RF TEST REPORT

Applicant	FOCAL JMLab
FCC ID	OV3-FH21041
Product	DIVA UTOPIA
Brand	FOCAL
Model	DIVA UTOPIA
Report No.	R2410A1479-R4
Issue Date	December 3, 2024

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15F**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Summary of measurement results

Number	Test Case	Clause in FCC rules	Verdict
1	-10dB Bandwidth	15.503 &15.517 (b) C63.10 6.9.4	PASS
2	Peak Power	15.517 (e)	PASS
3	Transmitter radiated emissions	15.517 (c) (d)	PASS
4	AC Power Line Conducted Emissions	15.207 (a)	PASS
Date of Testing: November 1, 2024 ~ December 2, 2025 Date of Sample Received: June 17, 2024			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. All indications of Pass/Fail in this report are opinions expressed by Eurofins TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

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1. Test Laboratory

1.1. Notes of the test report

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1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA (Certificate Number: 3857.01)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3. Testing Location

Company:	Eurofins TA Technology (Shanghai) Co., Ltd.
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2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	FOCAL JMLab
Applicant address	108 Avenue De l'Avenir, ZI Molina la Chazotte, 42350 LA TALAUDIERE, FRANCE
Manufacturer	FOCAL JMLab
Manufacturer address	108 Avenue De l'Avenir, ZI Molina la Chazotte, 42350 LA TALAUDIERE, FRANCE

2.2. General information

EUT Description	
Model	DIVA UTOPIA
Lab internal SN	R2410A1479/S01
Hardware Version	R1
Software Version	0.0.0.9862
Power Supply	AC power supply
Antenna Type	PCB Antenna
Antenna Connector	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)
Max. EIRP	-15.96 dBm
Operating Frequency Range(s)	3.1GHz - 10.6GHz
Operating temperature range	0 ° C to 35 ° C
Operating voltage range	198 VAC to 264 VAC
State voltage	220 - 240 VAC
Note: 1. The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant.	

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3. Applied Standards

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

Test standards:

FCC CFR47 Part 15F (2023) Ultra-Wideband Operation

ANSI C63.10-2013

Reference standard:

KDB 393764 D01 UWB FAQ v02r01

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4. Test Case Results

4.1. -10dB Bandwidth

Ambient condition

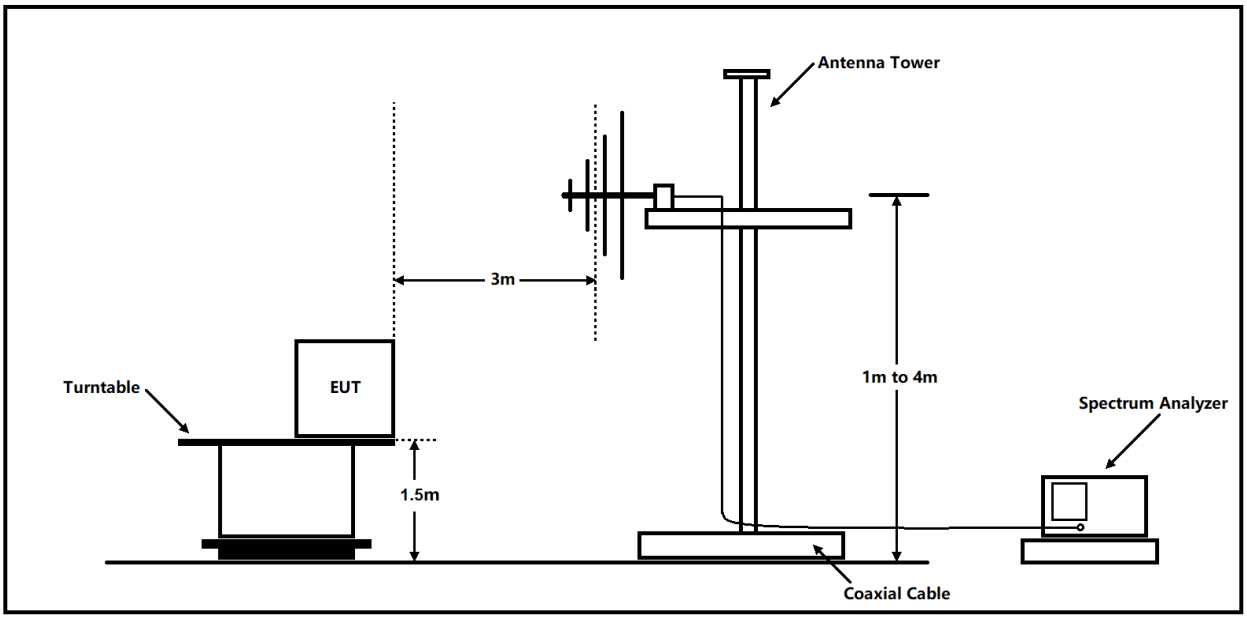
Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Method of Measurement

A UWB transmitter is defined as "an intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or great than 500MHz, regardless of the fractional bandwidth.

The frequency at which the maximum power level is measured with the peak detector is designated fM. The peak power measurements shall be made using a spectrum analyzer or EMI receiver with a 1 MHz resolution bandwidth and a video bandwidth of 1 MHz or greater. The instrument shall be set to peak detection using the maximum-hold trace mode. The outermost 1 MHz segments above and below fM, where the peak power falls by 10 dB relative to the level at fM, and designated as fH and fL, respectively.

Test Setup



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Limits

§15.503 (a) *UWB bandwidth.* For the purpose of this subpart, the UWB bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna. The upper boundary is designated fH and the lower boundary is designated fL. The frequency at which the highest radiated emission occurs is designated fM.

§15.503 (b) *Center frequency.* The center frequency,.

§15.503 (c) *Fractional bandwidth.* The fractional bandwidth equals.

§15.503 (d) *Ultra-wideband (UWB) transmitter.* An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

§15.517 (b) The UWB bandwidth of a UWB system operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 936 Hz.

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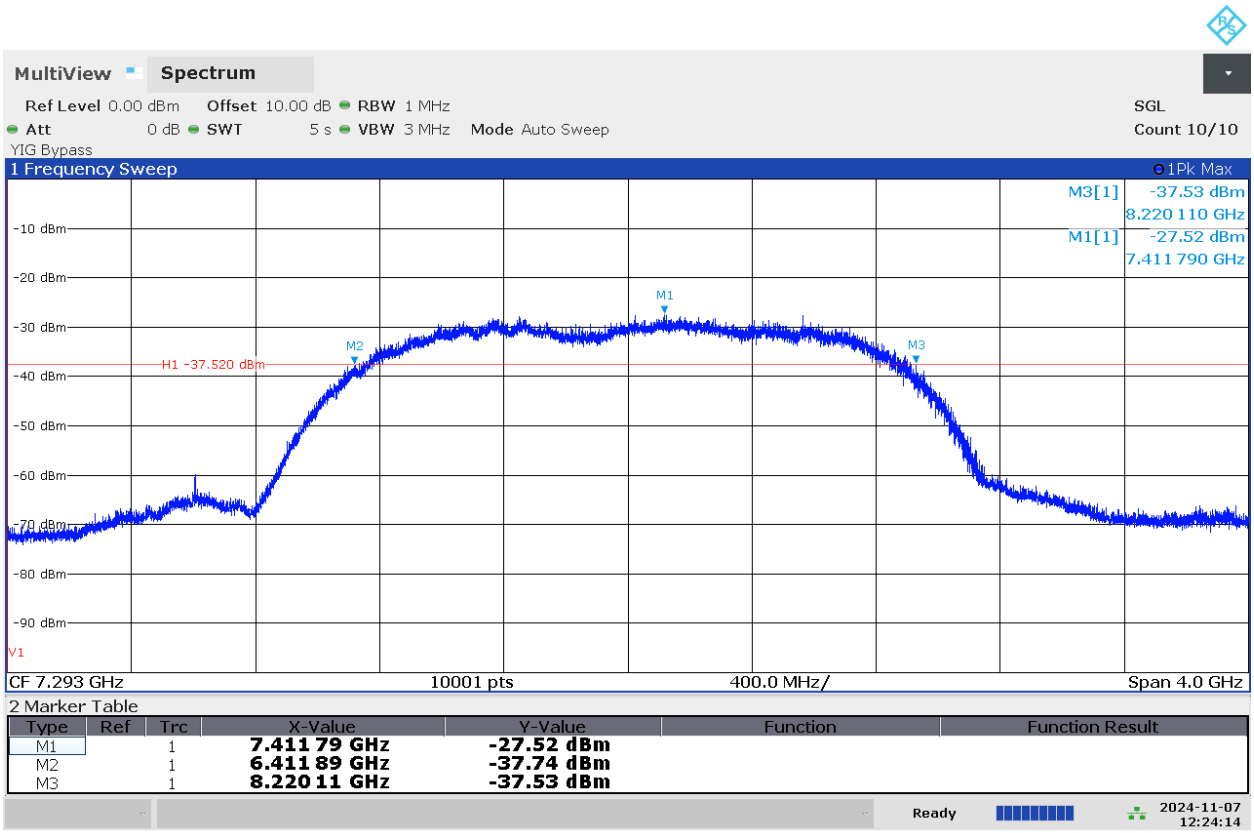
Test Results:

Frequency (MHz)	FM (MHz)	FL (MHz)	FH (MHz)	FC (MHz)	OBW (MHz)	Margin (MHz)	Limit (MHz)	Conclusion
7293	7411.79	6411.89	8220.11	7316.00	1808.22	0.247	500	PASS



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4.2. Peak Power

Ambient condition

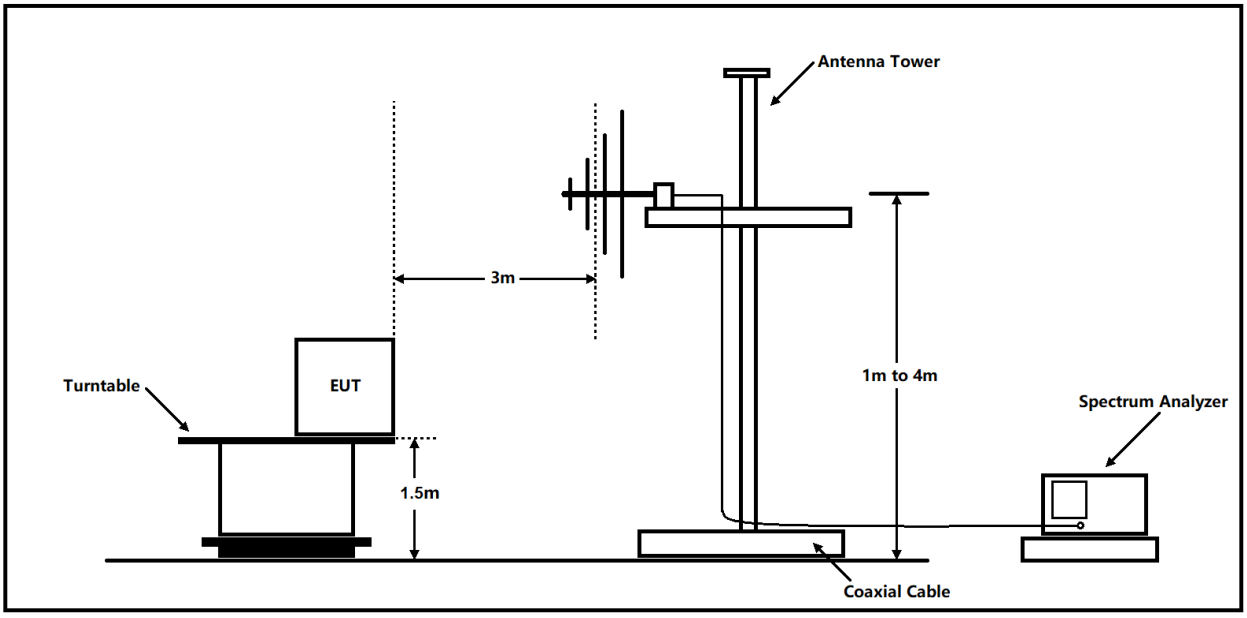
Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the average power meter through an external attenuator and a known loss cable. The EUT is max power transmission with proper modulation. We use Maximum average Radiated Output Power Level Method for this test.

The peak detector of the instrument is selected and the maximum hold feature activated. The RBW is set to 50 MHz and the VBW is set to at least 50 MHz (3 MHz is recommended).

Test Setup



Limits

15.517 (e) There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, fM. That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in § 15.521.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.44 dB.

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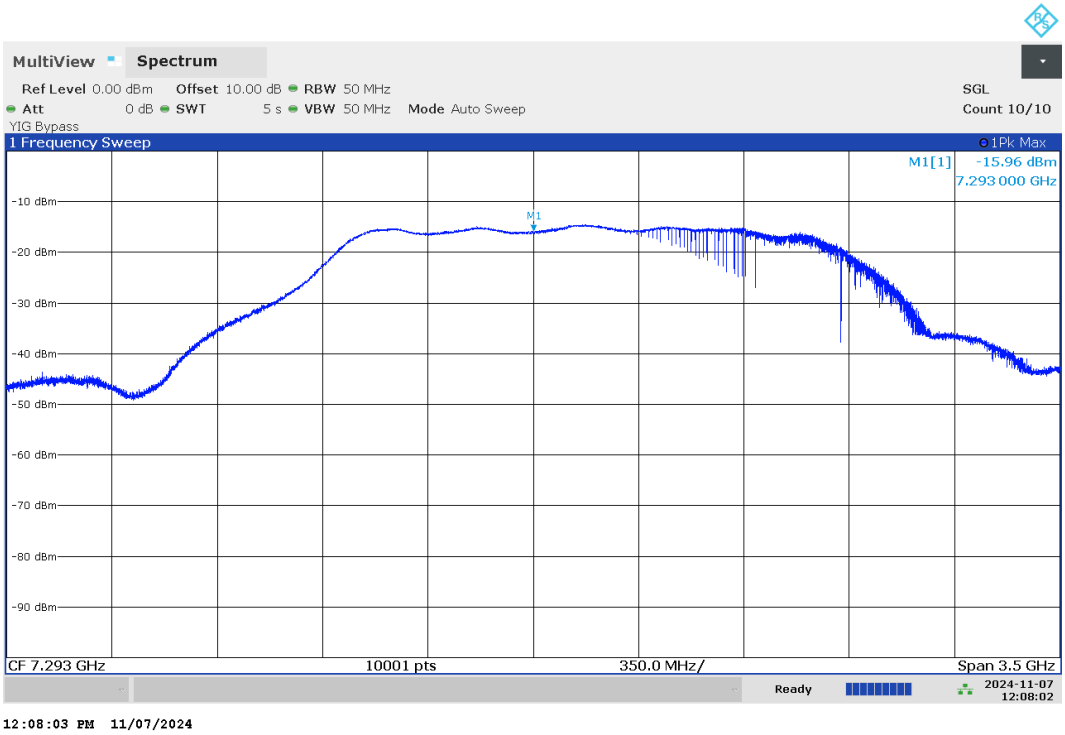
Test Results

Mode	Frequency /MHz	Max EIRP (dBm)	Limit (dBm)
UWB	7293	-15.96	0



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4.3. Transmitter Radiated Emissions

Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.
Sweep the whole frequency band range from 9kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.
Set the spectrum analyzer in the following:
9kHz~150 kHz
RBW=200Hz, VBW=1kHz/ Sweep=AUTO
150 kHz~30MHz
RBW=9KHz, VBW=30KHz,/ Sweep=AUTO
Below 1GHz
RBW=100kHz / VBW=300kHz / Sweep=AUTO
a) Peak emission levels are measured by setting the instrument as follows:
Above 1GHz
PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO
b) Average emission levels are measured by setting the instrument as follows:
Above 1GHz
AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO
c) Detector: The measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)
e) Sweep time = auto.
f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and

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OFF with the transmit cycle, at least 100 traces shall be averaged.)

g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is [10 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is [20 log (1 / D)], where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.

3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Reduce the video bandwidth until no significant variations in the displayed signal are observed in subsequent traces, provided the video bandwidth is no less than 1 Hz. For regulatory requirements that specify averaging only over the transmit duration (e.g., digital transmission system [DTS] and Unlicensed National Information Infrastructure [U-NII]), the video bandwidth shall be greater than [1 / (minimum transmitter on time)] and no less than 1 Hz.

The test is in transmitting mode.

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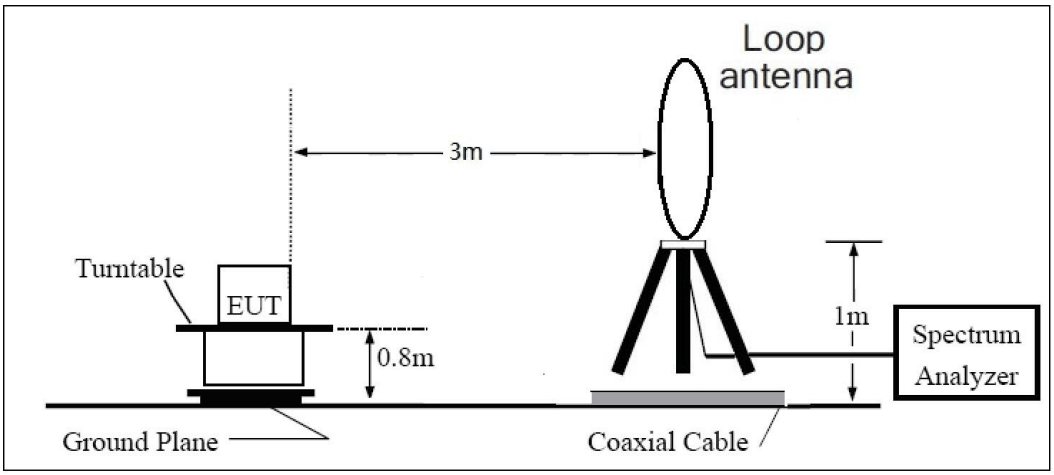
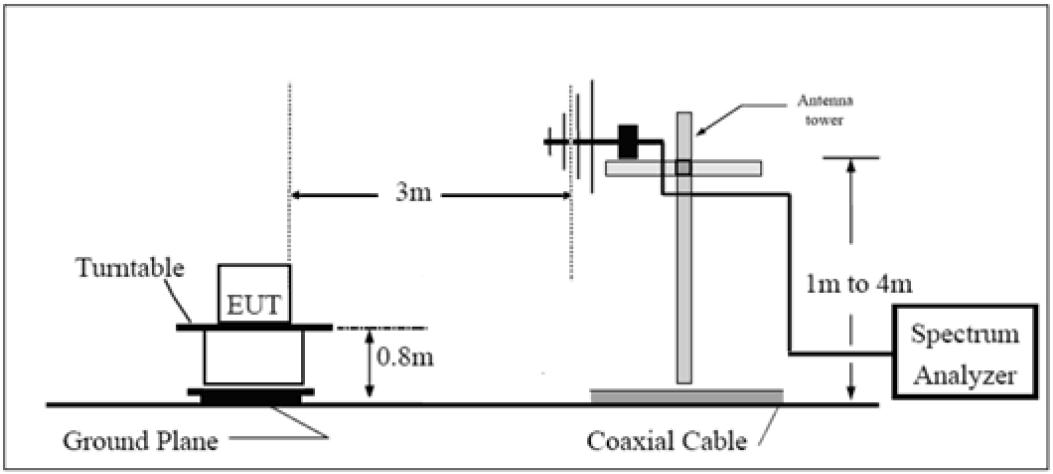
Test setup

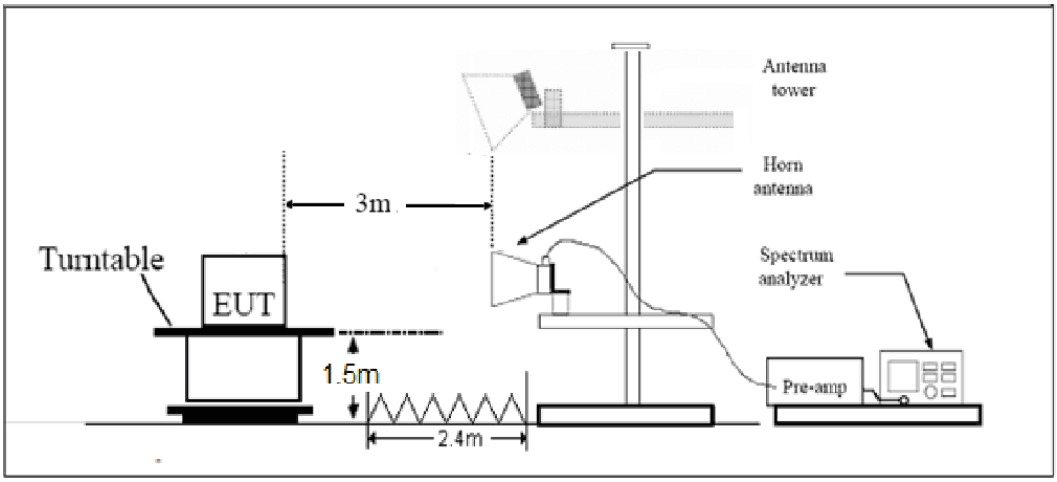
9KHz~ 30MHz



30MHz~ 1GHz



Above 1GHz



Note: Area side: 2.4mX3.6m

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Limits

15.517 (c) The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in § 15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency in MHz	EIRP in dBm
960-1610	−75.3
1610-1990	−53.3
1990-3100	−51.3
3100-10600	−41.3
Above 10600	−51.3

15.517 (d) In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency in MHz	EIRP in dBm
1164-1240	−85.3
1559-1610	−85.3

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor *k* = 1.96.

Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.17 dB
200MHz-1GHz	4.84 dB
1-18GHz	4.35 dB
18-26.5GHz	5.90 dB
26.5GHz~40GHz	5.92 dB

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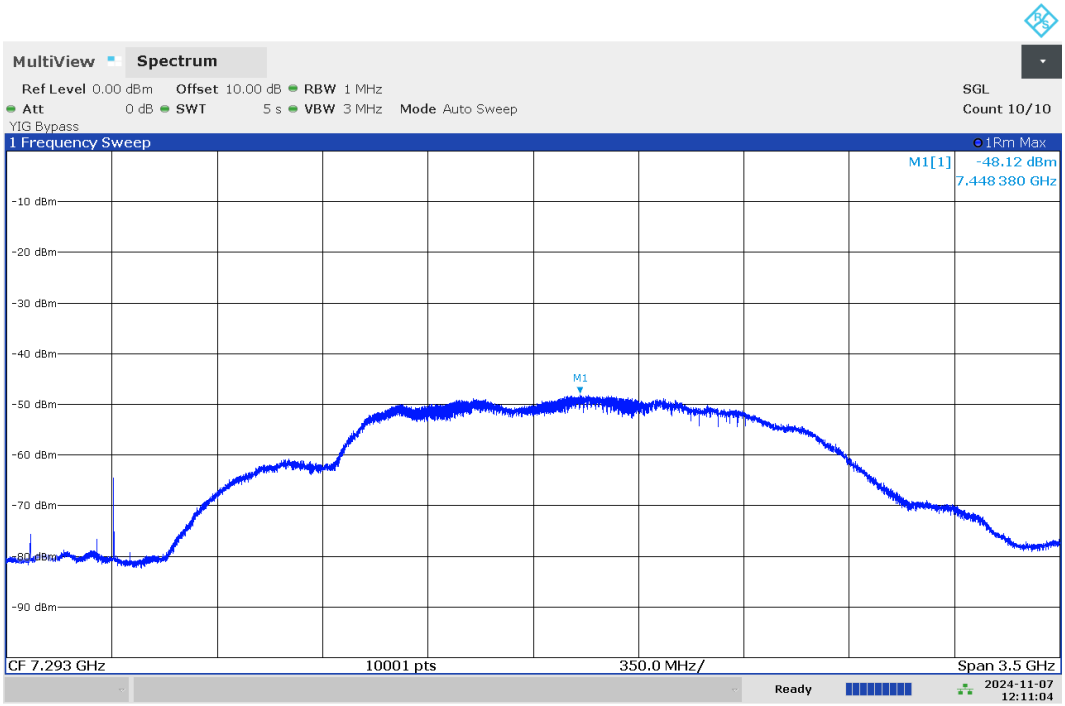
Test Results:

Mode	Frequency MHz	Average EIRP (dBm/MHz)	Limit (dBm/MHz)
UWB	7293	-48.12	-41.3



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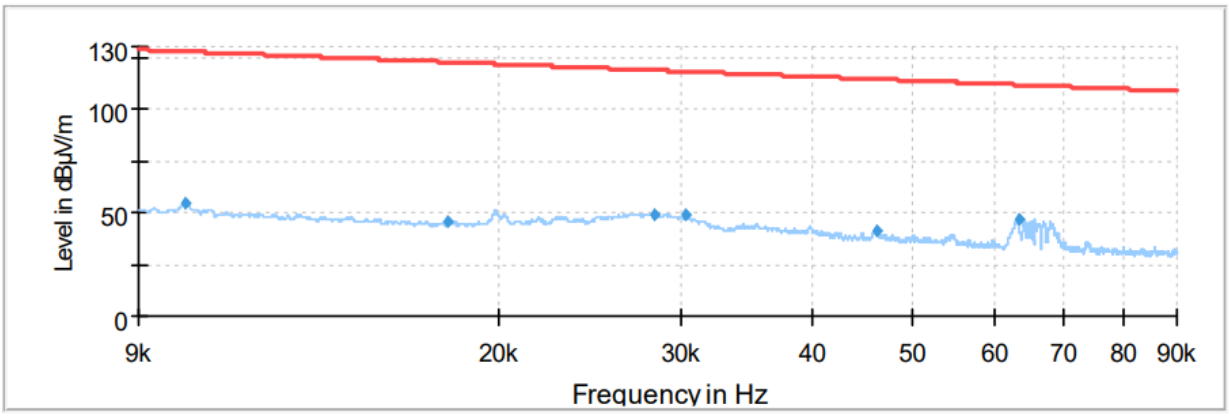
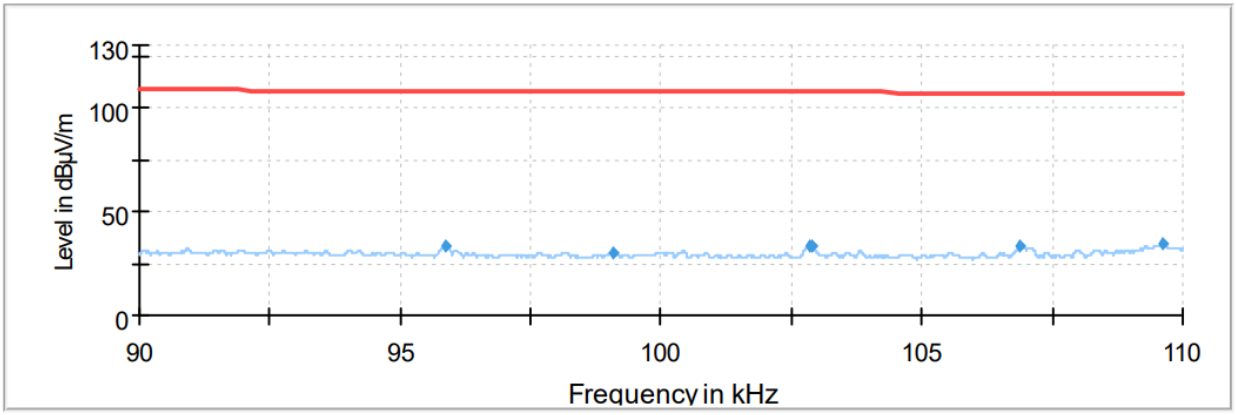
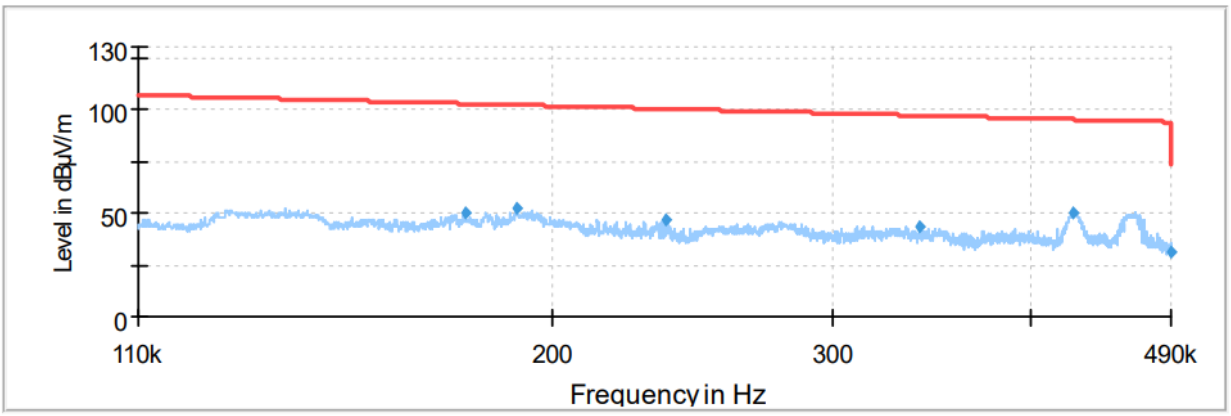


Radiates Emission from 9KHz to 90KHz



Radiates Emission from 90KHz to 110KHz



Radiates Emission from 110KHz to 490KHz

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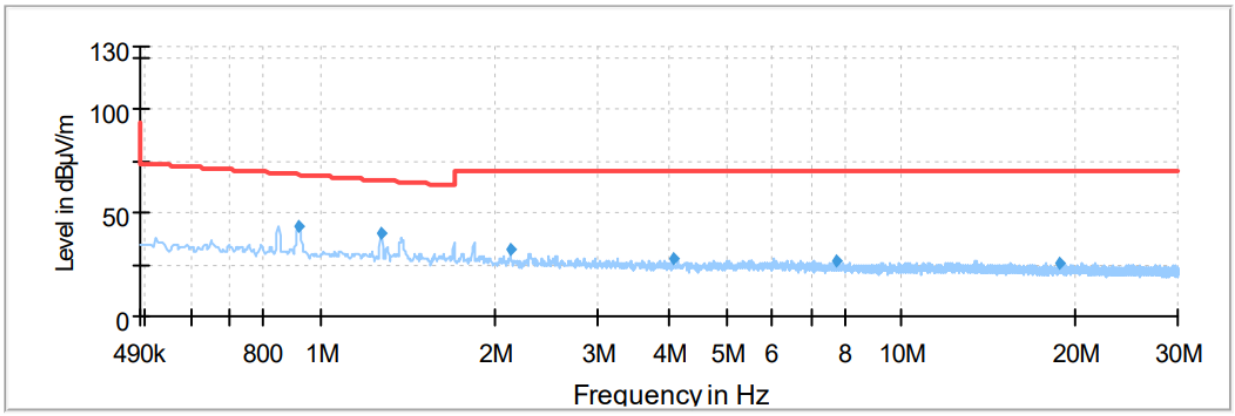
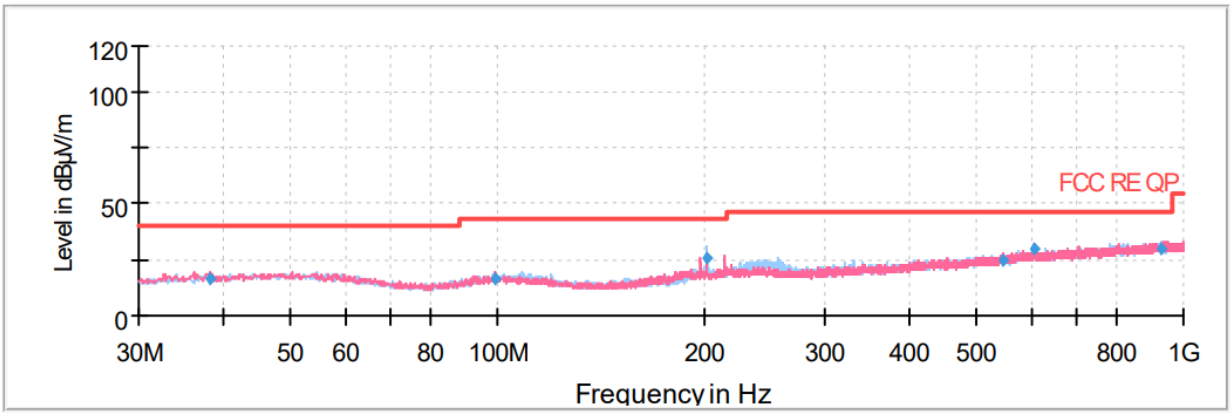


Radiates Emission from 490KHz to 30MHz



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
38.00	16.20	40.00	23.80	198.0	H	0.00	18
99.48	16.01	43.50	27.49	122.0	V	354.00	19
202.30	25.71	43.50	17.79	122.0	H	20.00	18
545.43	24.43	46.00	21.57	197.0	V	46.00	26
604.60	29.32	46.00	16.68	101.0	V	238.00	27
927.61	30.04	46.00	15.96	117.0	H	1.00	32

Remark: 1. Correction Factor = Antenna factor + Insertion loss (cable loss + amplifier gain)
2. Margin = Limit – Quasi-Peak

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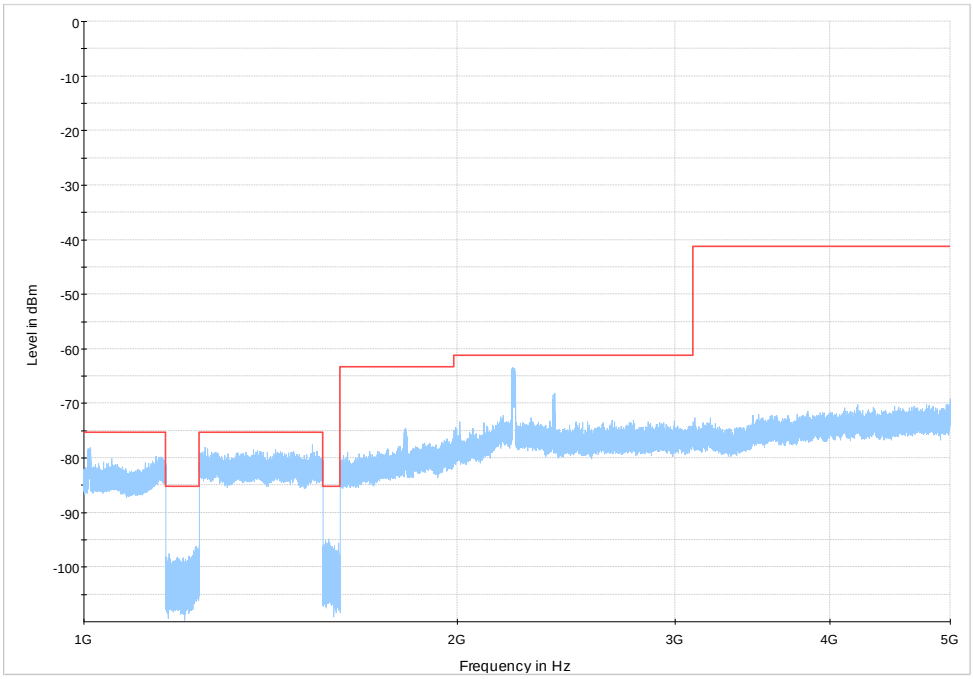
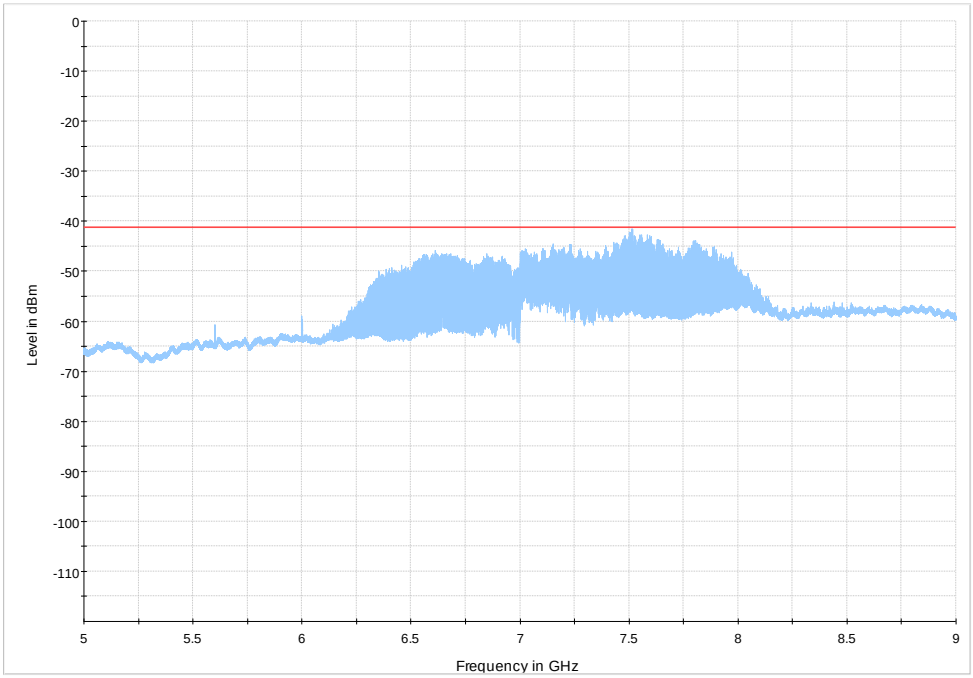


Radiates Emission from 1GHz to 5GHz



Radiates Emission from 5GHz to 9GHz

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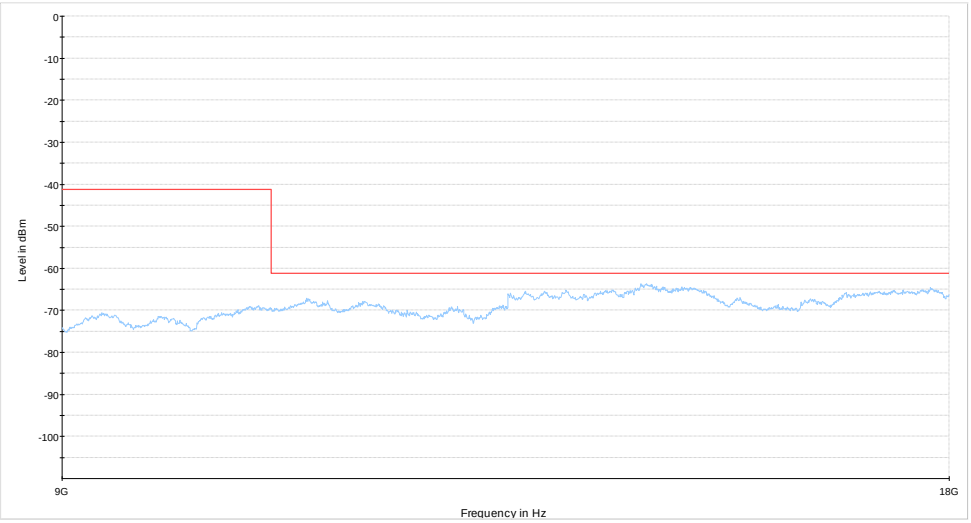

Radiates Emission from 9GHz to 18GHz

Test Data File Name	Frequency (MHz)	Maximum value (dBm)	Limit (dBm)	Margin (dB)	Degree
RSE_UWB_CH7293_XV_9-18GHz	2216.71	-63.43	-61.30	2.13	198
RSE_UWB_CH7293_XV_5-9GHz	7513.20	-41.62	-41.30	0.32	174
RSE_UWB_CH7293_XV_1-5GHz	14146.50	-63.63	-61.30	2.33	90

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4.4. AC Power Line Conducted Emissions

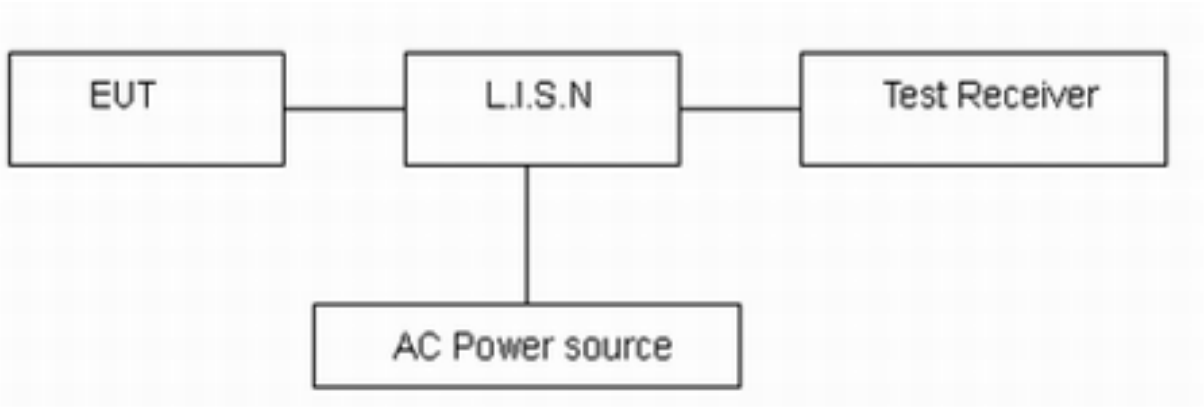
Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Methods of Measurement

The EUT IS placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.10. Connect the AC power line of the EUT to the LISN Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9kHz, VBW is set to 30kHz The measurement result should include both L line and N line.
The test is in transmitting mode.

Test Setup



Note: AC Power source is used to change the voltage 110V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U= 2.69 dB.

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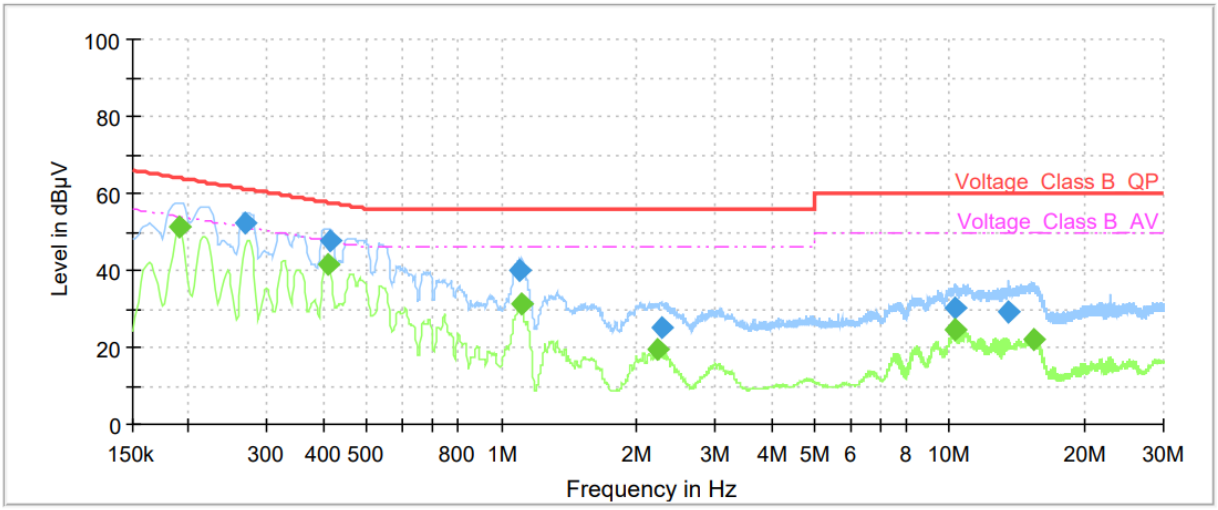
Test Results:

Following plots, Blue trace uses the peak detection and Green trace uses the average detection.



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.19	---	51.36	54.02	2.66	1000.0	9.000	L1	ON	21.1
0.27	52.47	---	61.21	8.74	1000.0	9.000	L1	ON	21.1
0.41	---	41.30	47.63	6.33	1000.0	9.000	L1	ON	21.0
0.41	47.67	---	57.58	9.91	1000.0	9.000	L1	ON	21.0
1.10	40.17	---	56.00	15.83	1000.0	9.000	L1	ON	20.2
1.11	---	31.17	46.00	14.83	1000.0	9.000	L1	ON	20.2
2.22	---	19.41	46.00	26.59	1000.0	9.000	L1	ON	19.7
2.27	25.00	---	56.00	31.00	1000.0	9.000	L1	ON	19.6
10.25	---	24.39	50.00	25.61	1000.0	9.000	L1	ON	19.6
10.33	30.01	---	60.00	29.99	1000.0	9.000	L1	ON	19.6
13.56	29.32	---	60.00	30.68	1000.0	9.000	L1	ON	19.6
15.41	---	22.31	50.00	27.69	1000.0	9.000	L1	ON	19.6

Remark: Correct factor=cable loss + LISN factor

L line Conducted Emission from 150 kHz to 30 MHz

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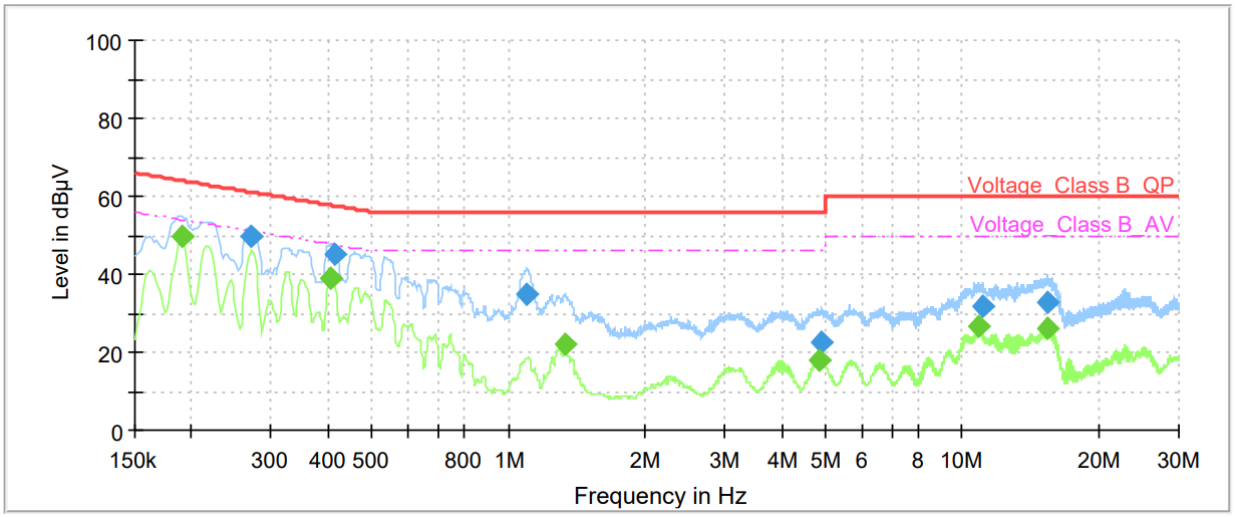

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.19	---	49.97	54.02	4.05	1000.0	9.000	N	ON	21.1
0.27	49.77	---	61.14	11.37	1000.0	9.000	N	ON	21.1
0.40	---	39.17	47.77	8.60	1000.0	9.000	N	ON	21.0
0.42	45.16	---	57.54	12.37	1000.0	9.000	N	ON	21.0
1.10	34.72	---	56.00	21.28	1000.0	9.000	N	ON	20.2
1.33	---	22.26	46.00	23.74	1000.0	9.000	N	ON	20.0
4.86	---	18.20	46.00	27.80	1000.0	9.000	N	ON	19.5
4.92	22.77	---	56.00	33.23	1000.0	9.000	N	ON	19.5
10.86	---	26.49	50.00	23.51	1000.0	9.000	N	ON	19.6
11.07	31.68	---	60.00	28.32	1000.0	9.000	N	ON	19.6
15.33	32.93	---	60.00	27.07	1000.0	9.000	N	ON	19.7
15.39	---	26.06	50.00	23.94	1000.0	9.000	N	ON	19.7

Remark: Correct factor=cable loss + LISN factor

N line Conducted Emission from 150 kHz to 30 MHz

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5. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Spectrum Analyzer	R&S	FSW26	103495	2024-05-07	2025-05-06
Signal Analyzer	R&S	FSV40	101186	2024-05-07	2025-05-06
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	1023	2023-07-14	2026-07-13
Horn Antenna	SCHWARZBECK	BBHA 9120D	430	2024-07-18	2027-07-17
Horn Antenna	ETS-Lindgren	3160-09	00102643	2024-09-24	2027-09-23
Horn Antenna	STEATITE	QSH-SL-26-40 -K-15	16779	2023-01-17	2026-01-16
Software	R&S	EMC32	9.26.01	/	/
Artificial main network	R&S	ENV216	101171	2023-12-05	2025-12-04
EMI Test Receiver	R&S	ESR	101667	2024-05-07	2025-05-06
Software	R&S	EMC32	10.35.10	/	/

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ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.

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ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.

******** END OF REPORT ********

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