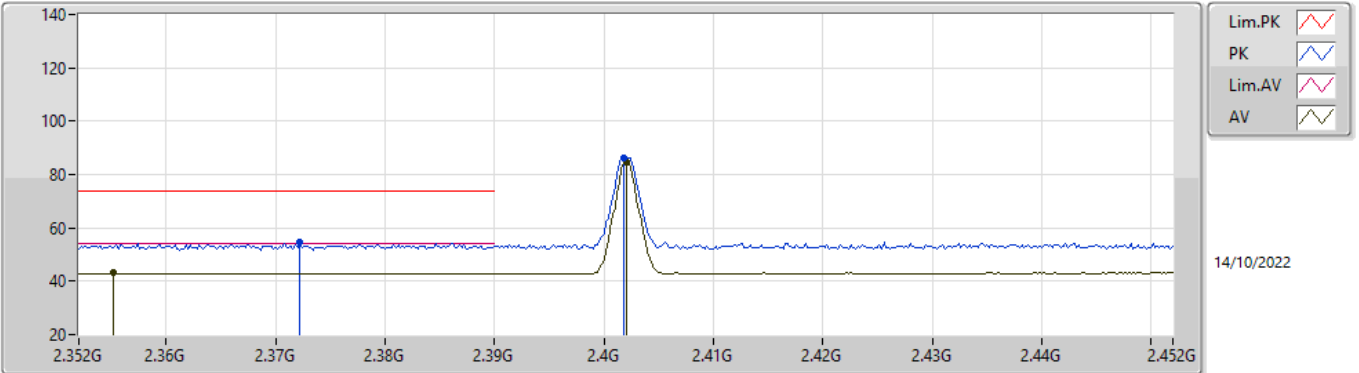


EUT X_1TX
Setting Default
04-D-P-5

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	2.3596G	54.78	74.00	-19.22	24.44	3	Vertical	88	1.52	-	27.16	3.18	-	
AV	2.3698G	42.99	54.00	-11.01	12.59	3	Vertical	88	1.52	-	27.22	3.18	-	
PK	2.4022G	88.65	Inf	-Inf	58.04	3	Vertical	88	1.52	-	27.41	3.20	-	
AV	2.402G	87.13	Inf	-Inf	56.52	3	Vertical	88	1.52	-	27.41	3.20	-	

BT-LE(1Mbps)

2402MHz_TX

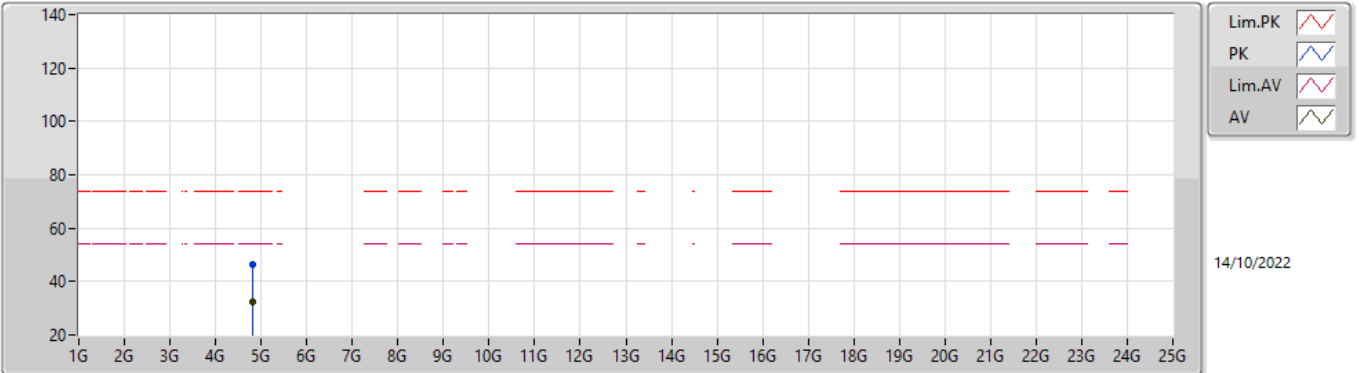


EUT X_1TX
Setting Default
04-D-P-5

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	2.3722G	54.49	74.00	-19.51	24.07	3	Horizontal	190	2.65	-	27.23	3.19	-	
AV	2.3552G	43.03	54.00	-10.97	12.72	3	Horizontal	190	2.65	-	27.13	3.18	-	
PK	2.4018G	86.32	Inf	-Inf	55.71	3	Horizontal	190	2.65	-	27.41	3.20	-	
AV	2.402G	84.82	Inf	-Inf	54.21	3	Horizontal	190	2.65	-	27.41	3.20	-	

BT-LE(1Mbps)

2402MHz_TX

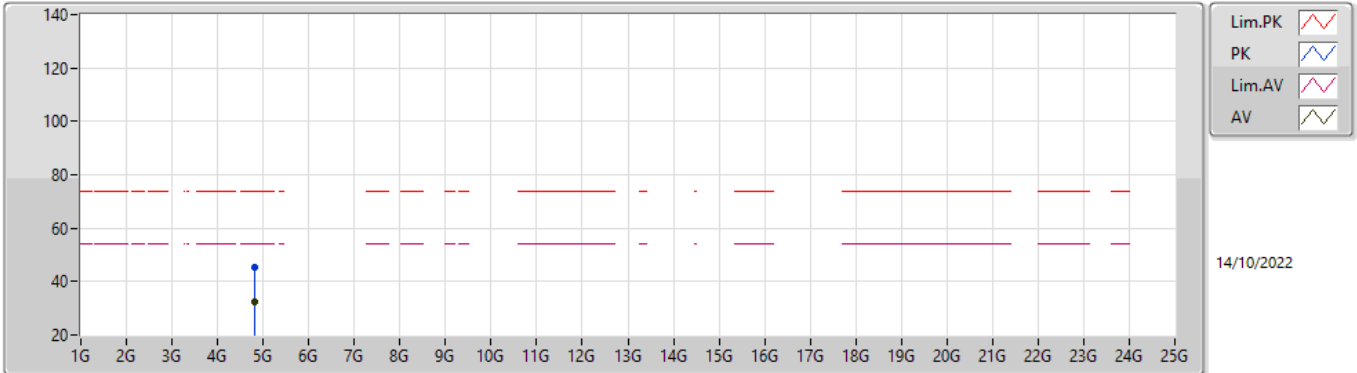


EUT_Z_1TX
Setting Default
04-D-P-5

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	4.80329G	46.43	74.00	-27.57	41.48	3	Vertical	190	1.94	-	32.31	5.30	32.66
AV	4.80418G	32.42	54.00	-21.58	27.46	3	Vertical	190	1.94	-	32.32	5.30	32.66

BT-LE(1Mbps)

2402MHz_TX

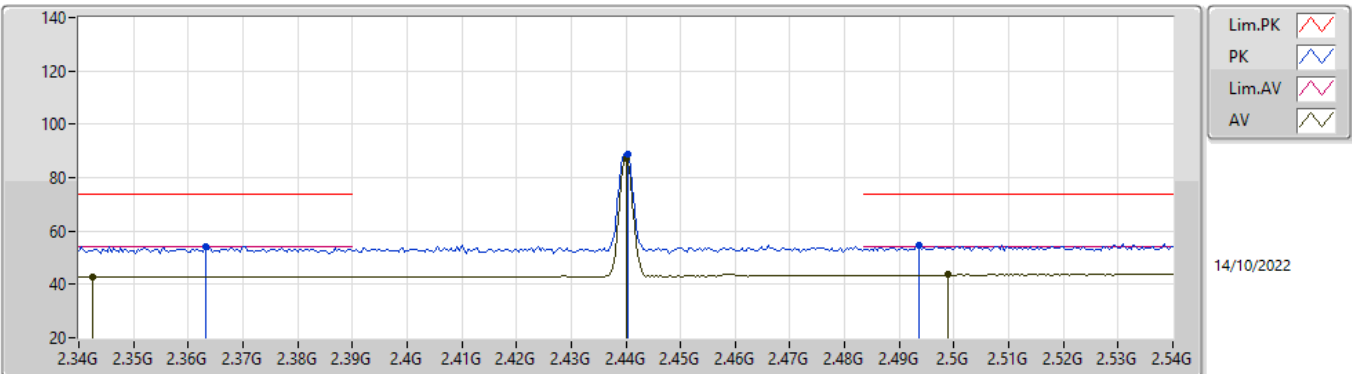


EUT_Z_1TX
Setting Default
04-D-P-5

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	4.80478G	45.32	74.00	-28.68	40.36	3	Horizontal	112	1.79	-	32.32	5.30	32.66
AV	4.80238G	32.42	54.00	-21.58	27.47	3	Horizontal	112	1.79	-	32.31	5.30	32.66

BT-LE(1Mbps)

2440MHz_TX

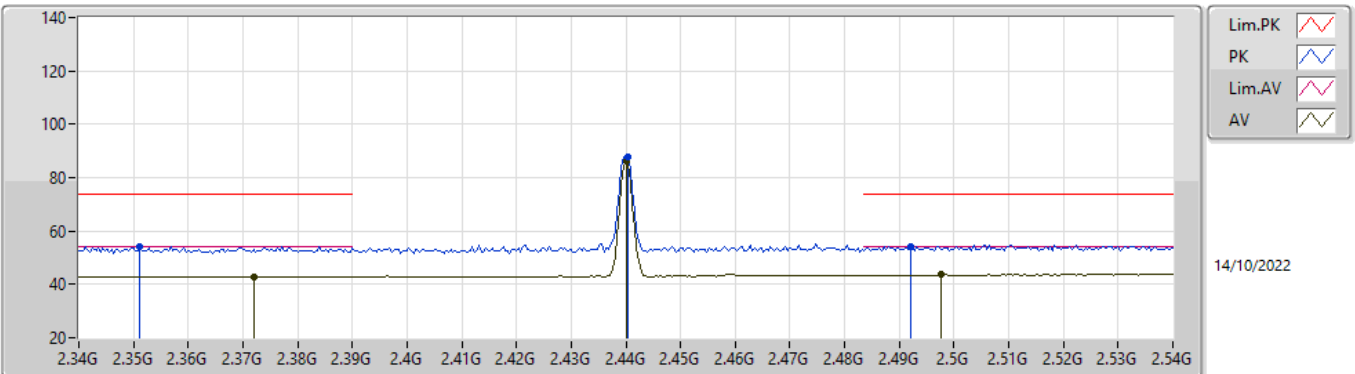


EUT X_1TX
Setting Default
04-D-P-5

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	2.3632G	54.11	74.00	-19.89	23.75	3	Vertical	34	1.07	-	27.18	3.18	-
AV	2.3424G	42.93	54.00	-11.07	12.64	3	Vertical	34	1.07	-	27.12	3.17	-
PK	2.4404G	88.88	Inf	-Inf	58.08	3	Vertical	34	1.07	-	27.56	3.24	-
AV	2.44G	87.33	Inf	-Inf	56.53	3	Vertical	34	1.07	-	27.56	3.24	-
PK	2.4936G	54.53	74.00	-19.47	23.38	3	Vertical	34	1.07	-	27.86	3.29	-
AV	2.4988G	43.62	54.00	-10.38	12.43	3	Vertical	34	1.07	-	27.89	3.30	-

BT-LE(1Mbps)

2440MHz_TX

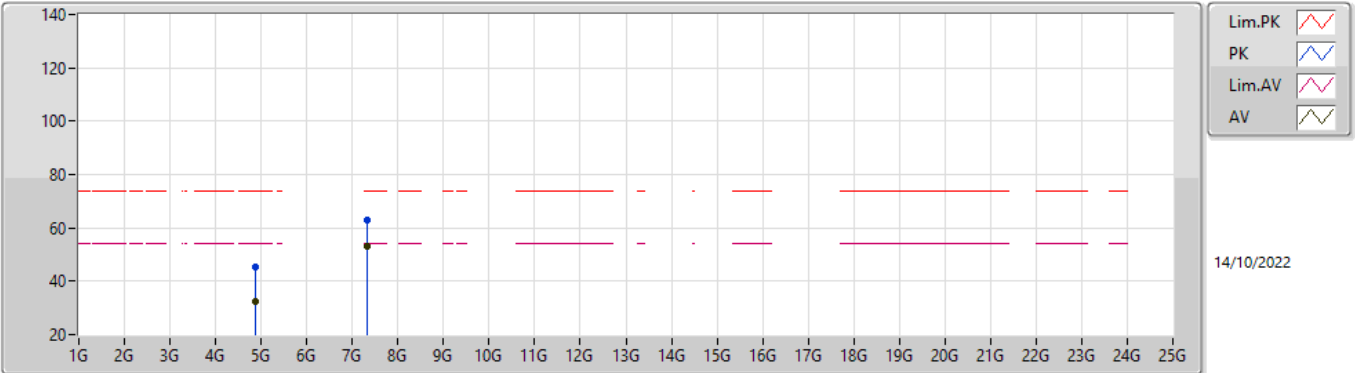


EUT X_1TX
Setting Default
04-D-P-5

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	2.3512G	54.19	74.00	-19.81	23.90	3	Horizontal	136	2.87	-	27.11	3.18	-
AV	2.372G	42.93	54.00	-11.07	12.51	3	Horizontal	136	2.87	-	27.23	3.19	-
PK	2.4404G	87.71	Inf	-Inf	56.91	3	Horizontal	136	2.87	-	27.56	3.24	-
AV	2.44G	86.09	Inf	-Inf	55.29	3	Horizontal	136	2.87	-	27.56	3.24	-
PK	2.492G	54.34	74.00	-19.66	23.20	3	Horizontal	136	2.87	-	27.85	3.29	-
AV	2.4976G	43.59	54.00	-10.41	12.40	3	Horizontal	136	2.87	-	27.89	3.30	-

BT-LE(1Mbps)

2440MHz_TX

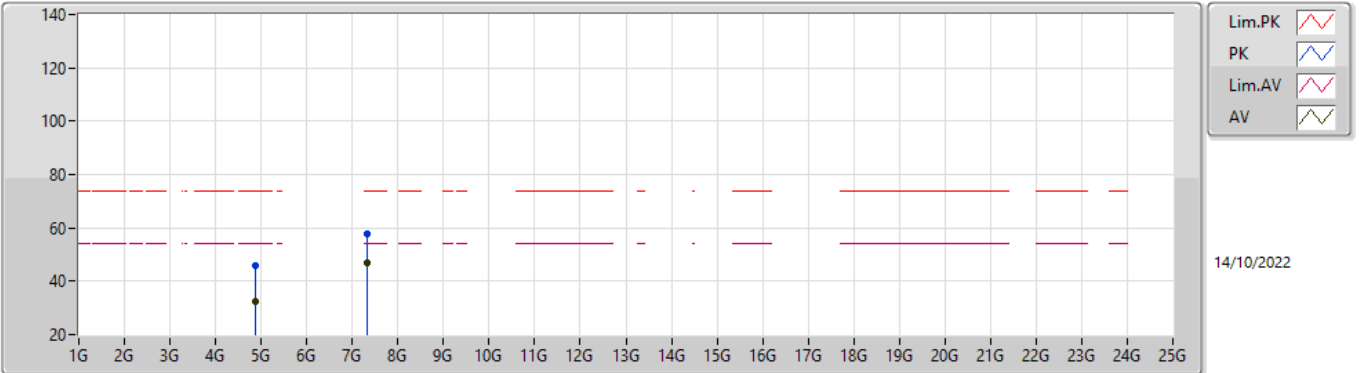


EUT_Z_1TX
Setting Default
04-D-P-5

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	4.87957G	45.33	74.00	-28.67	40.09	3	Vertical	217	2.93	-	32.56	5.30	32.62
AV	4.87804G	32.24	54.00	-21.76	27.00	3	Vertical	217	2.93	-	32.56	5.30	32.62
PK	7.32068G	62.74	74.00	-11.26	52.32	3	Vertical	191	2.31	-	36.72	6.92	33.22
AV	7.31933G	53.17	54.00	-0.83	42.75	3	Vertical	191	2.31	-	36.72	6.92	33.22

BT-LE(1Mbps)

2440MHz_TX

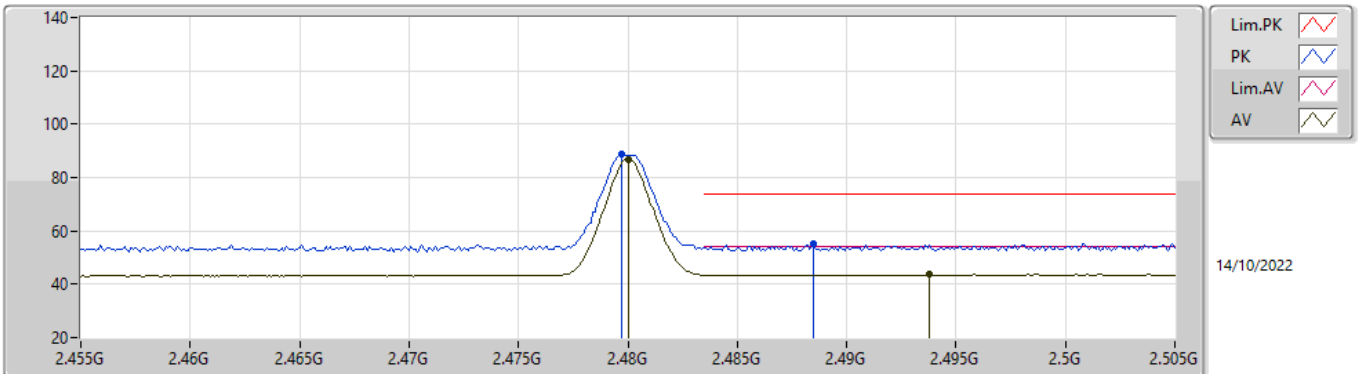


EUT_Z_1TX
Setting Default
04-D-P-5

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	4.87834G	45.87	74.00	-28.13	40.63	3	Horizontal	-0	1.01	-	32.56	5.30	32.62	
AV	4.87929G	32.38	54.00	-21.62	27.14	3	Horizontal	-0	1.01	-	32.56	5.30	32.62	
PK	7.32063G	57.58	74.00	-16.42	47.16	3	Horizontal	37	1.80	-	36.72	6.92	33.22	
AV	7.31932G	47.10	54.00	-6.90	36.68	3	Horizontal	37	1.80	-	36.72	6.92	33.22	

BT-LE(1Mbps)

2480MHz_TX

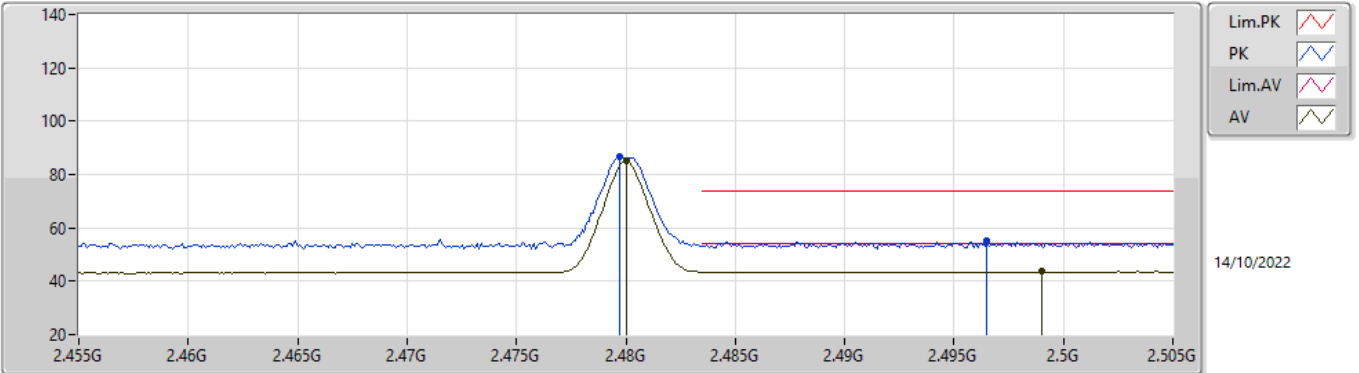


EUT X_1TX
Setting Default
04-D-P-5

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	2.4797G	88.56	Inf	-Inf	57.50	3	Vertical	93	1.97	-	27.78	3.28	-	
AV	2.48G	86.95	Inf	-Inf	55.89	3	Vertical	93	1.97	-	27.78	3.28	-	
PK	2.4885G	55.05	74.00	-18.95	23.93	3	Vertical	93	1.97	-	27.83	3.29	-	
AV	2.4938G	43.87	54.00	-10.13	12.72	3	Vertical	93	1.97	-	27.86	3.29	-	

BT-LE(1Mbps)

2480MHz_TX

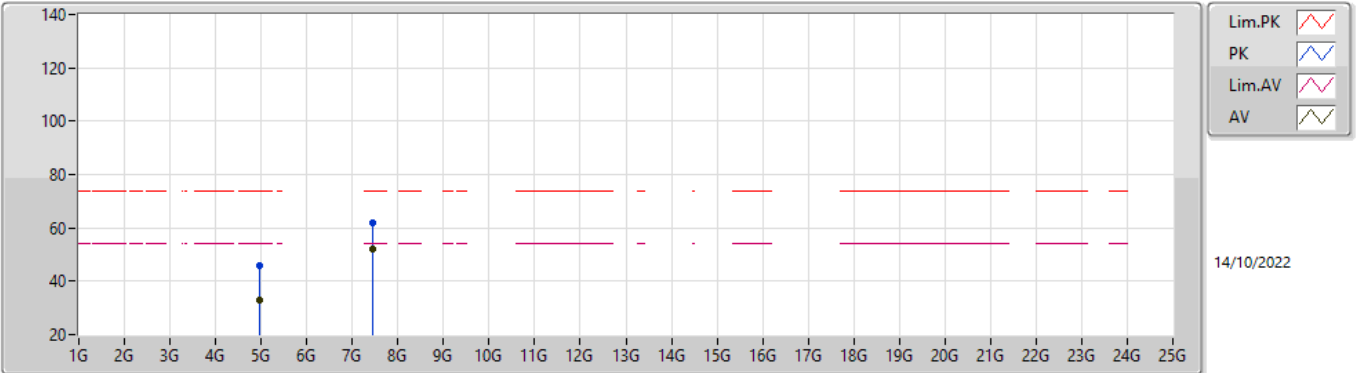


EUTX_1TX
Setting Default
04-D-P-5

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	2.4797G	86.52	Inf	-Inf	55.46	3	Horizontal	18	2.82	-	27.78	3.28	-
AV	2.48G	84.93	Inf	-Inf	53.87	3	Horizontal	18	2.82	-	27.78	3.28	-
PK	2.4965G	55.25	74.00	-18.75	24.07	3	Horizontal	18	2.82	-	27.88	3.30	-
AV	2.499G	43.56	54.00	-10.44	12.37	3	Horizontal	18	2.82	-	27.89	3.30	-

BT-LE(1Mbps)

2480MHz_TX

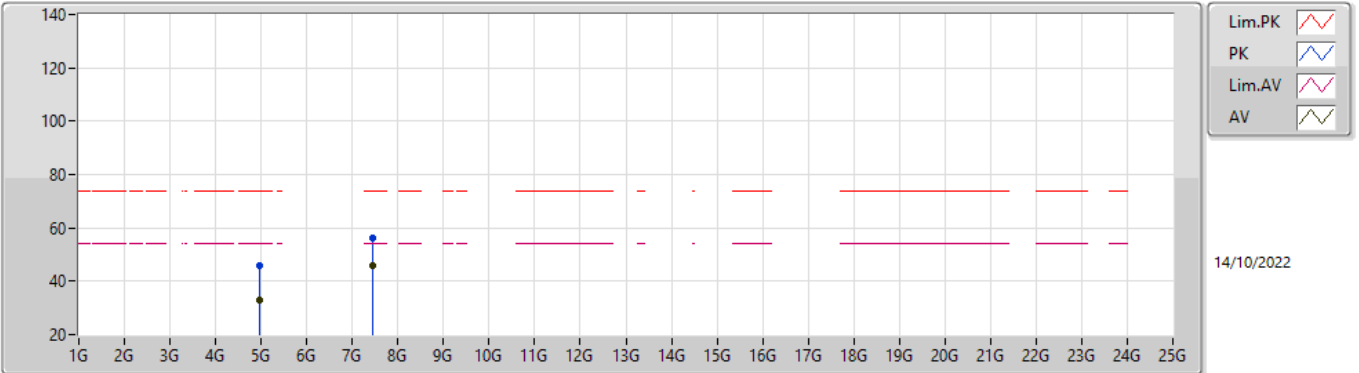


EUT_Z_1TX
Setting Default
04-D-P-5

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	4.96187G	46.07	74.00	-27.93	40.38	3	Vertical	41	1.44	-	32.97	5.30	32.58
AV	4.95976G	32.94	54.00	-21.06	27.26	3	Vertical	41	1.44	-	32.96	5.30	32.58
PK	7.44065G	61.68	74.00	-12.32	51.40	3	Vertical	193	2.34	-	36.52	7.02	33.26
AV	7.43933G	51.94	54.00	-2.06	41.66	3	Vertical	193	2.34	-	36.52	7.02	33.26

BT-LE(1Mbps)

2480MHz_TX



EUT_Z_1TX
Setting Default
04-D-P-5

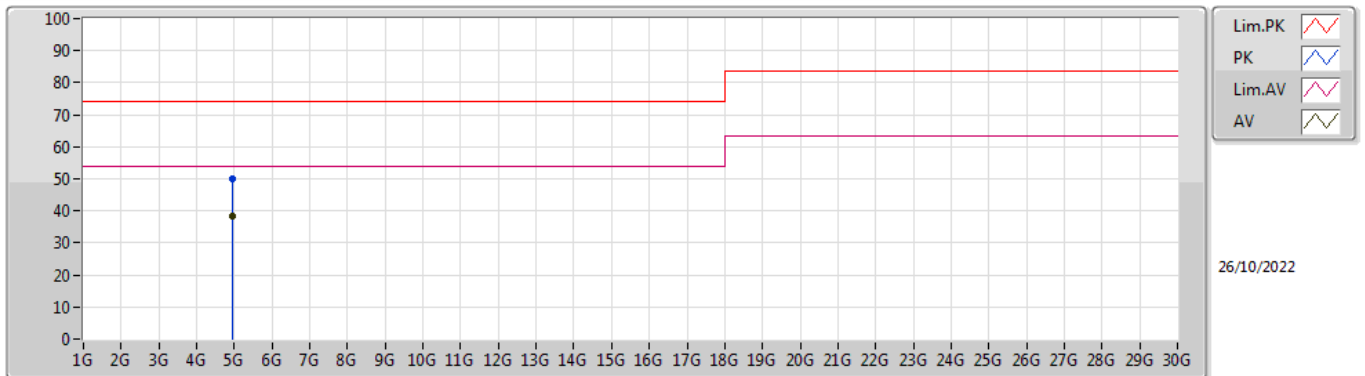
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.9616G	46.08	74.00	-27.92	40.39	3	Horizontal	178	2.36	-	32.97	5.30	32.58
AV	4.95945G	32.70	54.00	-21.30	27.02	3	Horizontal	178	2.36	-	32.96	5.30	32.58
PK	7.44071G	56.38	74.00	-17.62	46.10	3	Horizontal	11	1.80	-	36.52	7.02	33.26
AV	7.43927G	45.69	54.00	-8.31	35.41	3	Horizontal	11	1.80	-	36.52	7.02	33.26



Summary

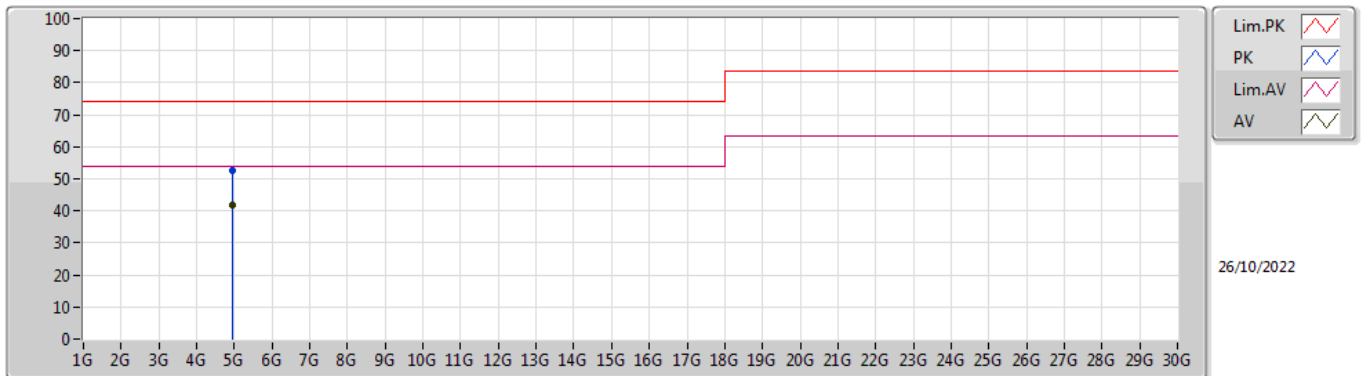
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	AV	4.95976G	41.85	54.00	-12.15	Horizontal

Mode 1



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	4.96652G	49.96	74.00	-24.04	5.14	3	Vertical	178	1.34	-	44.82	32.93	6.07	33.86
AV	4.95996G	38.56	54.00	-15.44	5.12	3	Vertical	178	1.34	"Worst"	33.44	32.92	6.06	33.86

Mode 1



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	4.95962G	52.58	74.00	-21.42	5.12	3	Horizontal	181	1.92	-	47.46	32.92	6.06	33.86
AV	4.95976G	41.85	54.00	-12.15	5.12	3	Horizontal	181	1.92	"Worst"	36.73	32.92	6.06	33.86