EMC TEST REPORT

Report No.:	20250117G01472X-W1
Product Name:	Pulse oximeter
FCC ID:	2ABOGCMS50D1A
Model No. :	CMS50D, CMS50D1, CMS50D1A, CMS50D1-Pro, CMS50D2, CMS50-Pro, CMS50D2-1, CMS50D2-2, CMS50D4, CMS50N, CMS50NA, CMS50DL2, CMS50L-Pro, CMS50M, CMS50L
Trade Name:	CONTEC
Applicant:	Contec Medical Systems Co., Ltd.
Address:	No.112 Qinhuang West Street, Economic &Technical Development Zone, Qinhuangdao, Hebei Province, PEOPLE`S REPUBLIC OF CHINA
Received Date:	2025.01.20
Dates of Testing:	2025.01.21~2025.01.23
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 **E-Mail:** manager@ccic-set.com

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Test Report

Product Name	Pulse oximeter
Model No.	CMS50D, CMS50D1, CMS50D1A, CMS50D1-Pro, CMS50D2, CMS50-Pro, CMS50D2-1, CMS50D2-2, CMS50D4, CMS50N, CMS50NA, CMS50DL2, CMS50L-Pro, CMS50M, CMS50L
Applicant	Contec Medical Systems Co., Ltd.
Applicant Address	No.112 Qinhuang West Street, Economic &Technical Development Zone, Qinhuangdao, Hebei Province, PEOPLE`S REPUBLIC OF CHINA
Manufacturer	Contec Medical Systems Co., Ltd.
Manufacturer Address	No.112 Qinhuang West Street, Economic &Technical Development Zone, Qinhuangdao, Hebei Province, PEOPLE`S REPUBLIC OF CHINA
Test Standards	47 CFR Part 15 Subpart B
Test Result	PASS

Tested by ..... Deng Shanfei

Deng Shanfei, Test Engineer 2025.01.24

Reviewed by ..... Sun Jiaohui

Sun Jiaohui, Senior Engineer 2025.01.24

Approved by ..... Chris You 2025.01.24

Chris You, Manager

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Change History		
Issue	Date	Reason for change
1.0	2025.01.24	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Name:	Pulse oximeter
Trade Name:	CONTEC
Power supply:	Battery (3V DC);

Note1: The EUT is a Pulse oximeter;

Note2: 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	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.

(2) AC conduction is not applicable because the product is 3V DC power supply.

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 Jun 30, 2025.

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 30, 2025.

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 (℃):	15 ℃ - 35 ℃
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 Conducted Emission:	Uc = 3.2 dB (k=2)
Uncertainty of Radiated Emission: (30MHz~1GHz)	Uc = 5.8 dB (k=2)
Uncertainty of Radiated Emission: (1~6GHz)	Uc = 5.1 dB (k=2)
Uncertainty of Radiated Emission: (6~18GHz)	Uc = 5.5 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 Equipment:

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

Support Cable：

Description	Shield Type	Ferrite Core	Length
/	/	/	/

2.2 Test Mode

Note 1: The EUT is a Pulse oximeter;
The EUT have the following typical setups during the test:
Setup1: EUT working (CMS50D1) + Battery;
Setup2: EUT working (CMS50L) + Battery;

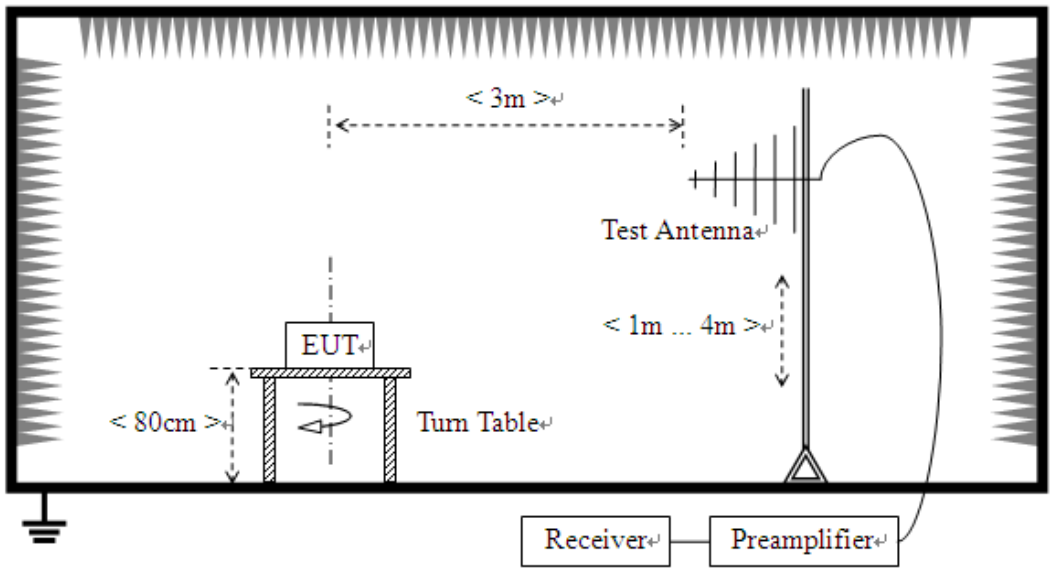
Note 2: The power supply mode, structural characteristics and circuit of all models are basically the same, the difference is: CMS50L has a buzzer, speaker and a TFT display and other model are LED displays we select CMS50D1, CMS50L to test and only worst-case data provide in the report.

2.3 Test Setup and Equipments List

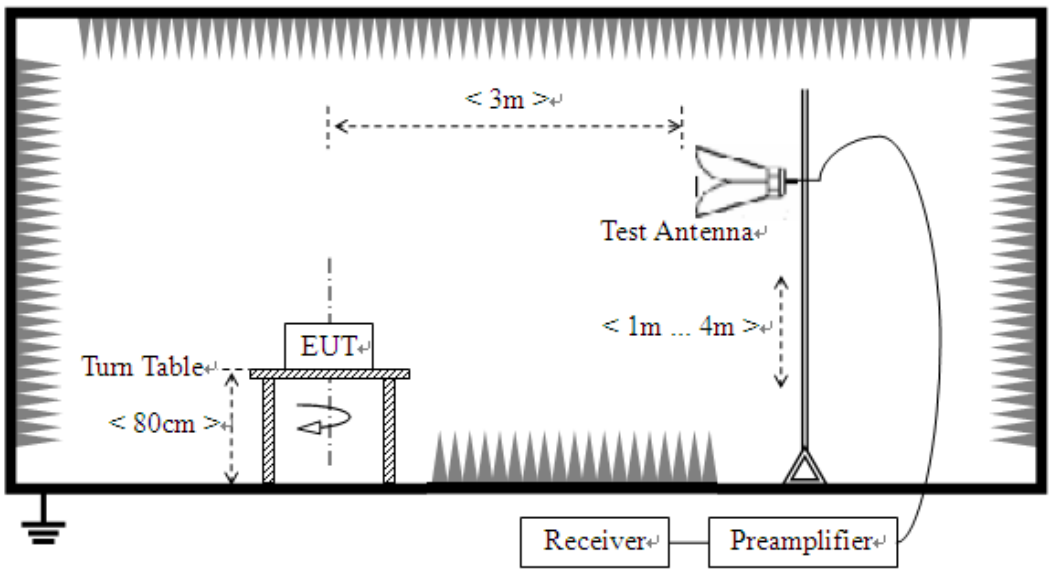
2.3.1 Radiated Emission

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	ESIB7	A0501375	2024.02.29	2025.02.28
Broadband Ant.	ETC	MCTD2786	A150402239	2024.06.01	2025.05.31
3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2024.02.28	2027.02.27
EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2024.05.24	2025.05.23
5M Anechoic Chamber	Albatross	SAC-5MAC 12.8x6.8x6.4m	A0304210	2023.08.02	2026.08.01
EMI Horn Ant.	ROHDE&SCHWARZ	HF906	A0304225	2022.04.12	2025.04.11

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

Frequency range (MHz)	Field Strength Limitation at 3m Measurement Dist	
	Class A(3m) QP (dBμV/m)	Class B(3m) QP (dBμV/m)
30 - 88	49.0	40.0
88 - 216	53.5	43.5
216 - 230	56.5	46.0
230 - 960	56.5	46.0
960-1000	59.5	54.0
Frequency range (MHz)	Field Strength Limitation at 3m Measurement Dist	
	Class A(3m) (dBμV/m)	Class B(3m) (dBμV/m)
Above 1G	59.5(AV) /79.5(PK)	54(AV) /74(PK)

a) 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 120 kHz, VBW 300 kHz.

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 ranges.
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

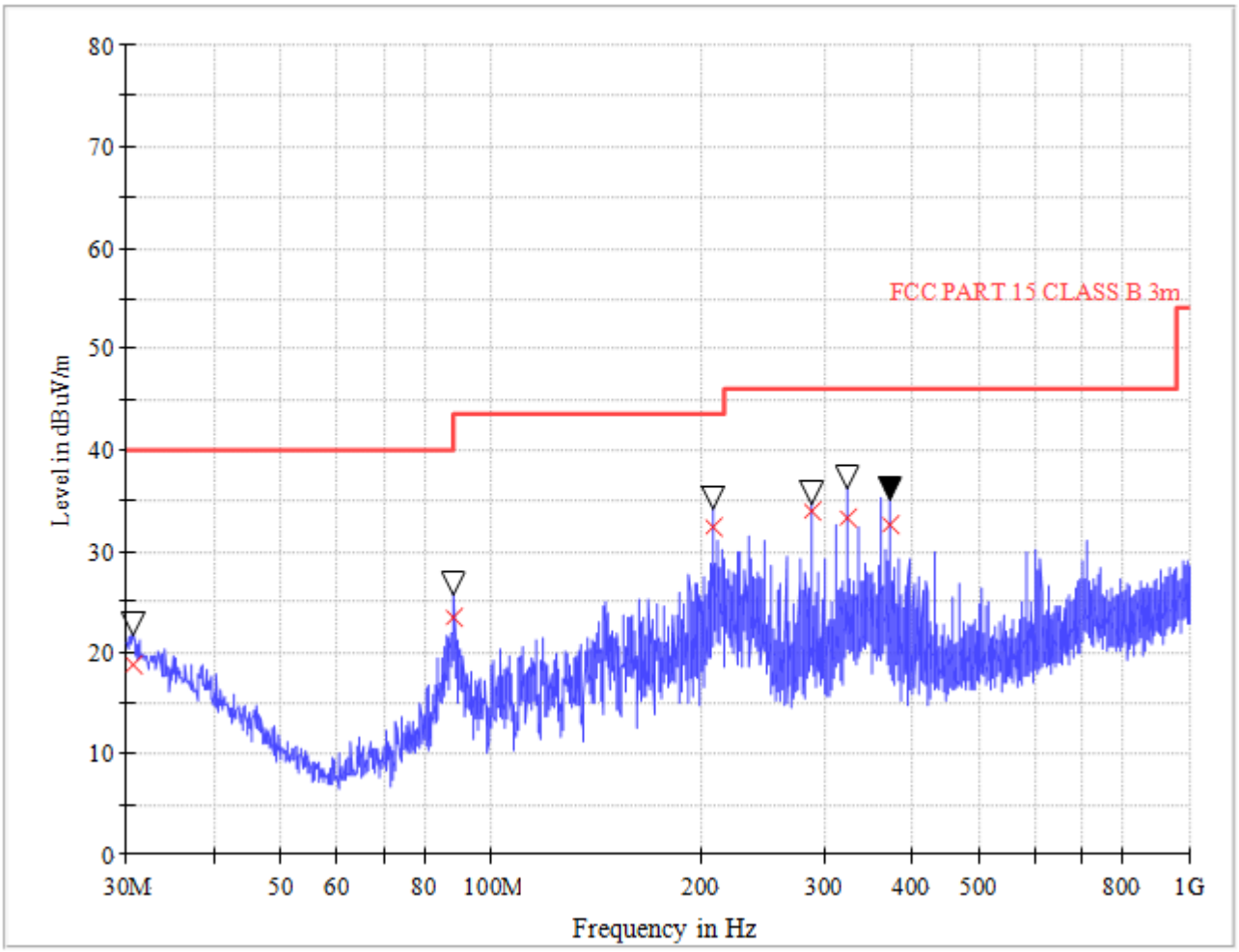
The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform 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:

1. 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.

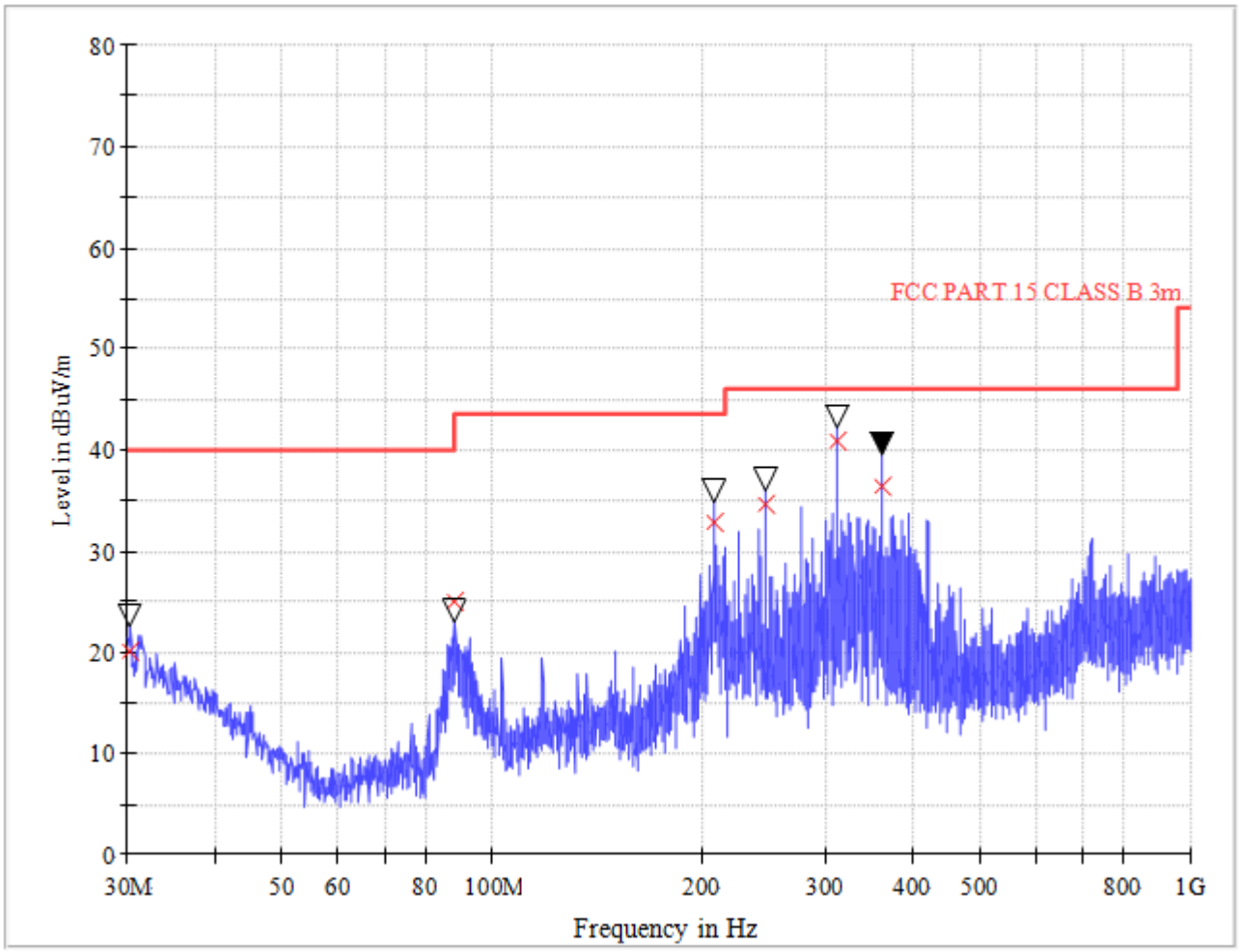
A. Radiation disturbances, antenna polarization: Vertical, Setup 2



(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
30.72	18.66	120.000	106	40.0	21.34	Vertical	0.5	18.5	Pass
88.44	23.40	120.000	103	43.5	20.10	Vertical	0.8	8.7	Pass
207.04	32.30	120.000	105	43.5	11.20	Vertical	1.2	10.6	Pass
288.00	33.96	120.000	101	46.0	12.04	Vertical	1.2	14.1	Pass
324.04	33.21	120.000	107	46.0	12.79	Vertical	1.4	14.8	Pass
372.04	32.57	120.000	105	46.0	13.43	Vertical	1.4	15.9	Pass

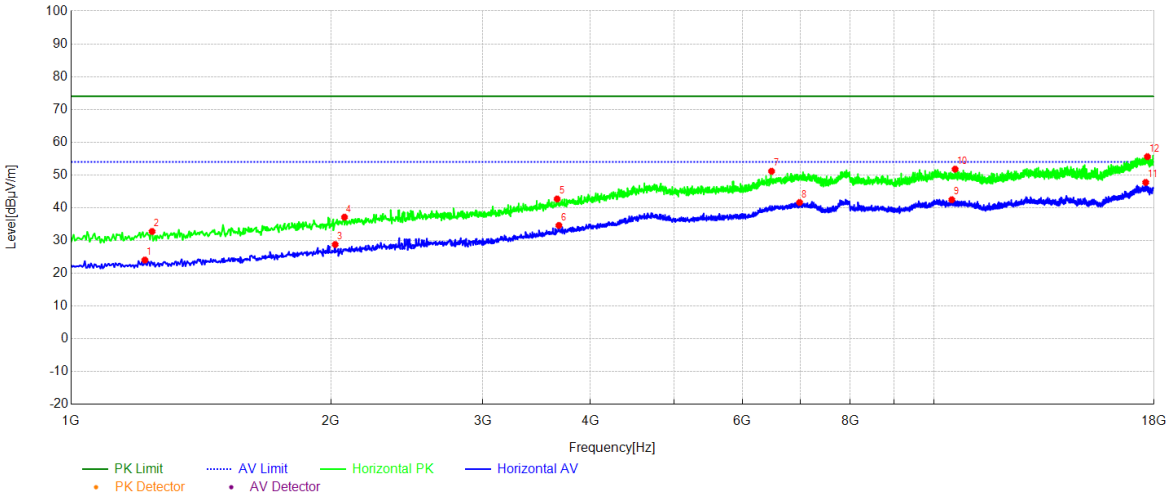
B. Radiation disturbances, antenna polarization: Horizontal, Setup 2



(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
30.24	20.19	120.000	102	40.0	19.81	Horizontal	0.5	18.6	Pass
88.44	25.04	120.000	106	43.5	18.46	Horizontal	0.8	8.7	Pass
207.04	32.90	120.000	105	43.5	10.60	Horizontal	1.2	10.6	Pass
245.84	34.55	120.000	107	46.0	11.45	Horizontal	1.2	11.3	Pass
312.04	40.90	120.000	103	46.0	5.10	Horizontal	1.4	14.5	Pass
360.04	36.39	120.000	106	46.0	9.61	Horizontal	1.4	15.7	Pass

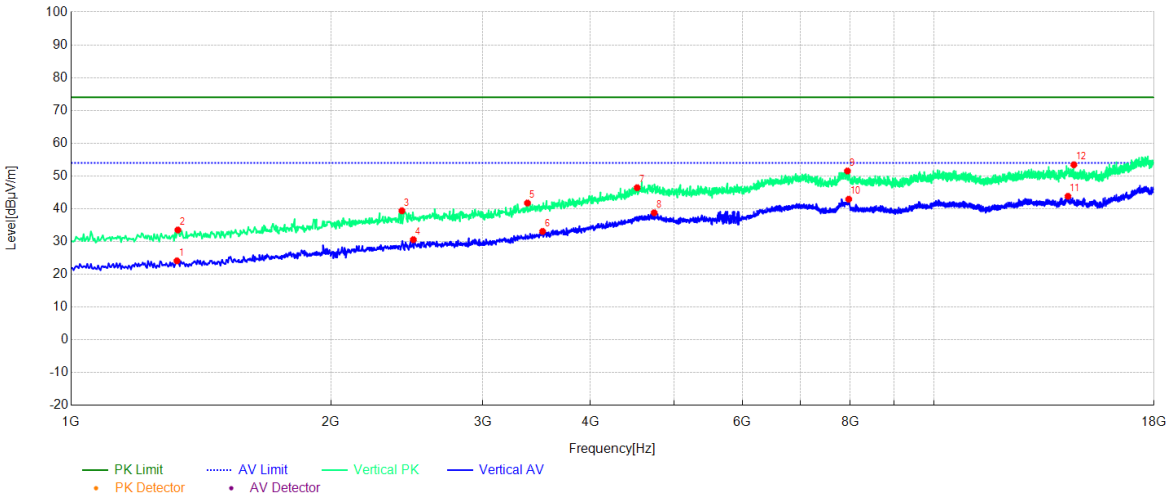
A. Radiation disturbances, antenna polarization: Horizontal, Setup 2



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

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin[dB µV/m]	Trace	Height [cm]	Angle [°]	Polarity
1	1217.64	24.06	-14.82	54.00	29.94	AV	106	173	Horizont
2	1241.45	32.77	-14.75	74.00	41.23	PK	103	98	Horizont
3	2023.60	28.79	-11.02	54.00	25.21	AV	105	182	Horizont
4	2074.61	37.13	-10.89	74.00	36.87	PK	102	33	Horizont
5	3659.33	42.68	-5.02	74.00	31.32	PK	107	215	Horizont
6	3676.34	34.61	-4.95	54.00	19.39	AV	106	141	Horizont
7	6485.30	51.14	3.33	74.00	22.86	PK	103	87	Horizont
8	6988.60	41.61	4.23	54.00	12.39	AV	101	216	Horizont
9	10491.30	42.45	7.03	54.00	11.55	AV	109	25	Horizont
10	10583.12	51.78	7.23	74.00	22.22	PK	105	143	Horizont
11	17602.12	47.73	14.47	54.00	6.27	AV	106	95	Horizont
12	17680.34	55.58	14.79	74.00	18.42	PK	104	181	Horizont

B. Radiation disturbances, antenna polarization: Vertical, Setup 2



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

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin[dBµV/m]	Trace	Height [cm]	Angle [°]	Polarity
1	1326.47	24.11	-14.47	54.00	29.89	AV	103	207	Vertical
2	1329.87	33.52	-14.46	74.00	40.48	PK	108	133	Vertical
3	2418.08	39.39	-9.70	74.00	34.61	PK	104	256	Vertical
4	2492.90	30.57	-9.38	54.00	23.43	AV	101	352	Vertical
5	3380.48	41.75	-6.32	74.00	32.25	PK	106	207	Vertical
6	3519.90	33.08	-5.70	54.00	20.92	AV	102	95	Vertical
7	4529.91	46.42	-0.31	74.00	27.58	PK	109	202	Vertical
8	4740.75	38.76	0.38	54.00	15.24	AV	103	316	Vertical
9	7940.79	51.51	5.34	74.00	22.49	PK	105	343	Vertical
10	7967.99	42.91	5.40	54.00	11.09	AV	107	318	Vertical
11	14303.46	43.81	10.20	54.00	10.19	AV	106	82	Vertical
12	14531.31	53.42	9.86	74.00	20.58	PK	101	151	Vertical

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