



EMC TEST REPORT

Report No.: SET2021-15129

Product Name: Saim Thermal Imaging Monocular

FCC ID: 2AYGT-254-1

Model No. : SCD35,SCD50

Applicant: IRay Technology Co.,Ltd

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

Dates of Testing: 2022.04.18—2022.04.25

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

This test report consists of **15** pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CCIC-SET. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CCIC-SET within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.



Test Report

Product Name..... Saim Thermal Imaging Monocular

Main Model No. SCD35,SCD50

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

2022.04.25

Reviewed by Chris You

Chris You Senior Engineer

2022.04.25

Approved by Shuangwen Zhang

Shuangwen Zhang, Manager

2022.04.25

**TABLE OF CONTENTS**

1.	GENERAL INFORMATION	4
1.1	EUT Description	4
1.2	Test Standards and Results	5
1.3	Facilities and Accreditations	6
1.3.1	Facilities	6
1.3.2	Test Environment Conditions	6
1.3.3	Measurement Uncertainty	6
1.4	Test Peripherals	7
1.5	Use of Software Checklist	7
1.6	Test Mode	7
1.7	Test Setup and Equipments List	8
1.7.1	Radiated Emission	8
2.	47 CFR PART 15B REQUIREMENTS	10
2.1	Radiated Emission	10
2.1.1	Requirement	10
2.1.2	Test Description	11
2.1.3	Test Result	11

Change History		
Issue	Date	Reason for change
1.0	2022.04.25	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.

Note 3: The original report is SET2021-15129, change PCB and models.

:



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 = 5.8dB (k=2)
Uncertainty of Radiated Emission: (1~18GHz)	Uc = 5.1 dB (k=2)
Conducted Emission: (150kHz to 30MHz)	Uc = 2.6 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:

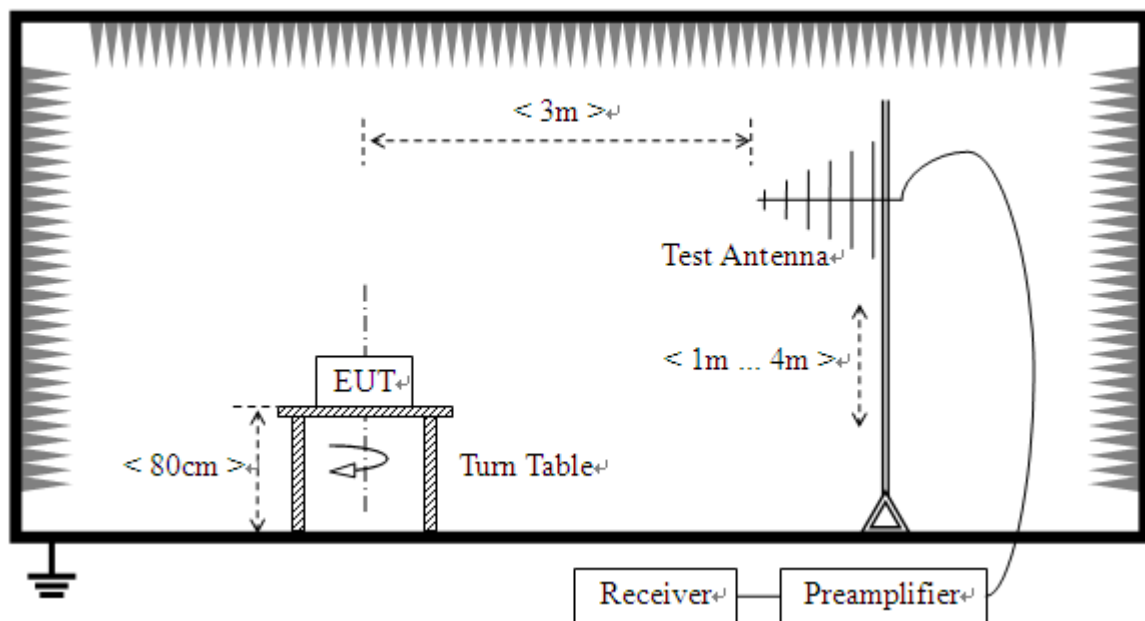
Setup1: EUT Working (Imaging) ;

1.7 Test Setup and Equipments List

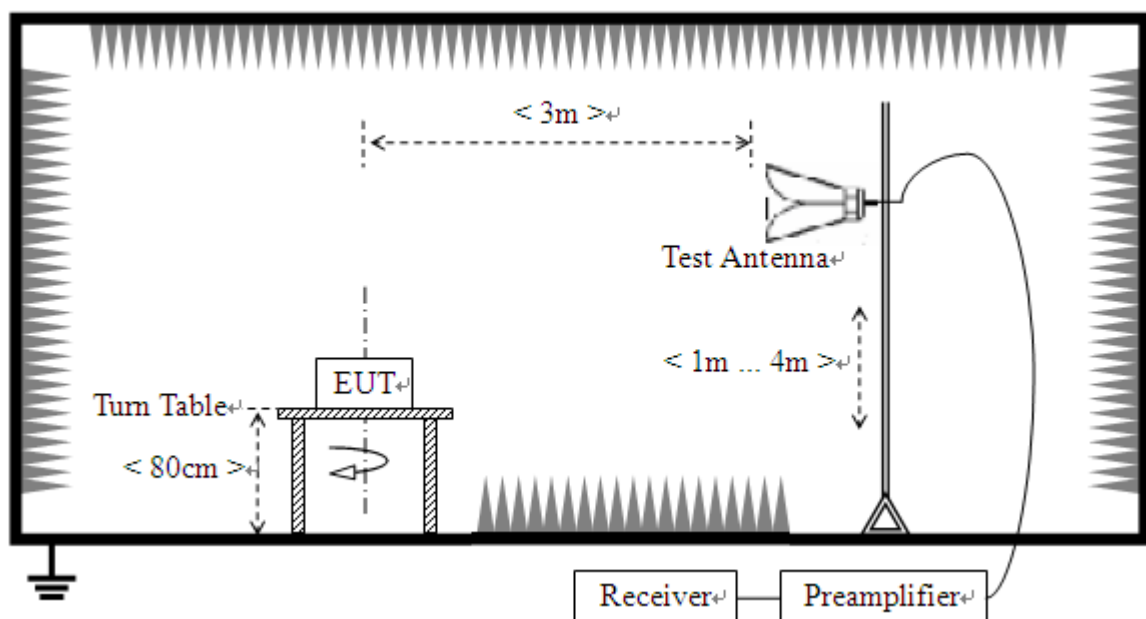
1.7.1 Radiated Emission

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	1209	A150402241	2021.01.02	2024.01.01

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	($\mu\text{V/m}$)	(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 $20\log \text{Emission Level}(\mu\text{V/m})$.
- 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

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

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.

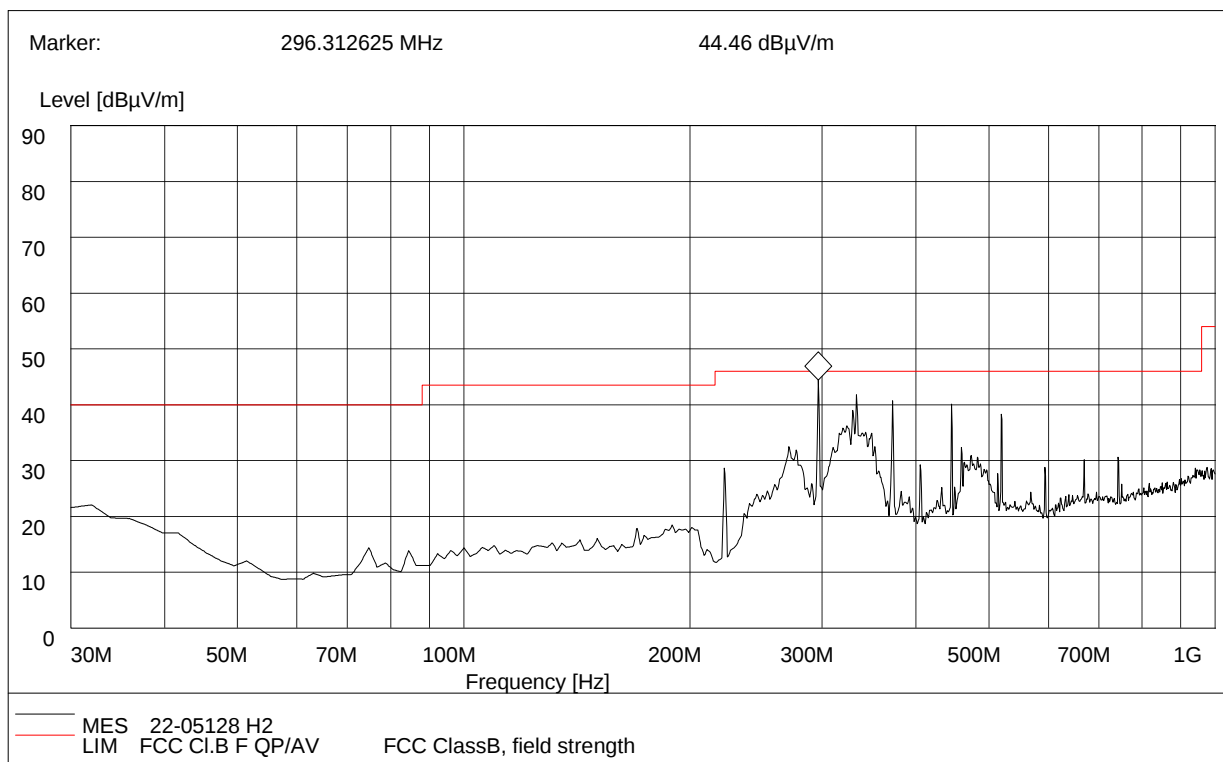
The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

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

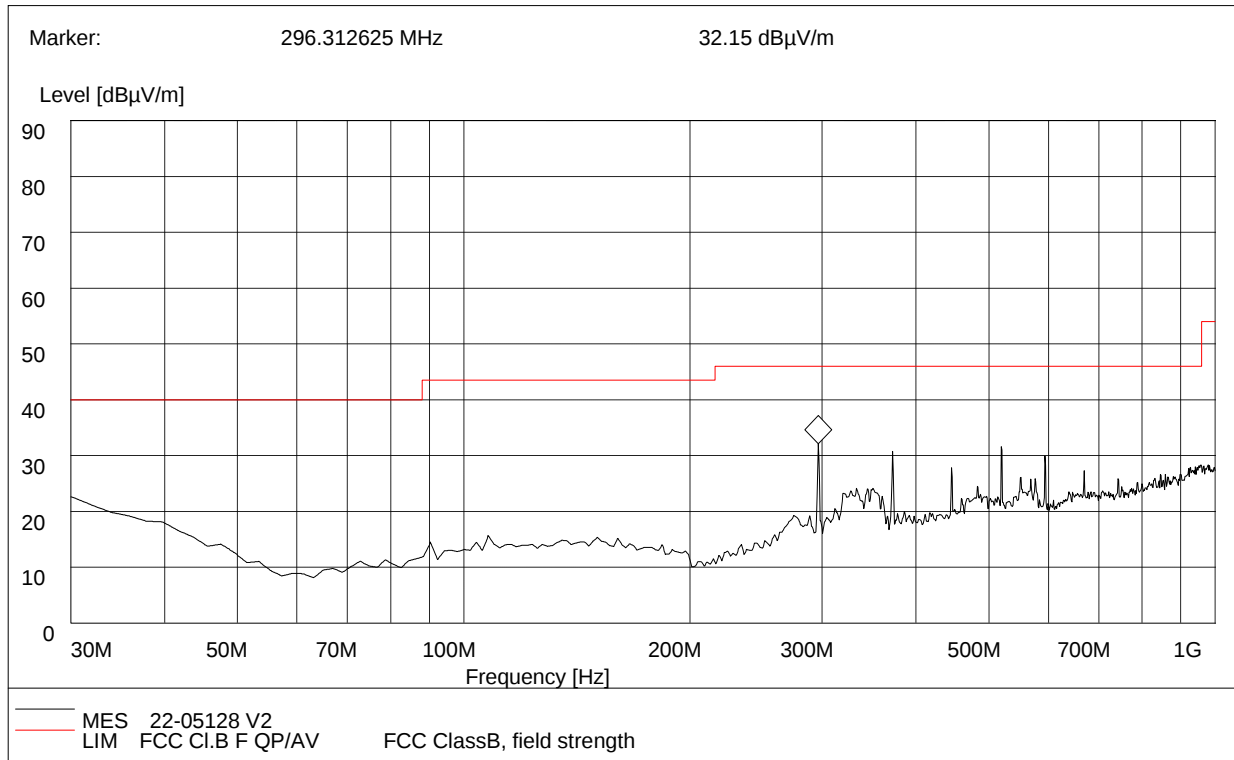
A.Radiation disturbances, antenna polarization: Horizontal



(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
31.56	21.35	120.000	129	40.0	18.65	Horizon	0.4	26.4	Pass
74.37	13.56	120.000	134	40.0	26.44	Horizon	0.4	26.2	Pass
169.54	17.53	120.000	150	43.5	25.97	Horizon	0.4	26.1	Pass
189.31	18.20	120.000	117	43.5	25.30	Horizon	0.5	26.2	Pass
296.57	44.05	120.000	124	46.0	1.95	Horizon	0.5	29.0	Pass
333.24	41.86	120.000	139	46.0	4.14	Horizon	0.7	29.1	Pass

B.Radiation disturbances, antenna polarization: Vertical

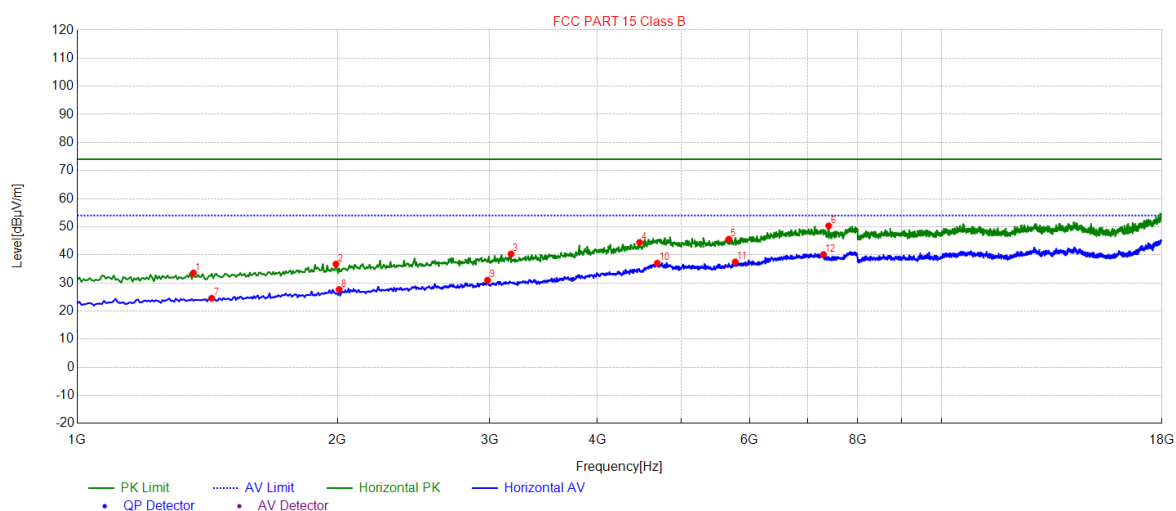


(Plot D: Test Antenna Horizontal 30M - 1G)

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	22.05	120.000	134	40.0	17.95	Vertical	0.4	26.3	Pass
47.61	14.20	120.000	117	40.0	25.80	Vertical	0.4	26.0	Pass
107.43	15.34	120.000	106	43.5	28.16	Vertical	0.5	26.5	Pass
162.07	13.67	120.000	155	43.5	29.83	Vertical	0.5	26.2	Pass
296.52	32.04	120.000	129	46.0	13.96	Vertical	0.6	29.1	Pass
519.69	31.05	120.000	143	46.0	14.95	Vertical	0.6	29.0	Pass

Test Result: PASS

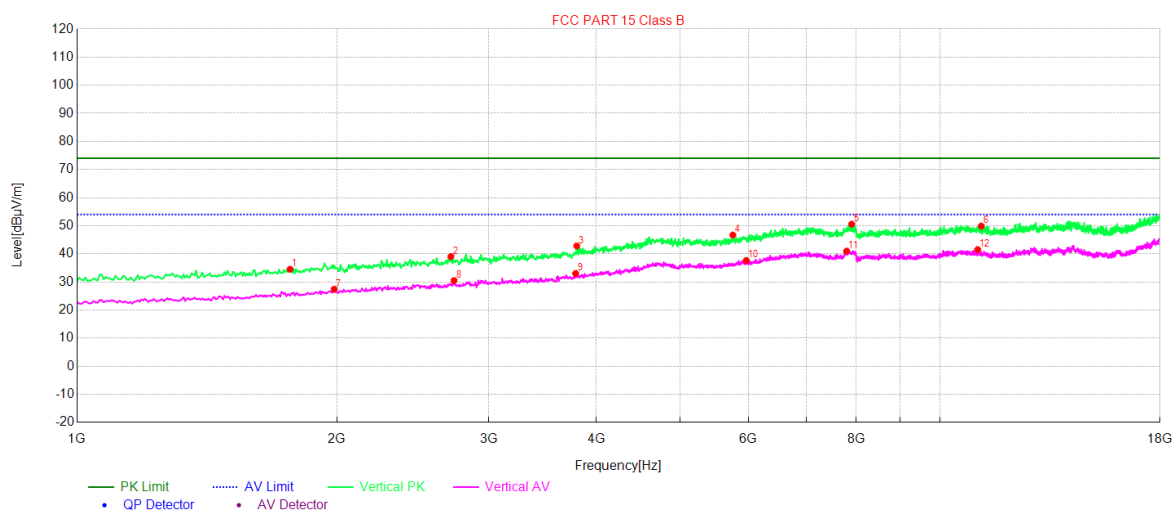
A.Radiation disturbances, antenna polarization: Horizontal



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

NO.	Freq. [MHz]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1362.787	33.54	74.00	40.46	PK	134	263	Horizontal
2	1991.997	36.70	74.00	37.30	PK	158	174	Horizontal
3	3176.725	40.31	74.00	33.69	PK	129	145	Horizontal
4	4474.824	44.44	74.00	29.56	PK	132	96	Horizontal
5	5676.558	45.59	74.00	28.41	PK	107	204	Horizontal
6	7405.468	50.32	74.00	23.68	PK	118	133	Horizontal
7	1430.810	24.56	54.00	29.44	AV	137	240	Horizontal
8	2009.003	27.64	54.00	26.36	AV	152	112	Horizontal
9	2983.994	30.97	54.00	23.03	AV	129	109	Horizontal
10	4690.230	37.05	54.00	16.95	AV	140	231	Horizontal
11	5772.924	37.51	54.00	16.49	AV	105	146	Horizontal
12	7303.434	40.14	54.00	13.86	AV	121	227	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	1765.25	34.53	74.00	39.47	PK	100	142	Vertical
2	2711.90	39.04	74.00	34.96	PK	100	131	Vertical
3	3794.59	42.81	74.00	31.19	PK	100	330	Vertical
4	5755.91	46.69	74.00	27.31	PK	100	39	Vertical
5	7904.30	50.55	74.00	23.45	PK	100	341	Vertical
6	11169.3	49.87	74.00	24.13	PK	100	283	Vertical
7	1986.32	27.42	54.00	26.58	AV	100	224	Vertical
8	2734.57	30.49	54.00	23.51	AV	100	49	Vertical
9	3783.26	33.04	54.00	20.96	AV	100	162	Vertical
10	5965.65	37.66	54.00	16.34	AV	100	87	Vertical
11	7796.59	40.99	54.00	13.01	AV	100	294	Vertical
12	11061.6	41.52	54.00	12.48	AV	100	167	Vertical

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