EMC TEST REPORT

Report No.:	SET2022-06545
Product Name:	Tyke-L3 Thermal Imager
Model No. :	Tyke L325 Tyke Labcd（a=0~9,A~Z; b=0~9, A~Z;c=0~9,A~Z;d=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:	2021.07.26
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 **Fax:** 86 755 26627238

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Test Report

Product Name.....	Tyke-L3 Thermal Imager
Model No.	Tyke L325 Tyke Labcd（a=0~9,A~Z; b=0~9, A~Z;c=0~9,A~Z;d=0~9,A~Z）
Trade name……	InfiRay
Brand 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 2022.05.26

Reviewed by ..... Chris You

Chris You Senior Engineer 2022.05.26

Approved by ..... Shuangwen Zhang

2022.05.26

Shuangwen Zhang, Manager

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Change History		
Issue	Date	Reason for change
1.0	2022.05.26	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Name ..... .:	Tyke-L3 Thermal Imager
Trade Name……:	InfiRay
Brand Name……:	InfiRay
Power supply……..:	N/A
Ancillary Equipment……:	N/A
Hardware Version……...:	IR2017072_A12_A13_A11
Software Version .....:	IR2020007_0M2_V6_02_D20210617_325_CNEN

Note1:The EUT is a Tyke-L3 Thermal Imager;

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

Note 3: Tyke-L3 Thermal Imager, main inspection model: Tyke L325

The different models covered are as follows:

Tyke Labcd (a = 0 ~ 9, a to Z.b=0~9, A~Z;c=0~9,A~Z;D = 0 ~ 9, A to Z)

Model differences represent differences in software functions or sales regions. The materials used are the same and the differences do not affect the EMC test results of the products.

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 17 025. 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 (℃):	15 ℃ - 35 ℃
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	Rated Voltage	Serial No.	FCCID
Battey	/	3.7V	/	/

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 +EUT;

Setup2: Idle + Battery +EUT;

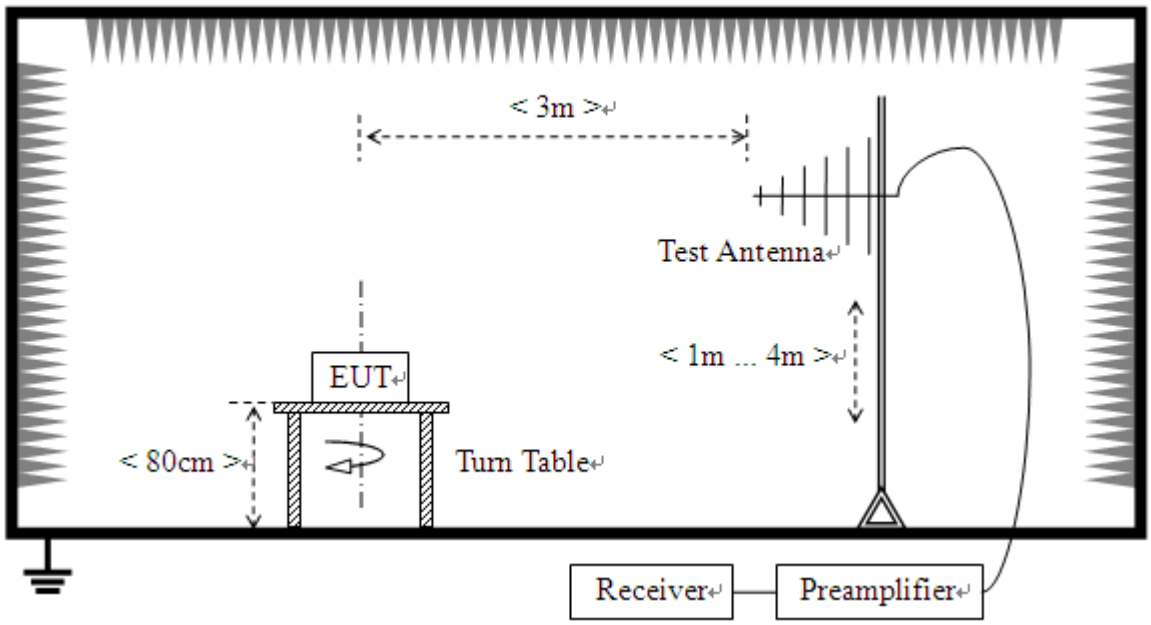
Note: Only worst-case mode setup 1 mode data provide at the report

2.3 Test Setup and Equipments List

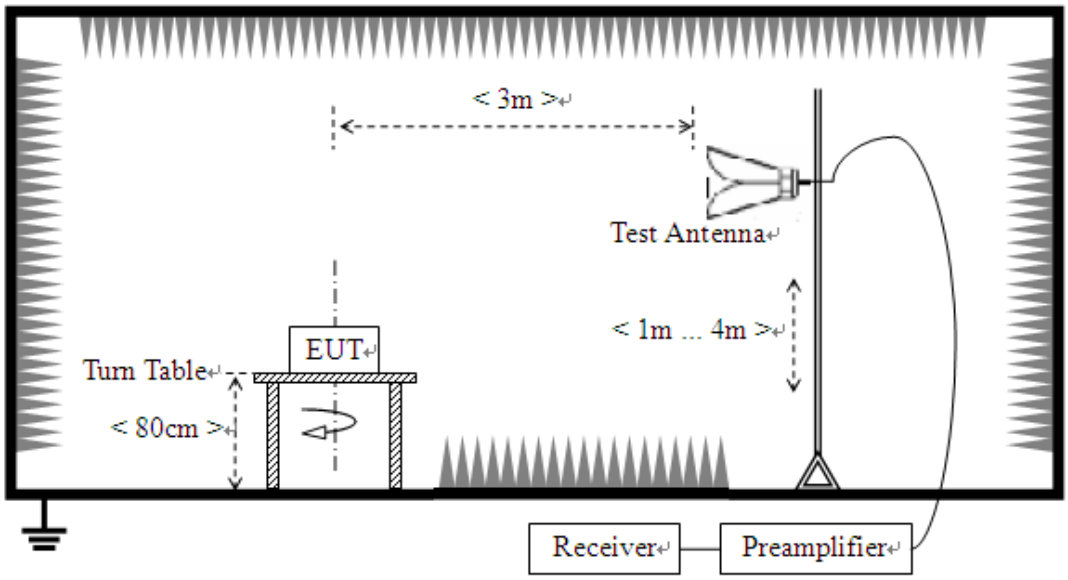
2.3.1 Radiated Emission

A. Test Setup:

1) For radiated emissions from 30MHz 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	ESCI	A0902601	2022.05.22	2023.04.17
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.	ETC	1209	A150402241	2021.01.02	2024.01.01

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	
	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) 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 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
   $Ld1 = L1 = 30uV/m * (10)^2 = 100 * 30uV/m.$

3.1.2 Test Description

See section 2.3.2 of this report.

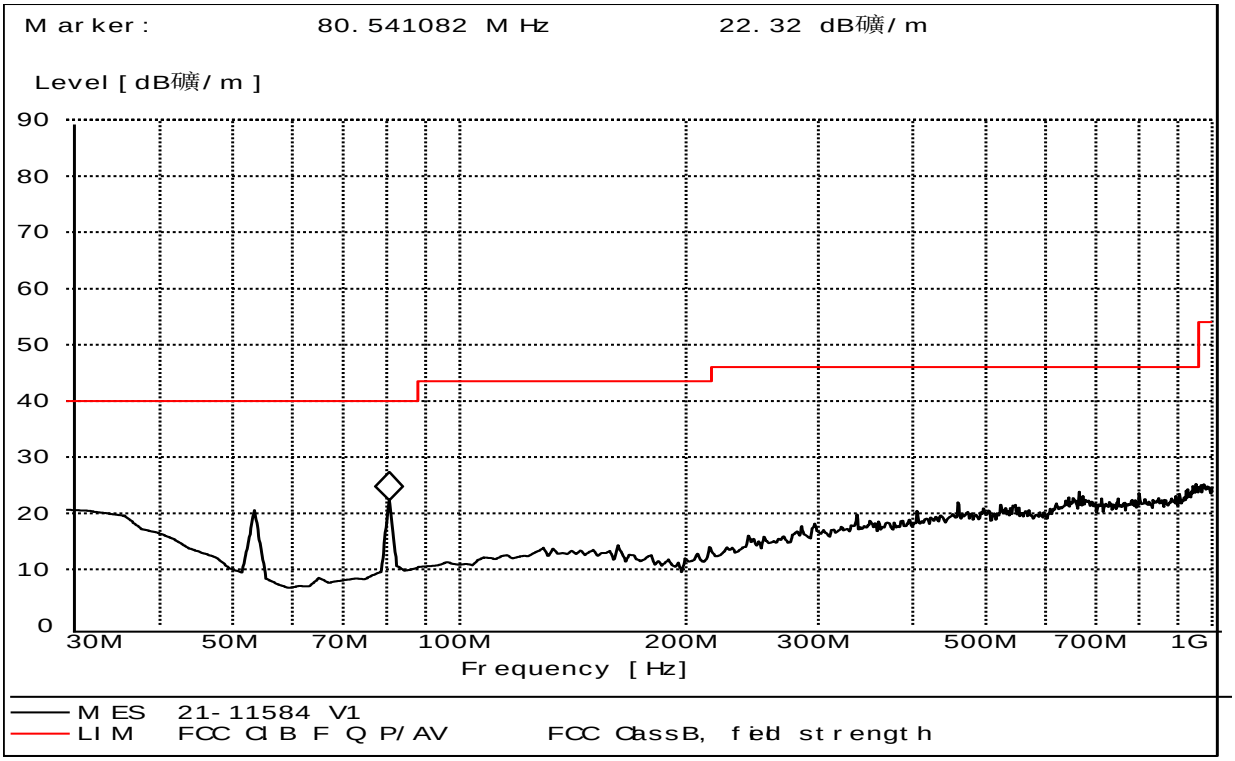
3.1.3 Test Result

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.

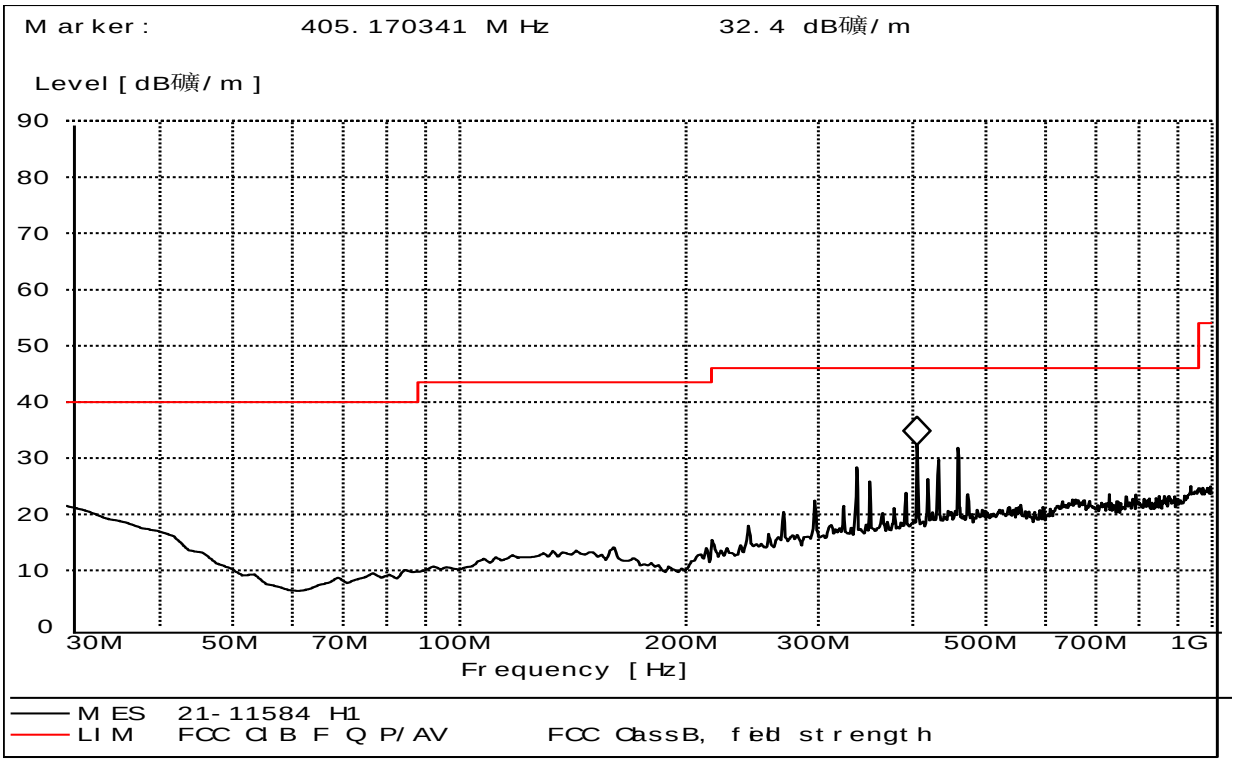
A.Radiation disturbances, antenna polarization:Setup 2 Vertical



(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
30.00	20.00	120.000	109	40.0	20.00	Vertical	0.3	26.2	Pass
53.29	20.20	120.000	127	40.0	19.80	Vertical	0.4	26.1	Pass
80.37	21.59	120.000	116	40.0	18.41	Vertical	0.6	26.4	Pass
129.19	13.28	120.000	130	43.5	30.22	Vertical	0.5	29.0	Pass
337.44	19.85	120.000	144	46.0	26.15	Vertical	0.4	29.1	Pass
459.20	21.86	120.000	147	46.0	24.14	Vertical	0.5	29.0	Pass

B.Radiation disturbances, antenna polarization: Setup 1 Horizontal

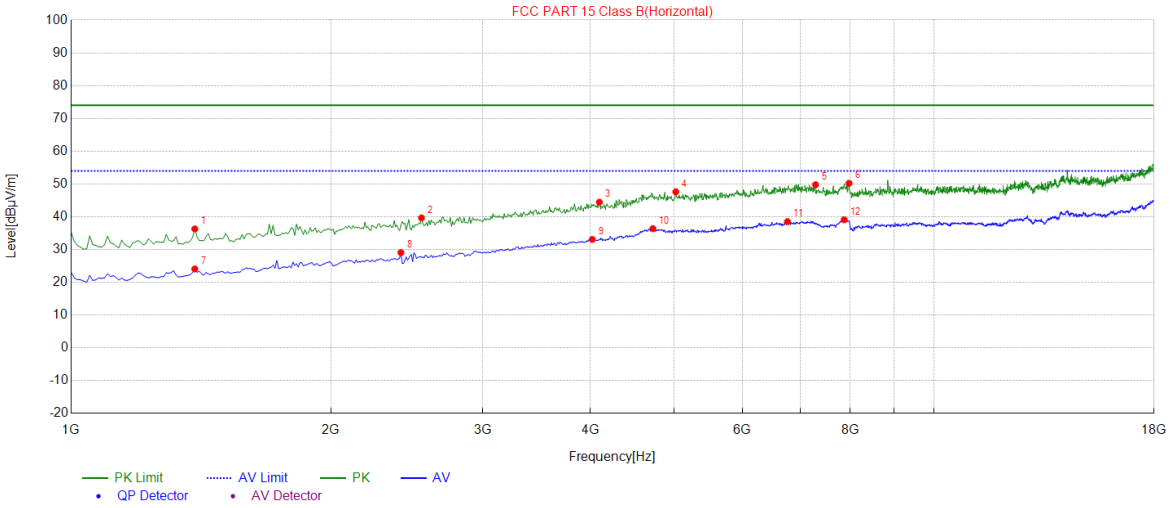


(Plot D: Test Antenna Horizontal 30M - 1G)

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	21.21	120.000	216	40.0	18.79	Horizontal	0.4	26.0	Pass
43.38	13.26	120.000	96	40.0	26.74	Horizontal	0.5	26.8	Pass
133.19	12.83	120.000	198	43.5	30.67	Horizontal	0.8	27.3	Pass
168.44	14.11	120.000	71	43.5	29.39	Horizontal	0.7	26.6	Pass
405.23	31.92	120.000	298	46.0	14.08	Horizontal	0.3	27.3	Pass
459.18	31.13	120.000	213	46.0	14.87	Horizontal	0.6	27.4	Pass

Test Result: PASS

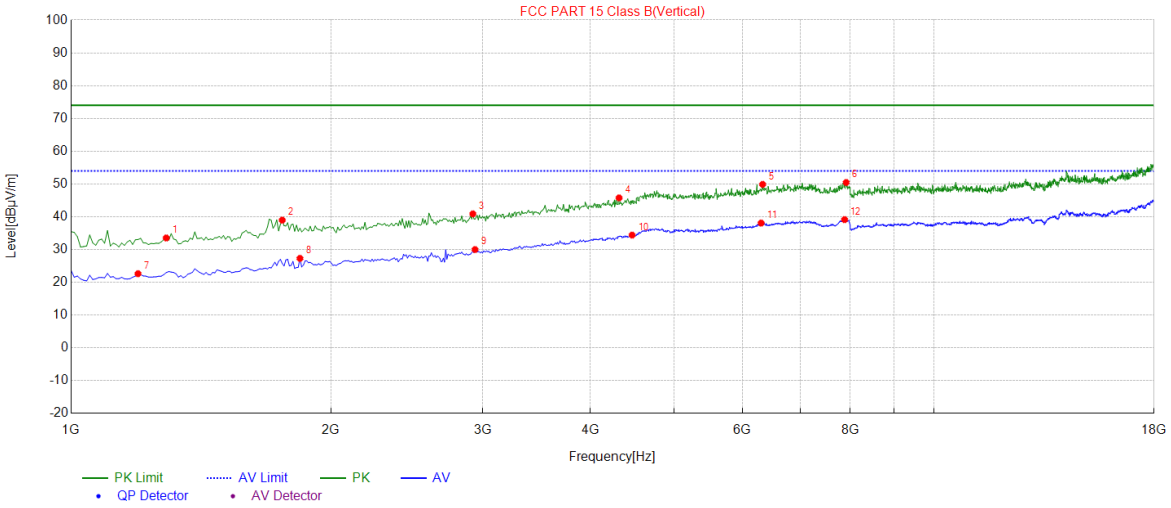
A.Radiation disturbances, antenna polarization: Setup2 Horizontal



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

NO.	Freq. [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1391.19	36.29	74.00	37.71	PK	124	26	Horizontal
2	2547.77	39.65	74.00	34.35	PK	136	145	Horizontal
3	4095.54	44.44	74.00	29.56	PK	109	267	Horizontal
4	5022.51	47.61	74.00	26.39	PK	124	109	Horizontal
5	7293.14	49.77	74.00	24.23	PK	117	210	Horizontal
6	7973.48	50.21	74.00	23.79	PK	162	240	Horizontal
7	1391.19	24.09	54.00	29.91	AV	161	332	Horizontal
8	2411.70	29.07	54.00	24.93	AV	150	148	Horizontal
9	4019.00	33.08	54.00	20.92	AV	134	96	Horizontal
10	4724.86	36.38	54.00	17.62	AV	119	113	Horizontal
11	6765.88	38.50	54.00	15.50	AV	124	134	Horizontal
12	7871.43	39.09	54.00	14.91	AV	106	95	Horizontal

B.Radiation disturbances, antenna polarization: Setup1 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	1289.14	33.54	74.00	40.46	PK	116	162	Vertical
2	1756.87	38.97	74.00	35.03	PK	124	243	Vertical
3	2921.96	40.88	74.00	33.12	PK	116	117	Vertical
4	4316.65	45.76	74.00	28.24	PK	138	120	Vertical
5	6332.16	49.88	74.00	24.12	PK	123	69	Vertical
6	7913.95	50.45	74.00	23.55	PK	107	342	Vertical
7	1195.59	22.63	54.00	31.37	AV	116	108	Vertical
8	1841.92	27.31	54.00	26.69	AV	154	123	Vertical
9	2938.96	30.00	54.00	24.00	AV	122	144	Vertical
10	4469.73	34.41	54.00	19.59	AV	110	137	Vertical
11	6306.65	38.08	54.00	15.92	AV	154	169	Vertical
12	7879.94	39.13	54.00	14.87	AV	117	254	Vertical

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