

FCC Part 15C Measurement and Test Report

For

LYRobotix Co., Ltd.

15B,12F,Building 3,No.48,North Third Ring West Road,Haidian Area,

Beijing City

FCC ID: 2ALY6NOLOMTSH-1705

FCC Rule(s):	<u>FCC Part 15.249</u>
Product Description:	<u>NOLO CV1 Headset Marker</u>
Tested Model:	<u>CV1</u>
Report No.:	<u>STR17048254I-1</u>
Tested Date:	<u>2017-04-27 to 2017-06-03</u>
Issued Date:	<u>2017-06-03</u>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: LYRobotix Co., Ltd.
Address of applicant: 15B,12F,Building 3,No.48,North Third Ring West Road,Haidian Area,Beijing City

Manufacturer: LYRobotix Co., Ltd.
Address of manufacturer: 15B,12F,Building 3,No.48,North Third Ring West Road,Haidian Area,Beijing City

General Description of EUT	
Product Name:	NOLO CV1 Headset Marker
Trade Name:	NOLO
Model No.:	CV1
Adding Model(s):	/
Rated Voltage:	DC 3.7V by Li-ion Battery; USB 5 charging purpose only
Power Adapter Model:	/
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Frequency Range:	2402-2475MHz
Max. Field Strength:	97.44dBuV/m (3m)
Data Rate:	/
Modulation:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi
Lowest Internal Frequency of EUT:	/

1.2 Test Standards

The following report is prepared on behalf of the LYRobotix Co., Ltd. in accordance with FCC Part 15, Subpart B, Subpart C, and section 15.107, 15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.107, 15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology 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 and the Registration is 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	Low Channel	2402MHz
TM2	Middle Channel	2441MHz
TM3	High Channel	2475MHz
TM4	Operation	Ant.1 TX + Ant.2 TX + Ant.3 RX

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB cable 1	0.2	Shielded	Without Core
USB cable 2	1.0	Shielded	Without Core
USB cable 3	2.5	Shielded	Without Core

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E10	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Conducted Emissions	Conducted	$\pm 2.88\text{dB}$
Transmitter Spurious Emissions	Radiated	$\pm 5.1\text{dB}$

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2016-06-04	2017-06-03
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2016-06-04	2017-06-03
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2016-06-04	2017-06-03
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2016-06-04	2017-06-03
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2016-06-04	2017-06-03
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2016-06-04	2017-06-03
SEMT-1042	Horn Antenna	ETS	3117	00086197	2016-06-04	2017-06-03
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2016-06-04	2017-06-03
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2016-06-04	2017-06-03
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2016-06-04	2017-06-03
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2016-06-04	2017-06-03
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2016-06-04	2017-06-03

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 15.203	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.209(a)(f)	Radiated Spurious Emissions	Compliant
§15.249(a)	Field Strength of Emissions	Compliant
§15.249(d)	Out of Band Emission	Compliant
§15.215 (c)	Emission Bandwidth	Compliant

3. Antenna Requirements

3.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Test Result

This product has an integral antenna, fulfill the requirement of this section.

4. Radiated Emissions

4.1 Standard Applicable

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of Harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

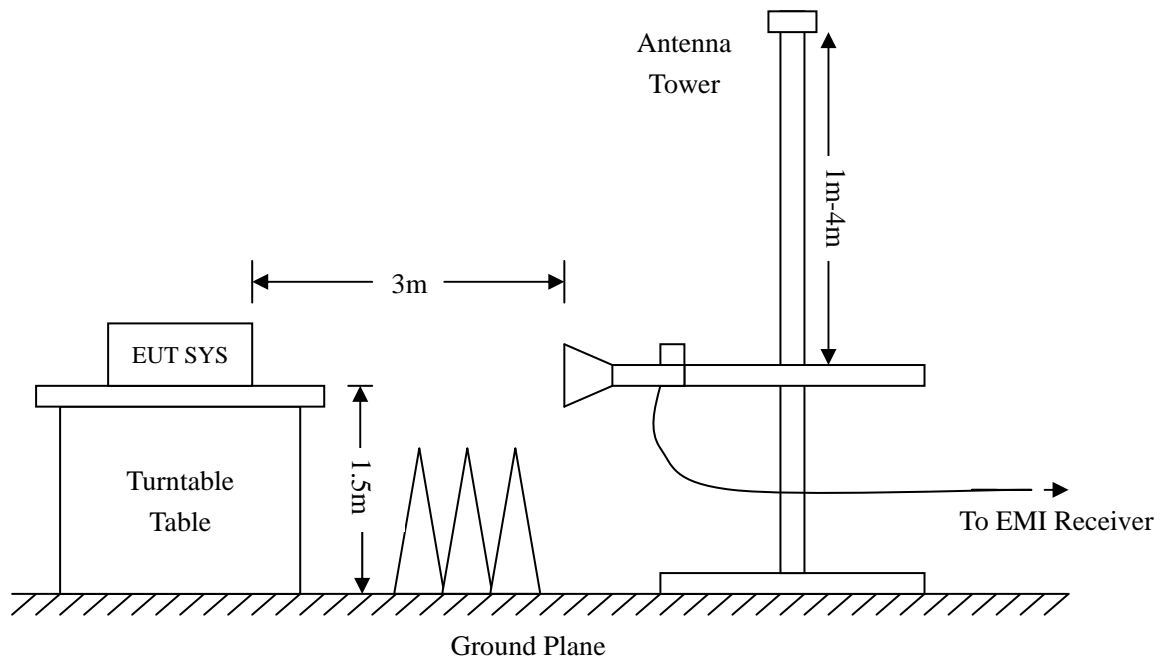
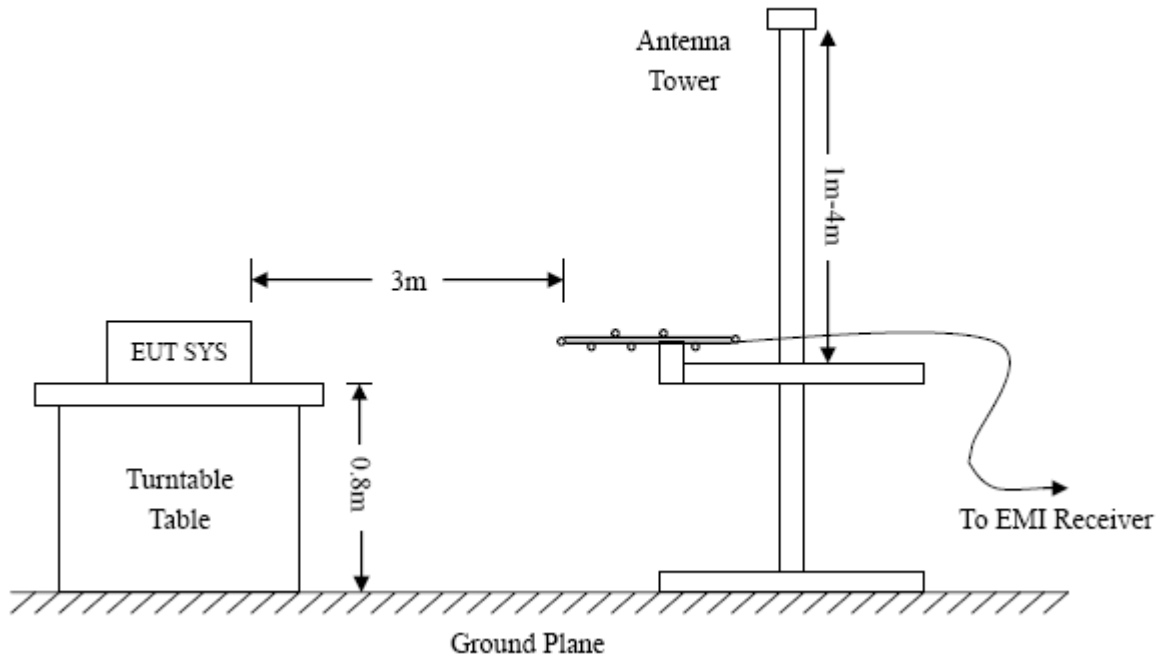
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

4.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.249(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



Frequency :9kHz-30MHz
 RBW=10KHz,
 VBW =30KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak

Frequency :30MHz-1GHz
 RBW=120KHz,
 VBW=300KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak, QP

Frequency :Above 1GHz
 RBW=1MHz,
 VBW=3MHz(Peak), 10Hz(AV)
 Sweep time= Auto
 Trace = max hold
 Detector function = peak, AV

4.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15C Limit}$$

4.4 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

4.5 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.249 standards, and had the worst margin of:

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

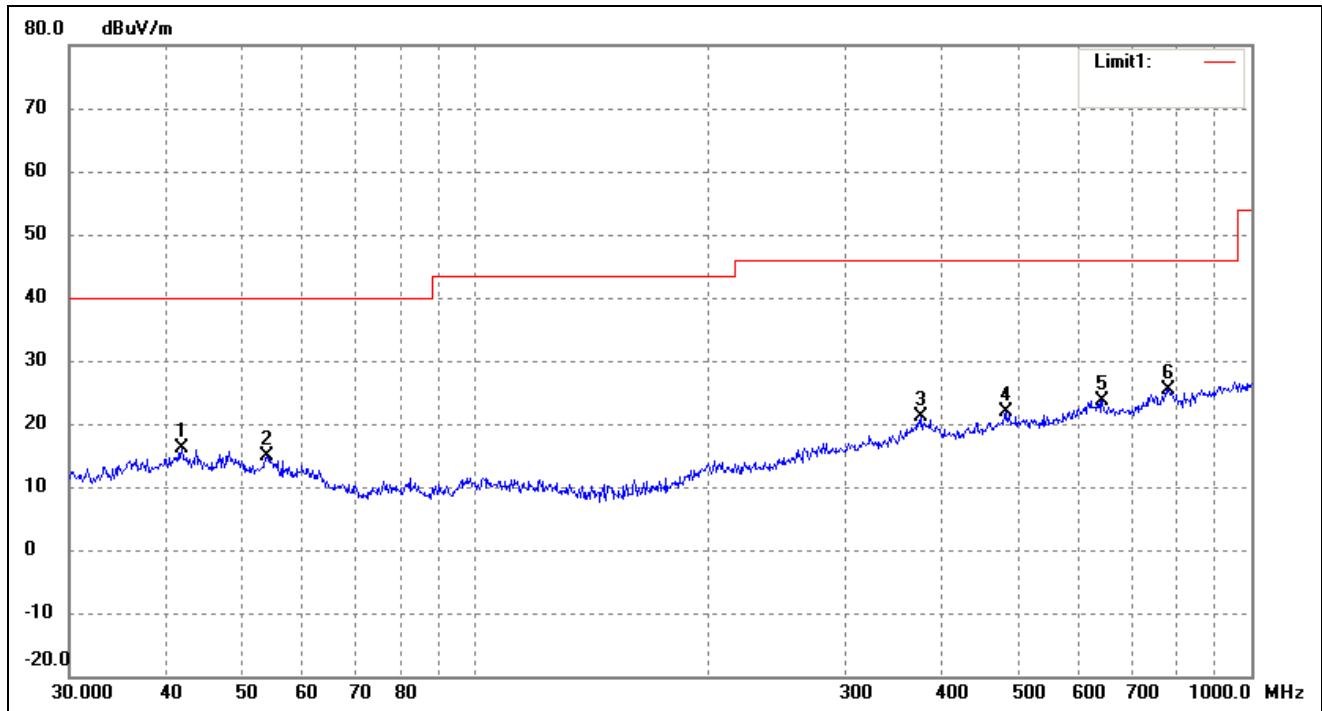
EUT: NOLO CV1 Headset Marker

Tested Model: CV1

Operating Condition: TM1

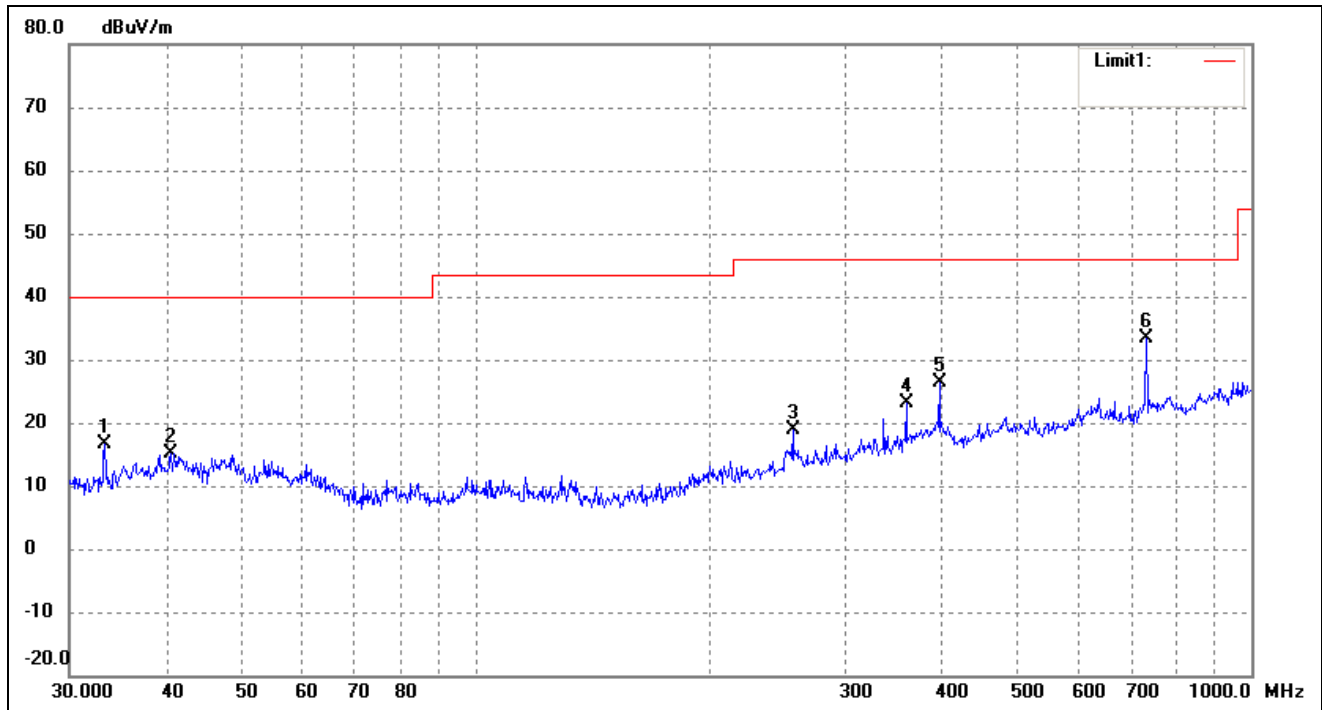
Comment: DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	41.8596	23.85	-7.79	16.06	40.00	-23.94	260	100	peak
2	53.8818	23.75	-8.81	14.94	40.00	-25.06	93	100	peak
3	375.9385	23.42	-2.33	21.09	46.00	-24.91	308	100	peak
4	483.9094	23.03	-1.27	21.76	46.00	-24.24	112	100	peak
5	642.8613	22.99	0.65	23.64	46.00	-22.36	196	100	peak
6	782.3453	22.63	2.78	25.41	46.00	-20.59	233	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	33.3279	26.14	-9.46	16.68	40.00	-23.32	331	100	peak
2	40.5591	22.85	-7.70	15.15	40.00	-24.85	96	100	peak
3	256.5211	26.02	-7.18	18.84	46.00	-27.16	125	100	peak
4	359.1860	26.57	-3.32	23.25	46.00	-22.75	116	100	peak
5	396.2415	29.28	-2.95	26.33	46.00	-19.67	159	100	peak
6	731.9203	31.73	1.66	33.39	46.00	-12.61	142	100	peak

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

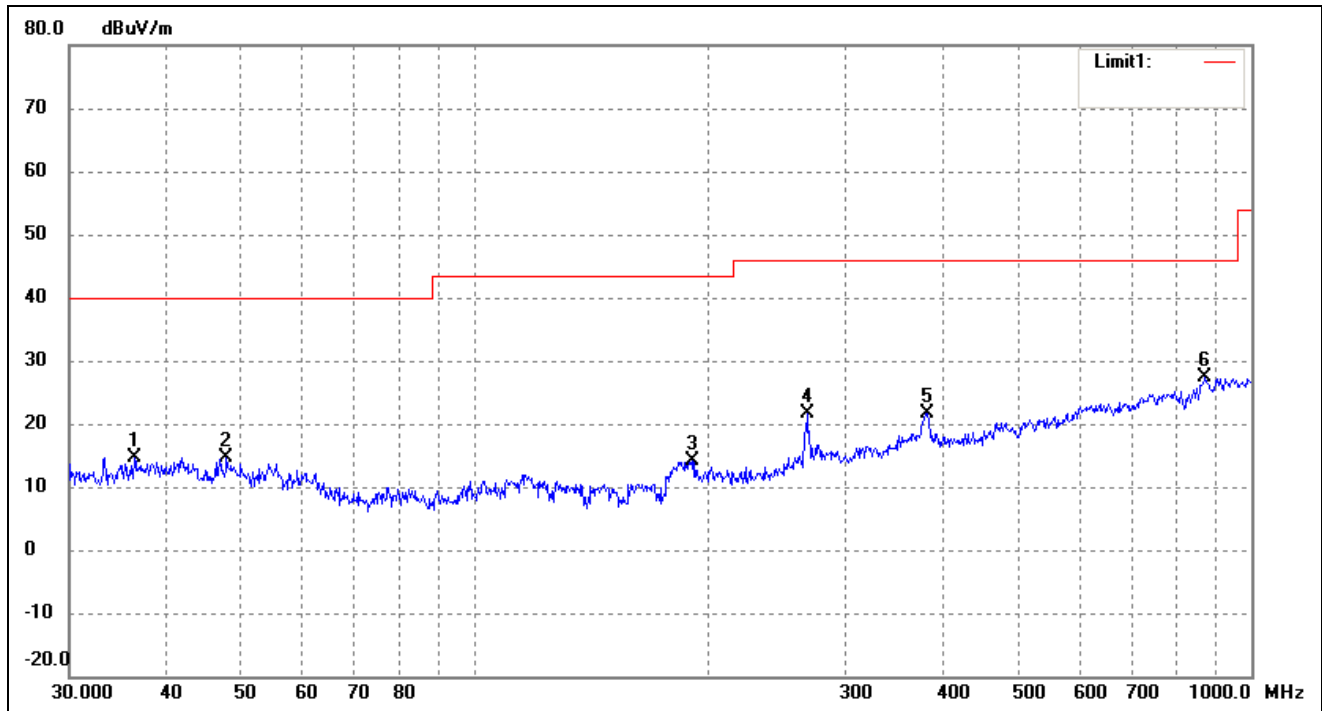
EUT: NOLO CV1 Headset Marker

Tested Model: CV1

Operating Condition: TM2

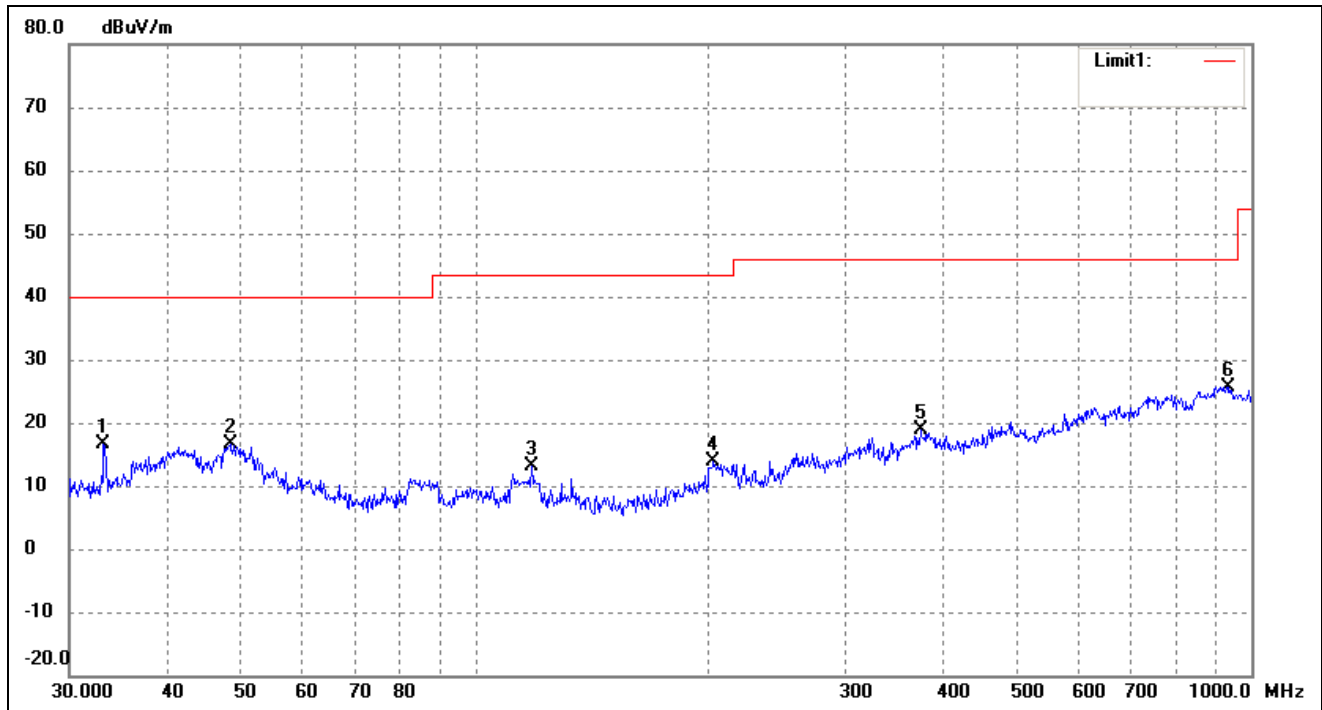
Comment: DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	36.3814	23.36	-8.66	14.70	40.00	-25.30	76	100	peak
2	47.8260	22.92	-8.18	14.74	40.00	-25.26	334	100	peak
3	190.4050	23.97	-9.96	14.01	43.50	-29.49	66	100	peak
4	267.5455	28.23	-6.63	21.60	46.00	-24.40	231	100	peak
5	382.5879	23.97	-2.23	21.74	46.00	-24.26	294	100	peak
6	872.1832	24.34	3.05	27.39	46.00	-18.61	114	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	33.2112	26.04	-9.50	16.54	40.00	-23.46	284	100	peak
2	48.3318	24.80	-8.21	16.59	40.00	-23.41	126	100	peak
3	118.1862	24.59	-11.38	13.21	43.50	-30.29	65	100	peak
4	202.8104	22.51	-8.68	13.83	43.50	-29.67	207	100	peak
5	374.6226	21.32	-2.41	18.91	46.00	-27.09	144	100	peak
6	935.5463	21.57	4.13	25.70	46.00	-20.30	322	100	peak

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

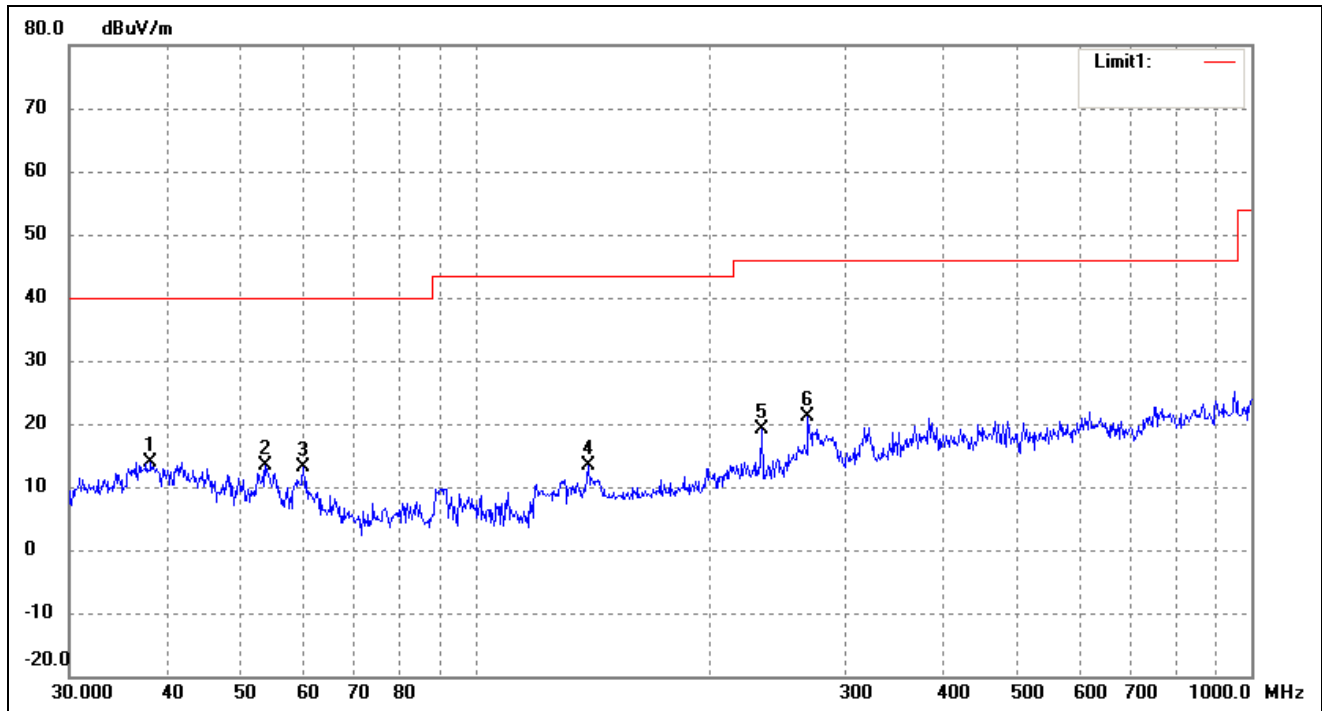
EUT: NOLO CV1 Headset Marker

Tested Model: CV1

Operating Condition: TM3

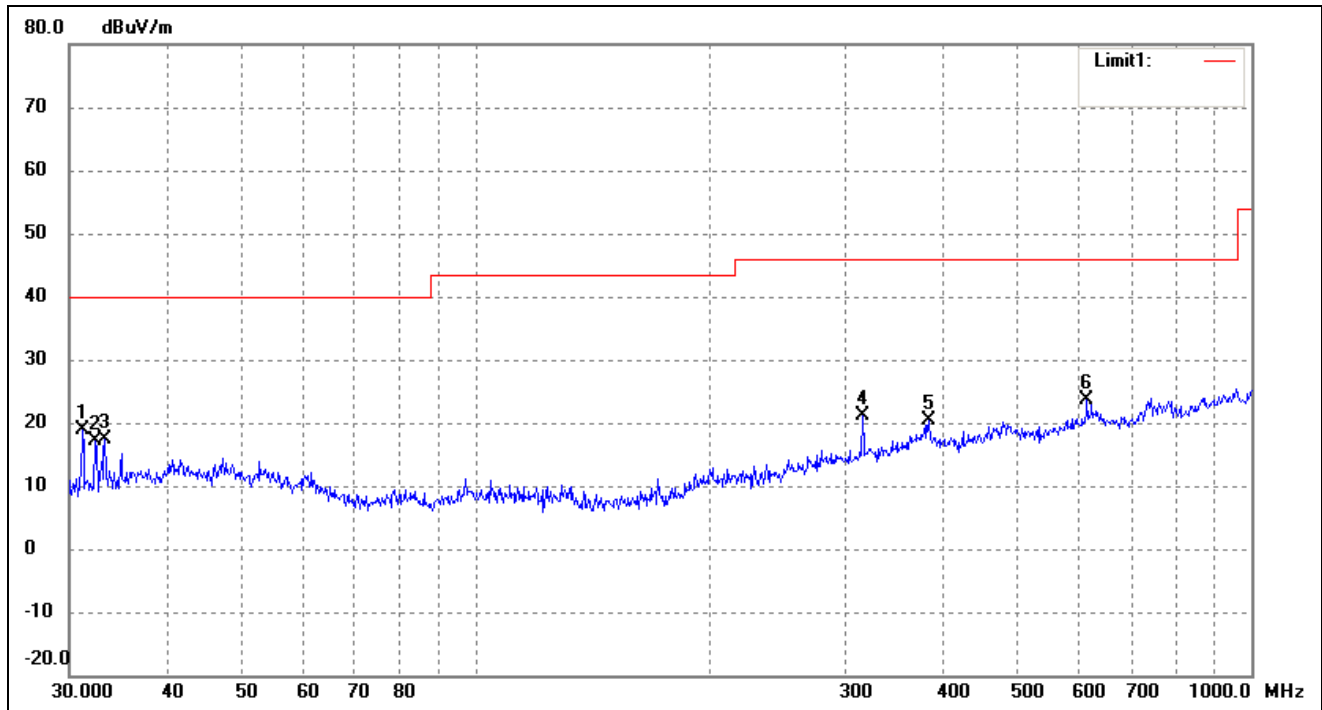
Comment: DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	38.2120	22.15	-8.16	13.99	40.00	-26.01	147	100	peak
2	53.6932	22.07	-8.78	13.29	40.00	-26.71	123	100	peak
3	60.0691	22.72	-9.60	13.12	40.00	-26.88	112	100	peak
4	139.8508	25.87	-12.55	13.32	43.50	-30.18	130	100	peak
5	234.1684	27.52	-8.48	19.04	46.00	-26.96	146	100	peak
6	268.4853	27.78	-6.59	21.19	46.00	-24.81	337	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	31.1798	28.97	-10.01	18.96	40.00	-21.04	83	100	peak
2	32.4059	26.89	-9.69	17.20	40.00	-22.80	180	100	peak
3	33.3279	26.87	-9.46	17.41	40.00	-22.59	53	100	peak
4	315.4808	26.08	-4.85	21.23	46.00	-24.77	142	100	peak
5	383.9318	22.78	-2.30	20.48	46.00	-25.52	205	100	peak
6	614.2142	22.78	0.83	23.61	46.00	-22.39	331	100	peak

Plot of Radiated Emissions Test Data (30MHz to 1GHz)

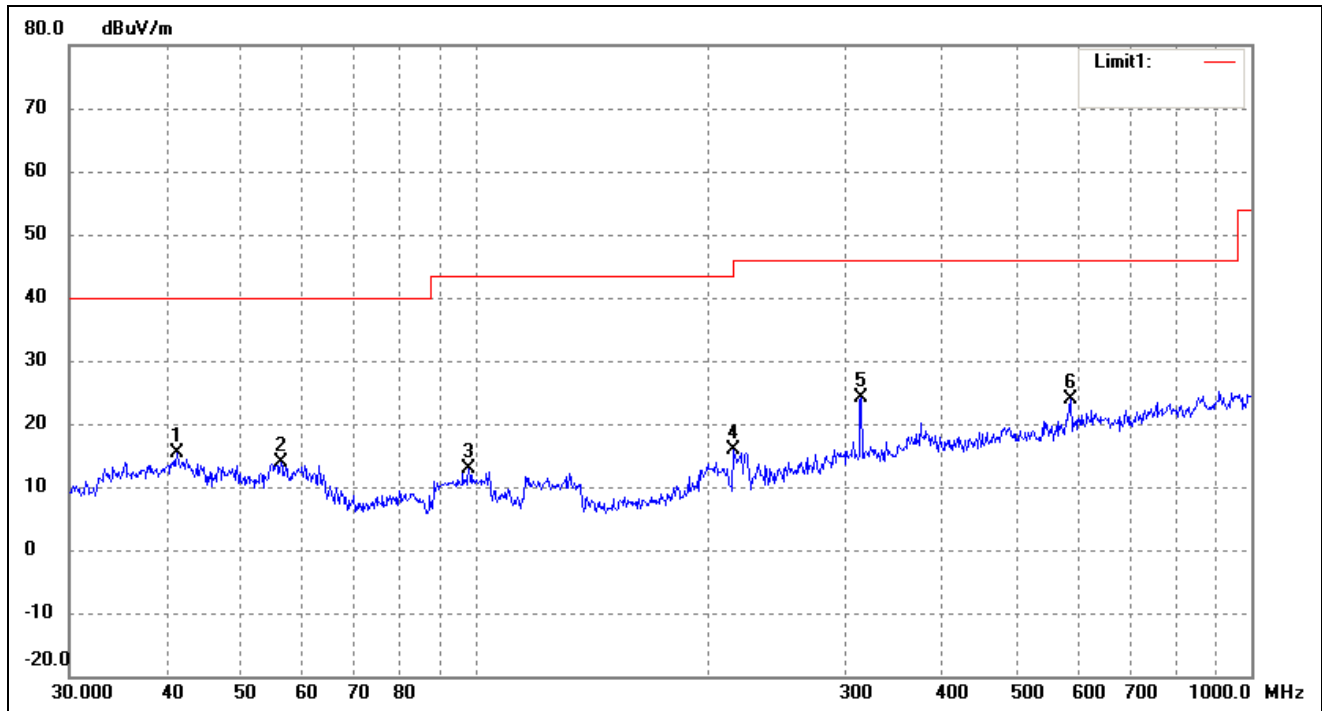
EUT: NOLO CV1 Headset Marker

Tested Model: CV1

Operating Condition: TM4

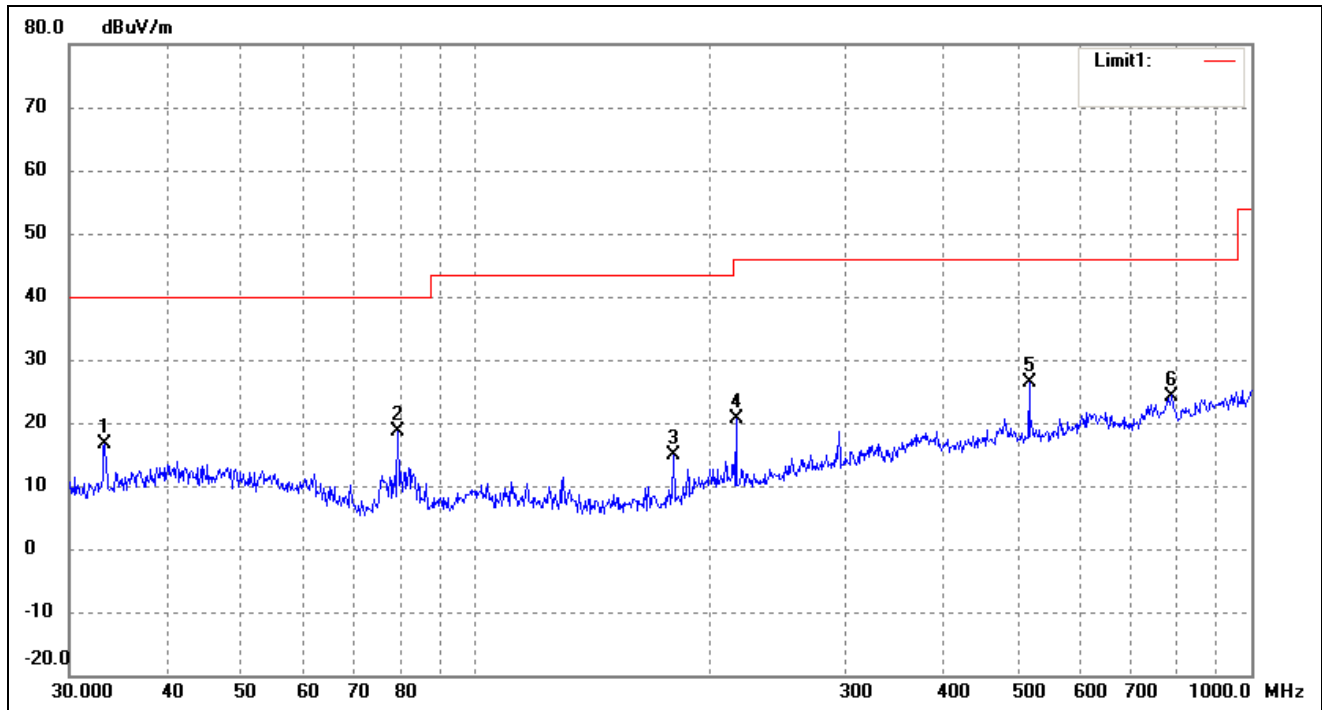
Comment: DC 5V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	41.2765	23.20	-7.75	15.45	40.00	-24.55	245	100	peak
2	56.1974	22.86	-9.10	13.76	40.00	-26.24	93	100	peak
3	98.1419	24.14	-11.28	12.86	43.50	-30.64	345	100	peak
4	215.2678	24.74	-8.79	15.95	43.50	-27.55	98	100	peak
5	314.3765	29.04	-4.92	24.12	46.00	-21.88	306	100	peak
6	584.7895	24.60	-0.77	23.83	46.00	-22.17	232	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	33.3279	26.18	-9.46	16.72	40.00	-23.28	324	100	peak
2	79.5209	30.62	-12.03	18.59	40.00	-21.41	99	100	peak
3	180.0165	26.14	-11.36	14.78	43.50	-28.72	294	100	peak
4	216.7828	29.40	-8.81	20.59	46.00	-25.41	121	100	peak
5	517.2480	28.21	-1.94	26.27	46.00	-19.73	323	100	peak
6	790.6188	21.88	2.37	24.25	46.00	-21.75	331	100	peak

Spurious Emissions Above 1GHz

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2402MHz							
2402	96.37	-3.59	92.78	114	-21.22	H	PK
2402	90.26	-3.59	86.67	94	-7.33	H	AV
4804	53.27	-3.59	49.68	74	-24.32	H	PK
4804	46.27	-3.59	42.68	54	-11.32	H	AV
7206	42.99	-0.52	42.47	74	-31.53	H	PK
7206	30.22	-0.52	29.70	54	-24.30	H	AV
2402	100.33	-3.59	96.74	114	-17.26	V	PK
2402	92.06	-3.59	88.47	94	-5.53	V	AV
4804	55.63	-3.59	52.04	74	-21.96	V	PK
4804	48.29	-3.59	44.70	54	-9.30	V	AV
7206	45.89	-0.52	45.37	74	-28.63	V	PK
7206	32.69	-0.52	32.17	54	-21.83	V	AV
Middle Channel-2441MHz							
2441	97.68	-3.59	94.09	114	-19.91	H	PK
2441	90.91	-3.59	87.32	94	-6.68	H	AV
4882	56.29	-3.59	52.70	74	-21.30	H	PK
4882	45.86	-3.59	42.27	54	-11.73	H	AV
7323	42.21	-0.52	41.69	74	-32.31	H	PK
7323	29.33	-0.52	28.81	54	-25.19	H	AV
2441	100.96	-3.59	97.37	114	-16.63	V	PK
2441	92.03	-3.59	88.44	94	-5.56	V	AV
4882	57.36	-3.59	53.77	74	-20.23	V	PK
4882	48.33	-3.59	44.74	54	-9.26	V	AV
7323	43.29	-0.52	42.77	74	-31.23	V	PK
7323	30.27	-0.52	29.75	54	-24.25	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
High Channel-2475MHz							
4882	56.29	-3.59	52.70	74	-21.30	H	PK
4882	45.86	-3.59	42.27	54	-11.73	H	AV
4950	58.33	-3.41	54.92	74	-19.08	H	PK
4950	47.62	-3.41	44.21	54	-9.79	H	AV
7425	46.89	-0.42	46.47	74	-27.53	H	PK
7425	33.57	-0.42	33.15	54	-20.85	H	AV
2475	100.19	-3.59	96.60	114	-17.40	V	PK
2475	91.28	-3.59	87.69	94	-6.31	V	AV
4950	58.99	-3.41	55.58	74	-18.42	V	PK
4950	48.52	-3.41	45.11	54	-8.89	V	AV
7425	47.51	-0.42	47.09	74	-26.91	V	PK
7425	33.69	-0.42	33.27	54	-20.73	V	AV

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Operation_Ant.1 TX + Ant.2 TX + Ant.3 RX							
1896.000	33.77	-8.85	24.92	54.00	-29.08	H	AV
2680.000	45.54	-6.78	38.76	74.00	-35.24	H	PK
3112.000	51.16	-6.16	45.00	74.00	-29.00	H	PK
3352.000	38.50	-6.00	32.50	54.00	-21.50	H	AV
3928.000	50.01	-5.44	44.57	74.00	-29.43	H	PK
4424.000	37.90	-4.98	32.92	54.00	-21.08	H	AV
4728.000	49.07	-4.72	44.35	74.00	-29.65	V	PK
3120.000	50.52	-6.17	44.35	74.00	-29.65	V	PK
3352.000	38.66	-6.00	32.66	54.00	-21.34	V	AV
3840.000	38.05	-5.53	32.52	54.00	-21.48	V	AV
4240.000	49.94	-5.14	44.80	74.00	-29.20	V	PK
4736.000	50.35	-4.70	45.65	74.00	-28.35	V	PK

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20dB below the limit from 9kHz to 30MHz..

5. Out of Band Emissions

5.1 Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

5.2 Test Procedure

As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2483.5MHz, than mark the higher-level emission for comparing with the FCC rules.

5.3 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

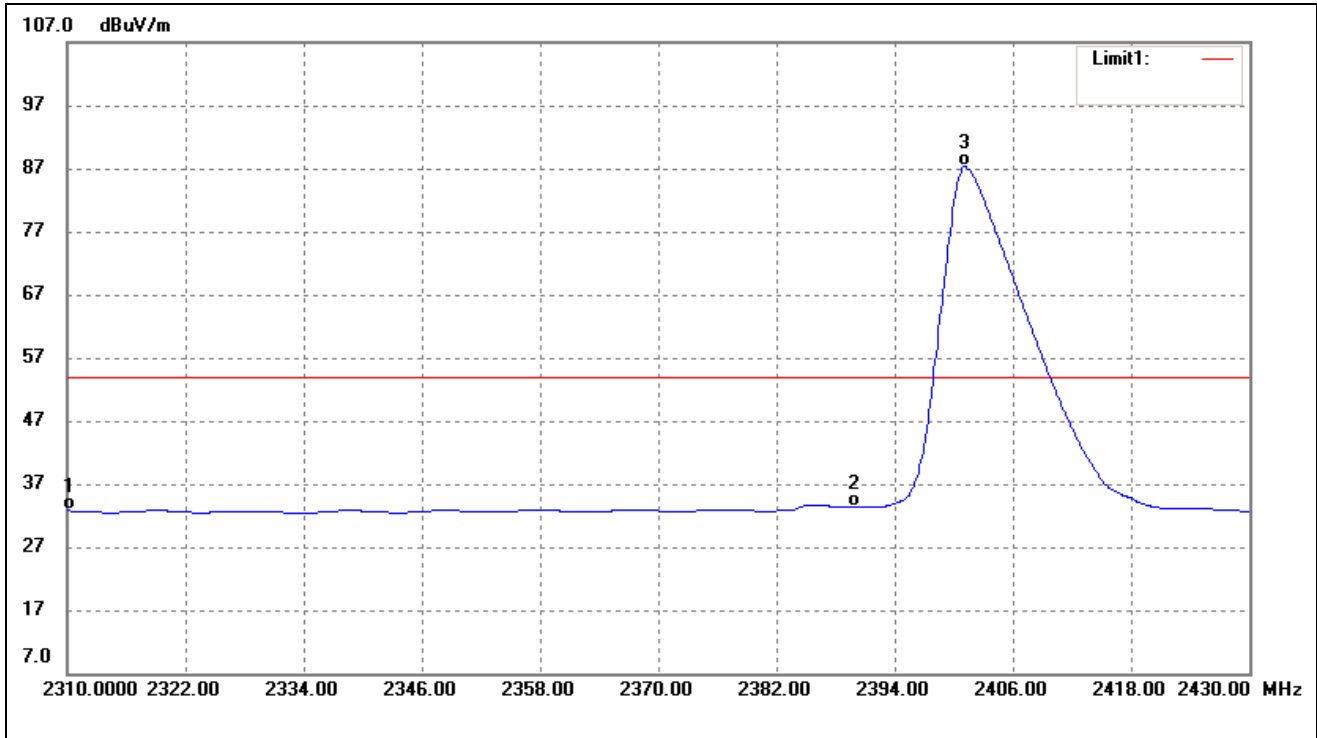
5.4 Summary of Test Results/Plots

Test mode	Frequency	Limit	Result
	MHz	dBuV / dBc	
Lowest	2310.00	<54 dBuV	Pass
	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
Highest	2483.50	<54 dBuV	Pass
	2500.00	<54 dBuV	Pass

The edge emissions are below the FCC 15.209 Limits or complies with the 15.249 requirements.

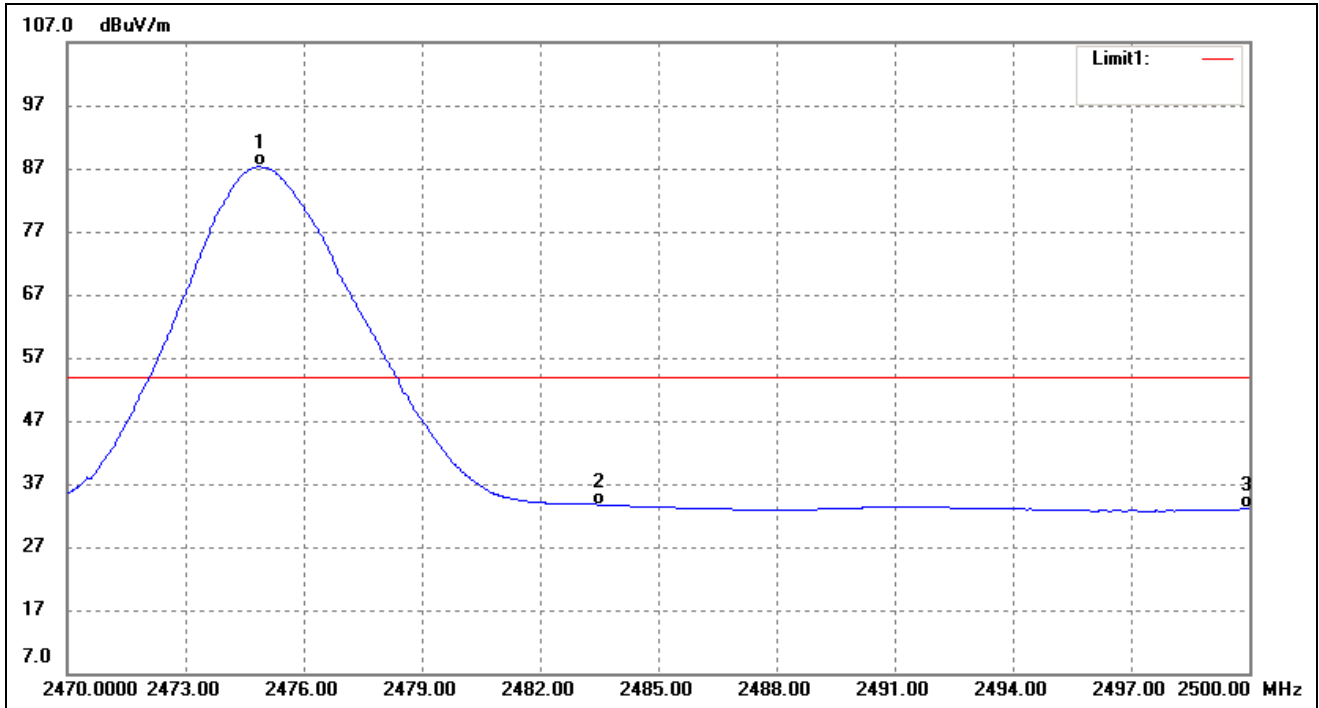
Please refer to the test plots as below.

Lowest Bandedge
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	36.46	-3.69	32.77	54.00	-21.23	Ave Detector
	2310.000	51.27	-3.69	47.58	74.00	-26.42	Peak Detector
2	2390.000	36.78	-3.49	33.29	54.00	-20.71	Ave Detector
	2390.000	67.67	-3.49	64.18	74.00	-9.82	Peak Detector
3	2401.080	90.86	-3.46	87.40	/	/	Ave Detector
	2402.640	101.32	-3.46	97.86	/	/	Peak Detector

Highest Bandedge
Vertical (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2474.740	90.35	-3.26	87.09	/	/	Ave Detector
	2474.800	97.57	-3.26	94.31	/	/	Peak Detector
2	2483.500	36.88	-3.25	33.63	54.00	-20.37	Ave Detector
	2483.500	64.53	-3.25	61.28	74.00	-12.72	Peak Detector
3	2500.000	36.23	-3.20	33.03	54.00	-20.97	Ave Detector
	2500.000	56.29	-3.20	53.09	74.00	-20.91	Peak Detector

6. Emission Bandwidth

6.1 Standard Applicable

According to 15.215 (c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

6.2 Test Procedure

According to the ANSI 63.10-2013, the emission bandwidth test method as follows.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Set span = 1MHz, centered on a transmitting channel

RBW \geq 1% 20dB Bandwidth, VBW \geq RBW

Sweep = auto

Detector function = peak

Trace = max hold

All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.

6.3 Environmental Conditions

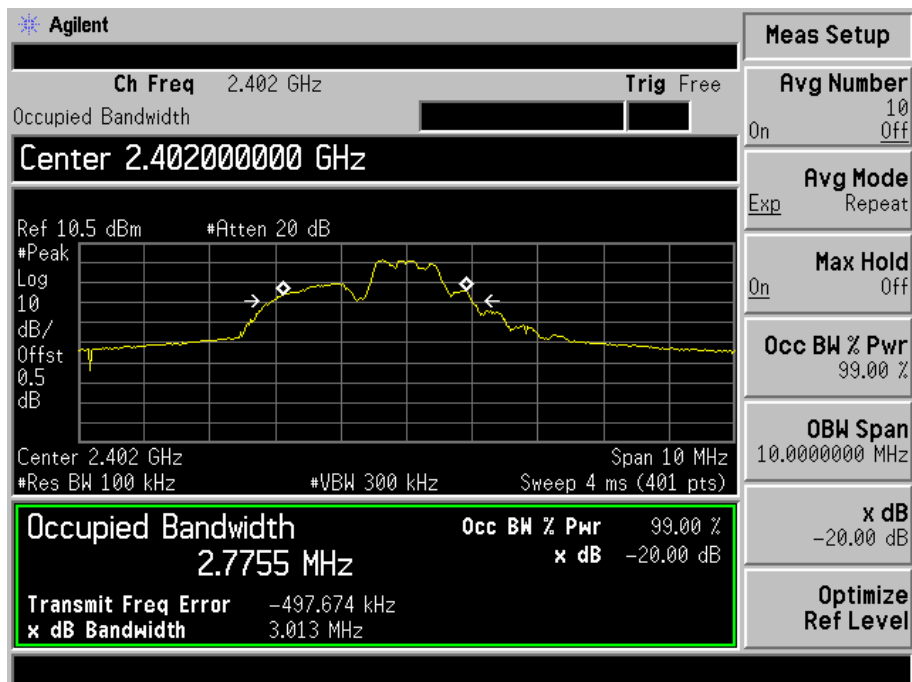
Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.4 Summary of Test Results/Plots

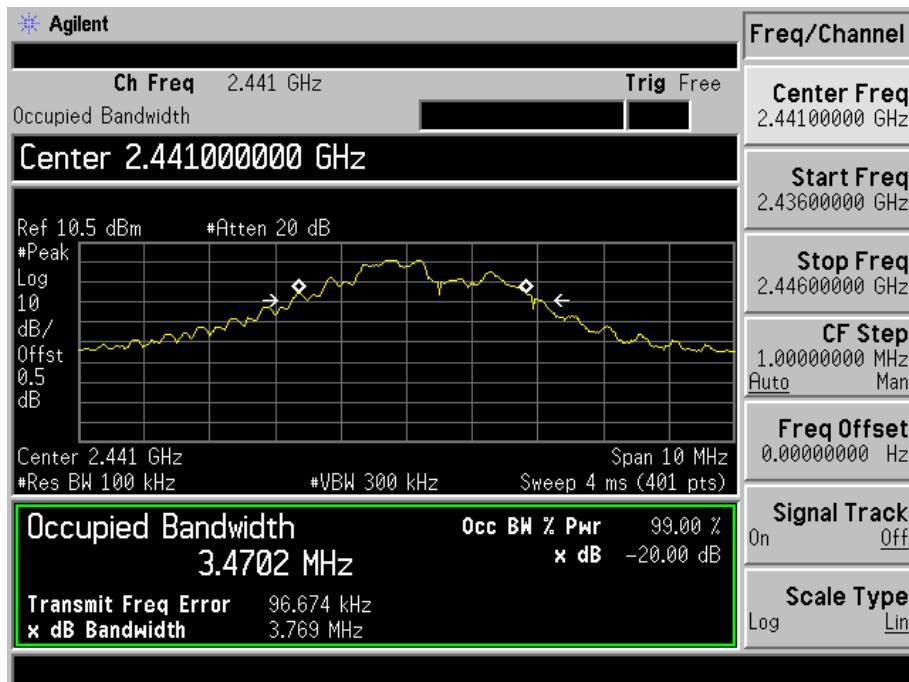
Channel	Frequency MHz	20dB Bandwidth MHz	99% Bandwidth MHz
Low Channel	2402	3.013	2.7755
Middle Channel	2441	3.769	3.4702
High Channel	2475	6.804	6.5362

Please refer to the following test plots

Low Channel:



Middle Channel:



High Channel:



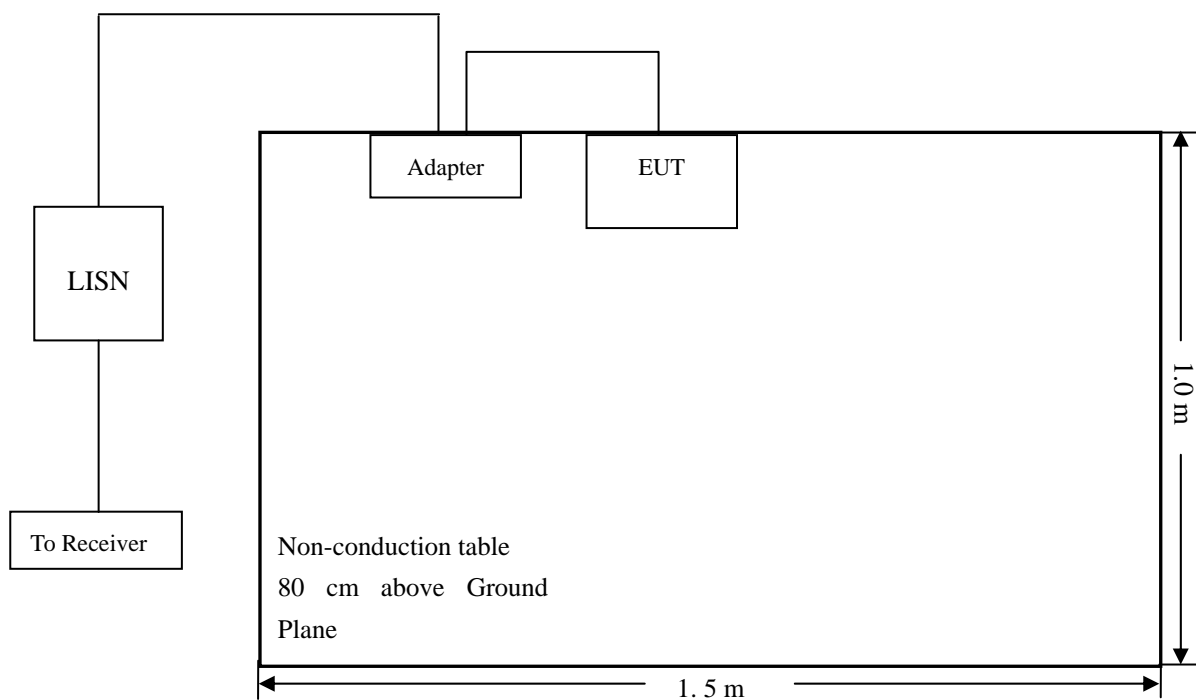
7. Conducted Emissions

7.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

7.2 Basic Test Setup Block Diagram



7.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

7.4 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 150 kHz
Stop Frequency..... 30 MHz
Sweep Speed Auto
IF Bandwidth..... 10 kHz
Quasi-Peak Adapter Bandwidth 9 kHz
Quasi-Peak Adapter Mode Normal

7.5 Summary of Test Results/Plots

According to the data in section 7.7, the EUT complied with the FCC Part 15.207 Conducted margin for this device, with the *worst* margin reading of:

-5.00 dB at 0.6020 MHz in the Line mode, QP detector, 0.15-30MHz

7.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

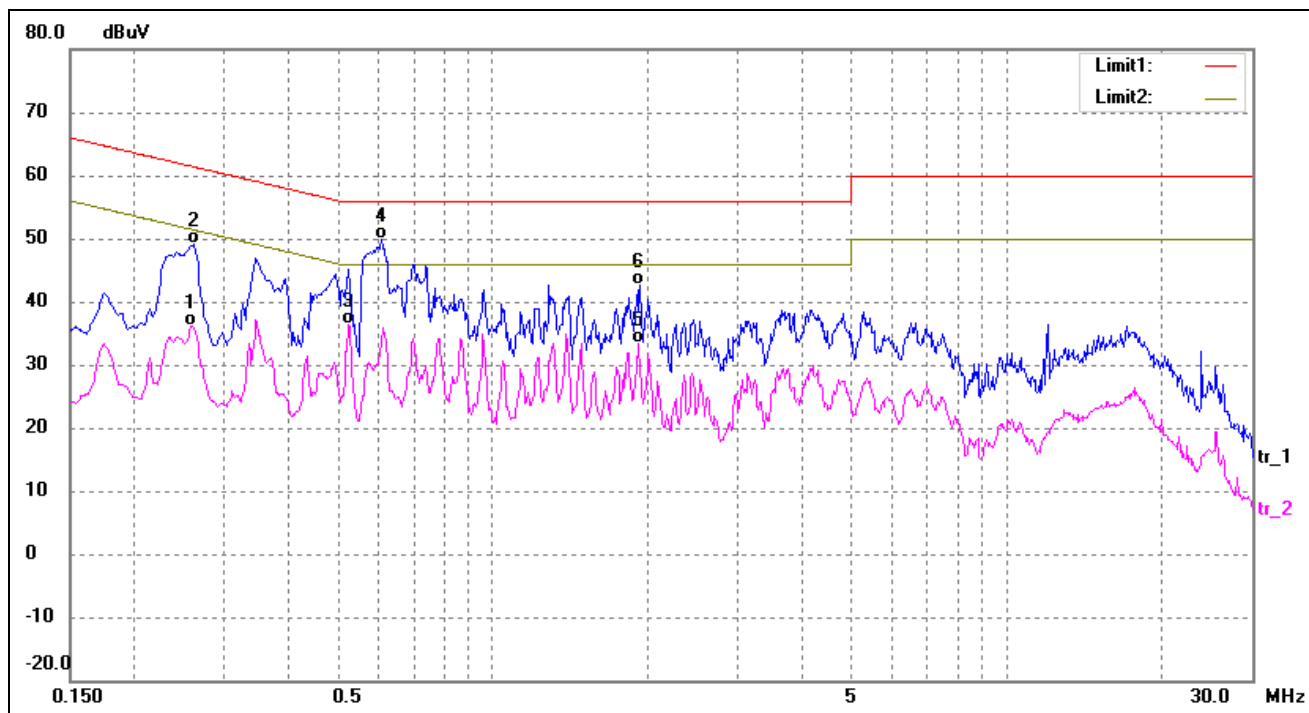
EUT: NOLO CV1 Headset Marker

Tested Model: CV1

Operating Condition: Transmitting

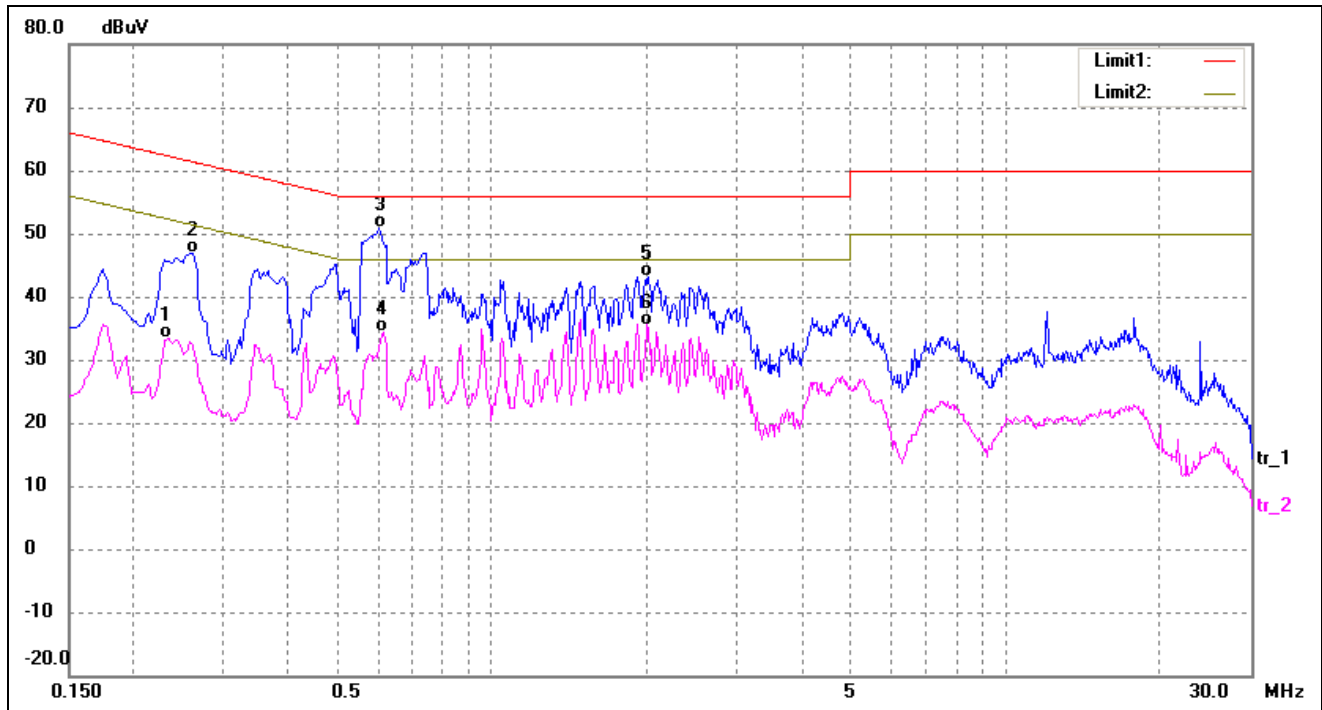
Comment: DC 5V

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2580	26.22	9.80	36.02	51.50	-15.48	AVG
2	0.2620	39.30	9.80	49.10	61.37	-12.27	QP
3	0.5220	26.64	9.80	36.44	46.00	-9.56	AVG
4*	0.6060	40.08	9.79	49.87	56.00	-6.13	QP
5	1.9180	23.66	9.74	33.40	46.00	-12.60	AVG
6	1.9300	32.96	9.74	42.70	56.00	-13.30	QP

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2340	23.66	9.80	33.46	52.31	-18.85	AVG
2	0.2620	37.14	9.80	46.94	61.37	-14.43	QP
3*	0.6020	41.21	9.79	51.00	56.00	-5.00	QP
4	0.6140	24.60	9.79	34.39	46.00	-11.61	AVG
5	2.0140	33.39	9.73	43.12	56.00	-12.88	QP
6	2.0140	25.68	9.73	35.41	46.00	-10.59	AVG

***** END OF REPORT *****