EMC TEST REPORT

Report No.:	SET2021-08324
Product Name:	Clip Thermal Imaging Attachment
FCC ID:	2AYGT-CML
Model No. :	CML25
Applicant:	IRay Techonlogy Co.,Ltd
Address:	11GUIYANG STREET, YANTAI ECONOMY AND TECHNOLOGY DEVELOPMENT DISTRICT, YANTAI SHANDONG P.R.CHINA
Received Date:	2021.01.11
Dates of Testing:	2020.01.11 —2021.07.02
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.....	Clip Thermal Imaging Attachment
Model No.	CML25
Series Model No.	Merlin-25、NEON C1
Trade name	InfiRay
Applicant.....	IRay Techonlogy Co.,Ltd
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 ..... Zhang Pei Sen

Pei Sen Zhang Test Engineer 2021.07.02

Reviewed by ..... Chris You

Chris You Senior Engineer 2021.07.02

Approved by ..... Shuangwen Zhang

2021.07.02

Shuangwen Zhang, Manager

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Change History		
Issue	Date	Reason for change
1.0	2021.07.02	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Name ..... .: Clip Thermal Imaging Attachment
Trade Name……: InfiRay
Brand Name……: InfiRay

Note1:The EUT is a Clip Thermal Imaging Attachment;

Note 2: Product Clip Thermal Imaging Attachment, Major Model CML25, Different Model Merlin-25,NEONC1.The difference of the model represents the difference of the built-in Sensor array and software function, which does not affect EMC. The type-c port of the product is only used for engineering debugging and upgrading by the manufacturer.

Note 3: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	**Unintentional Radiators**

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

1.3.1Facilities

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 Jun. 30th, 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 5721.01Test 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

1.3.2Measurement 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 = 2.6 dB (k=2)
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)

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 Cable：

N/A

Support Software：

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

2.2 Test Mode

The EUT have the following typical setups during the test:

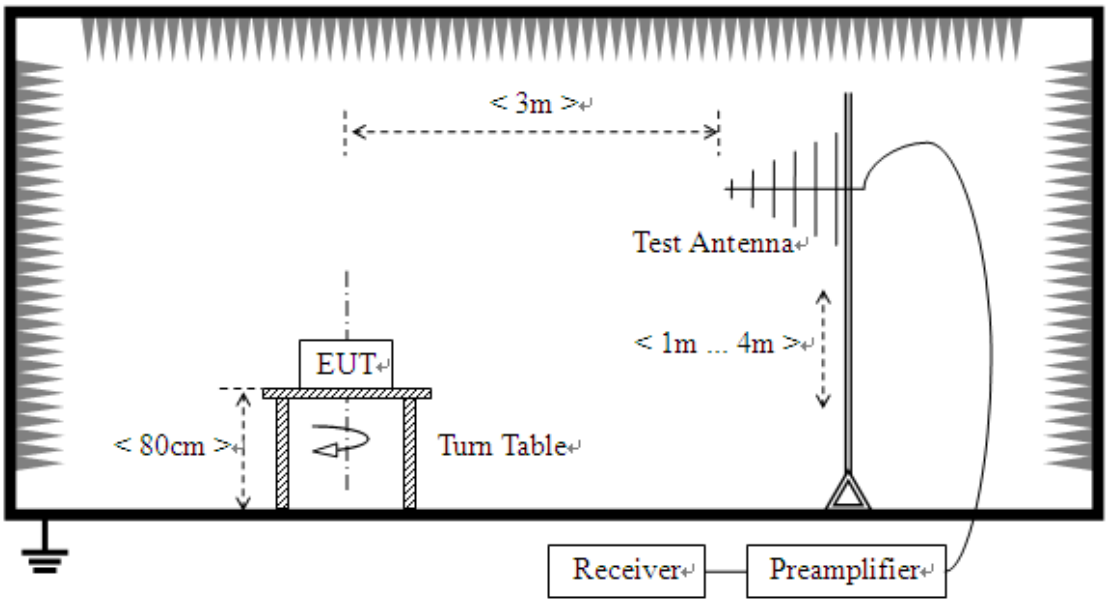
Setup1: EUT working;

2.3 Test Setup and Equipments List

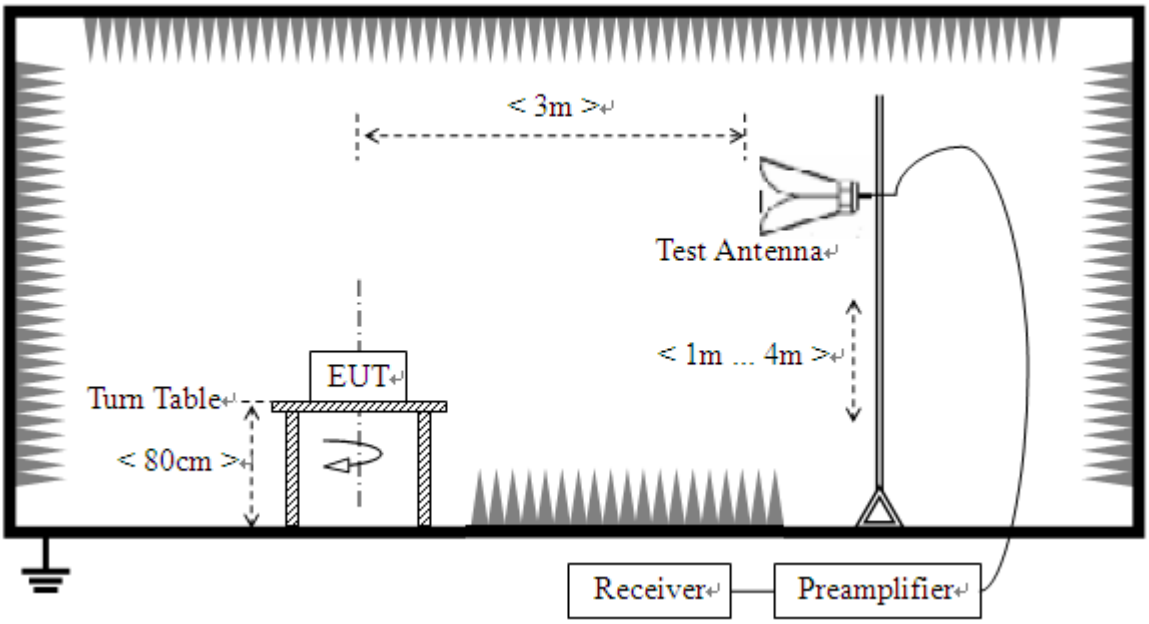
2.3.1 Radiated Emission

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	2021.06.23	2022.05.22
Broadband Ant.	2786	ETC	A150402239	2018.09.17	2021.09.16
3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2019.03.26	2023.03.25
EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2020.10.21	2021.08.12
System Simulator	ROHDE&SCHWARZ	CMW500	A150802214	2019.07.30	2021.07.29
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

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.

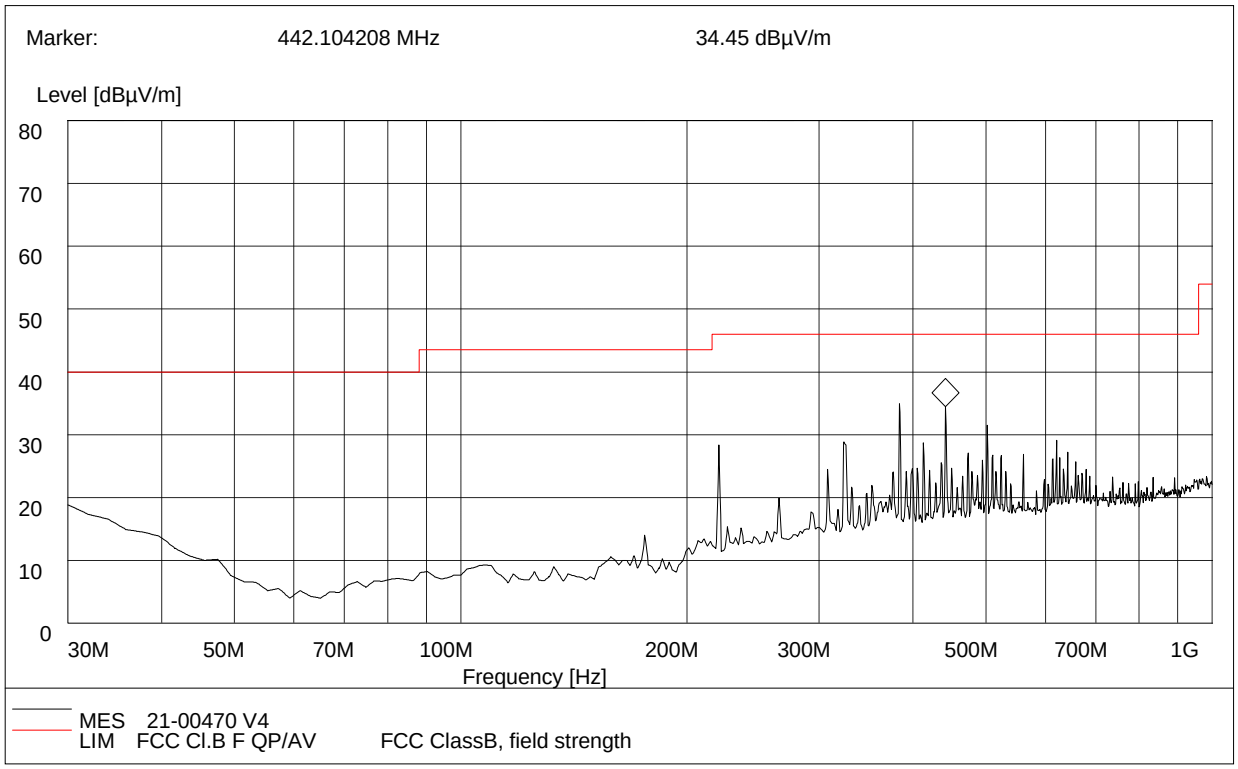
The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

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.

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

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

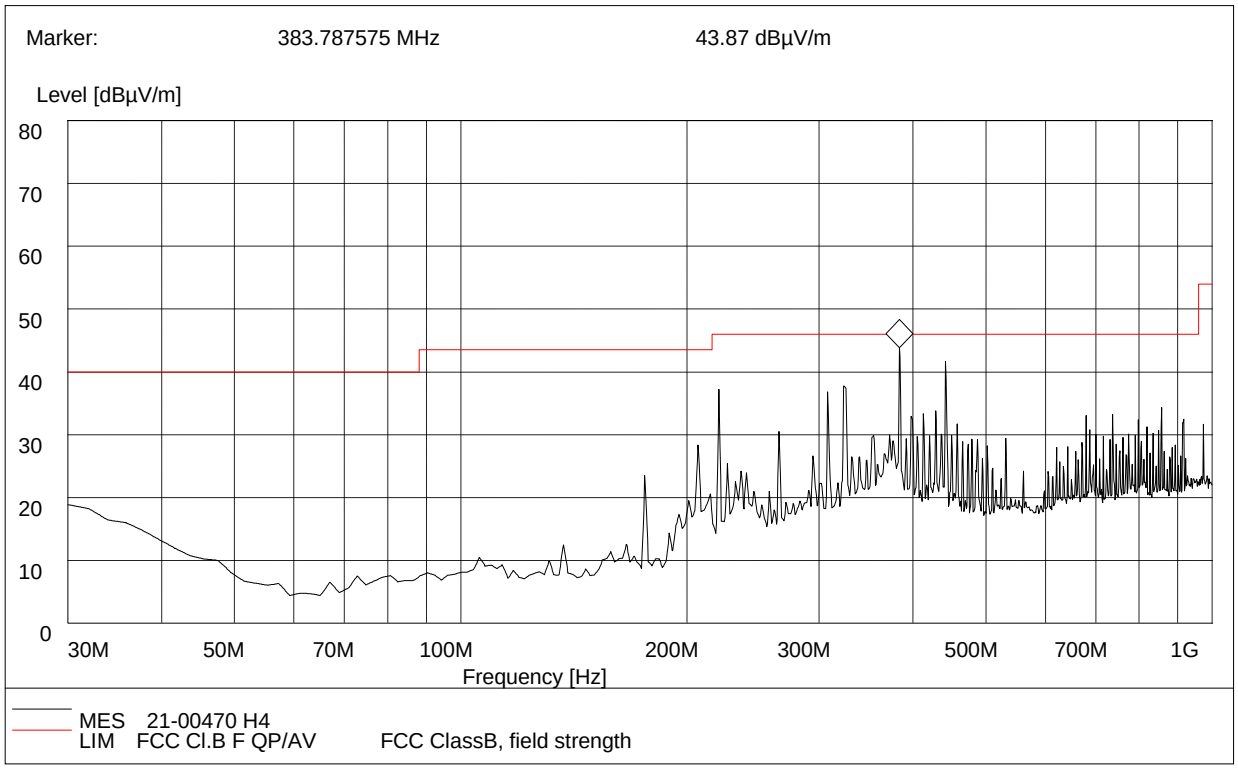
A.Radiation disturbances, antenna polarization:Vertical



(Plot A: 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
237.13	27.30	120.000	100	46.0	18.70	Vertical	0.4	26.0	Pass
332.41	28.50	120.000	100	46.0	17.50	Vertical	0.4	26.0	Pass
386.44	34.62	120.000	100	46.0	11.38	Vertical	0.4	26.1	Pass
441.21	33.51	120.000	100	46.0	12.49	Vertical	0.4	26.5	Pass
501.03	30.64	120.000	100	46.0	15.36	Vertical	0.5	26.8	Pass
607.68	27.68	120.000	100	46.0	18.32	Vertical	06	27.0	Pass

B.Radiation disturbances, antenna polarization: Horizontal

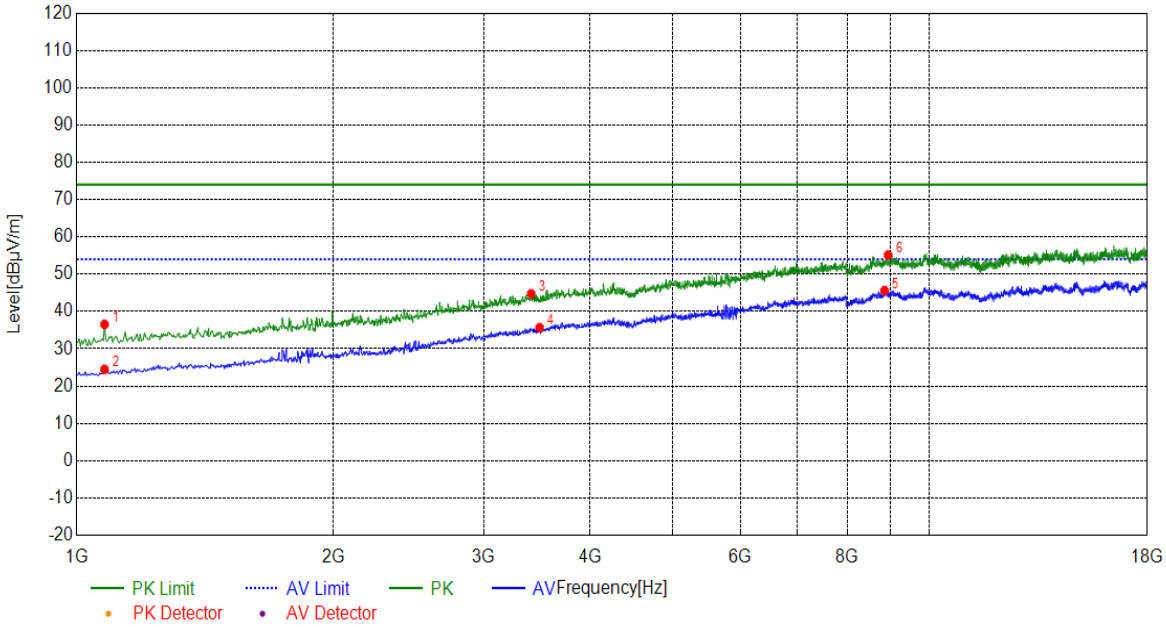


(Plot B: Test Antenna Horizontal 30M - 1G)

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dBµV/m)	Margin (dB)	Antenna	Cable Loss(dB)	ANT. Factor(dB)	Verdict
236.80	36.59	120.000	100	46.0	9.41	Horizontal	0.5	26.1	Pass
267.33	28.76	120.000	100	46.0	17.24	Horizontal	0.5	26.1	Pass
306.36	35.74	120.000	100	46.0	10.26	Horizontal	0.5	26.2	Pass
331.23	37.86	120.000	100	46.0	8.14	Horizontal	0.5	27.2	Pass
387.21	42.87	120.000	100	46.0	3.13	Horizontal	0.6	27.4	Pass
448.63	40.03	120.000	100	46.0	5.97	Horizontal	0.8	28.0	Pass

Test Result: PASS

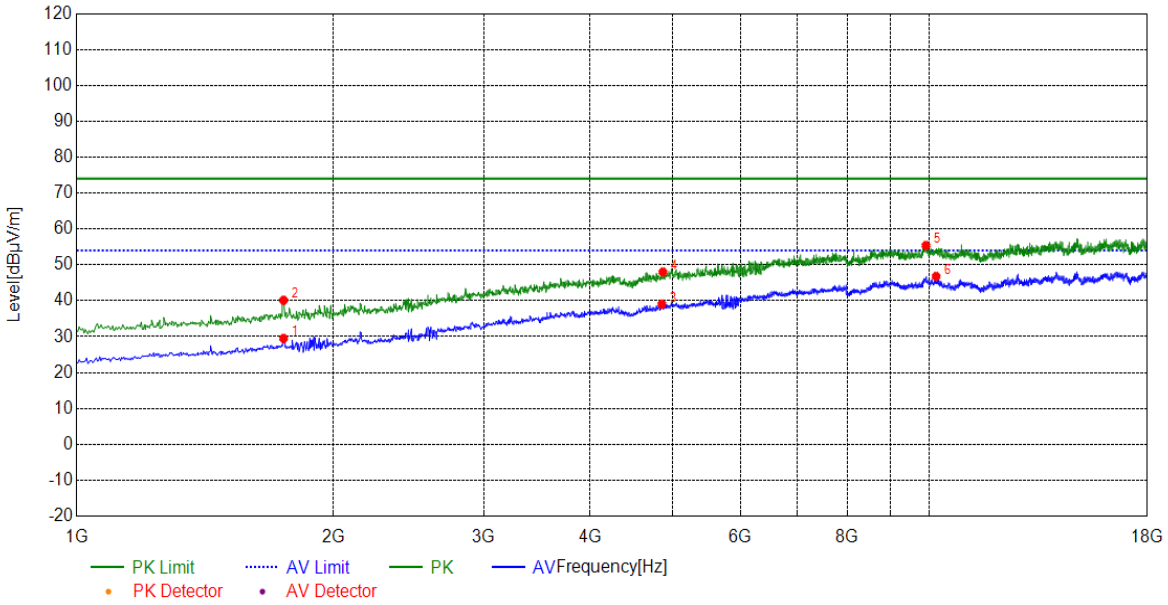
A.Radiation disturbances, antenna polarization: Horizontal



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

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1078.21	36.57	-14.47	74.00	37.43	PK	100	260	Horizont
2	1078.21	24.50	-14.47	54.00	29.50	AV	100	250	Horizont
3	3411.08	44.75	-2.60	74.00	29.25	PK	100	110	Horizont
4	3489.29	35.67	-2.85	54.00	18.33	AV	100	170	Horizont
5	8852.17	45.62	9.72	54.00	8.38	AV	100	50	Horizont
6	8937.18	55.14	9.91	74.00	18.86	PK	100	320	Horizont

B.Radiation disturbances, antenna polarization: Vertical



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

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Height [cm]	Angle [°]	Polarity
1	1748.14	29.52	-11.21	54.00	24.48	AV	100	40	Vertical
2	1748.14	40.15	-11.21	74.00	33.85	PK	100	50	Vertical
3	4852.97	39.06	1.30	54.00	14.94	AV	100	230	Vertical
4	4866.57	48.02	1.36	74.00	25.98	PK	100	190	Vertical
5	9899.57	55.40	11.88	74.00	18.60	PK	100	80	Vertical
6	10175.0	46.79	11.09	54.00	7.21	AV	100	80	Vertical

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