



# EMC TEST REPORT

**Report No.:** SET2022-03705

**Product Name:** Jerry-F Enhanced Night Vision Goggle

**Model No. :** Jerry-F ,Jerry-Fab-cdef(a,b,c,d,e,f=0-9,A-Z)

**Applicant:** IRay Technology Co.,Ltd

**Address:** 11GUIYANG STREET, YANTAI ECONOMY AND TECHNOLOGY  
DEVELOPMENT DISTRICT, YANTAI SHANDONG P.R.CHINA

**Received Date:** 2022.03.29

**Issued by:** CCIC Southern Testing Co., Ltd.

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### Test Report

**Product Name**..... Jerry-F Enhanced Night Vision Goggle

**Model No.** ..... Jerry-F,Jerry-Fab-cdef(a,b,c,d,e,f=0-9,A-Z)

**Trade name**..... InfiRay

**Applicant**..... IRay Technology Co.,Ltd

**Applicant Address**..... 11GUIYANG STREET, YANTAI ECONOMY AND TECHNOLOGY DEVELOPMENT DISTRICT, YANTAI SHANDONG P.R.CHINA

**Manufacturer** ..... IRay Technology Co.,Ltd

**Manufacturer Address** .... 11GUIYANG STREET, YANTAI ECONOMY AND TECHNOLOGY DEVELOPMENT DISTRICT, YANTAI SHANDONG P.R.CHINA

**Test Standards**..... 47 CFR Part 15 Subpart B

**Test Result**..... PASS

**Tested by** ..... Ruihong Xie  
Ruihong Xie Test Engineer 2022.04.12

**Reviewed by** ..... Chris You  
Chris You Senior Engineer 2022.04.12

**Approved by** ..... Shuangwen Zhang  
Shuangwen Zhang, Manager 2022.04.12



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Change History		
Issue	Date	Reason for change
1.0	2022.04.12	First edition



## 1. GENERAL INFORMATION

### 1.1 EUT Description

EUT Name ..... : Jerry-F Enhanced Night Vision Goggle

Trade Name.....: InfiRay

Brand Name.....: InfiRay

Power supply.....: N/A

Ancillary Equipment.....: N/A

Hardware Version.....: V2\_0

Software Version .....: IRJerryF\_M3640LP\_D20211215

*Note 1:*The EUT is a Jerry-F Enhanced Night Vision Goggle;

*Note 2:*For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

*Note 3:* The main test model is Jerry-F, and the coverage difference model is Jerry-Fab-cdef (a, b, c, d, e, f=0-9, A-Z). Model differences represent software functions or regional differences.



### 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 2018	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	N/A
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.



## 1.2 Facilities and Accreditations

### 1.2.1 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 April 19th, 2023.

#### **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 April 19th, 2023.

#### **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.

### 1.2.2 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

### 1.2.3 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 Radiated Emission(30MHz-1GHz):	Uc = 5.8 dB (k=2)
Uncertainty of Radiated Emission(1GHz-6GHz):	Uc = 5.1 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:

#### 2.1.1 Support Equipment:

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

#### 2.1.2 Support Cable:

Description	Shield Type	Ferrite Core	Length
PC Power adapter Cable	Un- shielding	No	1.2m
Mouse Cable	Un- shielding	No	1m

### 2.2 Test Model

The EUT have the following typical setups during the test:

Setup1: WIFI + Battery compartments+EUT;

Setup2: WIFI + Battery compartments+EUT+holder;

Setup3: Idle + Battery compartments+EUT+holder;

Setup4: Idle + Battery compartments+EUT;

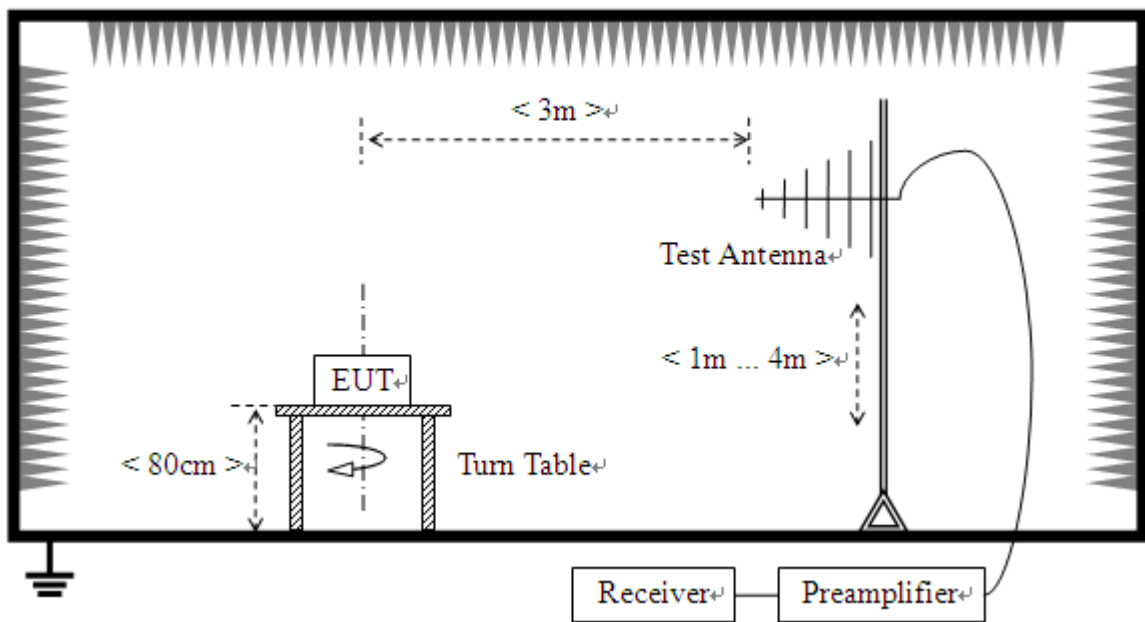
Note: Only worst-case mode setup 1 mode data provide at the report

## 2.3 Test Setup and Equipments List

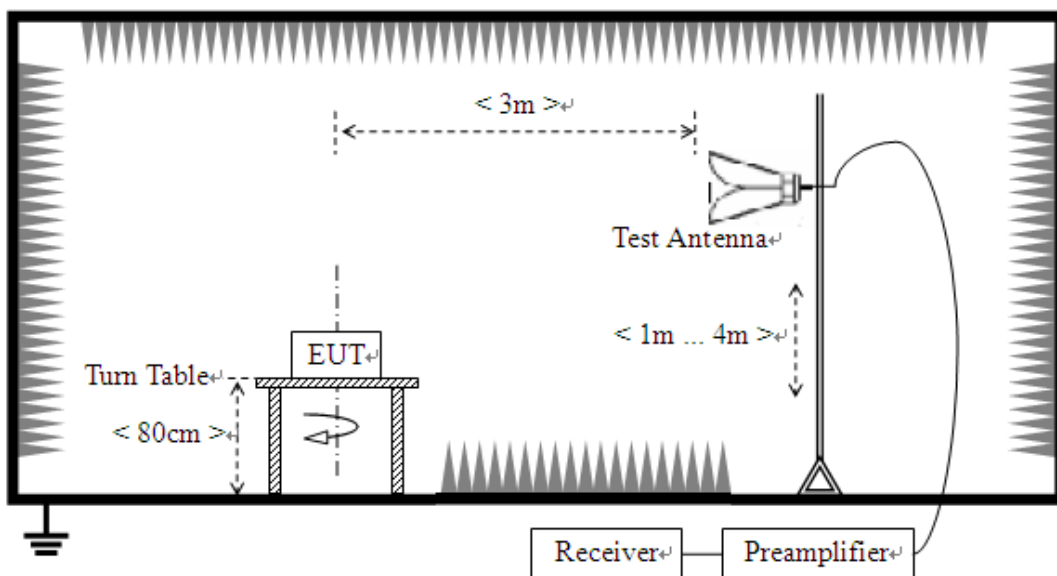
### 2.3.1 Radiated Emission

#### A. Test Setup:

- 1) For radiated emissions from 30MHz to 1GHz



- 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	ESCI	A0902601	2021.06.23	2022.05.22
Broadband Ant.	2786	ETC	A150402239	2021.09.16	2022.12.28
3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2019.03.26	2023.03.25
EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2021.08.12	2022.08.02
5M Anechoic Chamber	Albatross	SAC-5MAC 12.8x6.8x6.4m	A0304210	2019.03.25	2023.03.24
EMI Horn Ant.	ROHDE&SCHWARZ	HF906	A0304225	2019.04.17	2022.04.27



### 3. 47 CFR PART 15B REQUIREMENTS

#### 3.1 RADIATED EMISSION

##### 3.1.1 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	
	$\mu\text{V/m}$	Dist	( $\mu\text{V/m}$ )	( $\text{dBuV/m}$ )
30.0 - 88.0	100	3m	100	$20\log 100$
88.0 - 216.0	150	3m	150	$20\log 150$
216.0 - 960.0	200	3m	200	$20\log 200$
Above 960.0	500	3m	500	$20\log 500$

- a) As shown in FCC section 15.35(b), 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 120kHz ,VBW 300kHz.
- d) 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  $\text{dBuV/m}$  is calculated by  $20\log$  Emission Level( $\mu\text{V/m}$ ).
- 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  $30\mu\text{V/m}$ , then F.S Limitation at 3m distance is adjusted as

$$Ld1 = L1 = 30\mu\text{V/m} * (10)^2 = 100 * 30\mu\text{V/m}.$$



### **3.1.2 Test Description**

See section 2.3.2 of this report.

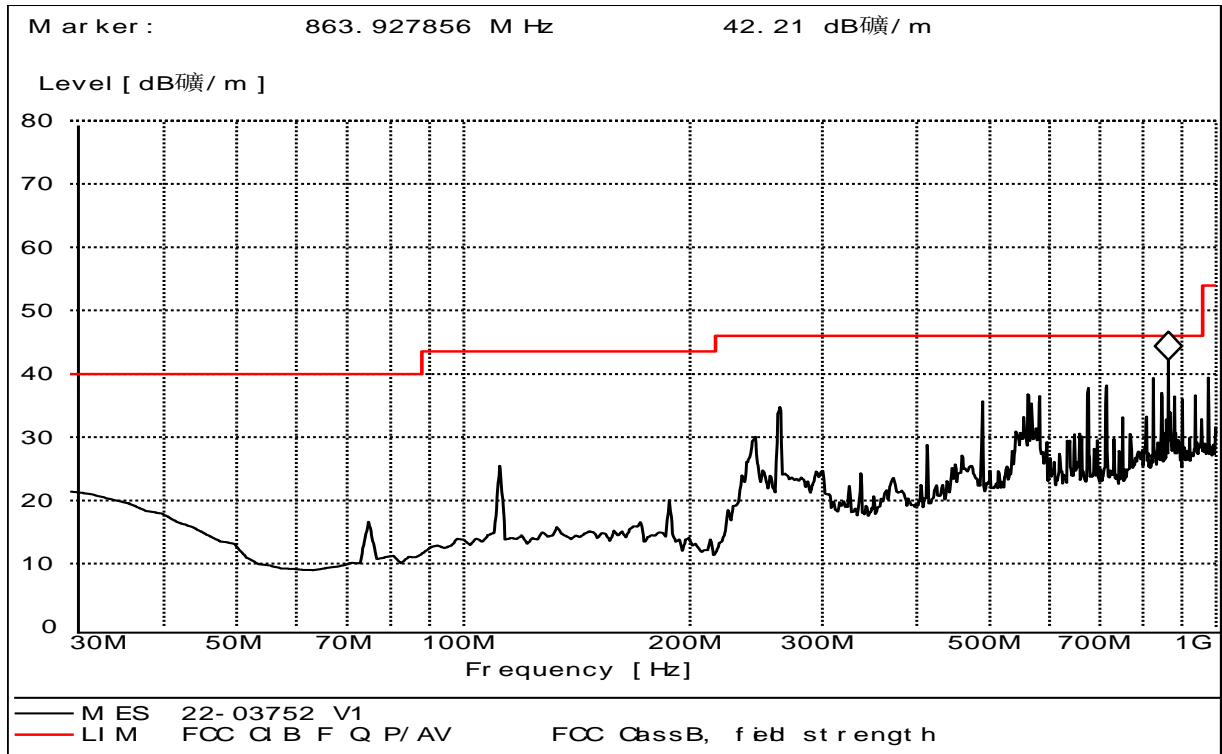
### **3.1.3 Test Result**

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:Setup 2 Vertical**

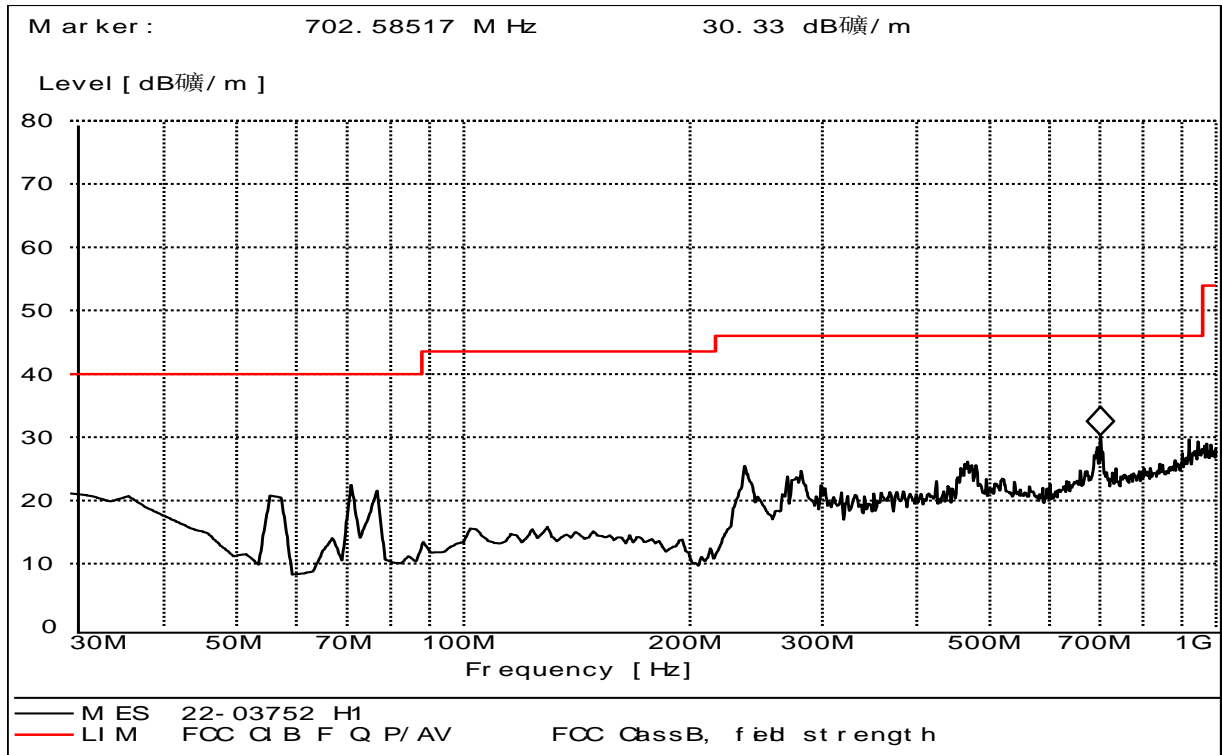


(Plot C: Test Antenna Vertical 30M - 1G)

Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dBμV/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
111.64	23.54	120.000	122	43.5	19.29	Vertical	0.4	26.3	Pass
263.26	33.16	120.000	109	46.0	17.55	Vertical	0.6	26.2	Pass
488.75	33.14	120.000	135	46.0	3.96	Vertical	0.5	26.1	Pass
562.62	32.97	120.000	117	46.0	9.55	Vertical	0.7	29.0	Pass
714.24	35.58	120.000	165	46.0	23.36	Vertical	0.3	29.3	Pass
863.92	40.14	120.000	159	46.0	20.58	Vertical	0.6	29.1	Pass



**B.Radiation disturbances, antenna polarization: Setup 2 Horizontal**



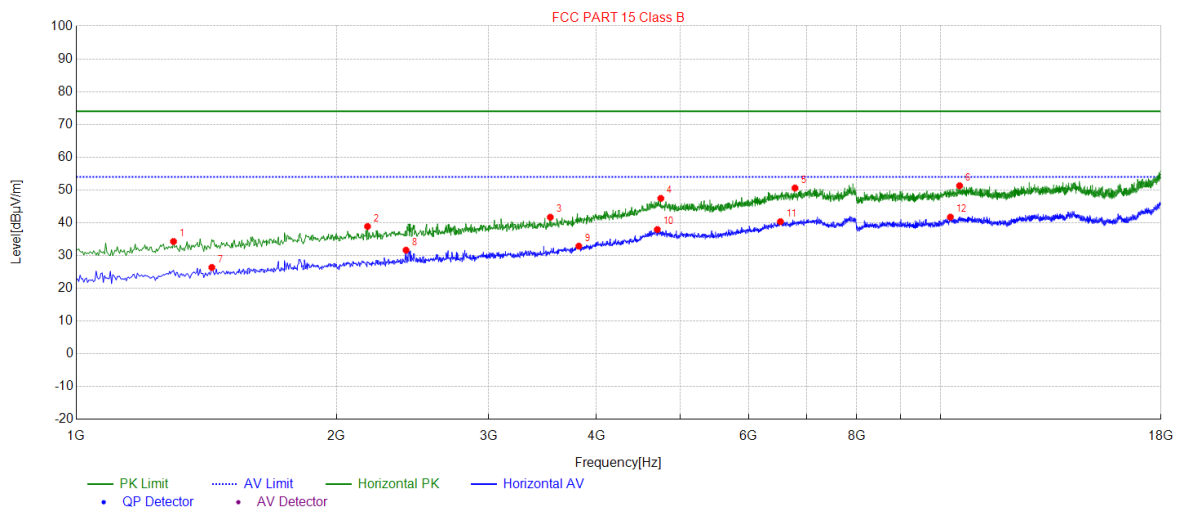
(Plot D: Test Antenna Horizontal 30M - 1G)

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dBµV/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
30.00	20.57	120.000	118	40.0	19.43	Horizontal	0.3	26.1	Pass
70.82	20.39	120.000	120	40.0	19.61	Horizontal	0.3	26.9	Pass
236.05	23.20	120.000	139	46.0	22.80	Horizontal	0.5	27.4	Pass
280.76	23.66	120.000	142	46.0	22.34	Horizontal	0.6	26.8	Pass
467.37	24.37	120.000	137	46.0	21.63	Horizontal	0.4	27.5	Pass
702.58	28.74	120.000	139	46.0	17.26	Horizontal	0.7	27.3	Pass

**Test Result: PASS**



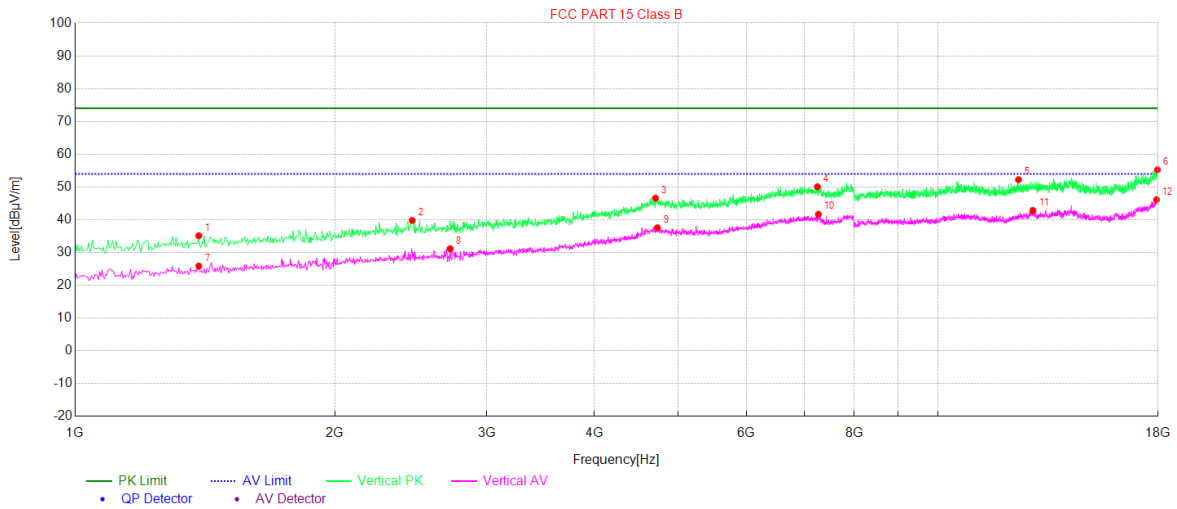
**A.Radiation disturbances, antenna polarization: Setup2 Horizontal**



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

NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1295.85	34.29	74.00	39.71	PK	114	134	Horizontal
2	2173.23	38.88	74.00	35.12	PK	126	117	Horizontal
3	3536.90	41.69	74.00	32.31	PK	177	96	Horizontal
4	4747.54	47.44	74.00	26.56	PK	130	342	Horizontal
5	6787.95	50.61	74.00	23.39	PK	124	163	Horizontal
6	10525.3	51.29	74.00	22.71	PK	151	165	Horizontal
7	1435.28	26.37	54.00	27.63	AV	163	84	Horizontal
8	2407.88	31.64	54.00	22.36	AV	152	332	Horizontal
9	3815.76	32.86	54.00	21.14	AV	140	217	Horizontal
10	4703.34	37.93	54.00	16.07	AV	125	200	Horizontal
11	6529.50	40.34	54.00	13.66	AV	148	183	Horizontal
12	10270.2	41.72	54.00	12.28	AV	175	344	Horizontal

### B.Radiation disturbances, antenna polarization: Setup2 Vertical



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

NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1391.07	35.14	74.00	38.86	PK	124	287	Vertical
2	2458.89	39.78	74.00	34.22	PK	170	143	Vertical
3	4706.74	46.58	74.00	27.42	PK	153	231	Vertical
4	7250.45	50.08	74.00	23.92	PK	148	62	Vertical
5	12402.4	52.23	74.00	21.77	PK	133	124	Vertical
6	17969.3	55.24	74.00	18.76	PK	127	307	Vertical
7	1391.07	25.89	54.00	28.11	AV	106	348	Vertical
8	2720.74	31.17	54.00	22.83	AV	114	162	Vertical
9	4730.54	37.57	54.00	16.43	AV	182	57	Vertical
10	7270.85	41.67	54.00	12.33	AV	125	128	Vertical
11	12885.3	42.85	54.00	11.15	AV	148	274	Vertical
12	17925.1	46.13	54.00	7.87	AV	161	61	Vertical

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