

FCC Test Report

Product Name	Video Intercom Reader Pro
Model No.	OP-VID-PRO-INT
FCC ID.	2APJVOPVNRC

Applicant	Openpath Security Inc.
Address	13428 Maxella Ave, #866 Marina Del Rey, CA 90292

Date of Receipt	Jul. 01, 2021
Issued Date	Oct. 27, 2021
Report No.	2170047R-RFUSOTHV02-A
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

Issued Date: Oct. 27, 2021

Report No.: 2170047R-RFUSOTHV02-A



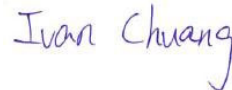
Product Name	Video Intercom Reader Pro
Applicant	Openpath Security Inc.
Address	13428 Maxella Ave, #866 Marina Del Rey, CA 90292
Manufacturer	VIVOTEK INC.
Model No.	OP-VID-PRO-INT
FCC ID.	2APJVOPVNRC
EUT Rated Voltage	DC 48V (Power by PoE)
EUT Test Voltage	DC 48V (Power by PoE)
Trade Name	Openpath Security Inc.
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



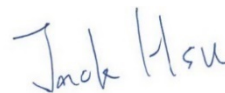
(Senior Project Specialist / Genie Chang)

Tested By :



(Senior Engineer / Ivan Chuang)

Approved By :



(Senior Engineer / Jack Hsu)

TABLE OF CONTENTS

Description	Page
1. GENERAL INFORMATION.....	5
1.1. EUT Description	5
1.2. Test System Details.....	6
1.3. Configuration of Test System	6
1.4. EUT Exercise Software.....	6
1.5. Test Facility.....	7
1.6. Uncertainty.....	9
2. Conducted Emission	10
2.1. Test Setup.....	10
2.2. Limits	10
2.3. Test Procedure.....	10
2.4. Test Result of Conducted Emission	11
3. Radiated Emission.....	13
3.1. Test Setup.....	13
3.2. Limits	14
3.3. Test Procedure.....	14
3.4. Test Result of Radiated Emission	15
4. EMI Reduction Method During Compliance Testing	17
Attachment 1: EUT Test Photographs	
Attachment 2: Product Photos-Please refer to the file: 2170047R-Product Photos	

Revision History

Report No.	Version	Description	Issued Date
2170047R-RFUSOTHV02-A	V1.0	Initial issue of report.	2021-10-27

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Video Intercom Reader Pro
Trade Name	Openpath Security Inc.
Model No.	OP-VID-PRO-INT
FCC ID.	2APJVOPVNRC
Frequency Range	125 kHz
Type of Modulation	ASK
Type of antenna	Loop coil Antenna
Number of Channel	1

Frequency of Each Channel:

Channel	Frequency
1	125 kHz

Note:

1. The EUT is a Video Intercom Reader Pro with a built-in 125 kHz transceiver.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.209.
3. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit
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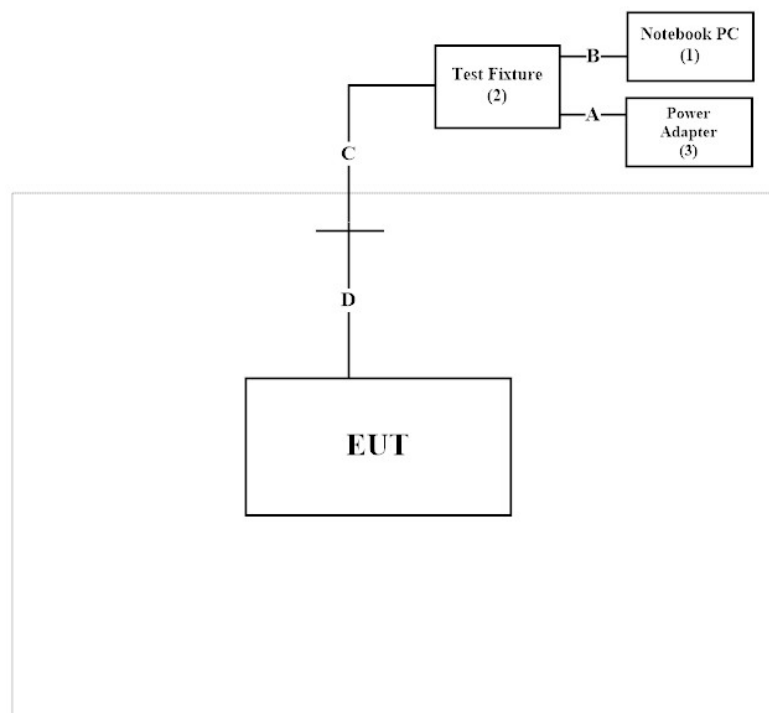
1.2. Test System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
(1)	Notebook PC	DELL	P62G	229FJC2	N/A
(2)	Test Fixture	Openpath Security Inc	RJ-45-END-SPAN VER 0.1	N/A	N/A
(3)	Power Adapter	Deevan	DSA-96PFB-48 1	N/A	Non-shielded, 1.8m

Signal Cable Type	Signal cable Description
A Power Cable	Non-shielded, 1.5m, with one ferrite core bonded.
B LAN Cable	Non-shielded, 1.8m
C LAN Cable	Non-shielded, 3m
D PoE Cable	Non-shielded, 0.36m

1.3. Configuration of Test System



1.4. EUT Exercise Software

1. Setup the EUT as shown in Section 1.3.
2. Execute software "CMD 10.0.19043.1110" on the Notebook PC.
3. Configure the test mode, the test channel.
4. Press "OK" to start the continuous transmit.
5. Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	24.7 °C
	Humidity (%RH)	10~90 %	61.5 %
Radiated Emission	Temperature (°C)	10~40 °C	26.3 °C
	Humidity (%RH)	10~90 %	59.2 %
Conductive	Temperature (°C)	10~40 °C	28 °C
	Humidity (%RH)	10~90 %	53 %

USA : FCC Registration Number: TW0033

Canada : IC Registration Number: 26930

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No. 5-22, Ruishukeng Linkou District, New Taipei City,
24451, Taiwan

Performed Location : No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City
333411, Taiwan, R.O.C.

Phone number : +886-3-275-7255
Fax number : +866-3-327-8031
Email address : info.tw@dekra.com
Website : <http://www.dekra.com.tw>

For Conduction measurements /SH1

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	EMI Test Receiver	R&S	ESR7	101601	2021.06.19	2022.06.18
X	Two-Line V-Network	R&S	ENV216	101306	2021.04.08	2022.04.07
X	Two-Line V-Network	R&S	ENV216	101307	2021.05.04	2022.05.03
X	Coaxial Cable	DEKRA	RG400_BNC	RF001	2021.05.24	2022.05.23

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : AUDIX e3 V9

For Conducted measurements /SH3

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Temperature Chamber	KSON	THS-D4T-100	A0606	2021.08.24	2022.08.23
X	Spectrum Analyzer	R&S	FSV40	101149	2021.02.04	2022.02.03
X	AC Power Source	eec	6605	1570547	2020.12.23	2021.12.22

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.

For Radiated measurements /966-3

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Loop Antenna	AMETEK	HLA6121	56736	2021.04.14	2022.04.13
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-678	2021.09.23	2022.09.22
	Horn Antenna	ETS-Lindgren	3117	00201259	2020.10.23	2021.10.22
	Horn Antenna	Com-Power	AH-840	101087	2021.06.16	2022.06.15
X	Pre-Amplifier	EMCI	EMC001330	980302	2021.07.26	2022.07.25
	Pre-Amplifier	EMCI	EMC051835SE	980312	2021.02.24	2022.02.23
	Pre-Amplifier	EMCI	EMC05820SE	980310	2021.07.07	2022.07.06
	Pre-Amplifier	EMCI	EMC184045SE	980314	2021.06.24	2022.06.23
	Filter	MICRO TRONICS	BRM50702	G251	2021.09.16	2022.09.15
	Filter	MICRO TRONICS	BRM50716	G188	2021.09.16	2022.09.15
X	EMI Test Receiver	R&S	ESR	102793	2020.12.17	2021.12.16
X	Spectrum Analyzer	R&S	FSV3044	101113	2021.02.03	2022.02.02
X	Coaxial Cable	SGH, EMCI	HA800 , SGH18	HY2103-001C	2021.03.03	2022.03.02
	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2021.06.25	2022.06.24

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : AUDIX e3 V9

1.6. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

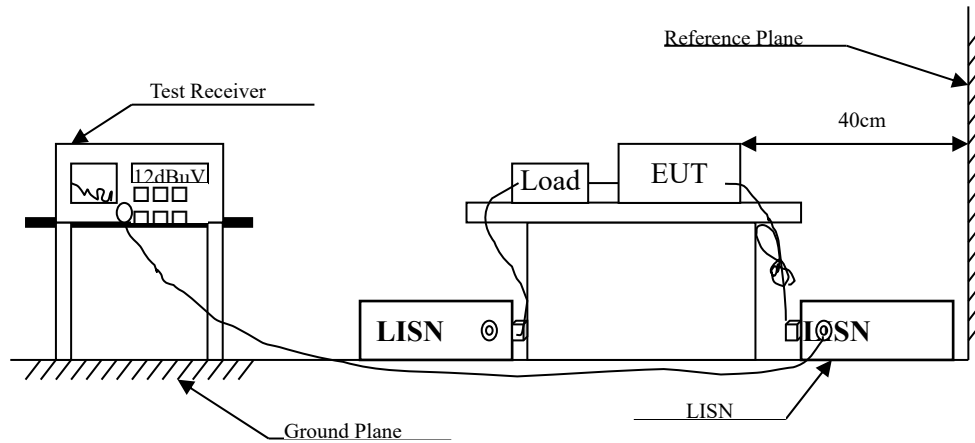
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	± 3.42 dB	
Radiated Emission	Under 1GHz ± 4.06 dB	Above 1GHz ± 3.73 dB

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBμV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56 _(註)	56-46 _(註)
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

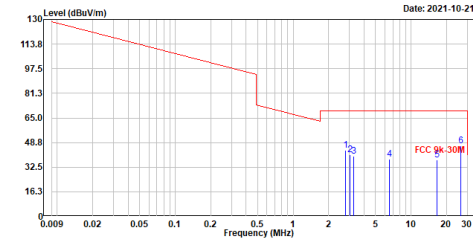
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.4. Test Result of Conducted Emission

Site :966-3
Condition :3m ,Horizontal
Mode :TX 9K-30M
TEST BY :Jing Chang

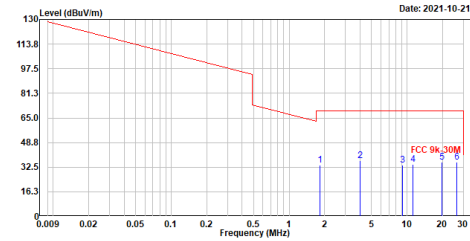


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level	dB	
1	2.786	43.55	69.50	-25.95	23.44	20.11	QP
2	3.046	40.49	69.50	-29.01	20.38	20.11	QP
3	3.250	39.51	69.50	-29.99	19.39	20.12	QP
4	6.582	37.60	69.50	-31.90	17.49	20.11	QP
5	16.594	37.12	69.50	-32.38	17.21	19.91	QP
6	26.563	46.46	69.50	-23.04	26.55	19.91	QP

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :966-3
Condition :3m ,Vertical
Mode :TX 9K-30M
TEST BY :Jing Chang

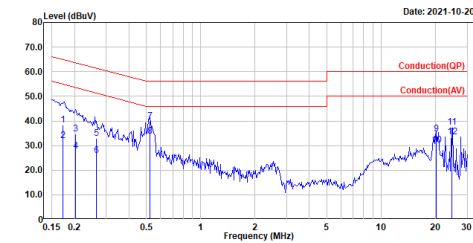


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level	dB	
1	1.827	33.80	69.50	-35.70	13.71	20.09	QP
2	4.013	36.62	69.50	-32.88	16.47	20.15	QP
3	9.105	34.09	69.50	-35.41	14.01	20.08	QP
4	11.242	34.26	69.50	-35.24	14.19	20.07	QP
5	19.836	35.63	69.50	-33.87	15.87	19.76	QP
6	26.563	35.73	69.50	-33.77	15.82	19.91	QP

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :ASR1
Condition :Line
Mode :125KHz_RX
test by :Michael

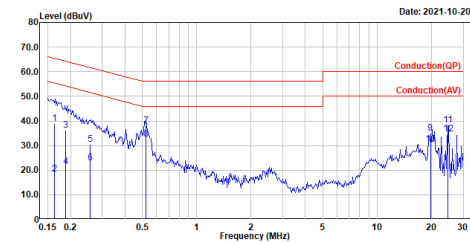


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level	dB	
1	0.173	38.26	64.82	-26.56	28.60	9.66	QP
2	0.173	32.01	54.82	-22.81	22.35	9.66	Average
3	0.202	34.74	63.52	-28.78	25.09	9.65	QP
4	0.202	27.86	53.52	-25.66	18.21	9.65	Average
5	0.263	32.66	61.32	-28.66	23.21	9.65	QP
6	0.263	25.96	51.32	-25.36	16.31	9.65	Average
7	0.524	39.90	56.00	-16.10	30.24	9.66	QP
8	0.524	33.96	46.00	-12.04	24.30	9.66	Average
9	20.258	34.79	60.00	-25.21	24.82	9.97	QP
10	20.258	30.26	50.00	-19.74	20.29	9.97	Average
11	24.533	37.38	60.00	-22.62	27.42	9.96	QP
12	24.533	33.51	50.00	-16.49	23.55	9.96	Average

Note:

1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

Site :ASR1
Condition :Neutral
Mode :125KHz_RX
test by :Michael

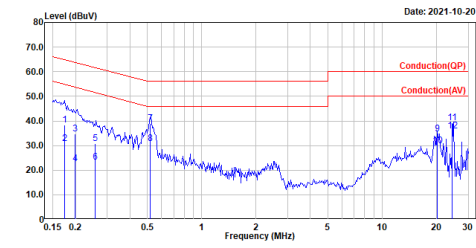


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level	dB	
1	0.163	39.03	65.29	-26.26	29.36	9.67	QP
2	0.163	18.55	55.29	-36.74	8.88	9.67	Average
3	0.188	36.14	64.12	-27.98	26.47	9.67	QP
4	0.188	21.42	54.12	-32.70	11.75	9.67	Average
5	0.257	30.58	61.54	-30.96	20.91	9.67	QP
6	0.257	22.91	51.54	-28.63	13.24	9.67	Average
7	0.523	38.00	56.00	-18.00	28.33	9.67	QP
8	0.523	32.65	46.00	-13.35	22.98	9.67	Average
9	19.709	35.00	60.00	-25.00	24.95	10.05	QP
10	19.709	30.43	50.00	-19.57	20.38	10.05	Average
11	24.533	38.48	60.00	-21.52	28.41	10.07	QP
12	24.533	34.63	50.00	-15.37	24.56	10.07	Average

Note:

1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

Site :ASR1
Condition :line
Node :125KHz_TX
test by :Michael

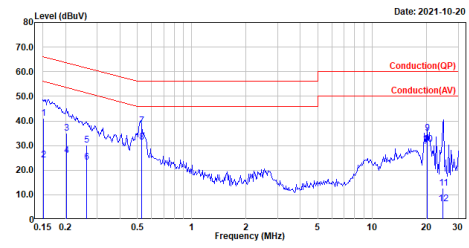


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.175	38.38	64.72	-26.34	28.73	9.65	QP
2	0.175	30.76	54.72	-23.96	21.11	9.65	Average
3	0.198	34.81	63.69	-28.88	25.16	9.65	QP
4	0.198	22.75	53.69	-30.94	13.10	9.65	Average
5	0.258	30.87	61.50	-30.63	21.22	9.65	QP
6	0.258	23.39	51.50	-28.11	13.74	9.65	Average
7	0.517	39.08	56.00	-16.92	29.42	9.66	QP
8	0.517	30.68	46.00	-15.32	21.02	9.66	Average
9	20.256	34.60	60.00	-25.40	24.63	9.97	QP
10	20.256	29.94	50.00	-20.06	19.97	9.97	Average
11	24.349	39.34	60.00	-20.66	29.38	9.96	QP
12	24.349	36.05	50.00	-13.95	26.09	9.96	Average

Note:

1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

Site :ASR1
Condition :Neutral
Node :125KHz_TX
test by :Michael



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.151	40.95	65.96	-25.01	31.28	9.67	QP
2	0.151	24.04	55.96	-31.92	14.37	9.67	Average
3	0.202	35.01	63.51	-28.50	25.34	9.67	QP
4	0.202	26.08	53.51	-27.43	16.41	9.67	Average
5	0.262	30.26	61.38	-31.12	20.59	9.67	QP
6	0.262	23.26	51.38	-28.12	13.59	9.67	Average
7	0.527	38.07	56.00	-17.93	28.40	9.67	QP
8	0.527	31.42	46.00	-14.58	21.75	9.67	Average
9	20.258	35.16	60.00	-24.84	25.11	10.05	QP
10	20.258	30.60	50.00	-19.40	20.55	10.05	Average
11	24.731	12.79	60.00	-47.21	2.72	10.07	QP
12	24.731	6.48	50.00	-43.52	-3.59	10.07	Average

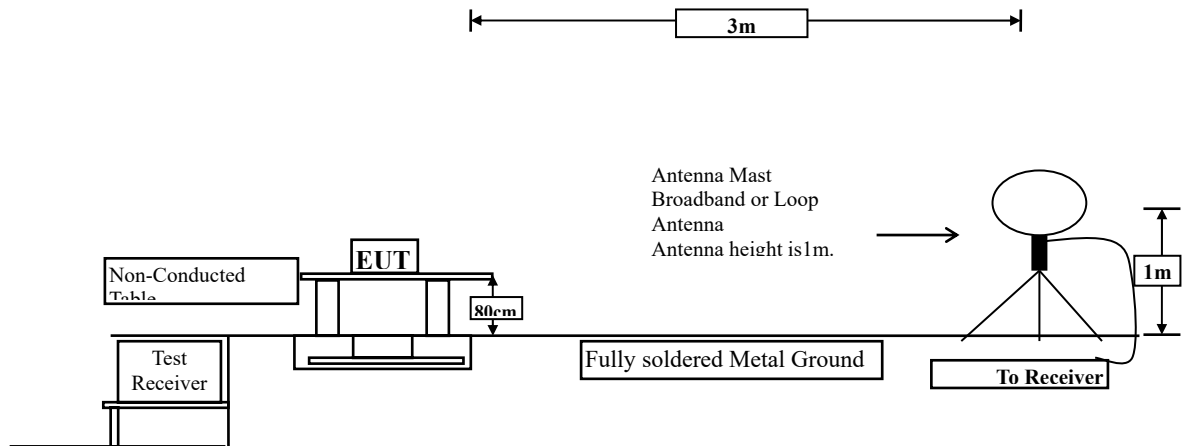
Note:

1. Level = Read Level + Factor
2. Factor = LISN insertion loss + Cable loss
3. Over Limit = Level - Limit Line

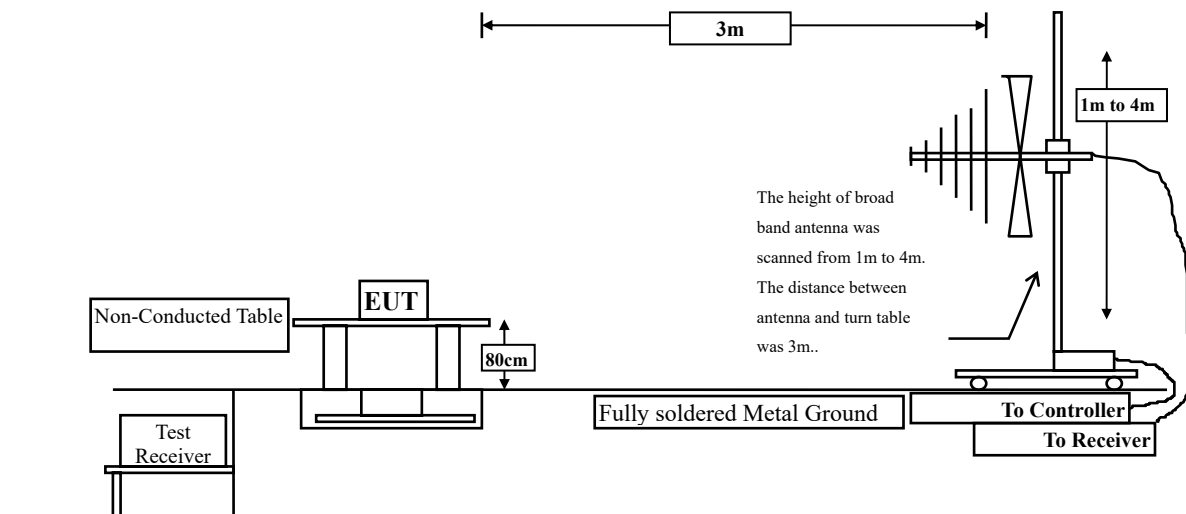
3. Radiated Emission

3.1. Test Setup

Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



3.2. Limits

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks :

1. RF Voltage (dB μ V) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.209 requirements.

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz. Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

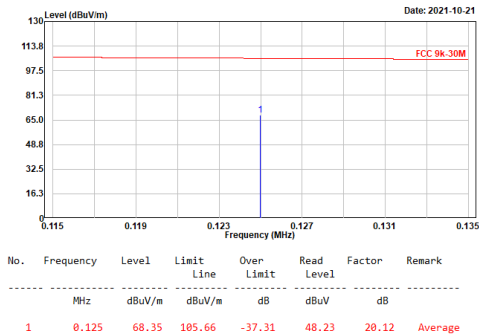
The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

3.4. Test Result of Radiated Emission

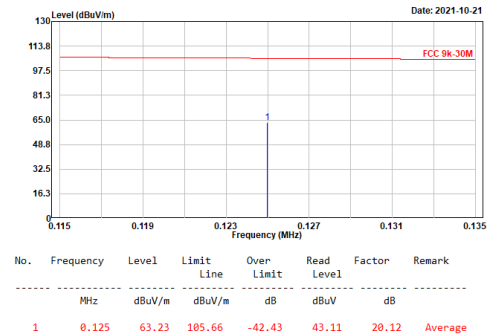
Site :966-3
Condition :3m ,Horizontal
Mode :TX_Fundamental_9k-30M_X
TEST BY :Jing Chang



Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

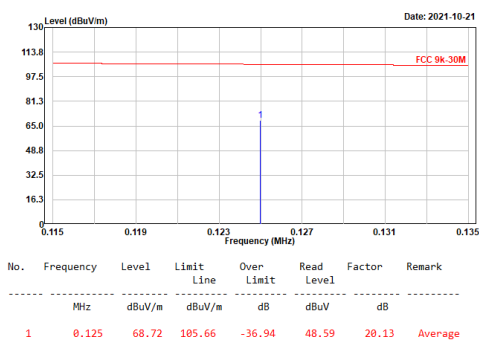
Site :966-3
Condition :3m ,Vertical
Mode :TX_Fundamental_9k-30M_X
TEST BY :Jing Chang



Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

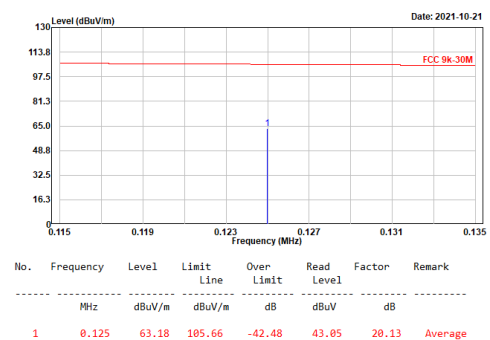
Site :966-3
Condition :3m ,Horizontal
Mode :TX_Fundamental_9k-30M_Y
TEST BY :Jing Chang



Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

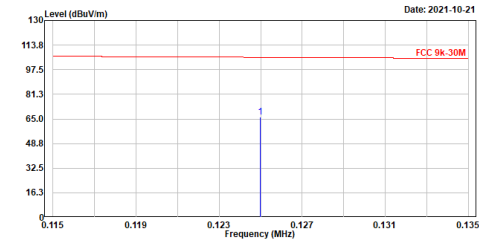
Site :966-3
Condition :3m ,Vertical
Mode :TX_Fundamental_9k-30M_Y
TEST BY :Jing Chang



Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :966-3
Condition :3m ,Horizontal
Mode :TX_Fundamental_9k-30M_Z
TEST BY :Jing Chang

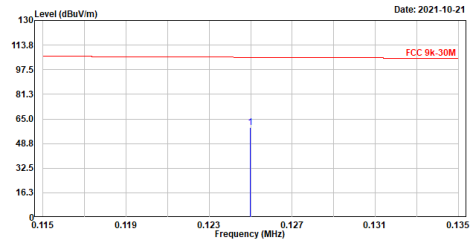


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.125	66.15	105.66	-39.51	46.02	20.13	Average

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :966-3
Condition :3m ,Vertical
Mode :TX_Fundamental_9k-30M_Z
TEST BY :Jing Chang

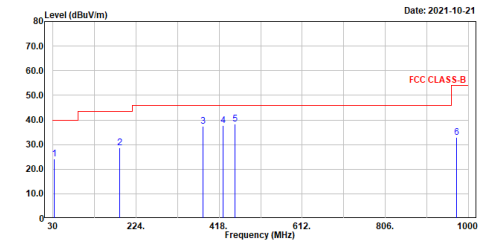


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	0.125	59.12	105.66	-46.54	39.00	20.12	Average

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :966-3
Condition :3m ,Horizontal
Mode :TX_30M-1G
TEST BY :Ashton Chiu

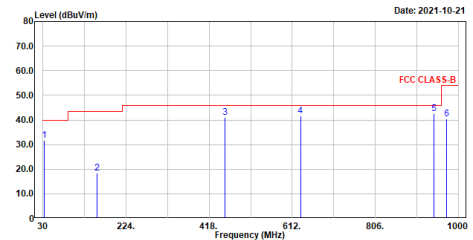


No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	33.880	24.21	40.00	-15.79	36.97	-12.76	QP
2	185.200	28.53	43.50	-14.97	41.68	-13.15	QP
3	381.140	37.50	46.00	-8.50	46.18	-8.68	QP
4	426.730	37.75	46.00	-8.25	45.33	-7.58	QP
5	454.860	38.39	46.00	-7.61	44.99	-6.60	QP
6	971.870	32.88	54.00	-21.12	31.75	1.13	QP

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :966-3
Condition :3m ,Vertical
Mode :TX_30M-1G
TEST BY :Ashton Chiu



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	32.910	31.73	40.00	-8.27	44.74	-13.01	QP
2	157.070	18.49	43.50	-25.01	29.63	-11.14	QP
3	454.860	40.95	46.00	-5.05	47.55	-6.60	QP
4	631.400	41.57	46.00	-4.43	44.80	-3.23	QP
5	943.740	42.70	46.00	-3.30	41.99	0.71	QP
6	971.870	40.47	54.00	-13.53	39.34	1.13	QP

Note:

1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

4. EMI Reduction Method During Compliance Testing

No modification was made during testing.