



EMC TEST REPORT

Report No.: SET2021-15129

Product Name: Saim Thermal Imaging Monocular

FCC ID: 2AYGT-254-1

Model No. : SCT35,Sperber35,ET50, HOGSTER-35,NEON S2,FOX 35,
MS-42R ,SUPER HOGSTER-35,IRUS_RB35, LGT A10

Applicant: IRay Techonlogy Co.,Ltd

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

Dates of Testing: 2021.05.27—2021.11.08

Issued by: CCIC Southern Testing Co., Ltd.

Lab Location: Electronic Testing Building, No. 43 Shahe Road, Xili Street,
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Test Report

Product Name..... Saim Thermal Imaging Monocular

Main Model No. SCT35,Sperber35,ET50, HOGSTER-35,NEON S2,FOX 35,
MS-42R ,SUPER HOGSTER-35,IRUS_RB35, LGT A10

Trade name InfiRay

Applicant..... InfiRay

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

Manufacturer IRay Techonlogy 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 2021.11.09

Reviewed by Chris You
Chris You Senior Engineer 2021.11.09

Approved by Shuangwen Zhang
Shuangwen Zhang, Manager 2021.11.09

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Change History		
Issue	Date	Reason for change
1.0	2021.11.09	First edition



1. GENERAL INFORMATION

1.1 EUT Description

EUT Name : Saim Thermal Imaging Monocular

Trade Name.....: InfiRay

Brand Name.....: InfiRay

Hardware Version.....: V50C

Software Version: 0150.1

Note 1: The EUT is a Cabin Thermal Imaging monocular; It could support the following operating mode and frequency band: 2.4GWIFI

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

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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	15.109	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 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.

1.3.2 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 Radiated Emission: (30MHz~1GHz)	Uc = 3.91 dB (k=2)
Uncertainty of Radiated Emission: (1~18GHz)	Uc = 4.5 dB (k=2)
Uncertainty of Radiated Emission: (18~40GHz)	Uc = 4.9 dB (k=2)



test conditions setting

1.4 Test Peripherals

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

1.5 Use of Software Checklist

Software	Version number	Manufacturer	Use the project
ES-K1	V1.73	ROHDE&SCHWARZ	Radiated Emissions below 1GHz
TS+	JS32-RE 2.5.2.0	Tonsceng	Radiated Emissions above 1GHz
EMC32	Version 10.35.10	ROHDE&SCHWARZ	Conducted Emission

1.6 Test Mode

Note1: The EUT have the following typical setups during the test:

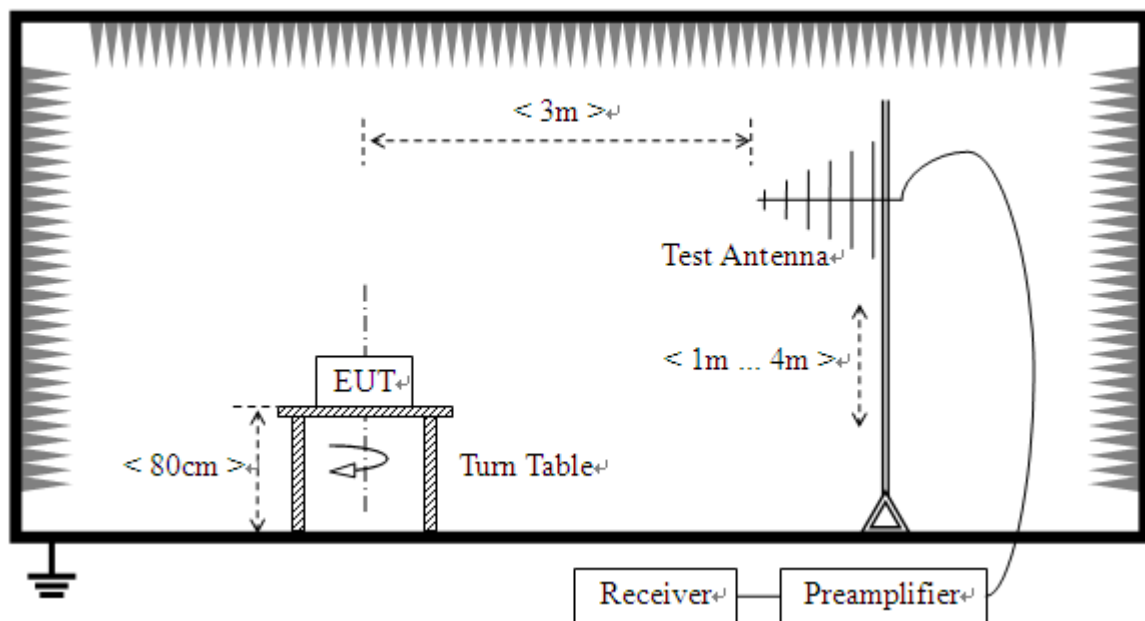
Setup1: EUT Working (Imaging) ;

1.7 Test Setup and Equipments List

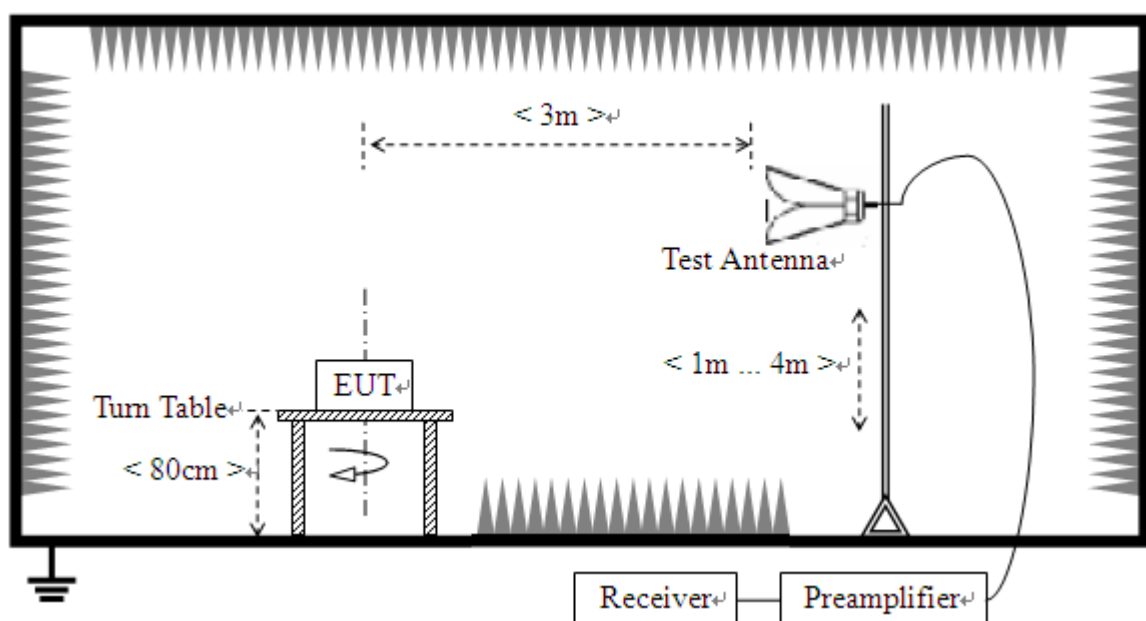
1.7.1 Radiated Emission

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
Test Receiver	KEYSIGHT	N9038A	A141202036	2021.09.20	2022.08.04
LISN	ROHDE&SCHWARZ	ENV216	A140701847	2021.09.21	2022.08.02
Shield Room	Xinju Electronics	L7300*W4500 *H3100	A181003226	2021.09.05	2024.07.29
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	A0902601	2021.06.23	2022.05.23
Broadband Ant.	2786	ETC	A150402239	2021.09.16	2024.03.03
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	2022.08.06
System Simulator	ROHDE&SCHWARZ	CMW500	A150802214	2021.08.02	2022.07.22
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	2022.04.17

2. 47 CFR PART 15B REQUIREMENTS

2.1 Radiated Emission

2.1.1 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	(uV/m)	(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	$20\log 500$

- 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.
- 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.
- For below 1G :QP detector RBW 120kHz ,VBW 300kHz.
- For Above 1G: PK detector RBW 1MHz,VBW 3MHz for PK value ;AV detector RBW 1MHz, VBW 10Hz for AV value.

Note:

- The tighter limit shall apply at the boundary between two frequency range.
- Limitation expressed in dBuV/m is calculated by $20\log \text{Emission Level}(\text{uV/m})$.
- If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $L_{d1} = L_{d2} * (d_2/d_1)^2$.

Example:

F.S Limit at 30m distance is 30uV/m , then F.S Limitation at 3m distance is adjusted as

$$L_{d1} = L_1 = 30\text{uV/m} * (10)^2 = 100 * 30\text{uV/m}.$$

2.1.2 Test Description

See section 2.3.2 of this report.

2.1.3 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.

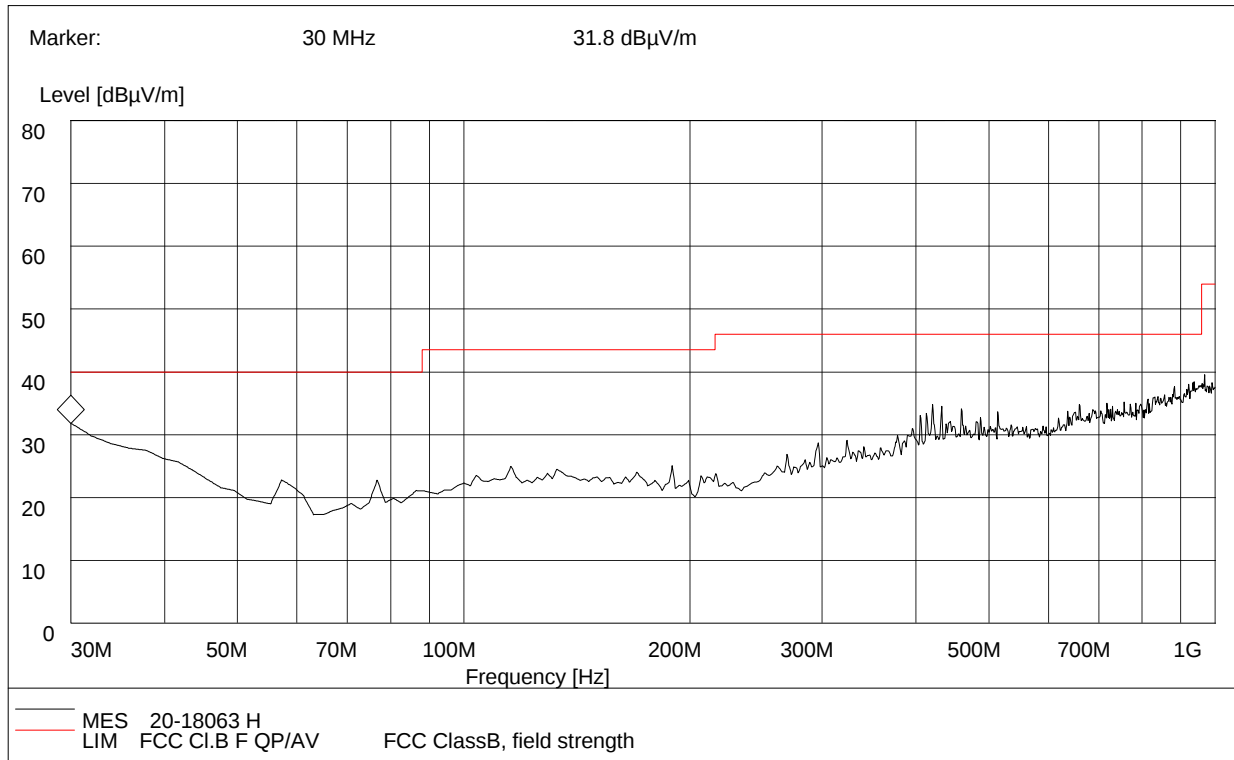
The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

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.

-Emission Level(dBuV/m)= 20log Emission Level(uV/m)

-Corrected Reading=Antenna factor+Cable Loss+Read Level-Preamp Factor= Level

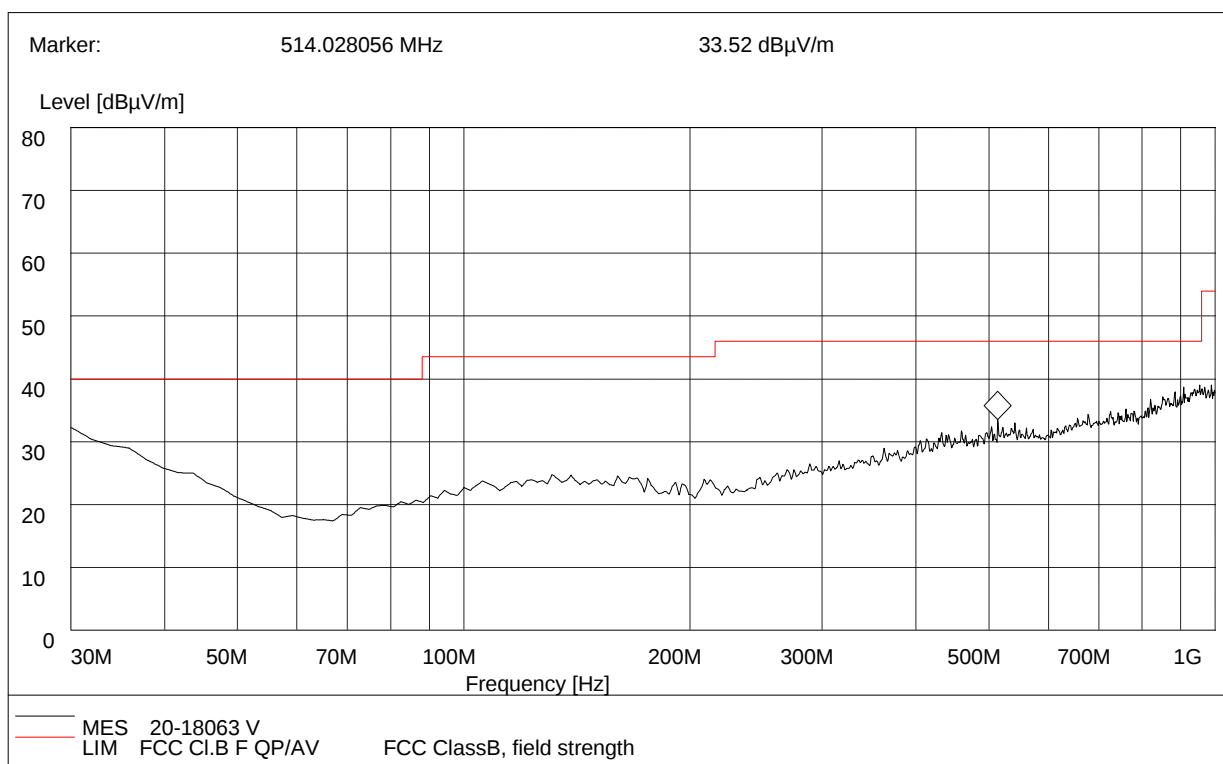
A.Radiation disturbances, antenna polarization: Horizontal



(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
30.00	31.82	120.000	149	40.0	8.18	Horizon	0.4	26.3	Pass
59.52	21.74	120.000	126	40.0	18.26	Horizon	0.4	26.3	Pass
115.02	23.58	120.000	157	43.5	19.92	Horizon	0.5	26.3	Pass
168.23	22.01	120.000	130	43.5	21.49	Horizon	0.5	26.3	Pass
420.02	33.95	120.000	106	46.0	12.05	Horizon	0.6	29.0	Pass
432.58	33.35	120.000	195	46.0	12.65	Horizon	0.6	29.0	Pass

B.Radiation disturbances, antenna polarization: Vertical

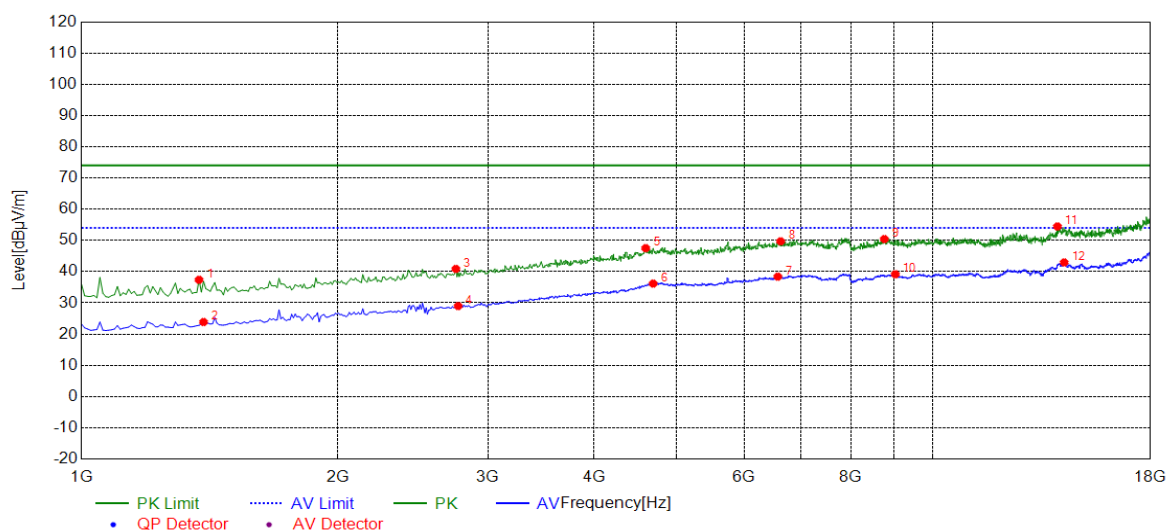


(Plot D: Test Antenna Horizontal 30M - 1G)

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
30.00	31.02	120.000	117	40.0	8.98	Vertical	0.4	26.3	Pass
42.08	23.85	120.000	162	40.0	16.15	Vertical	0.4	26.3	Pass
105.05	22.09	120.000	127	43.5	21.41	Vertical	0.5	26.3	Pass
175.22	23.28	120.000	100	43.5	20.22	Vertical	0.5	26.3	Pass
432.13	31.02	120.000	109	46.0	14.98	Vertical	0.6	29.0	Pass
514.19	32.02	120.000	122	46.0	13.98	Vertical	0.6	29.0	Pass

Test Result: PASS

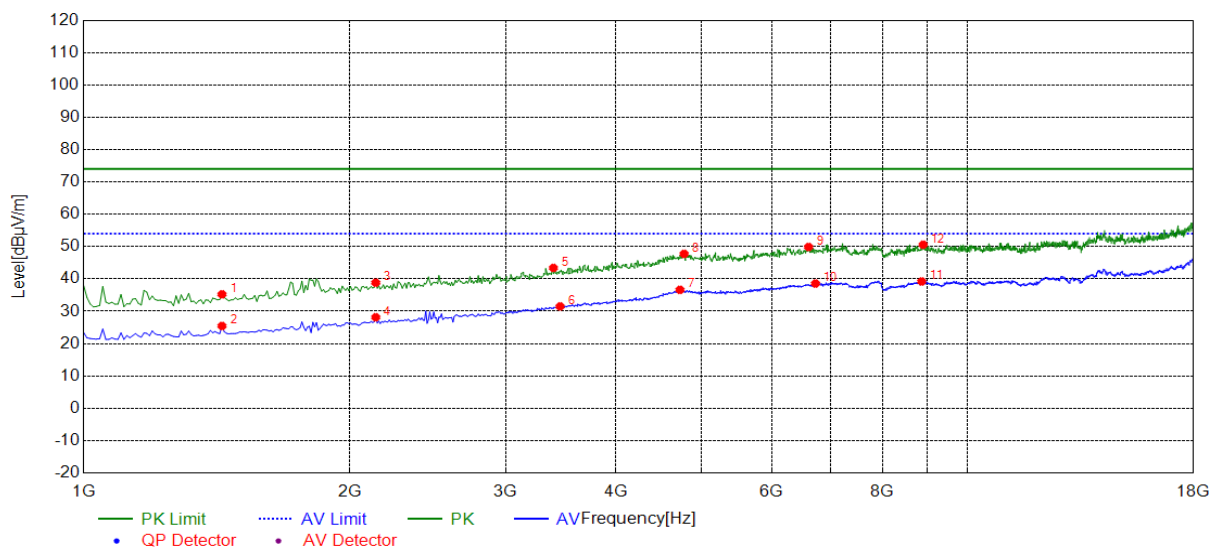
A.Radiation disturbances, antenna polarization: Horizontal



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

NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1374.187	37.38	74.00	36.62	PK	100	159	Horizontal
2	1391.195	23.87	54.00	30.13	AV	100	176	Horizontal
3	2751.875	40.88	74.00	33.12	PK	100	239	Horizontal
4	2768.884	28.98	54.00	25.02	AV	100	207	Horizontal
5	4597.298	47.52	74.00	26.48	PK	100	216	Horizontal
6	4690.845	36.18	54.00	17.82	AV	100	207	Horizontal
7	6570.285	38.40	54.00	15.60	AV	100	342	Horizontal
8	6621.310	49.71	74.00	24.29	PK	100	337	Horizontal
9	8764.382	50.43	74.00	23.57	PK	100	194	Horizontal
10	9028.014	39.16	54.00	14.84	AV	100	218	Horizontal
11	13994.49	54.47	74.00	19.53	PK	100	265	Horizontal
12	14249.62	42.95	54.00	11.05	AV	100	257	Horizontal

B.Radiation disturbances, antenna polarization: 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	1433.71	35.25	74.00	38.75	PK	100	49	Vertical
2	1433.71	25.46	54.00	28.54	AV	100	57	Vertical
3	2139.56	38.84	74.00	35.16	PK	100	126	Vertical
4	2139.56	28.14	54.00	25.86	AV	100	104	Vertical
5	3398.19	43.42	74.00	30.58	PK	100	137	Vertical
6	3457.72	31.51	54.00	22.49	AV	100	125	Vertical
7	4724.86	36.63	54.00	17.37	AV	100	224	Vertical
8	4775.88	47.75	74.00	26.25	PK	100	243	Vertical
9	6604.30	49.89	74.00	24.11	PK	100	158	Vertical
10	6723.36	38.58	54.00	15.42	AV	100	142	Vertical
11	8866.43	39.22	54.00	14.78	AV	100	304	Vertical
12	8900.45	50.59	74.00	23.41	PK	100	293	Vertical

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