EMC TEST REPORT

Report No.:	20240717G13903X-W1
Product Name:	ACE Thermal Imaging Scope
FCC ID:	2BHFB-ACE-00
Main Model No. :	ACE H50R
Series Model No. :	ACE H50, ACE S60R, ACE L35
Trade Name:	Nocpix
Applicant:	Inlumen Technologies Co., Ltd.
Address:	Building B3, NO.800 Wangjiang West Road, National High-tech Industry Development District,Hefei, Anhui, China.
Received Date:	2024.07.25
Dates of Testing:	2024.07.26-2024.08.01
Issued by:	CCIC Southern Testing Co., Ltd.
Lab Location:	Electronic Testing Building, No.43, Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China. **Tel:** 86-755-26627338 **E-Mail:** manager@ccic-set.com

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Test Report

Product Name.....	ACE Thermal Imaging Scope
Model No.	ACE H50R
Applicant.....	Inlumen Technologies Co., Ltd.
Applicant Address.....	Building B3, NO.800 Wangjiang West Road, National High-tech Industry Development District,Hefei, Anhui, China.
Manufacturer.....	Inlumen Technologies Co., Ltd.
Manufacturer Address.....	Building B3, NO.800 Wangjiang West Road, National High-tech Industry Development District,Hefei, Anhui, China.
Test Standards.....	47 CFR Part 15 Subpart B
Test Result.....	PASS

Tested by ..... Sun Jiaohui

Sun Jiaohui, Test Engineer 2024.08.23

Reviewed by..... Chris You

Chris You, Senior Engineer 2024.08.23

Approved by..... Wang Shijie 2024.08.23

Wang Shijie, Manager

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Change History		
Issue	Date	Reason for change
1.0	2024.08.23	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Name	ACE Thermal Imaging Scope
Hardware Version	V1_1
Software Version	V1.07
Power supply	Rechargeable Li-ion Battery Model No: IRB-2 Capacity: 3850mAh Rated Voltage: 3.6V Manufacturer: Jinqu Electronics (Zhejiang) Co., Ltd. Built-in Battery Model No: JQ033-201L MAX Charge Voltage: 4.2V Manufacturer: Jinqu Electronics (Zhejiang) Co., Ltd.

Note 1: The EUT is a ACE Thermal Imaging Scope; It could support the following operating mode and frequency band: 2.4G WIFI

Note 2: The EUT have the following typical setups during the test:
Setup1: 2.4G WIFI + Charger;
Setup2: 2.4G WIFI + Battery;
Setup3: EUT + Notebook PC + DATA;
Setup4: Idle + Charger;

Note 3: The ACE H50 have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, with ACE H50R the difference lies only in the laser module of the different models. The ACE S60R have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, with ACE H50R the difference lies only in lens focal length and thermal imaging module of the different models. The ACE L35 have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, with ACE H50R the difference lies only in lens focal length, thermal imaging module and the laser module of the different models.

Note 4: All the patterns have been tested and only the worst results are recorded in the report.

Note 5: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart B	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	15.107	Conducted Emission	PASS
2	15.109	Radiated Emission	PASS

NOTE:

(1) The EUT has been tested according to 47 CFR Part 15 Subpart B, CLASS B. The test procedure is according to ANSI C63.4:2014.

1.3 Facilities and Accreditations

1.3.1 Facilities

FCC-Registration No.: CN1283

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until Jun.30, 2025.

ISED Registration: 11185A-1

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Jun.30, 2025.

A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

1.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15°C - 35°C
Relative Humidity (%):	25% -75%
Atmospheric Pressure (kPa):	86kPa-106kPa

1.3.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission:	Uc = 3.2 dB (k=2)
Uncertainty of Radiated Emission: (30MHz~1GHz)	Uc = 5.8 dB (k=2)
Uncertainty of Radiated Emission: (1~6GHz)	Uc = 5.1 dB (k=2)
Uncertainty of Radiated Emission: (6~18GHz)	Uc = 5.5 dB (k=2)

2. TEST CONDITIONS SETTING

2.1 Test Peripherals

The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

Support Equipment:

Description	Brand name	Model	Serial No.	FCCID
Adapter	/	VC56JBCH	/	/

Support Cable：

Description	Shield Type	Ferrite Core	Length
/	/	/	/

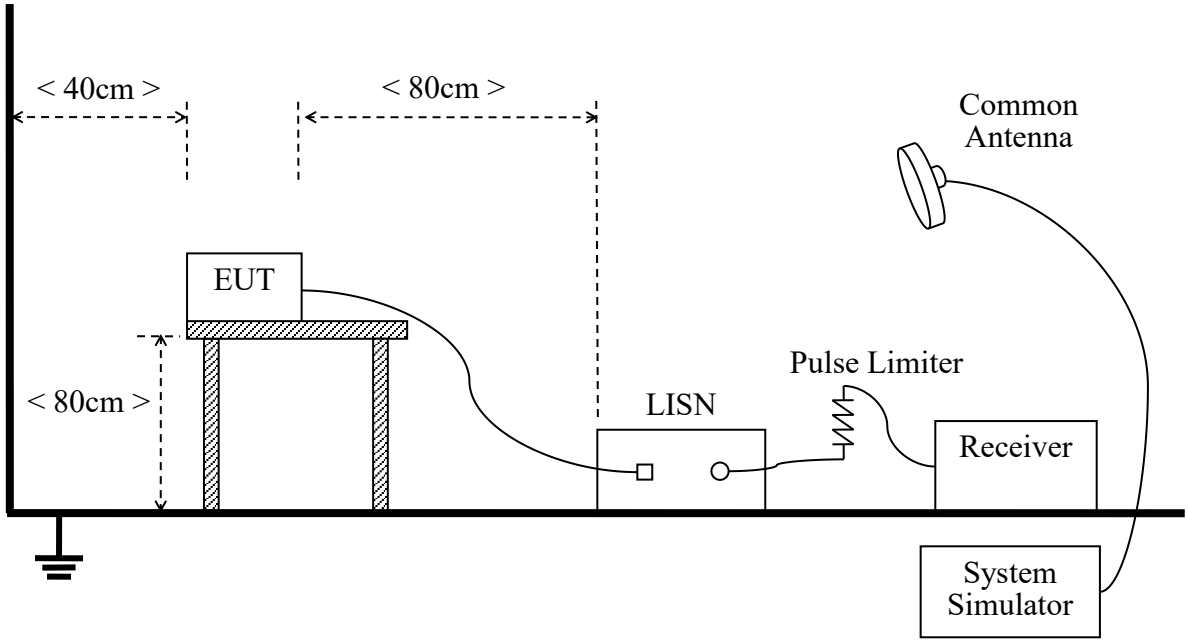
2.2 Test Mode

The EUT have the following typical setups during the test:
Setup1: 2.4G WIFI + Charger;
Setup2: 2.4G WIFI + Battery;
Setup3: EUT + Notebook PC + DATA;
Setup4: Idle + Charger;

2.3 Test Setup and Equipments List

2.3.1 Conducted Emission

A. Test Setup:



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. The Common Antenna is used for the call between the EUT and the System Simulator (SS). A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

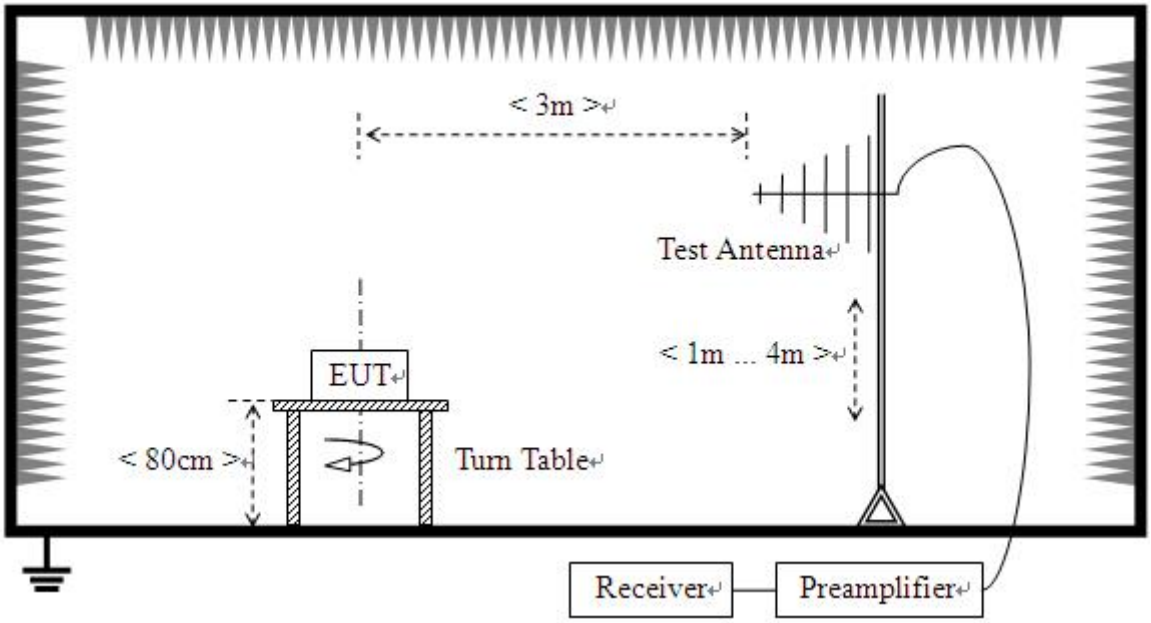
B. Equipments List:

Description	Manufacturer	Model	Serial No.	Calibration Date	Calibration Due. Date
Test Receiver	KEYSIGHT	N9038A	A141202036	2024.06.05	2025.06.04
LISN	ROHDE&SCHWARZ	ENV216	A140701847	2024.05.23	2025.05.22
Cable	MATCHING PAD	W7	/	2024.07.03	2025.07.02

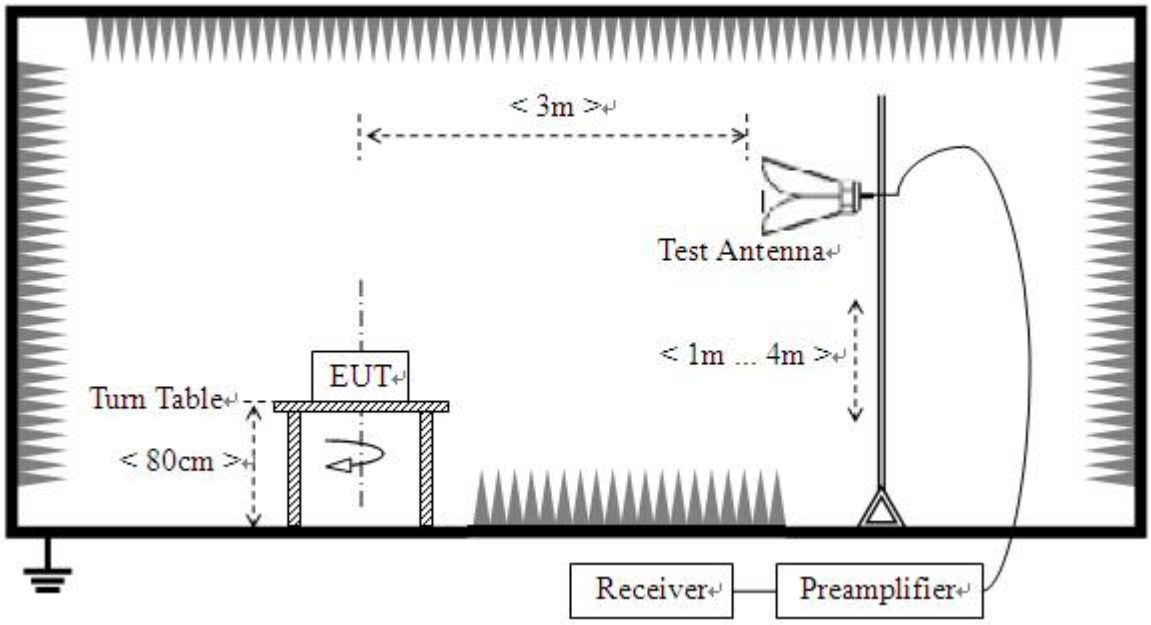
2.3.2 Radiated Emission

A. Test Setup:

1) For radiated emissions from 30MHz to1GHz



2) For radiated emissions above 1GHz



B. Test Procedure

The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

1) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

C. Equipments List:

Description	Manufacturer	Model	Serial No.	Calibration Date	Calibration Due. Date
EMI Test Receiver	ROHDE&SCHWARZ	ESIB7	A0501375	2024.02.28	2025.02.27
Broadband Ant.	ETC	MCTD2786	A150402239	2024.01.19	2025.01.18
3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2024.02.27	2027.02.27
EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2024.05.24	2025.05.23
5M Anechoic Chamber	Albatross	SAC-5MAC 12.8x6.8x6.4m	A0304210	2022.03.25	2025.06.07
EMI Horn Ant.	ROHDE&SCHWARZ	HF906	A0304225	2022.04.12	2025.04.11

3. 47 CFR PART 15B REQUIREMENTS

3.1 Conducted Emission

3.1.1 Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

a) The limit subjects to the Class B digital device.

b) The lower limit shall apply at the band edges.

c) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.1.2 Test Description

See section 2.3.1 of this report.

3.1.3 Test Result

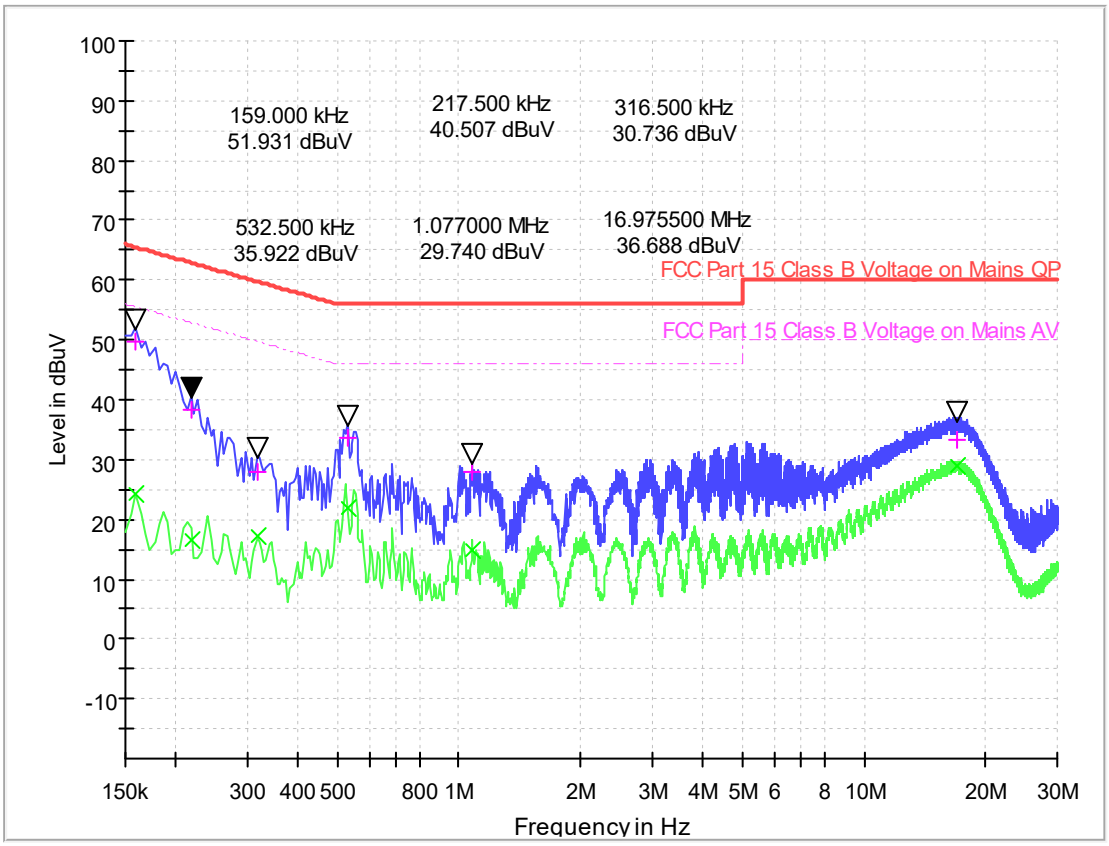
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

Note:

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a Nominal 230V AC, 50/60Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

Test voltage and frequency (230V AC, 60Hz)

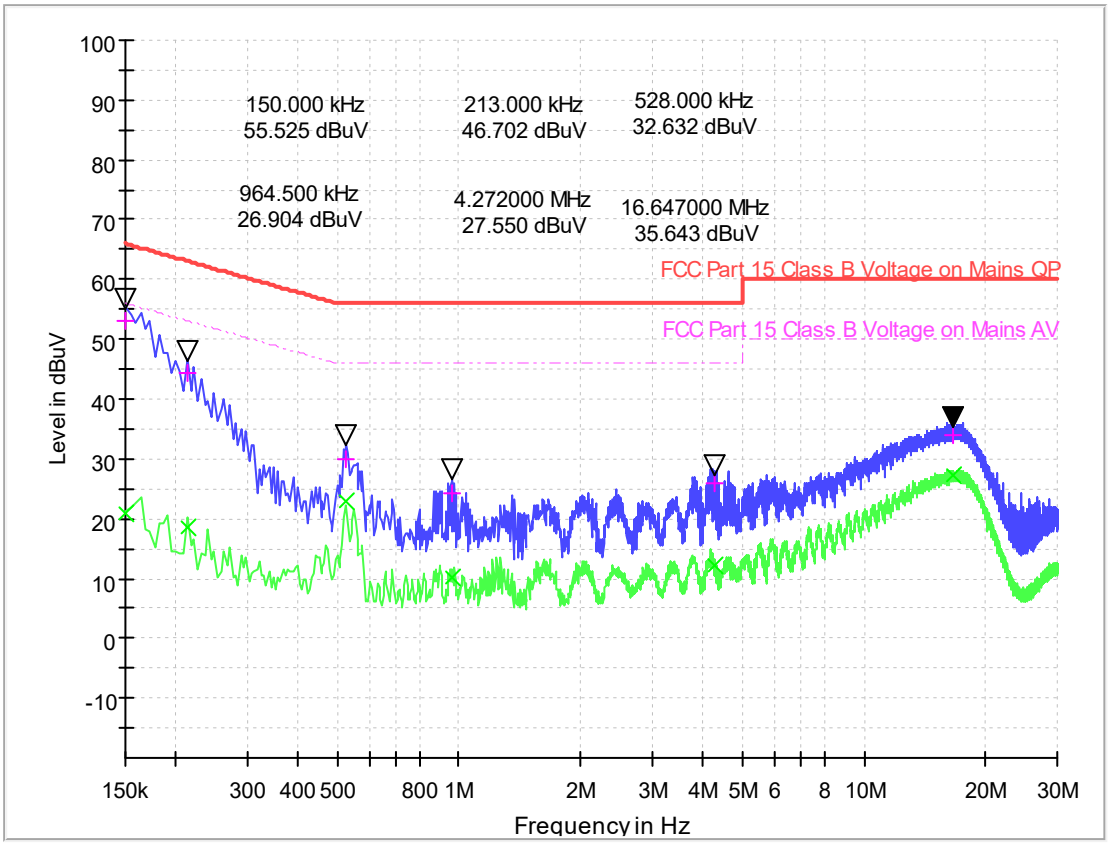
A. Mains terminal disturbance voltage, L phase, Setup 1



(Plot A: L Phase)

Frequency (MHz)	QuasiPeak	CAverage (dBµV)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dBµV)
0.159000	49.66	24.15	0.1	10.1	15.86	65.5	31.37	55.5
0.217500	38.16	16.51	0.1	10.1	24.75	62.9	36.40	52.9
0.316500	27.85	17.17	0.1	10.1	31.95	59.8	32.63	49.8
0.532500	33.69	21.76	0.1	10.1	22.31	56.0	24.24	46.0
1.077000	27.78	14.82	0.2	10.2	28.22	56.0	31.18	46.0
16.975500	33.30	28.79	0.5	10.5	26.70	60.0	21.21	50.0

B. Mains terminal disturbance voltage, N phase, Setup 1



(Plot B: N Phase)

Frequency (MHz)	QuasiPeak	CAverage (dBµV)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dBµV)
0.150000	53.11	20.82	0.1	10.1	12.89	66.0	35.18	56.0
0.213000	44.29	18.39	0.1	10.1	18.80	63.1	34.70	53.1
0.528000	30.05	22.77	0.1	10.1	25.95	56.0	23.23	46.0
0.964500	24.10	10.31	0.2	10.2	31.90	56.0	35.69	46.0
4.272000	25.77	12.20	0.5	10.5	30.23	56.0	33.80	46.0
16.647000	33.90	27.26	0.5	10.5	26.10	60.0	22.74	50.0

3.2 Radiated Emission

3.2.1 Requirement

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength		Field Strength Limitation at 3m Measurement Dist	
	μV/m	Dist	(uV/m)	(dBuV/m)
30.0 - 88.0	100	3m	100	20log 100
88.0 - 216.0	150	3m	150	20log 150
216.0 - 960.0	200	3m	200	20log 200
Above 960.0	500	3m	500	20log 500

a) For frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

b) Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

c) For below 1G: QP detector RBW 120 kHz, VBW 300 kHz.

For Above 1G: PK detector RBW 1MHz, VBW 3MHz for PK value; AV detector RBW 1MHz, VBW 10Hz for AV value.

Note:

1) The tighter limit shall apply at the boundary between two frequency range.
2) Limitation expressed in dBuV/m is calculated by 20log Emission Level(uV/m).
3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $Ld1 = Ld2 * (d2/d1)^{2.}$
   Example:
   F.S Limit at 30m distance is 30uV/m, then F.S Limitation at 3m distance is adjusted as
   $Ld1 = L1 = 30uV/m * (10)^2 = 100 * 30uV/m.$

3.2.2 Test Description

See section 2.3.2 of this report.

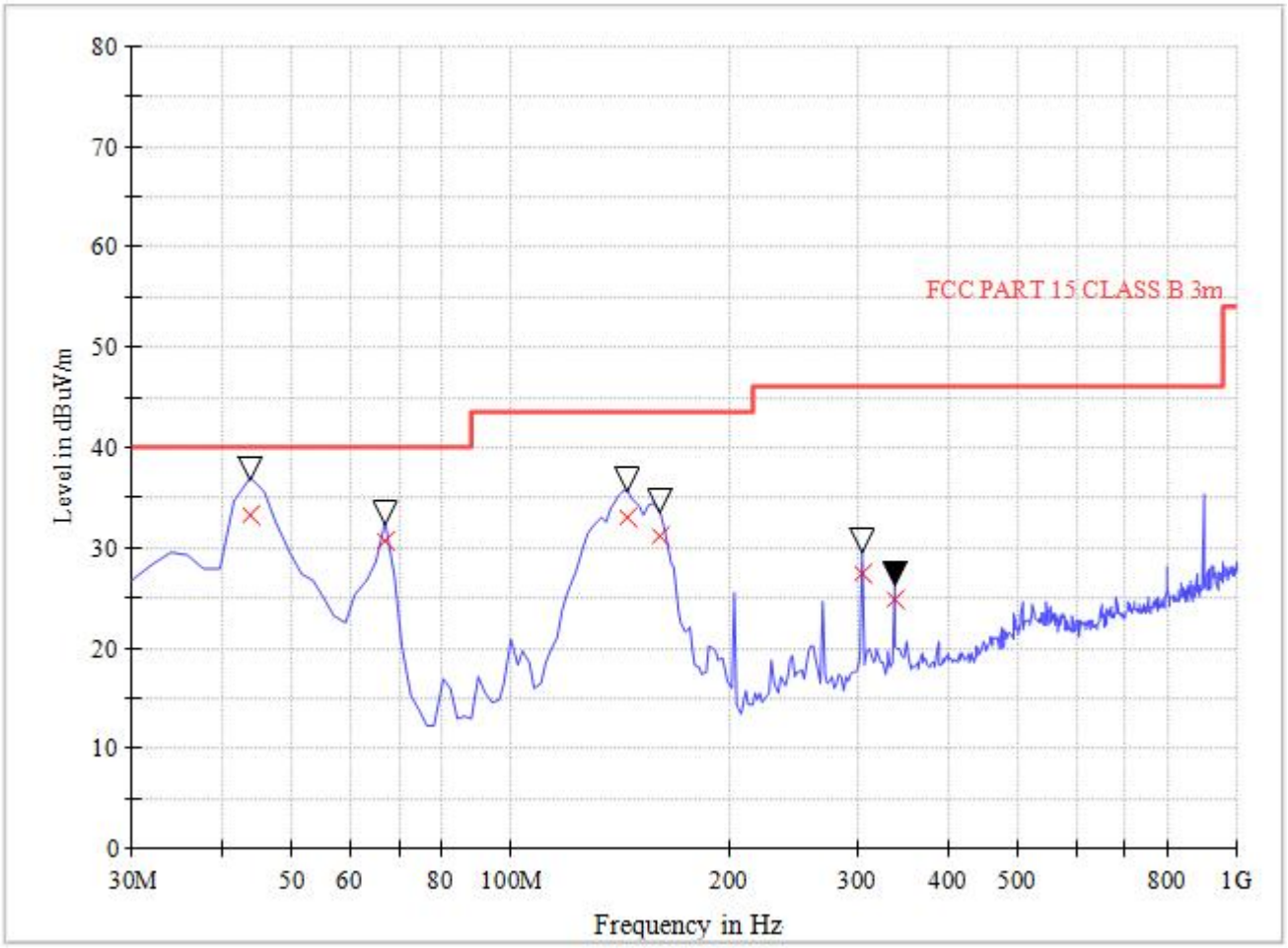
3.2.3 Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

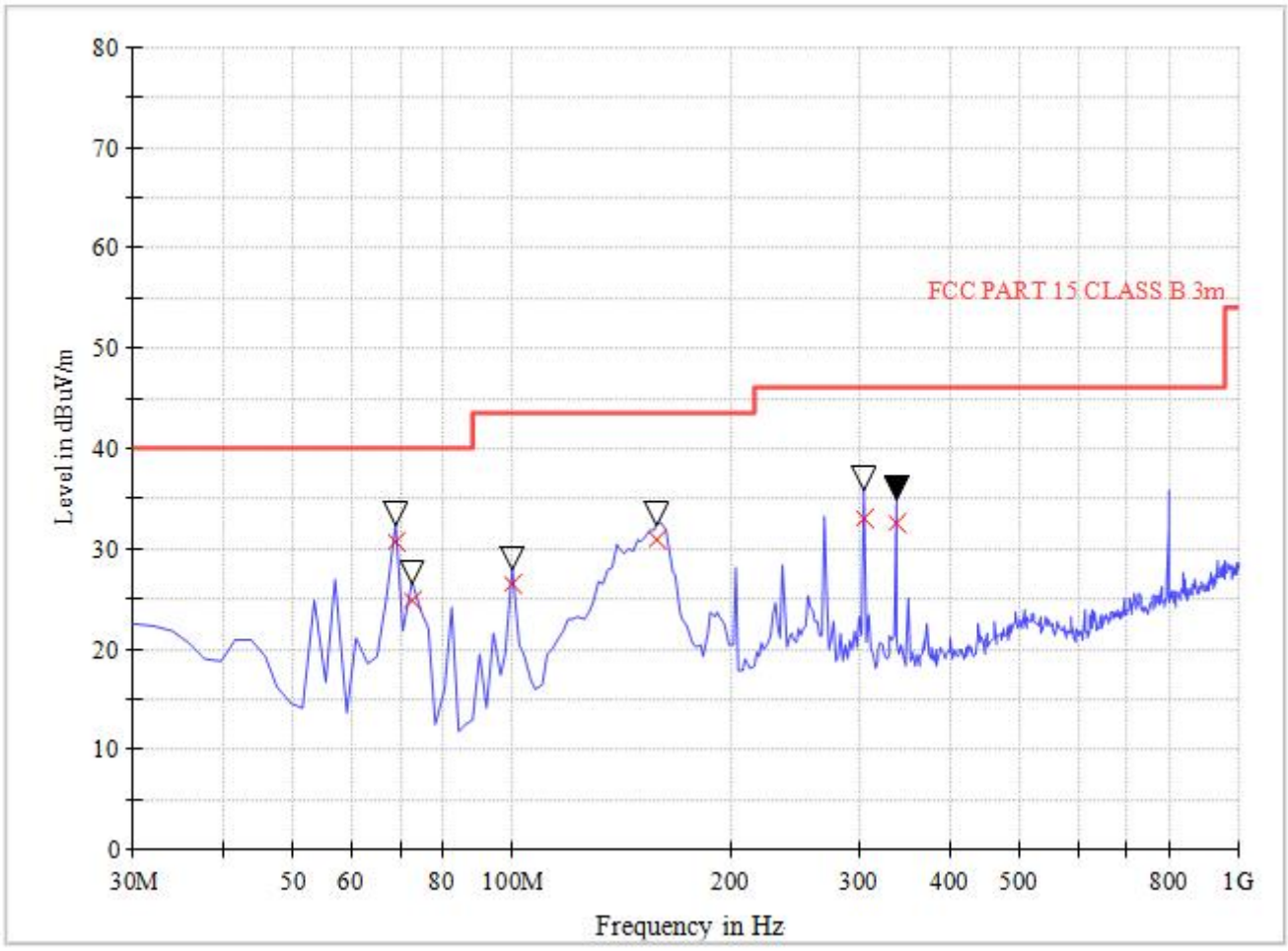
A. Radiation disturbances, antenna polarization: Vertical, Setup1



(Plot C: Test Antenna Vertical 30M - 1G)

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
43.60	33.33	120.000	106	40.0	6.67	Vertical	0.5	11.2	Pass
66.92	30.55	120.000	101	40.0	9.45	Vertical	0.8	5.7	Pass
144.68	32.98	120.000	105	43.5	10.52	Vertical	1.0	11.5	Pass
160.24	31.09	120.000	103	43.5	12.41	Vertical	1.2	11.2	Pass
304.08	27.43	120.000	106	46.0	18.57	Vertical	1.4	14.5	Pass
337.12	24.89	120.000	104	46.0	21.11	Vertical	1.4	15.1	Pass

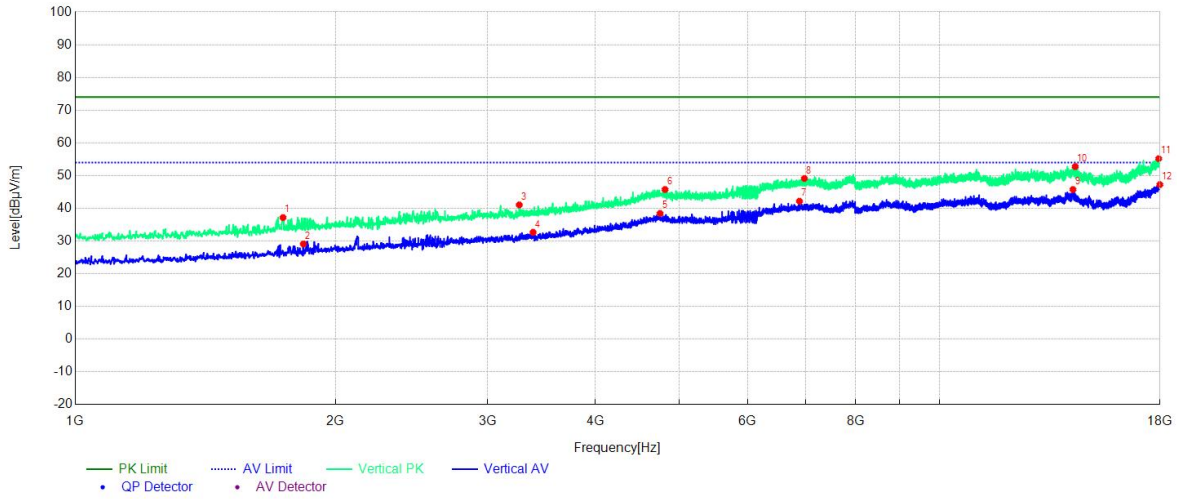
B. Radiation disturbances, antenna polarization: Horizontal, Setup1



(Plot D: Test Antenna Horizontal 30M - 1G)

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB μ V/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
68.88	30.74	120.000	105	40.0	9.26	Horizontal	0.8	5.9	Pass
72.76	24.82	120.000	103	40.0	15.18	Horizontal	0.8	6.4	Pass
99.96	26.35	120.000	106	43.5	17.15	Horizontal	0.8	10.0	Pass
158.28	30.88	120.000	102	43.5	12.62	Horizontal	1.1	11.4	Pass
304.08	32.87	120.000	107	46.0	13.13	Horizontal	1.4	14.5	Pass
337.12	32.48	120.000	105	46.0	13.52	Horizontal	1.4	15.1	Pass

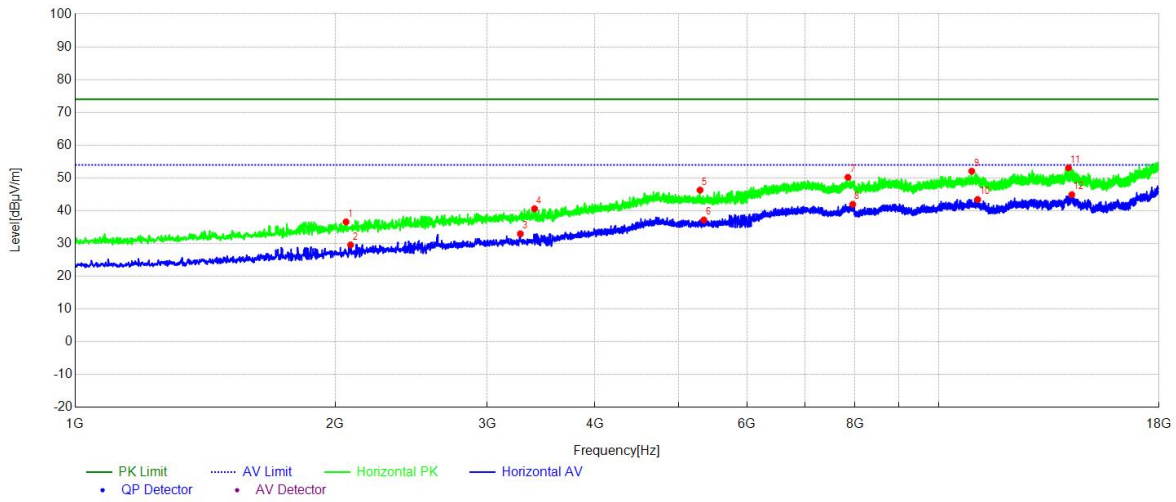
A. Radiation disturbances, antenna polarization: Vertical, Setup1



(Plot M: Test Antenna Vertical 1G – 18G)

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin[dBµV/m]	Trace	Height [cm]	Angle [°]	Polarity
1	1739.57	37.18	-13.05	74.00	36.82	PK	106	27	Vertical
2	1836.48	29.11	-12.58	54.00	24.89	AV	103	25	Vertical
3	3264.63	41.05	-7.78	74.00	32.95	PK	107	112	Vertical
4	3387.04	32.67	-7.45	54.00	21.33	AV	102	204	Vertical
5	4750.58	38.44	-0.96	54.00	15.56	AV	108	13	Vertical
6	4813.48	45.76	-0.92	74.00	28.24	PK	106	345	Vertical
7	6887.69	42.18	3.16	54.00	11.82	AV	104	27	Vertical
8	6977.80	49.13	3.30	74.00	24.87	PK	105	112	Vertical
9	14274.93	45.75	9.77	54.00	8.25	AV	101	104	Vertical
10	14361.64	52.77	9.44	74.00	21.23	PK	109	223	Vertical
11	17938.79	55.18	14.74	74.00	18.82	PK	106	342	Vertical
12	17993.20	47.23	14.85	54.00	6.77	AV	105	14	Vertical

B. Radiation disturbances, antenna polarization: Horizontal, Setup1



(Plot N: Test Antenna Horizontal 1G – 18G)

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin[dBµV/m]	Trace	Height [cm]	Angle [°]	Polarity
1	2059.21	36.61	-11.73	74.00	37.39	PK	101	324	Horizont
2	2084.71	29.58	-11.67	54.00	24.42	AV	108	203	Horizont
3	3278.23	32.97	-7.75	54.00	21.03	AV	106	241	Horizont
4	3404.04	40.62	-7.41	74.00	33.38	PK	107	158	Horizont
5	5292.93	46.31	-1.40	74.00	27.69	PK	108	274	Horizont
6	5347.33	37.19	-1.42	54.00	16.81	AV	103	136	Horizont
7	7849.99	50.21	4.02	74.00	23.79	PK	104	223	Horizont
8	7952.00	41.95	4.08	54.00	12.05	AV	102	224	Horizont
9	10923.89	52.06	6.60	74.00	21.94	PK	106	112	Horizont
10	11099.01	43.44	6.56	54.00	10.56	AV	105	219	Horizont
11	14138.91	53.09	9.35	74.00	20.91	PK	101	65	Horizont
12	14263.03	44.91	9.72	54.00	9.09	AV	108	294	Horizont

-----End of Report-----