

Prüfbericht-Nr.: Test report no.:	CN24ABIS 001	Auftrags-Nr.: Order no.:	180290402	Seite 1 von 26 Page 1 of 26
Kunden-Referenz-Nr.: Client reference no.:	N/A	Auftragsdatum: Order date:	2024.04.03	
Auftraggeber: Client:	Ningbo Dooya Mechanic & Electronic Technology Co., Ltd. No.168 Shengguang Road, Luotuo, Zhenhai, Ningbo 315202 Zhejiang P.R. China			
Prüfgegenstand: Test item:	M-Box			
Bezeichnung / Typ-Nr.: Identification / Type no.:	DD7006M, DD7006N, DD7006D, DD7006F			
Auftrags-Inhalt: Order content:	TÜV Rheinland – FCC Service			
Prüfgrundlage: Test specification:	FCC 47 CFR Part 15.203 FCC 47 CFR Part 15.231 FCC Part 15, Subpart B:2023			
Wareneingangsdatum: Date of sample receipt:	2024.04.08	Refer to Photo Documentation		
Prüfmuster-Nr.: Test sample no:	A003692064-001			
Prüfzeitraum: Testing period:	2024.04.23 - 2025.02.11			
Ort der Prüfung: Place of testing:	Refer to section 1.1			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von: tested by:	genehmigt von: authorized by:			
Datum: Date:	2025.04.28	Ausstelldatum: Issue date:	2025.04.28	
Stellung / Position:	Keda Zhou/PE	Stellung / Position:	Chonghai Liang/Authorizer	
Sonstiges / Other:	All models use the same PCB design, Model DD7006N has a ethernet port while Model DD7006M does not, the only difference is that the DD7006M model lacks ethernet port related components. Model DD7006D and DD7006F are the same as Model DD7006N. FCC ID: VYYDD7006M Contains FCC ID: 2AC7Z-ESP32WROVERE			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.				

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Anmerkungen Remarks

Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.

Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.

The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.

Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.

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Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.

*Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.*

Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.

Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.

The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.

Test Summary

4.1.1 ANTENNA REQUIREMENT

Result:

Pass

4.1.2 DEACTIVATION OF THE TRANSMISSION

Result:

Pass

4.1.3 20DB EMISSION BANDWIDTH

Result:

Pass

4.1.4 FIELD STRENGTH OF FUNDAMENTAL AND UNWANTED EMISSIONS

Result:

Pass

4.2.1 MAINS TERMINAL CONTINUOUS DISTURBANCE VOLTAGE

Result:

Pass

4.2.2 RADIATED DISTURBANCE

Result:

Pass

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1. Test Sites

1.1 Test Facilities

Laboratory: TÜV Rheinland /CCIC (Ningbo) Co., Ltd.

1st Floor, Building 11, Scholar Innovation Park, No.1188 Zhongguan Road, Zhenhai District, Ningbo 315200 P.R. China

FCC Designation Number: CN1237

FCC Test Firm Registration Number: 647754

The used test equipment is in accordance with CISPR 16-1 series standards.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment, Laboratory

Kind of Equipment	Type	Serial No.	Last cal. date	Cal. due date
EMI test receiver	ESR3	102331	2024.10.23	2025.10.22
LISN	ENV216	102250	2024.10.23	2025.10.22
EMI test receiver	ESR7	101929	2024.10.23	2025.10.22
Spectrum analyzer	FSV40	101412	2024.10.23	2025.10.22
Bilog Antenna	CBL6112D	49033	2024.03.17	2027.03.16
Horn antenna	HF907	102653	2023.07.20	2026.07.19
Pre-amplifier	SCU-18F	180051	2024.10.23	2025.10.22

1.3 Uncertainty of Measurement

Table 2: Measurement Uncertainty

Test Item	Expanded Measurement Uncertainty (k=2)
Conducted Emission (9-150kHz)	3.70 dB
Conducted Emission (150k-30MHz)	3.30 dB
Radiated Emission (30-1000MHz)	4.39 dB
Radiated Emission (1-18GHz)	4.67 dB

2. General Product Information

2.1 Product Function and Intended Use

The EUT (equipment under test) is a M-Box operating at 433.05 - 434.79MHz.

For more detail information, refer to the user's manual.

2.2 Ratings and System Details

Table 3: General Description of EUT

General Description of EUT	
FCC ID:	VYYDD7006M
Rated Voltage:	USB 5V
Protection Class:	Class III
Technical Specification of SRD (433MHz)	
Operating Frequency band	433.05 - 434.79MHz
Modulation	GFSK
Antenna Type	PCB Antenna
Antenna Gain	-2.52dBi

2.3 Independent Operation Modes

There are some modes:

Mode A: Transmitting on Operating Frequency Band: 433.05 - 434.79MHz

Mode B: Transmitting by 2.4GHz Wi-Fi module

Mode C: Normal Working

Refer to the user's manual for further information.

2.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram for further information.

2.5 Submitted Documents

Circuit diagram, Schematics, PCB Layout, Label, User Manual etc.

3. Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

3.2 Test Operation and Test Software

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power was selected according to the instruction given by the manufacturer. The setting of the RF output power expected by the customer shall be fixed on the firmware of the final end product.

All testing were performed according to the procedures in ANSI C63.10: 2020.

Test Software EMC32 V10.30 was used in the radiated emission test.

More details refer to the related paragraph of this report.

3.3 Special Accessories and Auxiliary Equipment

None.

3.4 Countermeasures to Achieve ERM Compliance

The test sample which has been tested contained the noise suppression parts as described in the Circuit Diagram. No additional measures were employed to achieve compliance.

3.5 Test set-up

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

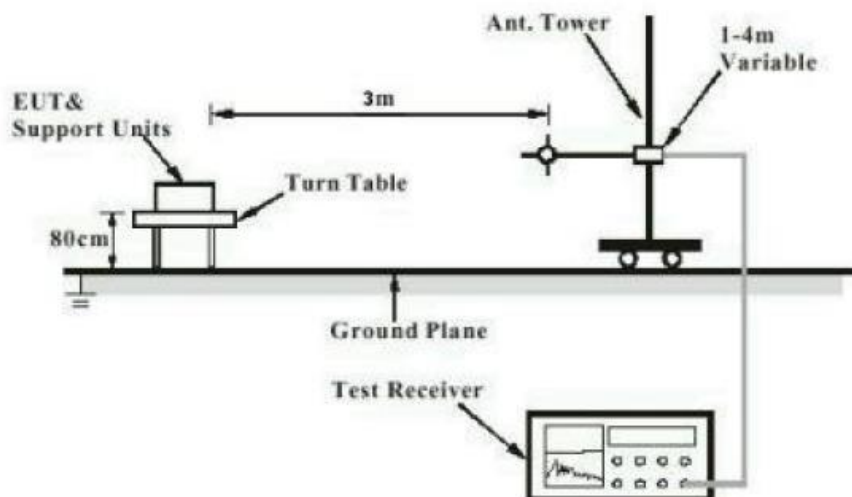


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

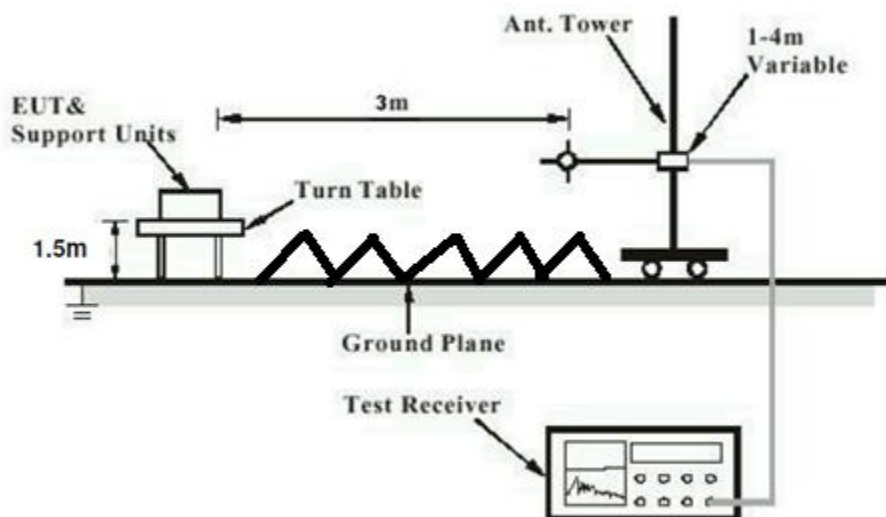
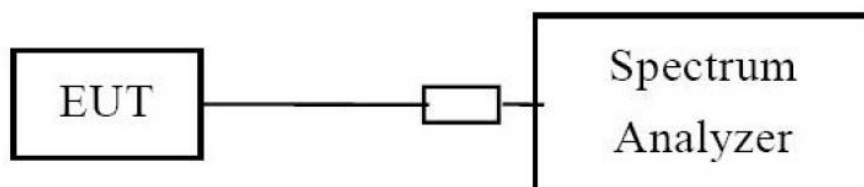


Diagram of Measurement Configuration for Conducted Transmitter Measurement



4. Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

Result:

Pass

Test Specification

Test standard

: FCC 47 CFR Part 15.203

Limit

: the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an integral antenna (PCB antenna, Antenna Gain: -2.52dBi), and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore, the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

4.1.2 Deactivation of the Transmission

Result: Pass

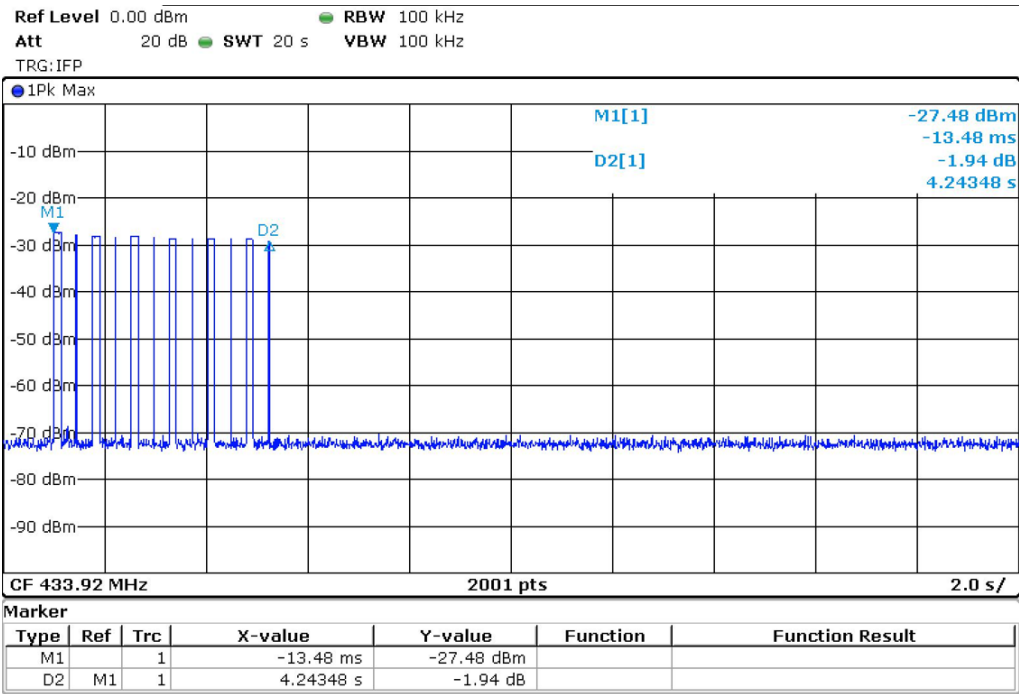
Test Specification	
Test standard	: FCC 47 CFR Part 15.231
Basic standard	: ANSI C63.10: 2020
Test requirement	: CFR47 FCC Part 15.231 (a)(1)
Limits	: A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. A transmitter activated automatically shall cease transmission within 5 seconds after activation.
Test suite	: Shielded Room

Test Setup

Date of testing	: 2024.05.25
Test environment:	: Normal test conditions
Operational mode	: Mode A
Temperature	: 23°C
Relative humidity	: 56%
Atmospheric pressure	: 101.2 kPa

Figure 1: Test Results of Deactivation of the Transmission

Activated mode	Duration Time (S)	Limit (S)
Manually	4.2435	≤5



4.1.3 20dB Emission Bandwidth

Result: Pass

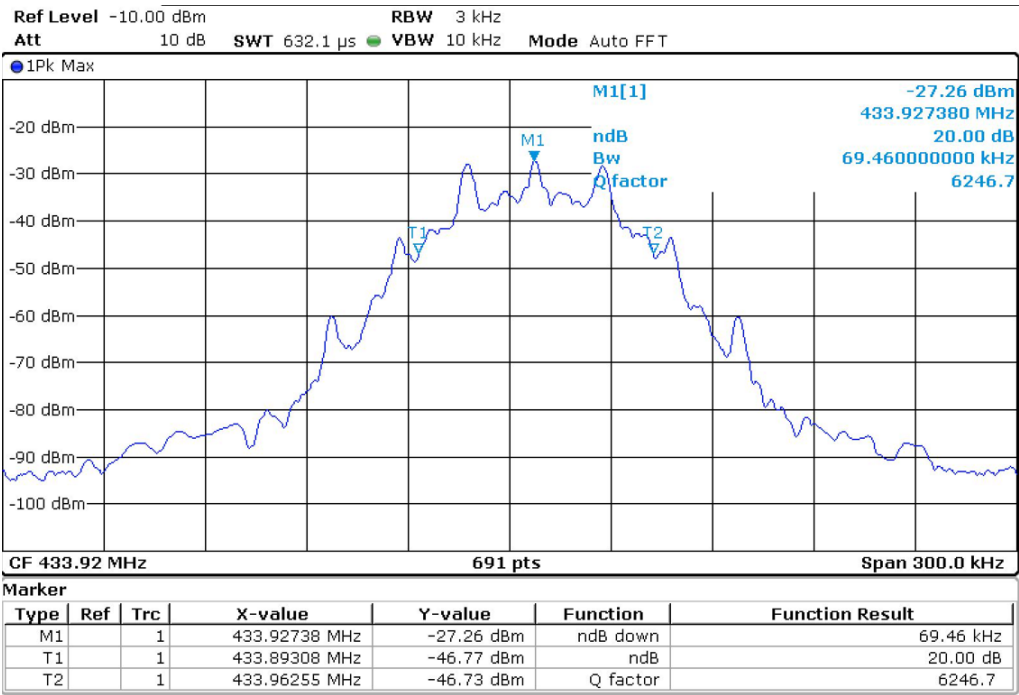
Test Specification	
Test standard	: FCC 47 CFR Part 15.231
Basic standard	: ANSI C63.10: 2020
Test requirement	: CFR47 FCC Part 15.231 (c)
Limit	: CFR47 FCC Part 15.231 (c)
Test suite	: Shielded Room

Test Setup

Date of testing	: 2024.05.25
Test environment	: Normal test conditions
Operational mode	: Mode A
Temperature	: 23°C
Relative humidity	: 56%
Atmospheric pressure	: 101.2 kPa

Figure 2: Test Results of 20dB Emission Bandwidth

Bandwidth (kHz) Limit (kHz)
 69.46 ≤1085



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4.1.4 Field strength of fundamental and Unwanted Emissions

Result:

Pass

Test Specification

Test standard

: FCC 47 CFR Part 15.231

CFR47 FCC Part 15.205

CFR47 FCC Part 15.209

Basic standard

: ANSI C63.10: 2020

Test requirement

: CFR47 FCC Part 15.231 (b)(1)(2)(3)

Limits

: CFR47 FCC Part 15.231 (b)

Test suite

: 3m Semi Anechoic Room

Test Setup

Date of testing

: 2024.05.21

Test environment

: Normal test conditions

Operational mode

: Mode A, Mode A+Mode B

Temperature

: 23°C

Relative humidity

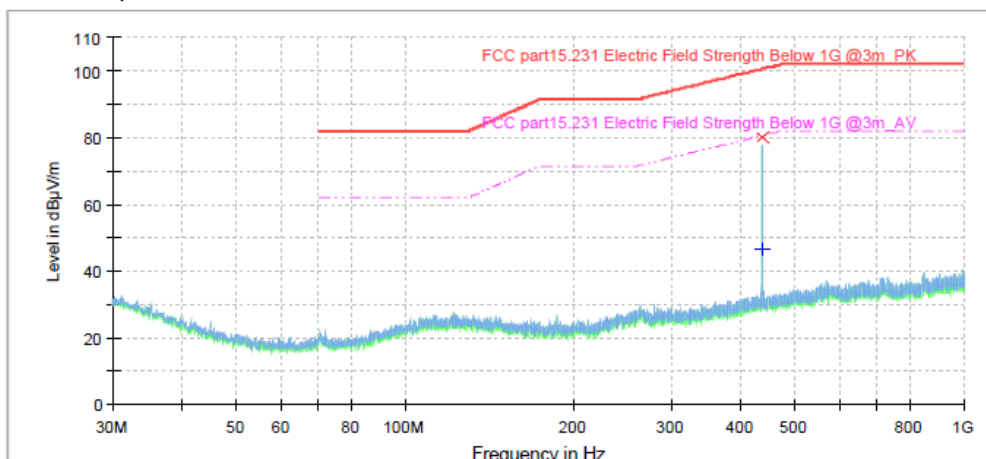
: 56%

Atmospheric pressure

: 101.2 kPa

Figure 3: Field strength of fundamental

Fundamental, Horizontal



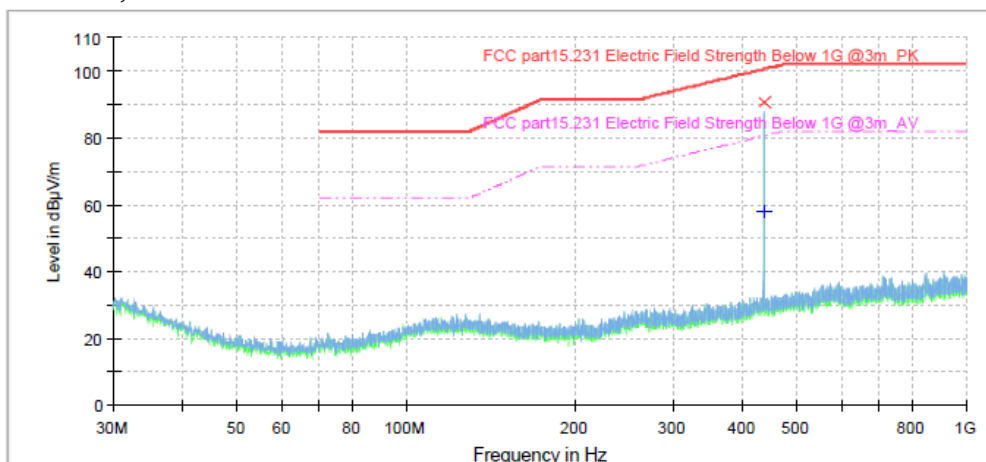
Limit and Margin-PK

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
433.900000	79.9	1000.0	120.000	100.0	H	11.0	24.5	20.7	100.6

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
433.900000	46.5	1000.0	120.000	100.0	H	11.0	24.5	34.1	80.6

Fundamental, Vertical



Limit and Margin-PK

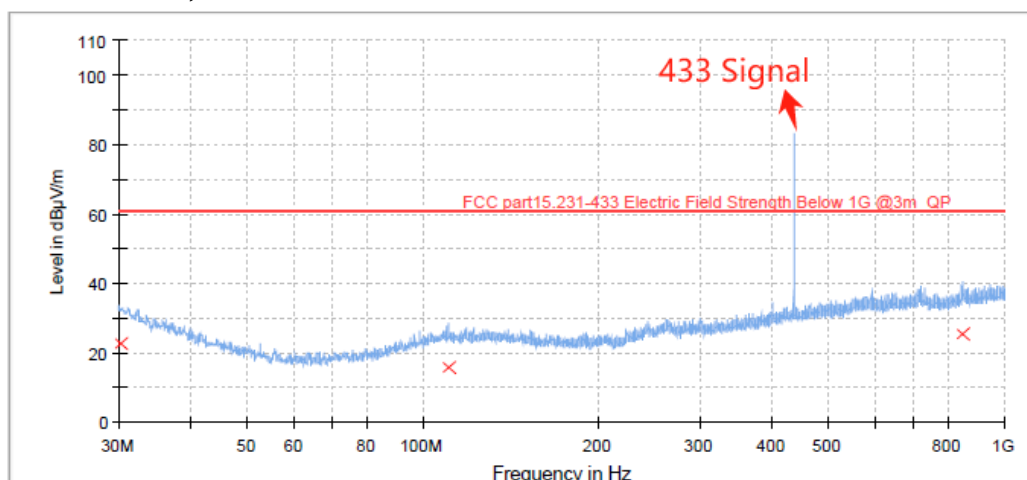
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
433.900000	90.7	1000.0	120.000	100.0	V	11.0	24.5	9.9	100.6

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
433.900000	57.9	1000.0	120.000	100.0	V	11.0	24.5	22.7	80.6

Figure 4: Spectral Diagrams, Radiated Spurious Emission, Mode A

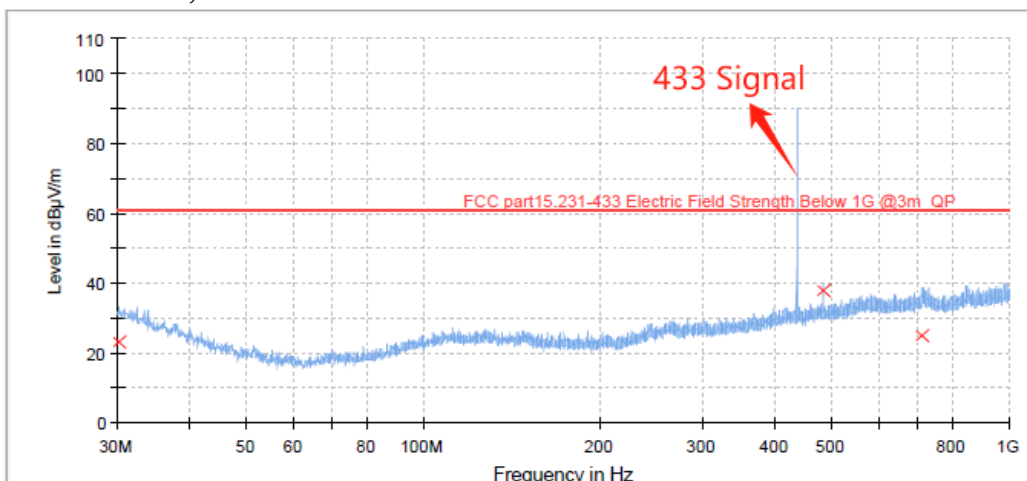
30MHz-1000MHz, Horizontal



Limit and Margin

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.220000	22.6	1000.0	120.000	100.0	H	11.0	25.8	38.0	60.6
110.620000	15.7	1000.0	120.000	100.0	H	11.0	18.9	44.9	60.6
845.230000	25.1	1000.0	120.000	100.0	H	11.0	29.4	35.5	60.6

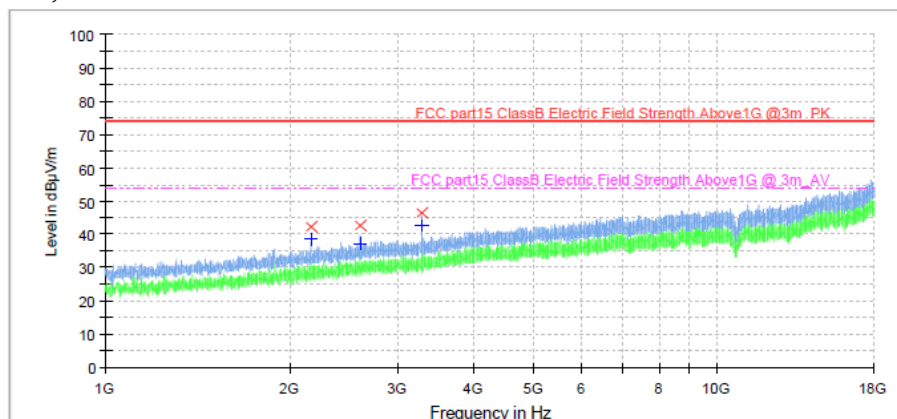
30MHz-1000MHz, Vertical



Limit and Margin

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.220000	22.8	1000.0	120.000	100.0	V	11.0	25.8	37.8	60.6
480.030000	37.5	1000.0	120.000	100.0	V	11.0	25.6	23.1	60.6
709.480000	24.8	1000.0	120.000	100.0	V	11.0	27.8	35.8	60.6

Above 1GHz, Horizontal



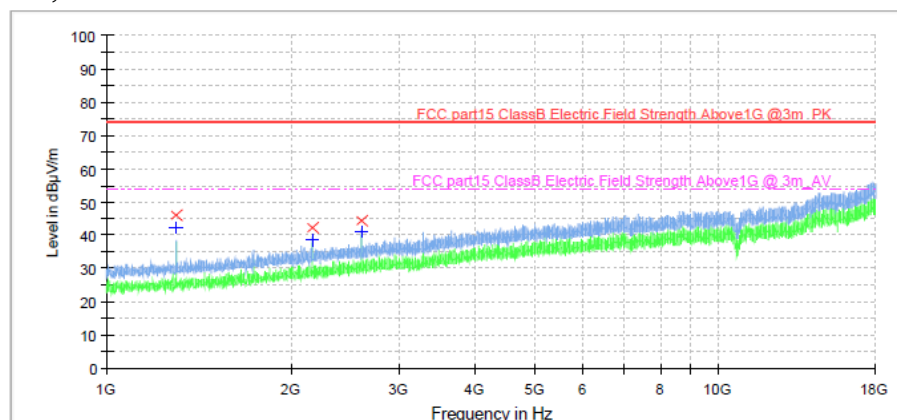
Limit and Margin-PK

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2169.810000	42.1	1000.0	1000.000	150.0	H	0.0	-6.9	31.9	74.0
2603.310000	42.7	1000.0	1000.000	150.0	H	0.0	-4.4	31.3	74.0
3282.780000	46.4	1000.0	1000.000	150.0	H	0.0	-1.0	27.6	74.0

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2169.810000	38.3	1000.0	1000.000	150.0	H	0.0	-6.9	15.7	54.0
2603.310000	37.3	1000.0	1000.000	150.0	H	0.0	-4.4	16.7	54.0
3282.780000	42.7	1000.0	1000.000	150.0	H	0.0	-1.0	11.3	54.0

Above 1GHz, Vertical



Limit and Margin-PK

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1301.750000	45.9	1000.0	1000.000	150.0	V	0.0	-12.1	28.1	74.0
2169.280000	42.5	1000.0	1000.000	150.0	V	0.0	-6.9	31.5	74.0
2603.310000	44.3	1000.0	1000.000	150.0	V	0.0	-4.4	29.7	74.0

Limit and Margin-AV

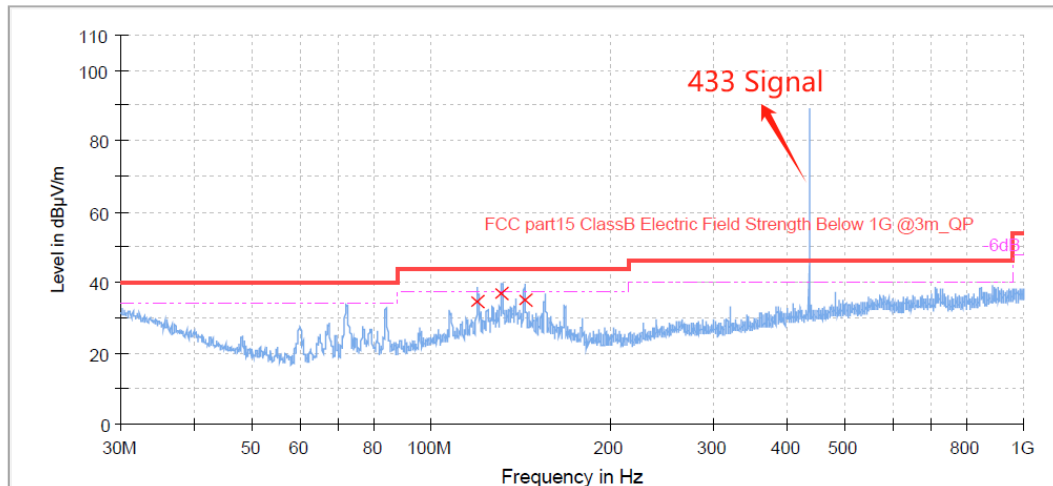
Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1301.750000	42.4	1000.0	1000.000	150.0	V	0.0	-12.1	11.6	54.0
2169.280000	38.5	1000.0	1000.000	150.0	V	0.0	-6.9	15.5	54.0
2603.310000	41.0	1000.0	1000.000	150.0	V	0.0	-4.4	13.0	54.0

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Figure 5: Spectral Diagrams, Radiated Spurious Emission, Mode A+ Mode B

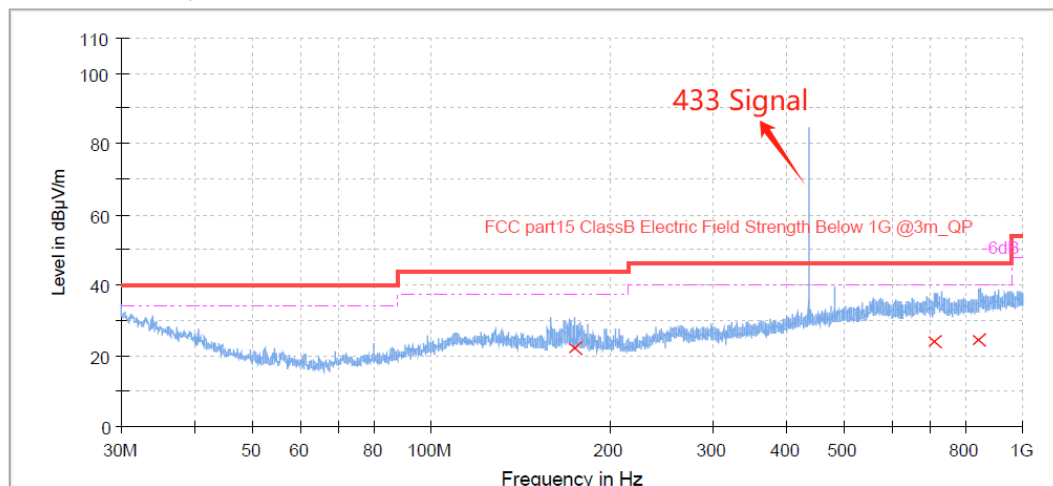
30MHz-1000MHz, Horizontal



Limit and Margin

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
119.890000	34.3	1000.0	120.000	100.0	H	11.0	19.0	9.2	43.5
131.800000	36.9	1000.0	120.000	100.0	H	11.0	18.8	6.6	43.5
143.760000	35.1	1000.0	120.000	100.0	H	11.0	18.1	8.4	43.5

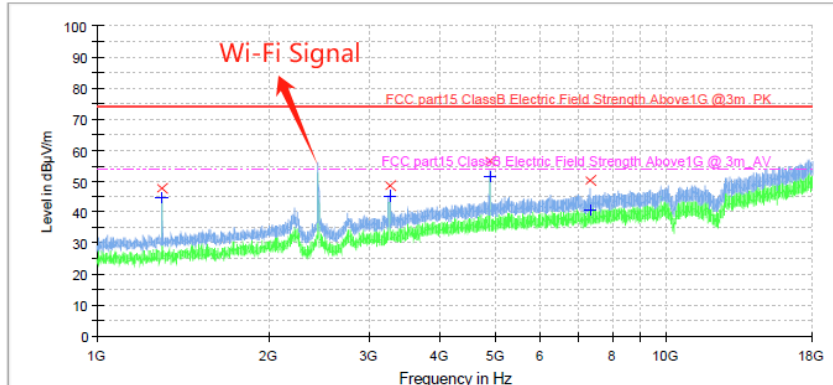
30MHz-1000MHz, Vertical



Limit and Margin

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
175.550000	21.9	1000.0	120.000	100.0	V	11.0	16.5	21.6	43.5
709.220000	23.8	1000.0	120.000	100.0	V	11.0	26.9	22.2	46.0
844.910000	24.2	1000.0	120.000	100.0	V	11.0	28.4	21.8	46.0

Above 1GHz, Horizontal



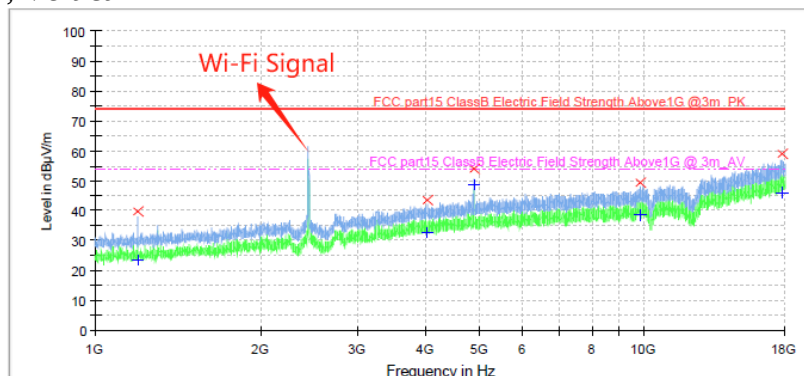
Limit and Margin-PK

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1301.750000	47.9	1000.0	1000.000	150.0	H	0.0	-11.5	26.1	74.0
3256.220000	48.5	1000.0	1000.000	150.0	H	0.0	-0.5	25.5	74.0
4883.970000	56.6	1000.0	1000.000	150.0	H	0.0	4.3	17.4	74.0
7324.000000	50.2	1000.0	1000.000	150.0	H	0.0	8.4	23.8	74.0

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1301.750000	44.7	1000.0	1000.000	150.0	H	0.0	-11.5	9.3	54.0
3256.220000	45.3	1000.0	1000.000	150.0	H	0.0	-0.5	8.7	54.0
4883.970000	51.5	1000.0	1000.000	150.0	H	0.0	4.3	2.5	54.0
7324.000000	40.6	1000.0	1000.000	150.0	H	0.0	8.4	13.4	54.0

Above 1GHz, Vertical



Limit and Margin-PK

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1195.500000	39.6	1000.0	1000.000	150.0	V	0.0	-12.0	34.4	74.0
4022.810000	43.6	1000.0	1000.000	150.0	V	0.0	1.9	30.4	74.0
4883.970000	54.1	1000.0	1000.000	150.0	V	0.0	4.3	19.9	74.0
9828.845000	49.2	1000.0	1000.000	150.0	V	0.0	11.6	24.8	74.0
17743.405000	59.1	1000.0	1000.000	150.0	V	0.0	22.7	14.9	74.0

Limit and Margin-AV

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1195.500000	23.2	1000.0	1000.000	150.0	V	0.0	-12.0	30.8	54.0
4022.810000	32.6	1000.0	1000.000	150.0	V	0.0	1.9	21.4	54.0
4883.970000	48.5	1000.0	1000.000	150.0	V	0.0	4.3	5.5	54.0
9828.845000	38.7	1000.0	1000.000	150.0	V	0.0	11.6	15.3	54.0
17743.405000	45.9	1000.0	1000.000	150.0	V	0.0	22.7	8.1	54.0

4.2 Other Requirement & Test Suites

4.2.1 Mains Terminal Continuous Disturbance Voltage

Result:	Pass
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Date of testing	: 2024.05.13 - 2025.02.11
Test procedure	: ANSI C63.4:2014+A1:2017 and CISPR 16-1 series standards
Frequency range	: 0.15 – 30MHz
Limits	: FCC Part 15, Subpart B:2023, Class B
Kind of test site	: Shielding Room
Operation modes	: Mode C
Port	: Mains
Temp.& Humidity	: 21°C, 63%

The measurement setup was made according to ANSI C63.4:2014+A1:2017 in a shielded room.

The measurement equipment like test receivers, quasi-peak detector and artificial mains network (AMN) are in compliance with ANSI C63.4:2014+A1:2017 and CISPR 16-1 series standards.

The tested object was set-up on a wooden table. The EUT was set 0.8m away from the AMN. The cord longer than necessary to be connected to the AMN was folded forth and back parallel so as to form a bundle with a length between 0.3m and 0.4m.

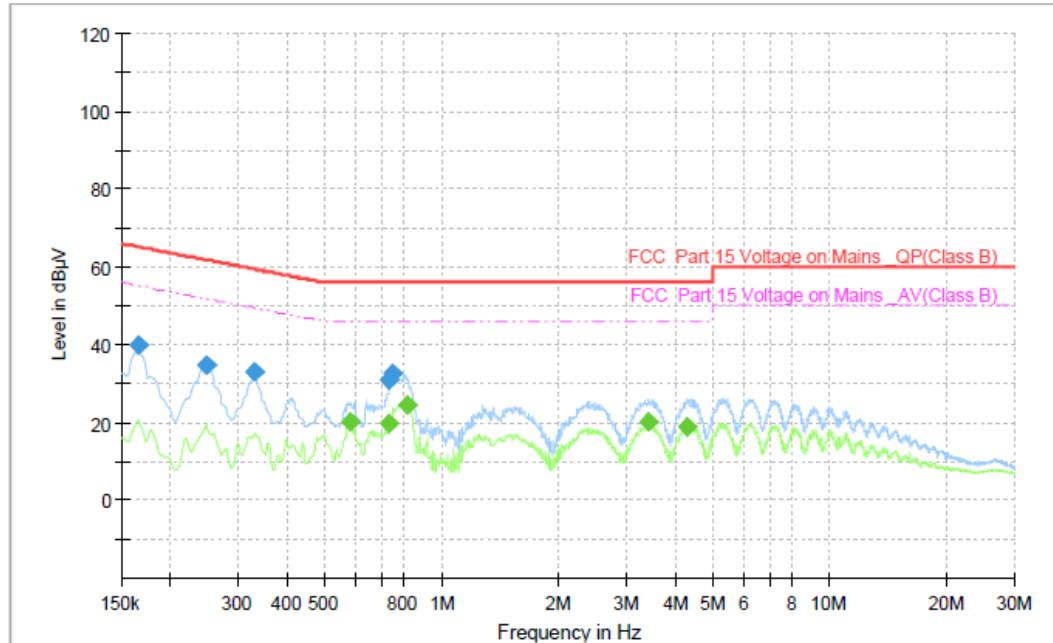
The disturbance voltage test was performed on the neutral line and phase line of the power supply of the EUT respectively.

Before measurement, a survey was made to determine in which state the maximum disturbance was obtained. And the measurement was made in the state the maximum disturbance was obtained.

The following figures and tables were those measured by an automatic measuring system. Both Quasi Peak and Average Value were measured. Quasi-Peak and Average Value were measured and listed respectively where they had a maximum in previous scanning survey. In the Figures, “◆” means Quasi-Peak Value and Average Value which were measured in final measurement.

The measurement result is calculated based on the following formula by the test software:
Emission Level = Reading level + Correction (LISN factor + cable loss)

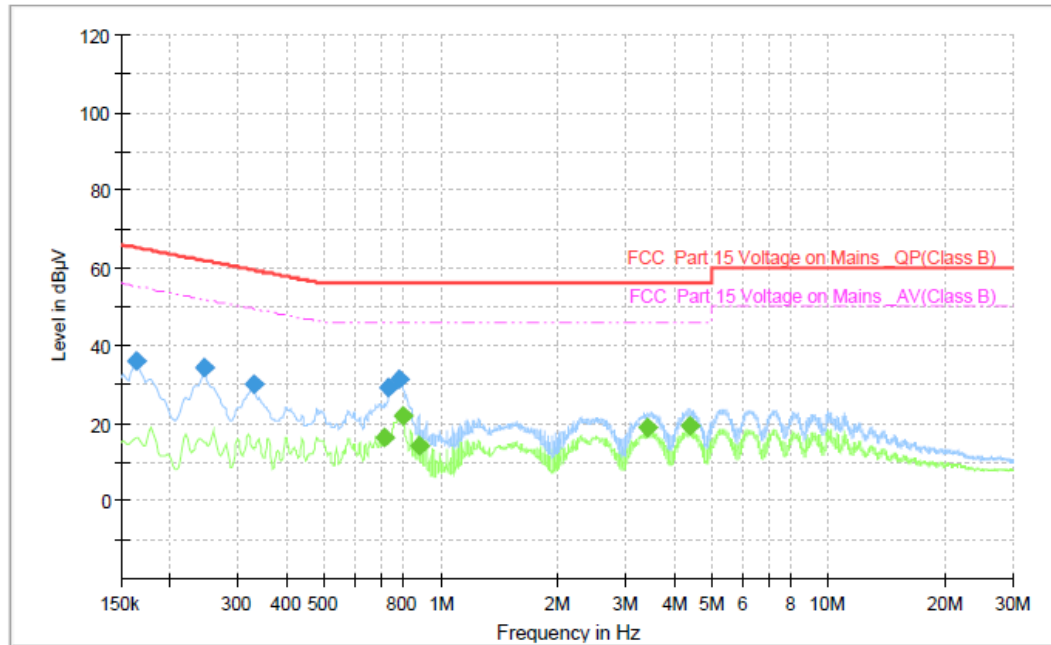
Figure 6: Spectral Diagrams, Conducted Emission, 150KHz - 30MHz, L



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.165750	40.09	---	65.17	25.08	1000.0	9.000	L1	ON	9.7
0.246750	34.64	---	61.87	27.22	1000.0	9.000	L1	ON	9.6
0.327750	32.96	---	59.51	26.55	1000.0	9.000	L1	ON	9.6
0.582000	---	20.03	46.00	25.97	1000.0	9.000	L1	ON	9.6
0.735000	---	19.74	46.00	26.26	1000.0	9.000	L1	ON	9.6
0.735000	31.14	---	56.00	24.86	1000.0	9.000	L1	ON	9.6
0.748500	32.45	---	56.00	23.55	1000.0	9.000	L1	ON	9.6
0.816000	---	24.35	46.00	21.65	1000.0	9.000	L1	ON	9.6
3.421500	---	20.38	46.00	25.62	1000.0	9.000	L1	ON	9.7
4.305750	---	18.93	46.00	27.07	1000.0	9.000	L1	ON	9.8

Figure 7: Spectral Diagrams, Conducted Emission, 150KHz - 30MHz, N



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.163500	35.89	---	65.28	29.40	1000.0	9.000	N	ON	9.7
0.244500	34.35	---	61.94	27.59	1000.0	9.000	N	ON	9.6
0.327750	30.18	---	59.51	29.33	1000.0	9.000	N	ON	9.6
0.717000	---	16.28	46.00	29.72	1000.0	9.000	N	ON	9.6
0.735000	29.39	---	56.00	26.61	1000.0	9.000	N	ON	9.6
0.780000	31.40	---	56.00	24.60	1000.0	9.000	N	ON	9.6
0.795750	---	21.76	46.00	24.24	1000.0	9.000	N	ON	9.6
0.876750	---	14.31	46.00	31.69	1000.0	9.000	N	ON	9.6
3.426000	---	18.78	46.00	27.22	1000.0	9.000	N	ON	9.7
4.364250	---	19.37	46.00	26.63	1000.0	9.000	N	ON	9.8

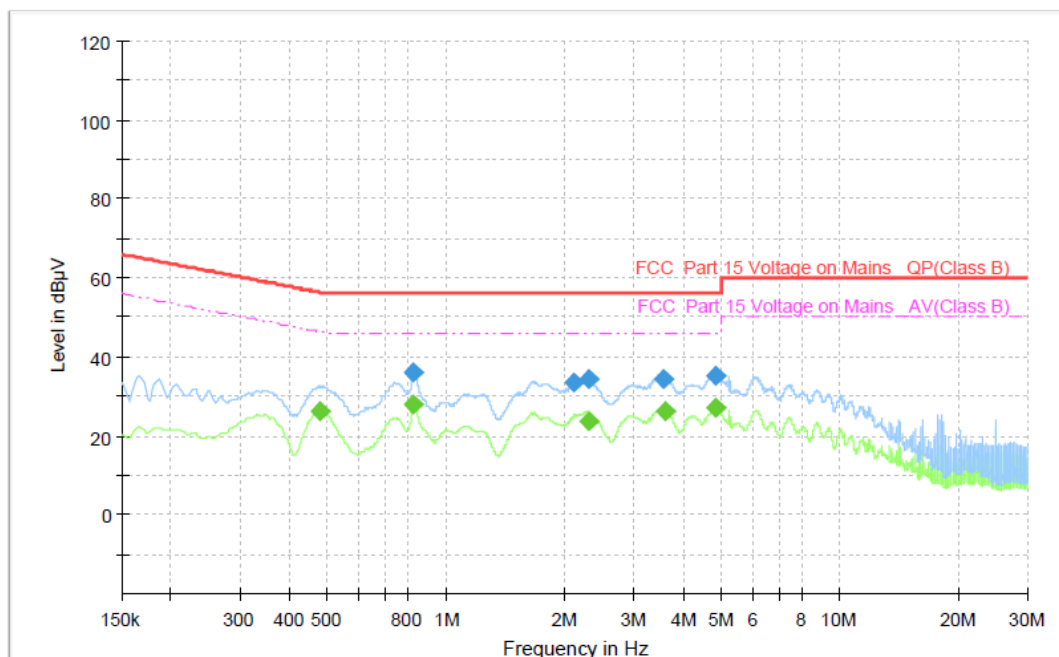
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Figure 8: Spectral Diagrams, Conducted Emission, 150KHz - 30MHz, L, use network port



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.478500	---	26.04	46.37	20.32	1000.0	9.000	L1	ON	9.7
0.825000	---	28.10	46.00	17.90	1000.0	9.000	L1	ON	9.7
0.825000	36.16	---	56.00	19.84	1000.0	9.000	L1	ON	9.7
2.118750	33.34	---	56.00	22.66	1000.0	9.000	L1	ON	9.8
2.292000	34.54	---	56.00	21.46	1000.0	9.000	L1	ON	9.8
2.292000	---	23.83	46.00	22.17	1000.0	9.000	L1	ON	9.8
3.547500	34.53	---	56.00	21.47	1000.0	9.000	L1	ON	9.8
3.585750	---	26.33	46.00	19.67	1000.0	9.000	L1	ON	9.8
4.830000	---	27.14	46.00	18.86	1000.0	9.000	L1	ON	9.9
4.830000	35.44	---	56.00	20.56	1000.0	9.000	L1	ON	9.9

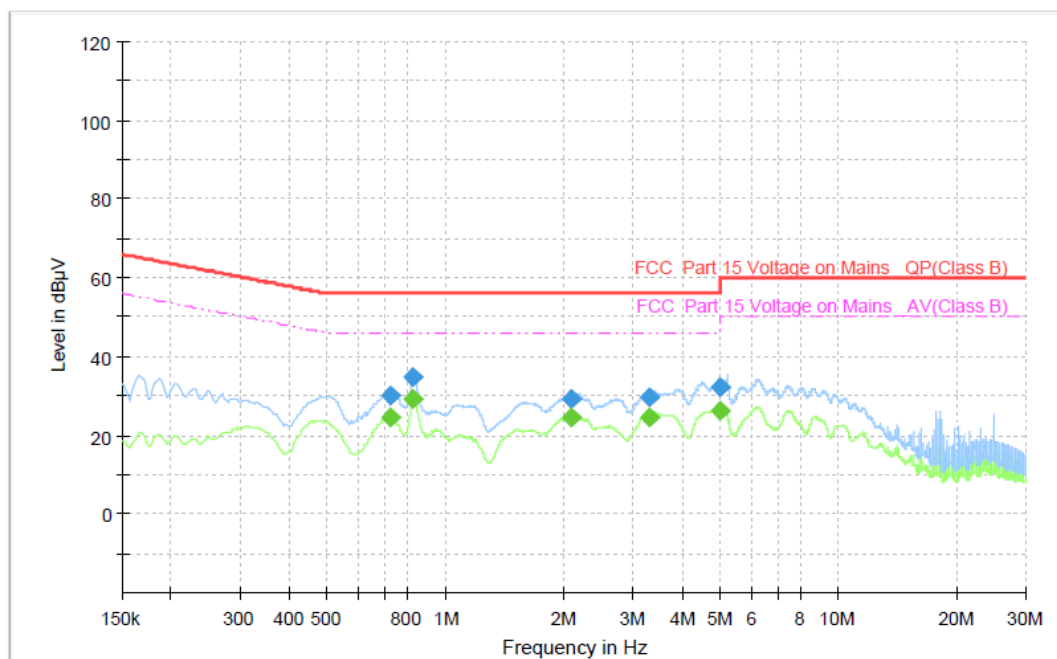
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Figure 9: Spectral Diagrams, Conducted Emission, 150KHz - 30MHz, N, use network port



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.721500	---	24.37	46.00	21.63	1000.0	9.000	N	ON	9.6
0.723750	29.92	---	56.00	26.08	1000.0	9.000	N	ON	9.6
0.822750	---	29.15	46.00	16.85	1000.0	9.000	N	ON	9.7
0.822750	34.99	---	56.00	21.01	1000.0	9.000	N	ON	9.7
2.085000	29.41	---	56.00	26.59	1000.0	9.000	N	ON	9.7
2.087250	---	24.52	46.00	21.48	1000.0	9.000	N	ON	9.7
3.311250	29.85	---	56.00	26.15	1000.0	9.000	N	ON	9.8
3.311250	---	24.66	46.00	21.34	1000.0	9.000	N	ON	9.8
4.989750	---	26.22	46.00	19.78	1000.0	9.000	N	ON	9.8
4.989750	32.42	---	56.00	23.58	1000.0	9.000	N	ON	9.8

4.2.2 Radiated disturbance

Result:

Pass

Date of testing	: 2024.05.21 - 2024.12.18
Test standard	: FCC Part 15, Subpart B:2023, Class B
Test procedure	: ANSI C63.4:2014+A1:2017 and CISPR 16-1 series standards
Frequency range	: 30MHz– 5th harmonic of the highest frequency
Limits	: Quasi-peak limits (3m test distance): 30-88MHz, 40dBμV/m; 88-216MHz, 43.5dBμV/m; 216-960MHz, 46dBμV/m; Above 960MHz, 54dBμV/m. Average limits (3m test distance): Above 1000MHz, 54dBμV/m.
Kind of test site	: Semi-anechoic chamber
Operation modes	: Mode C
Temp.& Humidity	: 21°C, 56%

The radiated disturbance test was carried out in a semi-anechoic chamber. The test distance from the receiving antenna to the EUT is 3m. The normalized site attenuation of the semi-anechoic chamber is regularly calibrated to ensure the radiated disturbance test results are valid. During the test, the EUT was placed on a wooden table, which is 0.8m high. The wooden table was rotated 360° around and the antenna was varied from 1m to 4m to find the maximum disturbance. The test was performed with the antenna both in its horizontal and vertical polarizations.

The following figures and tables were those measured by an automatic measurement system. A preview test was firstly performed with peak detector. The final test was performed with quasi-peak at those critical frequencies during the preview test. In the following figures, “◆” mean final measurement results with quasi-peak detector.

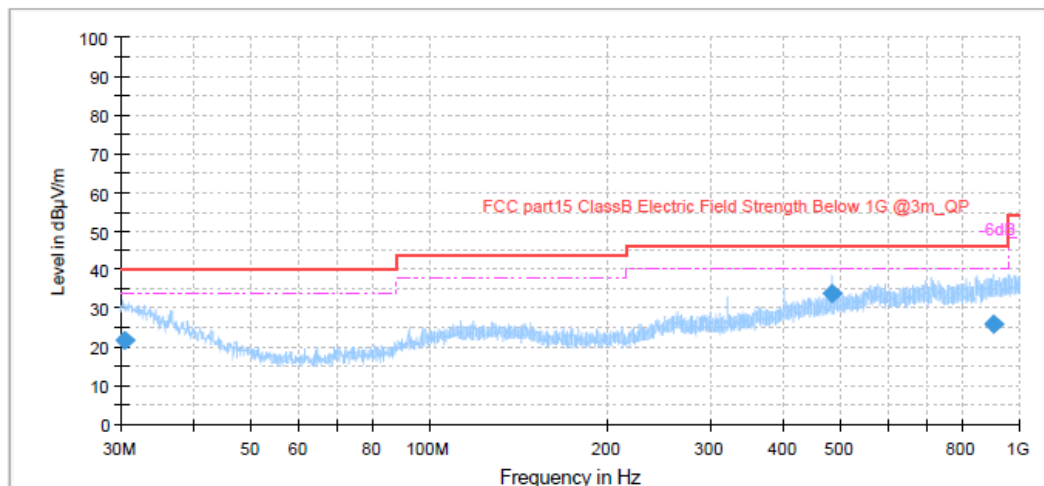
Before measurement, a survey was made to determine in which state the maximum disturbance was obtained. And the measurement was made in the state the maximum disturbance was obtained.

The following figures were those measured and recorded by a test receiver. Peak Value were measured and listed respectively where they had a maximum in previous scanning survey. In the Figures, “◆” means Quasi-Peak Value which were measured in final measurement.

The measurement result is calculated based on the following formula by the test software:
Emission Level = Reading level + Correction (Antenna factor + Cable loss - preamplifier factor (if used))

Figure 10: Spectral Diagrams, Radiated disturbance

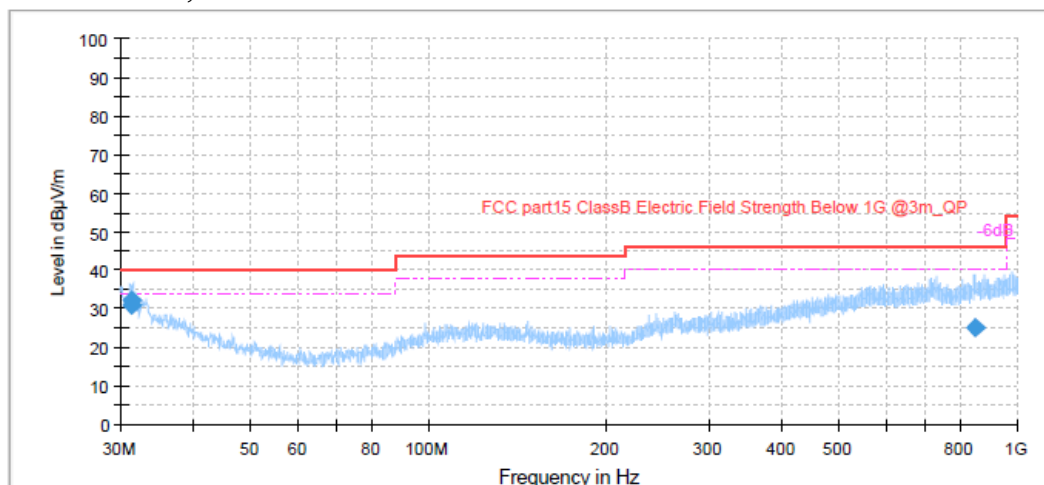
30MHz-1000MHz, Horizontal



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.400000	21.90	40.00	18.10	1000.0	120.000	225.0	H	170.0	25.3
479.966111	33.82	46.00	12.18	1000.0	120.000	100.0	H	312.0	25.6
904.680000	25.95	46.00	20.05	1000.0	120.000	150.0	H	133.0	30.1

30MHz-1000MHz, Vertical



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.328889	32.01	40.00	7.99	1000.0	120.000	108.0	V	3.0	25.1
31.365556	31.09	40.00	8.91	1000.0	120.000	130.0	V	33.0	25.0
845.638889	25.20	46.00	20.80	1000.0	120.000	142.0	V	122.0	29.3

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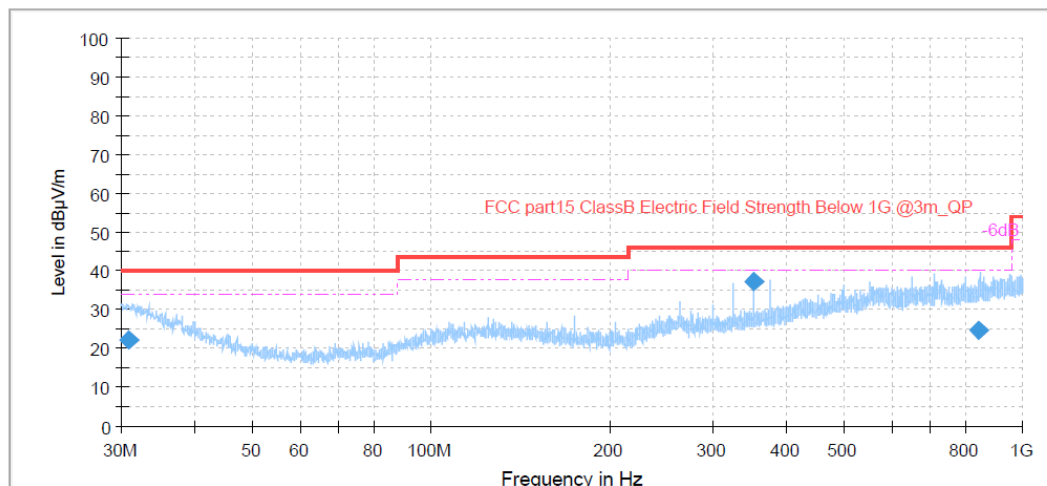
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Figure 11: Spectral Diagrams, Radiated disturbance, use network port

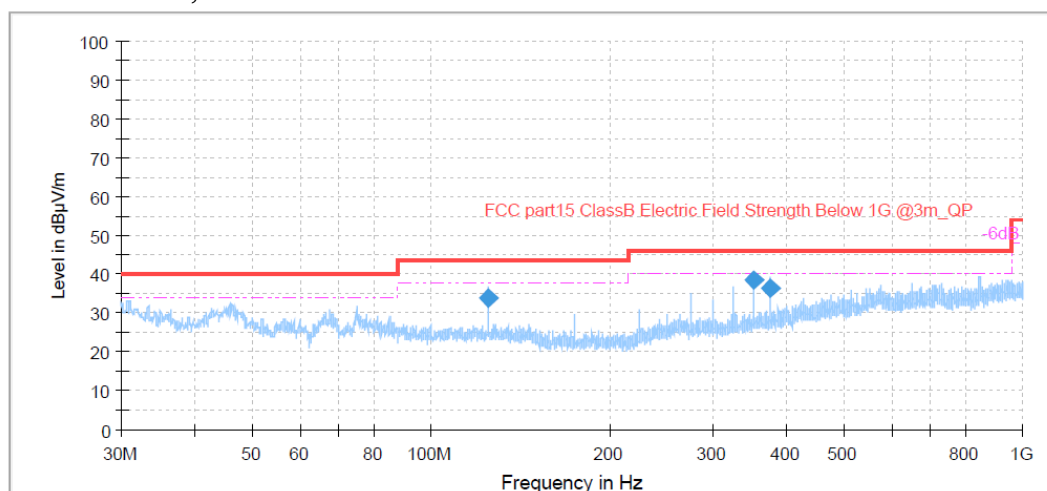
30MHz-1000MHz, Horizontal



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.814444	22.32	40.00	17.68	1000.0	120.000	200.0	H	301.0	25.0
349.972222	37.21	46.00	8.79	1000.0	120.000	112.0	H	35.0	21.9
844.795556	24.85	46.00	21.15	1000.0	120.000	142.0	H	226.0	28.4

30MHz-1000MHz, Vertical



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
124.986111	33.86	43.50	9.64	1000.0	120.000	100.0	V	26.0	18.9
350.012222	38.32	46.00	7.68	1000.0	120.000	122.0	V	29.0	21.9
375.016667	36.40	46.00	9.60	1000.0	120.000	128.0	V	77.0	22.4

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