



## TEST REPORT

**Application No.:** SZEM2011012138CR  
**Applicant:** Guangdong OPPO Mobile Telecommunications Corp., Ltd.  
**Address of Applicant:** NO.18 HaiBin Road, Wusha Village, Chang An Town, DongGuan City, GuangDong, China  
**Manufacturer:** Guangdong OPPO Mobile Telecommunications Corp., Ltd.  
**Address of Manufacturer:** NO.18 HaiBin Road, Wusha Village, Chang An Town, DongGuan City, GuangDong, China  
**Equipment Under Test (EUT):**  
**EUT Name:** Mobile Phone  
**Model No.:** CPH2173  
**FCC ID:** R9C-CPH2173  
**Trade Mark:** OPPO  
**Standard(s) :** 47 CFR Part 15, Subpart C  
**Date of Receipt:** 2020-11-26  
**Date of Test:** 2020-12-08 to 2020-12-30  
**Date of Issue:** 2021-01-06

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu  
EMC Laboratory Manager



SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch EMC Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-01-06		Original

<b>Authorized for issue by:</b>			
			
		<hr/> <b>Leo Lai/Project Engineer</b>	
			
		<hr/> <b>Eric Fu/Reviewer</b>	

## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C	47 CFR Part 15, Subpart C 15.203	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Mains Power Port (150kHz-30MHz)	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 6.9.2	47 CFR Part 15, Subpart C 15.215	Pass
Restricted Bands	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205	Pass
Radiated Emissions (9kHz-30MHz)	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

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## 4 General Information

### 4.1 Details of E.U.T.

Antenna type:	Loop Antenna
Modulation type:	Load modulation
Operation frequency:	110kHz to 148kHz

#### Accessory:

Battery Information:	Model:	BLP831
	Normal Voltage:	7.74V
	Rated capacity:	2200mAh/17.41Wh
Adapter Information 1:	Model:	VCA7JAUH
	Power Rating	1.I/P:100-130VAC 50/60Hz 1.8A O/P:5VDC 2.0A or 10VDC,5.0A MAX 2.I/P:200-240VAC 50/60Hz 1.8A O/P:5VDC 2.0A or 10VDC,6.5A MAX
Adapter Information 2:	Model:	VCA7JDUH
	Power Rating	1.I/P:100-130VAC 50/60Hz 1.8A O/P:5VDC 2.0A or 10VDC,5.0A MAX 2.I/P:200-240VAC 50/60Hz 1.8A O/P:5VDC 2.0A or 10VDC,6.5A MAX
Adapter Information 3:	Model:	VCA7HAUH
	Power Rating	1.I/P:100-130VAC 50/60Hz 1.8A O/P:5VDC 2.0A or 10VDC,5.0A MAX 2.I/P:200-240VAC 50/60Hz 1.8A O/P:5VDC 2.0A or 10VDC,6.5A MAX
USB Cable Information:	Model:	DL129
	Signal Line	1m
Headset Information:	Model:	MH147

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Mobile Phone	OPPO	CPH2173	--
The EUT has been tested as an independent unit.			

### 4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Mains Power Port (150kHz-30MHz)	$\pm 3.0\text{dB}$ (150kHz to 30MHz)
20dB Bandwidth	$\pm 3\%$
Restricted Bands	$\pm 3\%$
Radiated Emissions (9kHz-30MHz)	$\pm 4.5\text{dB}$
Radiated Emissions (30MHz-1GHz)	$\pm 4.5\text{dB}$



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**Remark:**

The  $U_{lab}$  (lab Uncertainty) is less than  $U_{CISPR}$  (CISPR Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



#### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

#### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



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## 5 Equipment List

Conducted Emissions at AC Mains Power Port (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2019-06-13	2022-06-12
EMI Test Receiver	Rohde&Schwarz	ESCI	SEM004-02	2020-03-24	2021-03-23
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2020-07-10	2021-07-09
LISN	Rohde&Schwarz	ENV216	SEM007-01	2020-09-23	2021-09-22
LISN	ETS-LINDGREN	3816/2	SEM007-02	2020-04-01	2021-03-31

20dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	SAEMC	MSR733	SEM001-09	2019-06-13	2022-06-12
DC Power Supply	Rohde & Schwarz	NGSM 32/10	SEM011-04	2020-03-24	2021-03-23
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2020-04-01	2021-03-31
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2020-09-23	2021-09-22
Measurement Software	TST	TST PASS V1.0.5	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2020-05-21	2021-05-20
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2020-03-25	2021-03-24

Restricted Bands					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	SAEMC	MSR733	SEM001-09	2019-06-13	2022-06-12
DC Power Supply	Rohde & Schwarz	NGSM 32/10	SEM011-04	2020-03-24	2021-03-23
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2020-04-01	2021-03-31
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2020-09-23	2021-09-22
Measurement Software	TST	TST PASS V1.0.5	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2020-05-21	2021-05-20
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2020-03-25	2021-03-24



Radiated Emissions (9kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2018-03-31	2021-03-30
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-16	2020-11-02	2021-11-01
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-18	2019-08-08	2022-08-07
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2020-04-09	2021-04-08
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2020-08-14	2023-08-13
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM029-01	2020-07-10	2021-07-09

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2020-11-02	2021-11-01
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2020-09-15	2021-09-14
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2020-09-15	2021-09-14
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06



## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

Limit:

Standard Requirement:

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement.

Antenna location: Refer to Internal photos.



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## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Emissions at AC Mains Power Port (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission (MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C

Humidity: 47.3 % RH

Atmospheric Pressure: 1010 mbar

#### 7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Charge mode_Keep the EUT in charging by adapter1 and reverse charging
Final test	01	Charge mode_Keep the EUT in charging by adapter2 and reverse charging
Final test	02	Charge mode_Keep the EUT in charging by adapter3 and reverse charging



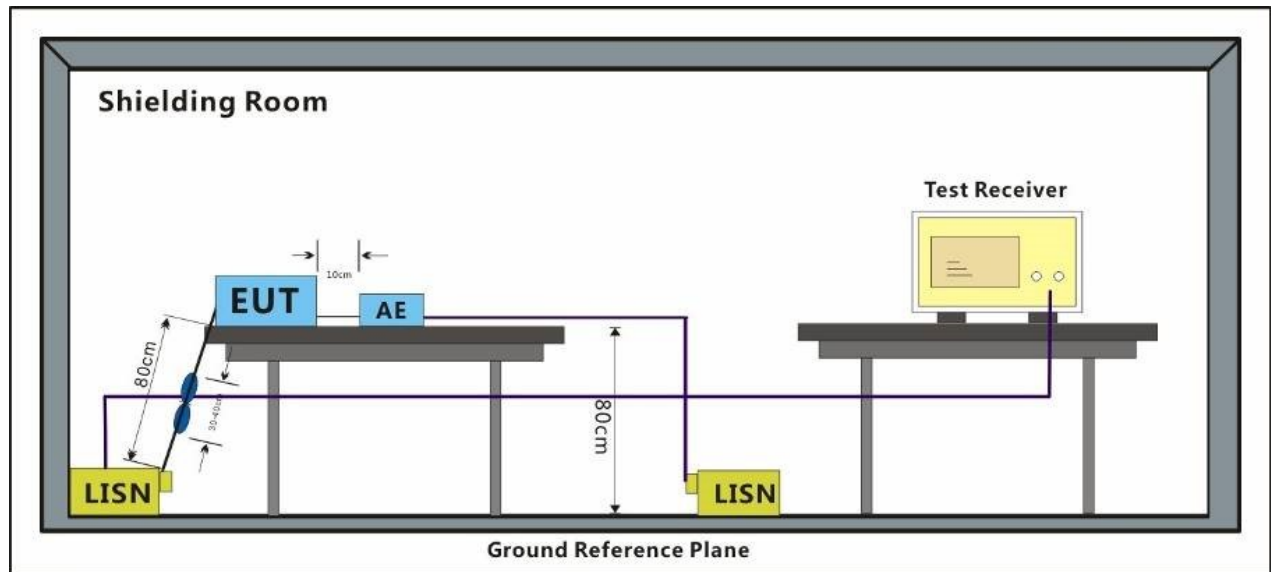
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### 7.1.3 Test Setup Diagram



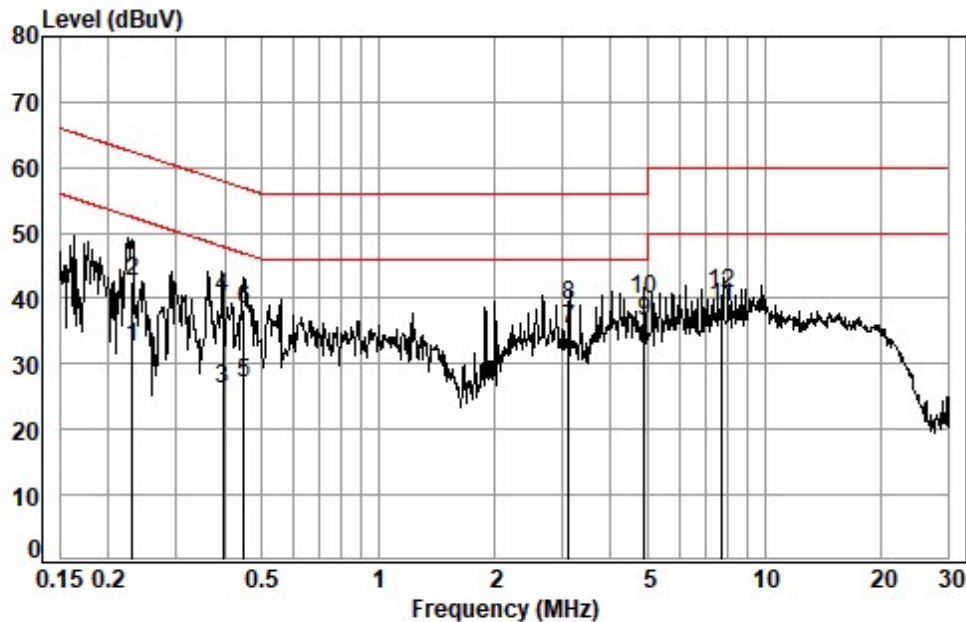
### 7.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor



Test Mode: 00; Line: Live line



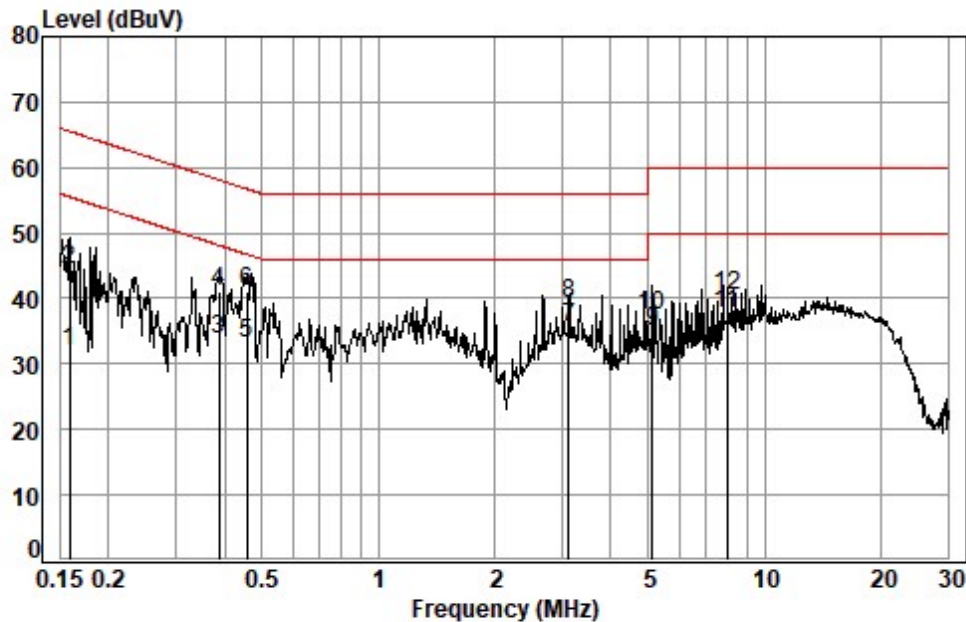
Site : Shielding Room  
Condition: Line  
Job No. : 12138CR  
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dB	
1	0.2304	0.04	9.73	22.81	32.58	52.44	Average
2	0.2304	0.04	9.73	32.88	42.65	62.44	QP
3	0.3955	0.06	9.76	16.25	26.07	47.95	Average
4	0.3955	0.06	9.76	30.40	40.22	57.95	QP
5	0.4492	0.07	9.77	17.21	27.05	46.89	Average
6	0.4492	0.07	9.77	28.34	38.18	56.89	QP
7	3.1149	0.14	9.85	25.21	35.20	46.00	Average
8	3.1149	0.14	9.85	28.91	38.90	56.00	QP
9	4.8931	0.16	9.93	26.45	36.54	46.00	Average
10	4.8931	0.16	9.93	29.69	39.78	56.00	QP
11	7.7853	0.16	10.08	28.37	38.61	50.00	Average
12	7.7853	0.16	10.08	30.66	40.90	60.00	QP



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Test Mode: 00; Line: Neutral Line



Site : Shielding Room  
Condition: Neutral  
Job No. : 12138CR  
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dB	
1	0.1590	0.03	9.71	22.29	32.03	55.52	-23.49 Average
2	0.1590	0.03	9.71	34.66	44.40	65.52	-21.12 QP
3	0.3872	0.06	9.75	24.06	33.87	48.12	-14.25 Average
4	0.3872	0.06	9.75	31.35	41.16	58.12	-16.96 QP
5	0.4564	0.07	9.76	23.19	33.02	46.76	-13.74 Average
6	0.4564	0.07	9.76	31.19	41.02	56.76	-15.74 QP
7	3.1153	0.14	9.85	25.61	35.60	46.00	-10.40 Average
8	3.1153	0.14	9.85	29.30	39.29	56.00	-16.71 QP
9	5.1171	0.16	9.94	24.94	35.04	50.00	-14.96 Average
10	5.1171	0.16	9.94	27.36	37.46	60.00	-22.54 QP
11	8.0090	0.16	10.10	27.56	37.82	50.00	-12.18 Average
12	8.0090	0.16	10.10	30.05	40.31	60.00	-19.69 QP



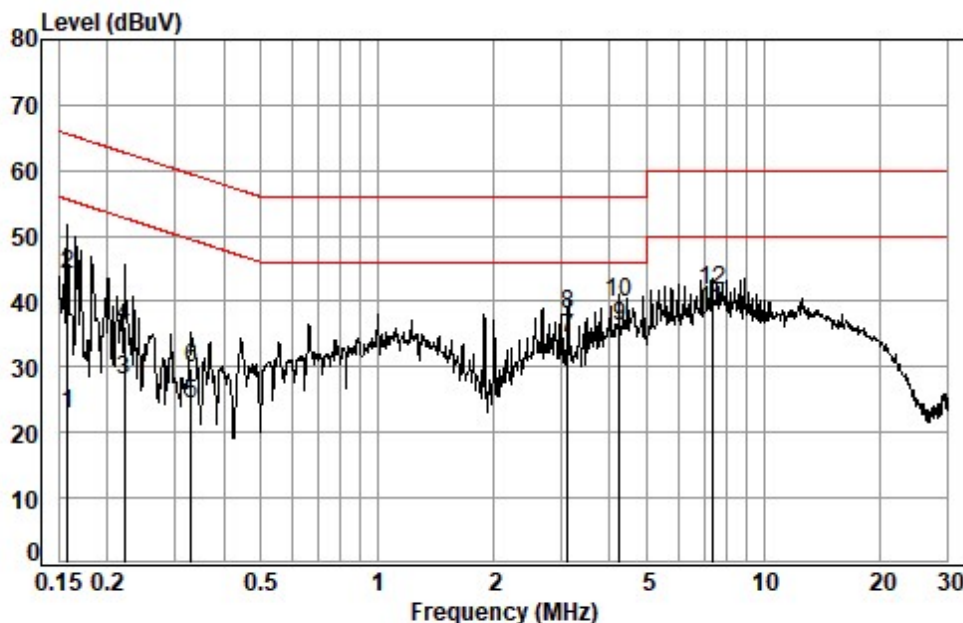
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Test Mode: 01; Line: Live line



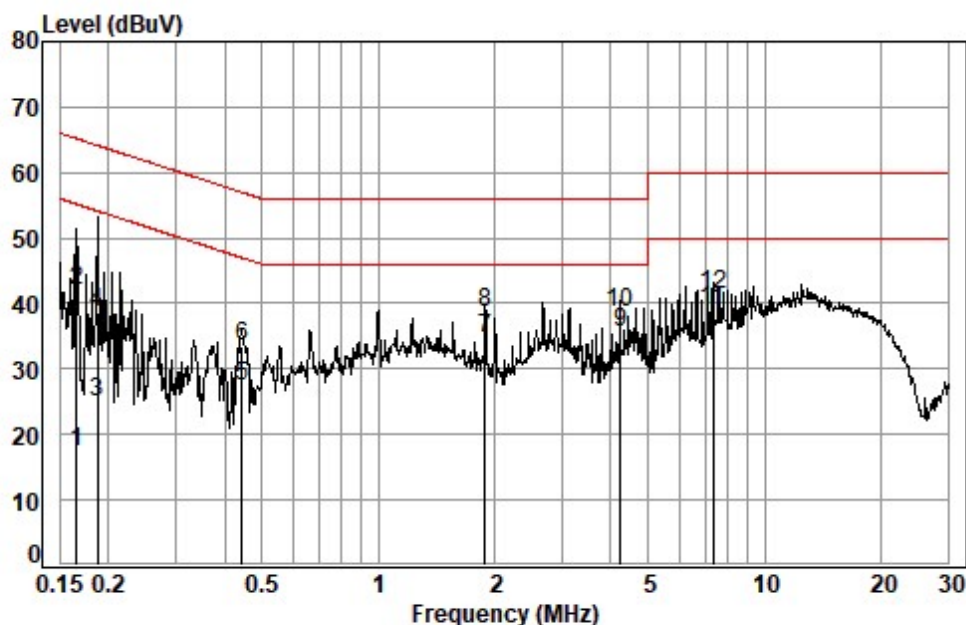
Site : Shielding Room  
Condition: Line  
Job No. : 12138CR  
Test mode: 01

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1582	0.03	9.70	13.03	22.76	55.56	-32.80	Average
2	0.1582	0.03	9.70	34.51	44.24	65.56	-21.32	QP
3	0.2220	0.04	9.73	18.34	28.11	52.74	-24.63	Average
4	0.2220	0.04	9.73	26.42	36.19	62.74	-26.55	QP
5	0.3303	0.06	9.75	14.58	24.39	49.44	-25.05	Average
6	0.3303	0.06	9.75	20.04	29.85	59.44	-29.59	QP
7	3.1156	0.14	9.85	24.31	34.30	46.00	-11.70	Average
8	3.1156	0.14	9.85	28.00	37.99	56.00	-18.01	QP
9	4.2269	0.15	9.89	26.02	36.06	46.00	-9.94	Average
10	4.2269	0.15	9.89	29.77	39.81	56.00	-16.19	QP
11	7.3395	0.16	10.05	28.57	38.78	50.00	-11.22	Average
12	7.3395	0.16	10.05	31.57	41.78	60.00	-18.22	QP



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Test Mode: 01; Line: Neutral Line



Site : Shielding Room  
Condition: Neutral  
Job No. : 12138CR  
Test mode: 01

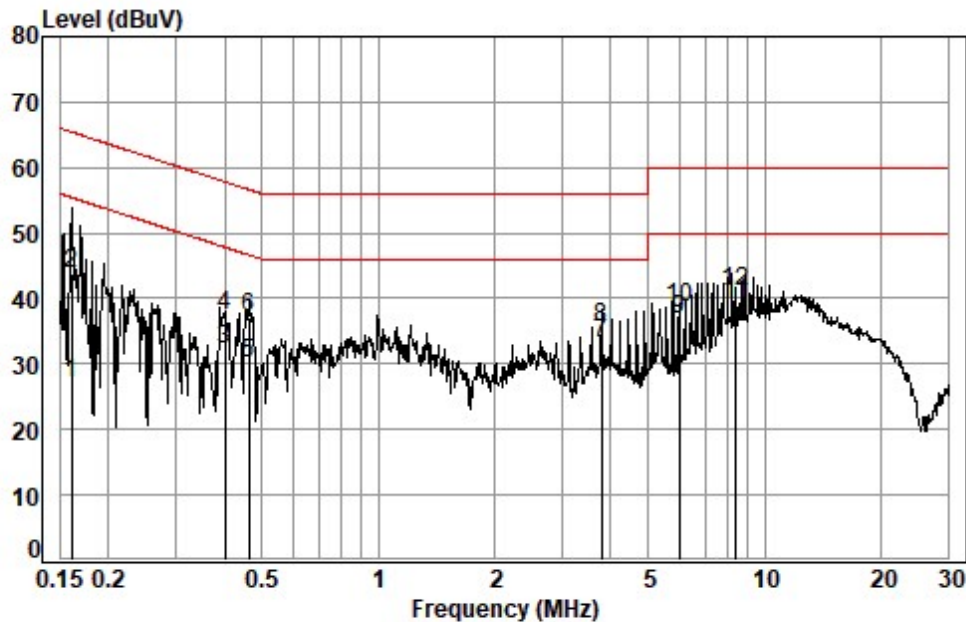
	Freq	Cable Loss	LISN Factor	Read Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dB	
1	0.1659	0.03	9.71	7.70	17.44	55.16	Average
2	0.1659	0.03	9.71	32.16	41.90	65.16	QP
3	0.1874	0.03	9.72	15.22	24.97	54.15	Average
4	0.1874	0.03	9.72	28.96	38.71	64.15	QP
5	0.4444	0.07	9.75	17.44	27.26	46.98	Average
6	0.4444	0.07	9.75	23.69	33.51	56.98	QP
7	1.8904	0.12	9.81	24.65	34.58	46.00	Average
8	1.8904	0.12	9.81	28.85	38.78	56.00	QP
9	4.2261	0.15	9.89	25.42	35.46	46.00	Average
10	4.2261	0.15	9.89	28.71	38.75	56.00	QP
11	7.3389	0.16	10.06	28.64	38.86	50.00	Average
12	7.3389	0.16	10.06	31.04	41.26	60.00	QP



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Test Mode: 02; Line: Live line



Site : Shielding Room  
Condition: Line  
Job No. : 12138CR  
Test mode: 02

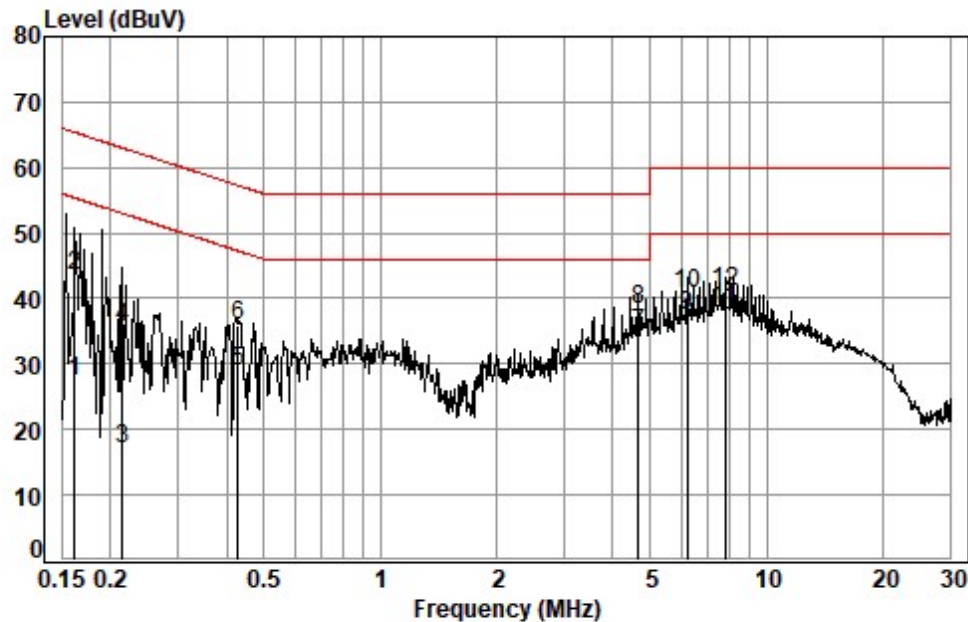
	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1607	0.03	9.71	17.36	27.10	55.43	-28.33	Average
2	0.1607	0.03	9.71	34.06	43.80	65.43	-21.63	QP
3	0.4019	0.06	9.76	22.54	32.36	47.81	-15.45	Average
4	0.4019	0.06	9.76	27.55	37.37	57.81	-20.44	QP
5	0.4612	0.07	9.77	20.40	30.24	46.67	-16.43	Average
6	0.4612	0.07	9.77	27.15	36.99	56.67	-19.68	QP
7	3.7817	0.15	9.87	23.03	33.05	46.00	-12.95	Average
8	3.7817	0.15	9.87	25.70	35.72	56.00	-20.28	QP
9	6.0071	0.16	9.98	26.61	36.75	50.00	-13.25	Average
10	6.0071	0.16	9.98	28.52	38.66	60.00	-21.34	QP
11	8.4539	0.16	10.11	28.98	39.25	50.00	-10.75	Average
12	8.4539	0.16	10.11	30.93	41.20	60.00	-18.80	QP



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Test Mode: 02; Line: Neutral Line



Site : Shielding Room  
Condition: Neutral  
Job No. : 12138CR  
Test mode: 02

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1615	0.03	9.71	17.68	27.42	55.38	-27.96	Average
2	0.1615	0.03	9.71	33.85	43.59	65.38	-21.79	QP
3	0.2151	0.04	9.72	7.23	16.99	53.01	-36.02	Average
4	0.2151	0.04	9.72	25.94	35.70	63.01	-27.31	QP
5	0.4282	0.07	9.75	19.23	29.05	47.29	-18.24	Average
6	0.4282	0.07	9.75	25.94	35.76	57.29	-21.53	QP
7	4.6709	0.16	9.91	24.48	34.55	46.00	-11.45	Average
8	4.6709	0.16	9.91	28.24	38.31	56.00	-17.69	QP
9	6.2282	0.16	10.00	27.19	37.35	50.00	-12.65	Average
10	6.2282	0.16	10.00	30.70	40.86	60.00	-19.14	QP
11	7.7875	0.16	10.09	27.94	38.19	50.00	-11.81	Average
12	7.7875	0.16	10.09	30.89	41.14	60.00	-18.86	QP



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## 7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215

Test Method: ANSI C63.10 (2013) Section 6.9.2

Limit:

For report reference only

### 7.2.1 E.U.T. Operation

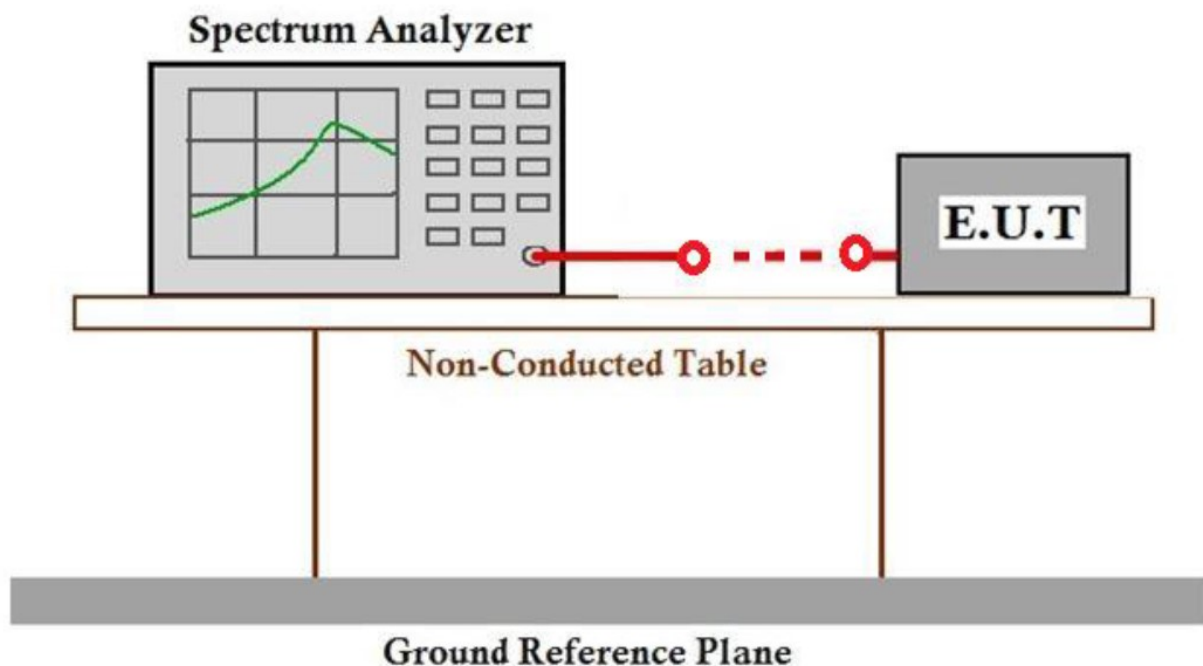
Operating Environment:

Temperature: 26.0 °C Humidity: 37.4 % RH Atmospheric Pressure: 1010 mbar

### 7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Charge mode_Keep the EUT in charging by adapter1 and reverse charging

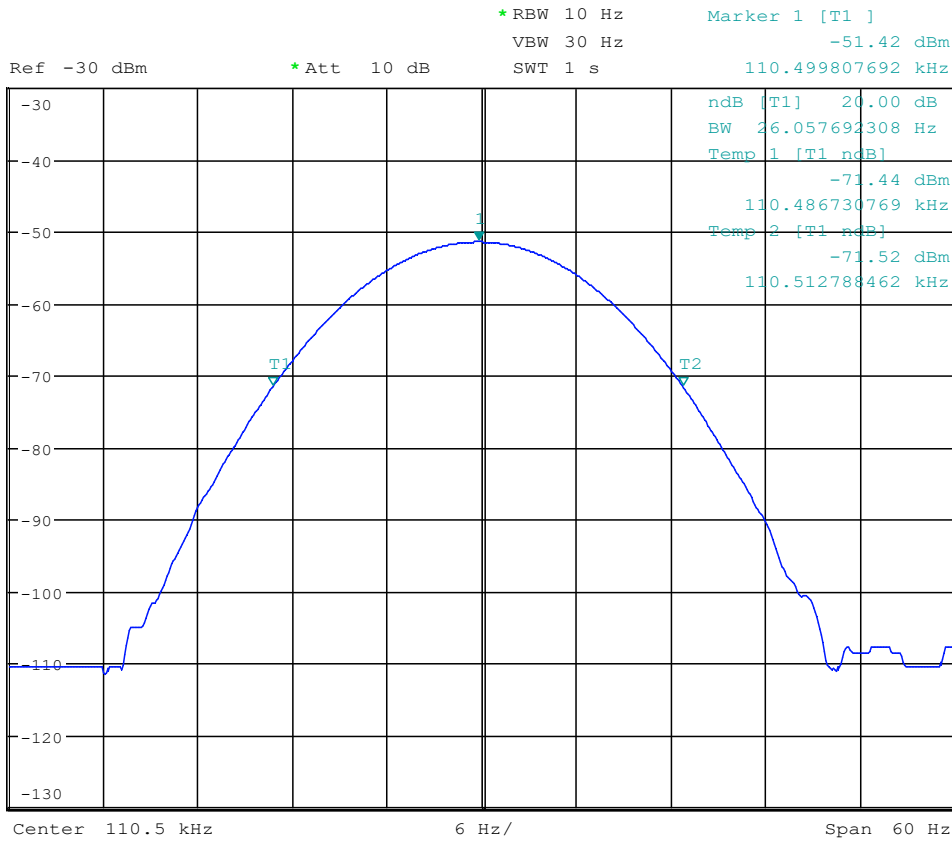
### 7.2.3 Test Setup Diagram



### 7.2.4 Measurement Procedure and Data



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### 7.3 Restricted Bands

Test Requirement 47 CFR Part 15, Subpart C 15.205  
 Test Method: ANSI C63.10 (2013) Section 6.10.5

Limit:

The fundamental wave could not fall in the restricted band 90KHz-110KHz

#### 7.3.1 E.U.T. Operation

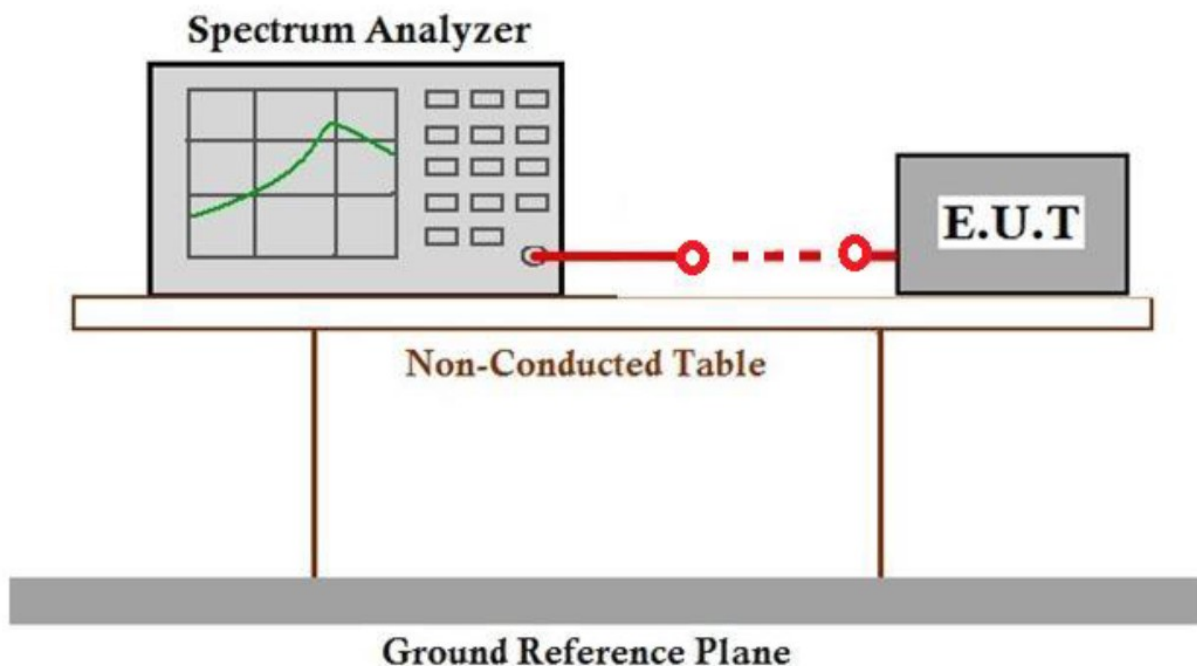
Operating Environment:

Temperature: 26.0 °C Humidity: 37.4 % RH Atmospheric Pressure: 1010 mbar

#### 7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Charge mode_Keep the EUT in charging by adapter1 and reverse charging

#### 7.3.3 Test Setup Diagram



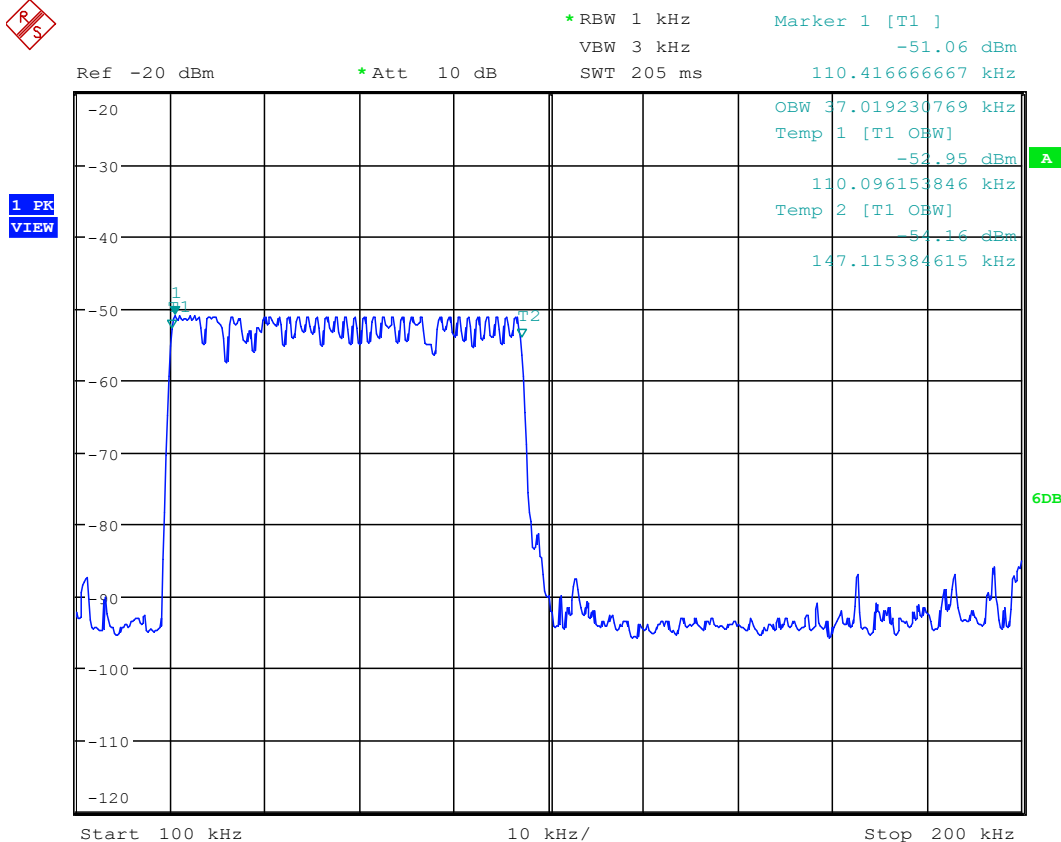
#### 7.3.4 Measurement Procedure and Data



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According the test data above, the fundamental wave is not fall in the restricted band 90KHz-110KHz, the field strength also meet the 15.209 requirement, please refer to clause 7.3.



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#### 7.4 Radiated Emissions (9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than  $\lambda/2\pi$  and the limit distance is greater than  $\lambda/2\pi$ , the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the  $\lambda/2\pi$  distance, and at a 20 dB/decade of distance rate beyond  $\lambda/2\pi$ . This shall be accomplished using Equation (2):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(\text{near field})}/d_{(10m)}\} + 20\log\{d_{(30/300m)}/d_{(\text{near field})}\} \quad (2)$$

If the single point measured is at a distance greater than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(10m)} = FS_{(30/300m)} + 20\log\{d_{(30/300m)}/d_{(10m)}\} \quad (3)$$

If both the single point and the limit distance are equal to or closer to the EUT than  $\lambda/2\pi$ , then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(30/300m)}/d_{(10m)}\} \quad (4)$$

Remark:

$$d_{\text{near field}} = 47.77 / f_{\text{MHz}}$$

where  $f_{\text{MHz}}$  is the frequency of the emission being measured in MHz.

##### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.2 °C

Humidity: 48 % RH

Atmospheric Pressure: 1010 mbar



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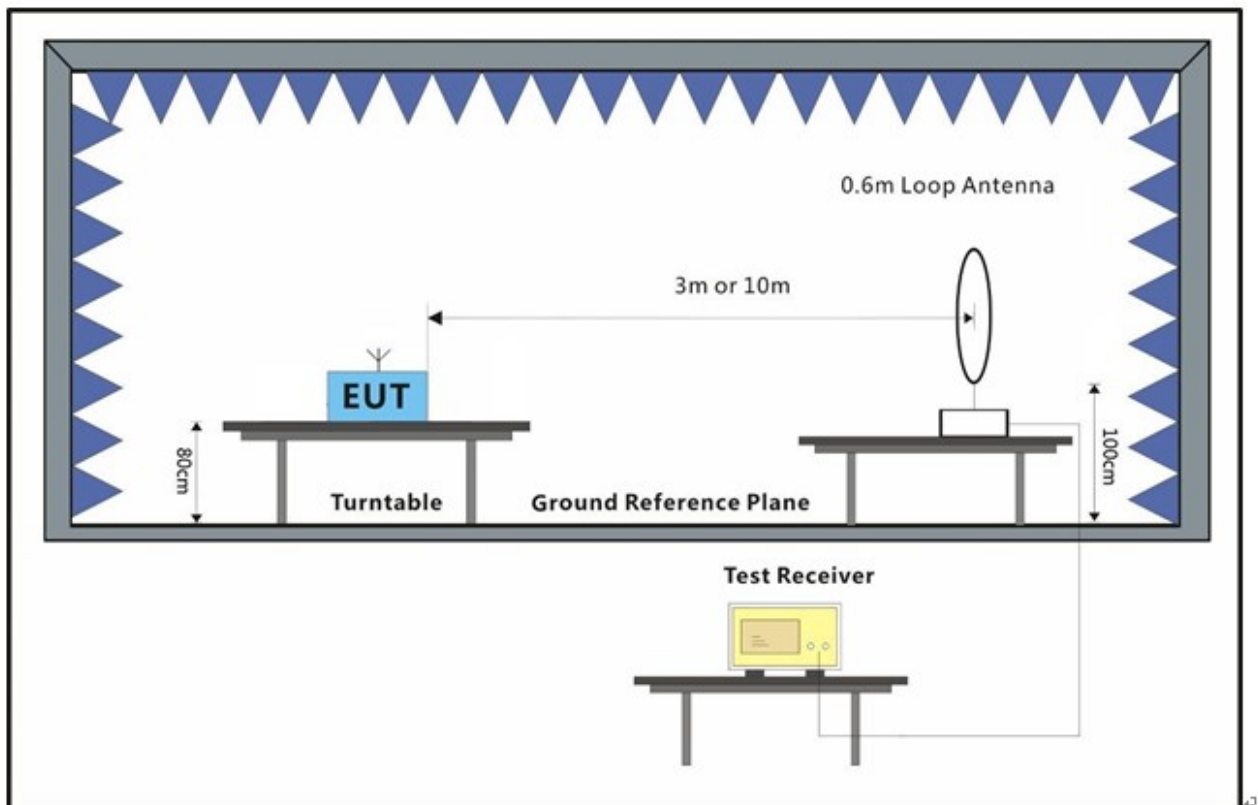
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#### 7.4.2 Test Mode Description

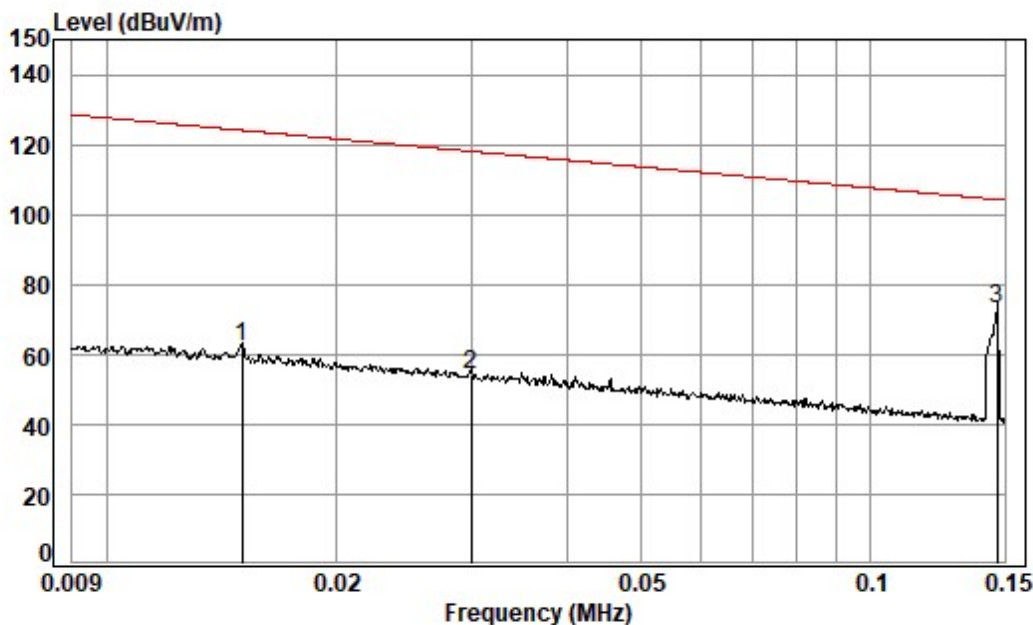
Pre-scan / Final test	Mode Code	Description
Final test	00	Charge mode_Keep the EUT in charging by adapter1 and reverse charging
Pre-scan	01	Charge mode_Keep the EUT in charging by adapter2 and reverse charging
Pre-scan	02	Charge mode_Keep the EUT in charging by adapter3 and reverse charging
Pre-scan	03	Charge mode_Keep the EUT in reverse charging

#### 7.4.3 Test Setup Diagram



#### 7.4.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



Condition: 3m  
Job No. : 12138CR  
Test Mode: 00

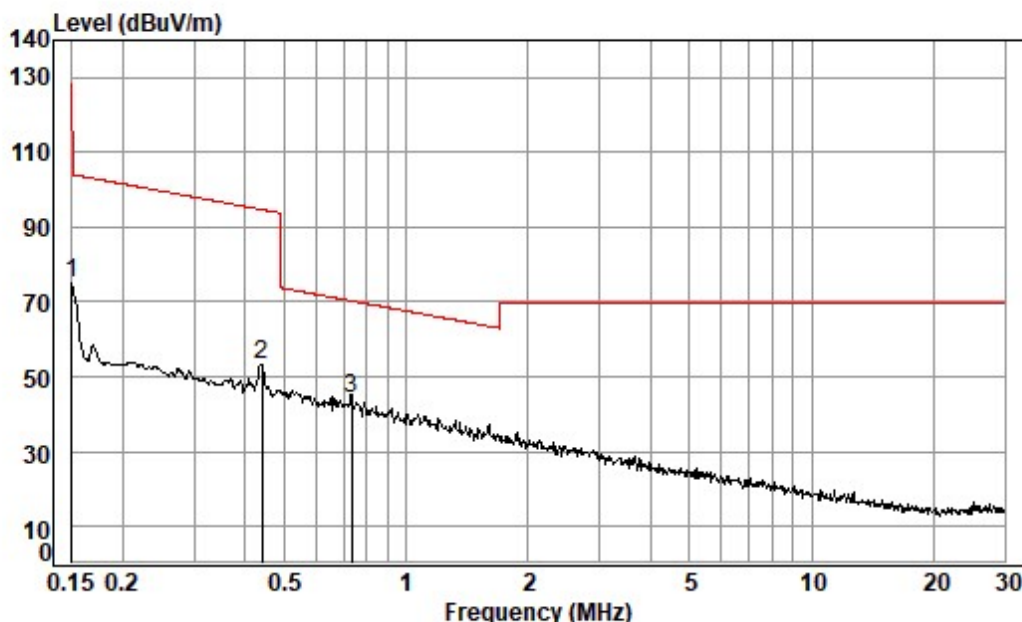


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Condition: 3m

Job No. : 12138CR

Test Mode: 00

Frequency (MHz)	Level @ 3m (dBuV/m)	Limit @ 300m (dBuV/m)	Limit @ 30m (dBuV/m)	Factor (dB)	Level @ 300m (dBuV/m)	Level @ 30m (dBuV/m)	Margin (dB)
0.01502	62.19	44.07	-	80.00	-17.81	-	-61.88
0.03001	54.03	38.06	-	80.00	-25.97	-	-64.03
0.14666	72.91	24.28	-	80.00	-7.09	-	-31.37
0.15000	74.98	24.08	-	80.00	-5.02	-	-29.10
0.44208	53.48	14.69	-	80.00	-26.52	-	-41.21
0.73519	44.38		30.28	40.00	-	4.38	-25.90

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor



## 7.5 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.3 °C

Humidity: 51.3 % RH

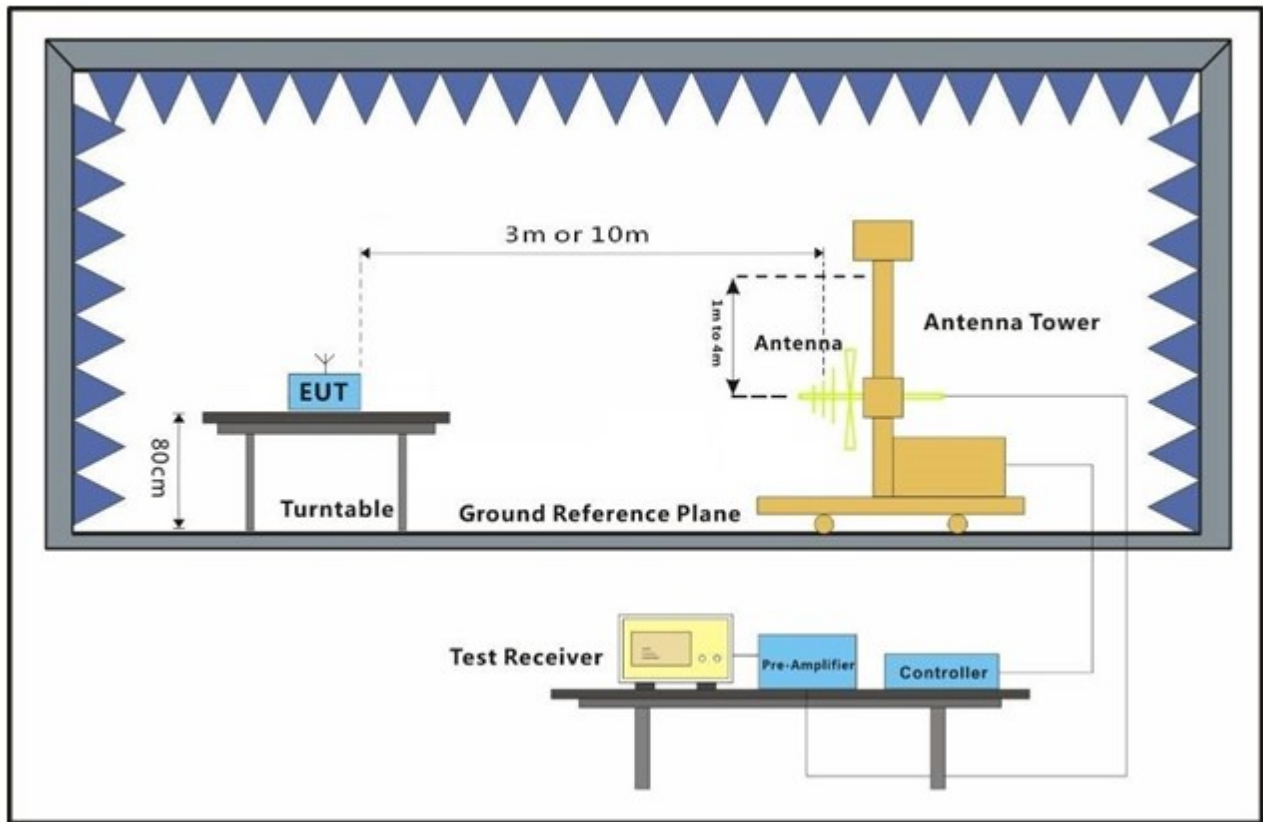
Atmospheric Pressure: 1010 mbar

### 7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Charge mode_Keep the EUT in charging by adapter1 and reverse charging
Final test	01	Charge mode_Keep the EUT in charging by adapter2 and reverse charging
Final test	02	Charge mode_Keep the EUT in charging by adapter3 and reverse charging
Final test	03	Charge mode_Keep the EUT in reverse charging



### 7.5.3 Test Setup Diagram





#### 7.5.4 Measurement Procedure and Data

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel,the middle channel,the Highest channel
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

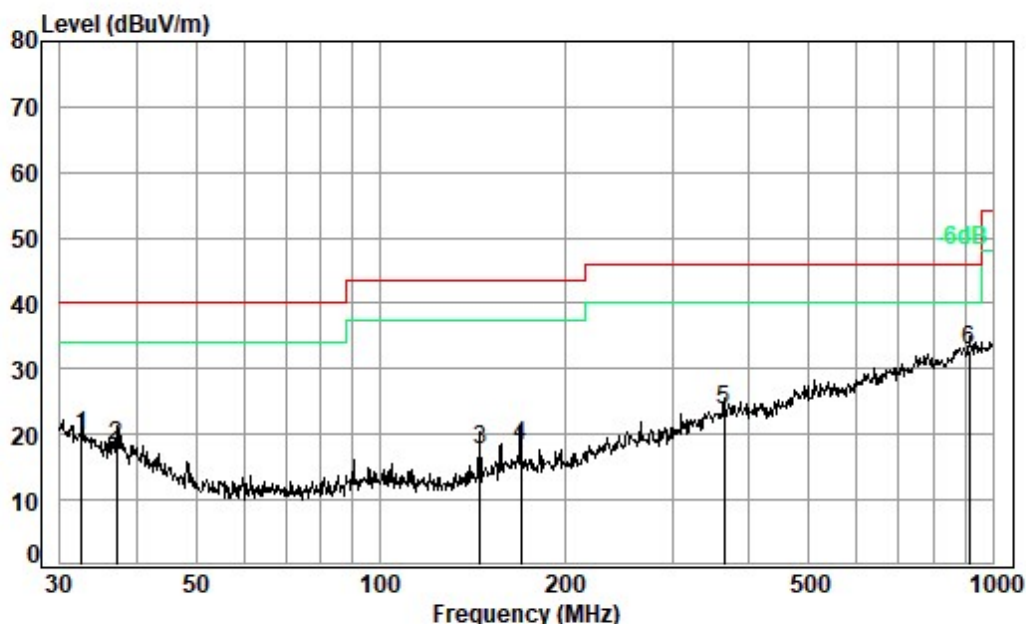


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Test Mode: 00; Polarity: Horizontal



Condition: 3m HORIZONTAL

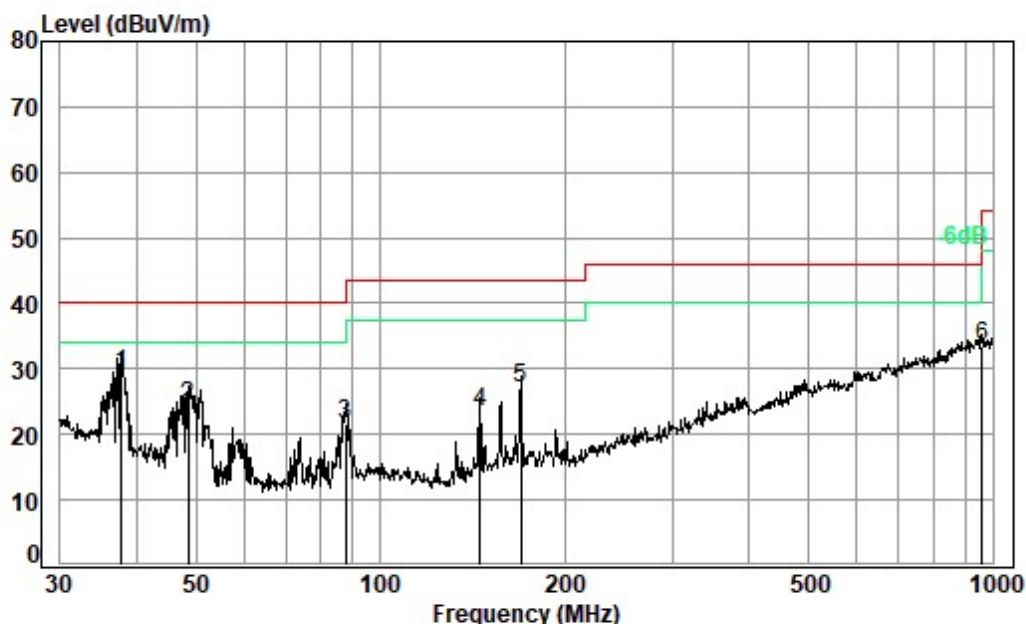
Job No. : 12138CR

Test Mode: 00

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	32.52	0.63	21.34	27.73	25.55	19.79	40.00	-20.21	QP
2	37.15	0.67	19.41	27.71	25.90	18.27	40.00	-21.73	QP
3	145.35	1.15	14.11	27.36	29.60	17.50	43.50	-26.00	QP
4	169.60	1.18	15.59	27.25	28.72	18.24	43.50	-25.26	QP
5	364.26	2.20	21.91	27.22	26.81	23.70	46.00	-22.30	QP
6 pp	916.07	3.52	29.14	27.08	27.26	32.84	46.00	-13.16	QP



Test Mode: 00; Polarity: Vertical



Condition: 3m VERTICAL

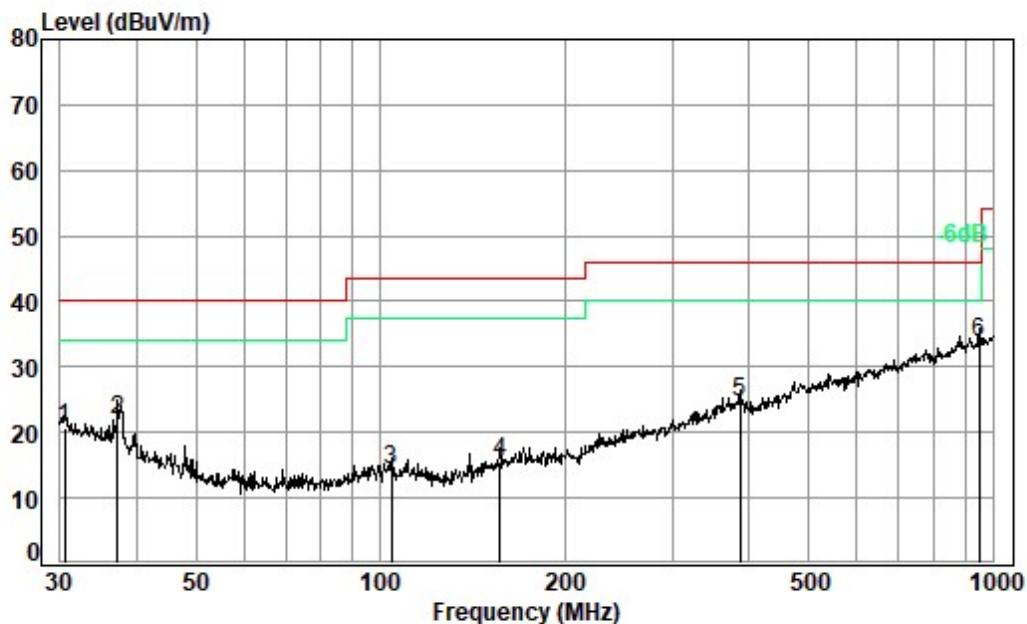
Job No. : 12138CR

Test Mode: 00

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	37.81	0.68	19.25	27.71	37.10	29.32	40.00	-10.68 QP
2	48.50	0.70	14.47	27.69	36.76	24.24	40.00	-15.76 QP
3	87.72	1.28	12.85	27.62	35.03	21.54	40.00	-18.46 QP
4	145.35	1.15	14.11	27.36	35.63	23.53	43.50	-19.97 QP
5	169.60	1.18	15.59	27.25	37.42	26.94	43.50	-16.56 QP
6	962.16	3.56	29.50	26.84	27.18	33.40	54.00	-20.60 QP



Test Mode: 01; Polarity: Horizontal



Condition: 3m HORIZONTAL

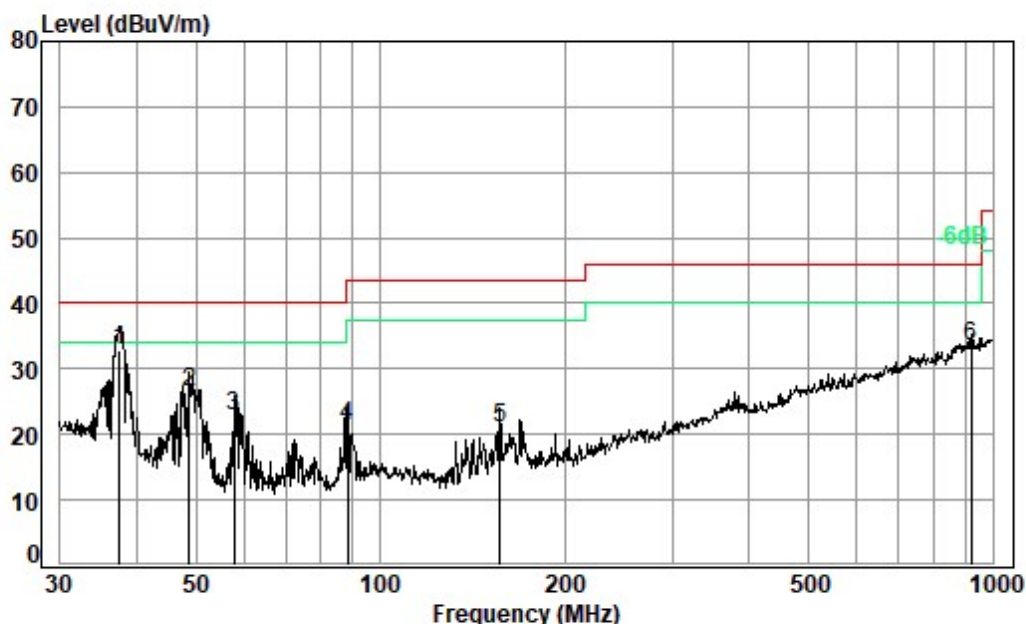
Job No. : 12138CR

Test Mode: 01

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.53	0.61	22.59	27.73	25.32	20.79	40.00	-19.21	QP
2	37.29	0.68	19.38	27.71	29.56	21.91	40.00	-18.09	QP
3	104.17	1.11	13.87	27.58	26.86	14.26	43.50	-29.24	QP
4	157.01	1.17	15.20	27.31	26.51	15.57	43.50	-27.93	QP
5	386.63	2.26	22.27	27.33	27.36	24.56	46.00	-21.44	QP
6 pp	948.76	3.55	29.33	26.91	27.83	33.80	46.00	-12.20	QP



Test Mode: 01; Polarity: Vertical



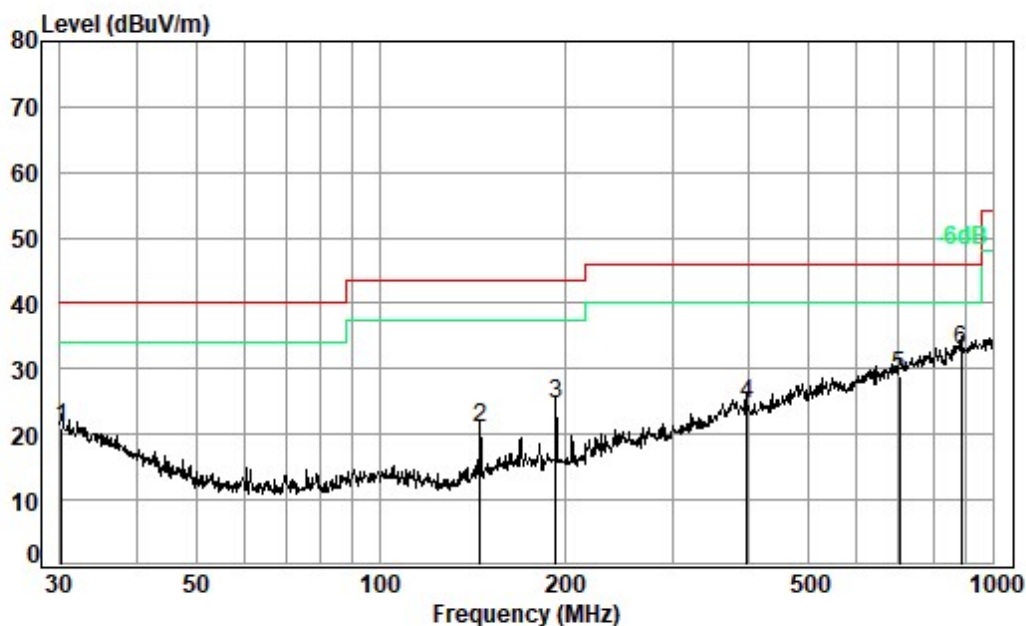
Condition: 3m VERTICAL

Job No. : 12138CR

Test Mode: 01

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp	37.55	0.68	19.31	27.71	40.60	32.88	40.00 -7.12 QP
2		48.84	0.70	14.39	27.68	39.04	26.45	40.00 -13.55 QP
3		57.80	0.78	13.17	27.67	36.45	22.73	40.00 -17.27 QP
4		88.34	1.28	12.93	27.62	34.64	21.23	43.50 -22.27 QP
5		157.01	1.17	15.20	27.31	31.94	21.00	43.50 -22.50 QP
6		922.52	3.52	29.20	27.05	27.72	33.39	46.00 -12.61 QP

Test Mode: 02; Polarity: Horizontal



Condition: 3m HORIZONTAL

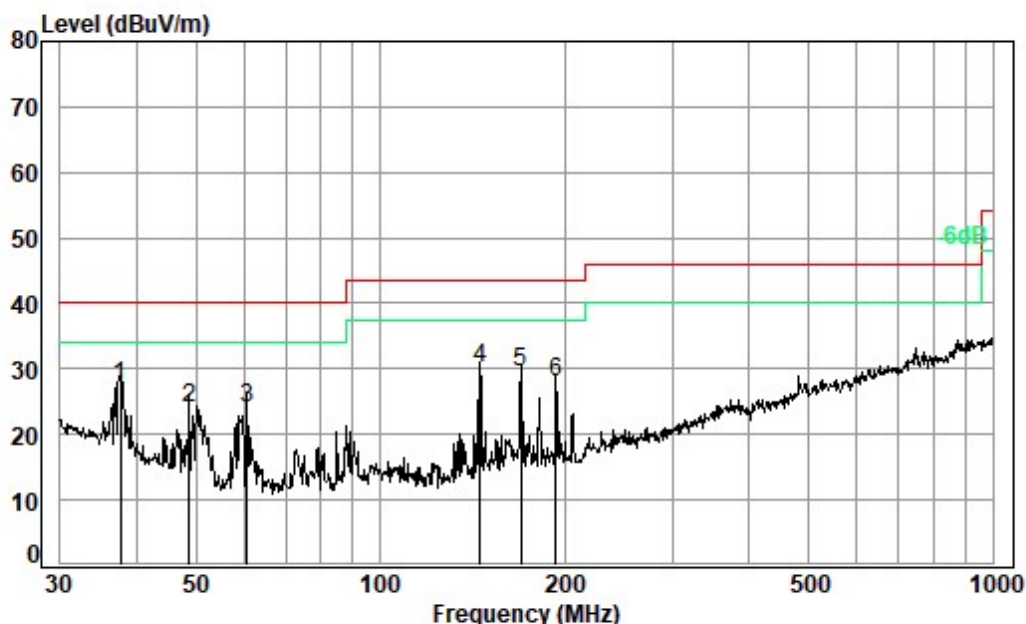
Job No. : 12138CR

Test Mode: 02

	Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.21	0.60	22.84	27.73	25.30	21.01	40.00 -18.99 QP
2	145.35	1.15	14.11	27.36	33.14	21.04	43.50 -22.46 QP
3	193.77	1.20	15.61	27.16	35.00	24.65	43.50 -18.85 QP
4	396.24	2.29	21.92	27.38	27.77	24.60	46.00 -21.40 QP
5	704.23	2.92	27.19	27.91	26.79	28.99	46.00 -17.01 QP
6 pp	887.61	3.48	29.02	27.23	27.70	32.97	46.00 -13.03 QP



Test Mode: 02; Polarity: Vertical



Condition: 3m VERTICAL

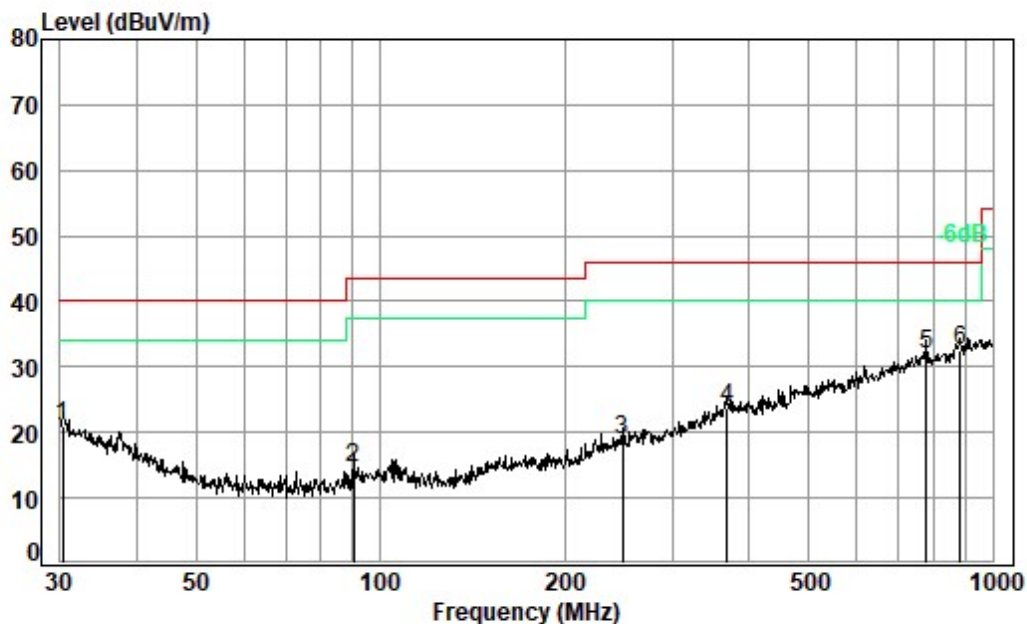
Job No. : 12138CR

Test Mode: 02

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp	37.68	0.68	19.28	27.71	35.07	27.32	40.00 -12.68 QP
2		48.84	0.70	14.39	27.68	36.73	24.14	40.00 -15.86 QP
3		60.49	0.80	12.85	27.66	38.02	24.01	40.00 -15.99 QP
4		145.35	1.15	14.11	27.36	42.20	30.10	43.50 -13.40 QP
5		169.60	1.18	15.59	27.25	39.95	29.47	43.50 -14.03 QP
6		193.77	1.20	15.61	27.16	38.27	27.92	43.50 -15.58 QP



Test Mode: 03; Polarity: Horizontal



Condition: 3m HORIZONTAL

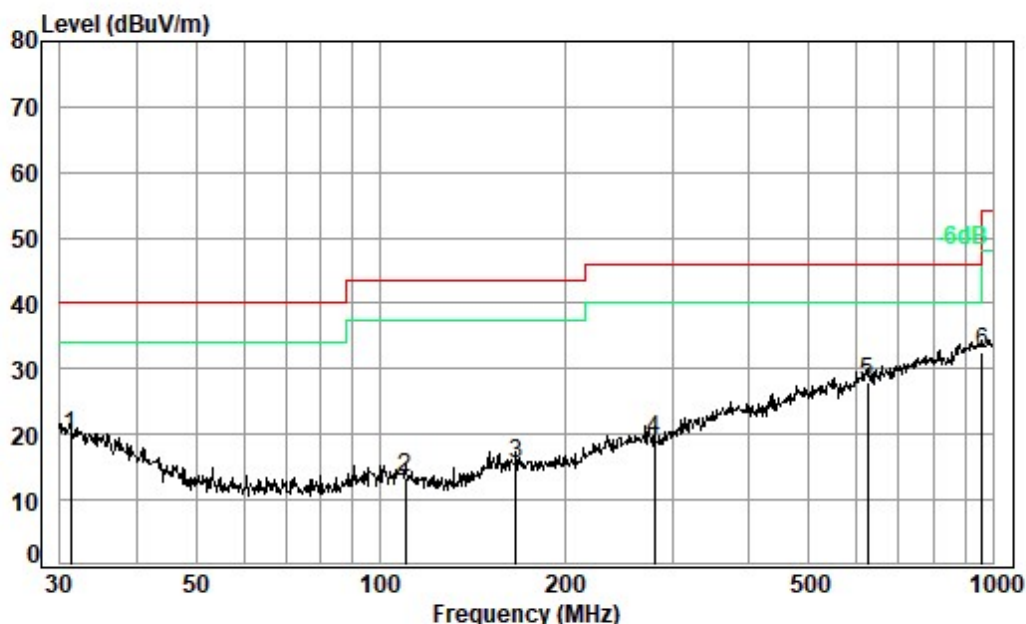
Job No. : 12138CR

Test Mode: 03

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.32	0.60	22.76	27.73	25.34	20.97	40.00	-19.03	QP
2	90.54	1.29	13.21	27.62	27.80	14.68	43.50	-28.82	QP
3	248.55	1.63	18.14	27.00	26.01	18.78	46.00	-27.22	QP
4	368.11	2.21	22.11	27.24	26.61	23.69	46.00	-22.31	QP
5	779.61	3.22	28.10	27.77	28.47	32.02	46.00	-13.98	QP
6 pp	884.50	3.47	29.05	27.25	27.23	32.50	46.00	-13.50	QP



Test Mode: 03; Polarity: Vertical



Condition: 3m VERTICAL

Job No. : 12138CR

Test Mode: 03

	Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	31.18	0.61	22.10	27.73	24.75	19.73	40.00 -20.27 QP
2	109.80	1.11	13.71	27.55	26.13	13.40	43.50 -30.10 QP
3	166.65	1.17	15.53	27.27	25.95	15.38	43.50 -28.12 QP
4	280.02	1.86	18.40	26.92	25.83	19.17	46.00 -26.83 QP
5 pp	625.08	2.75	26.60	28.07	26.80	28.08	46.00 -17.92 QP
6	962.16	3.56	29.50	26.84	26.29	32.51	54.00 -21.49 QP



## 8 Test Setup Photo

Please refer to setup photos.

### 8.1 EUT Constructional Details (EUT Photos)

Please refer to external and internal photos for details.

- End of the Report -



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