



# FCC Radio Test Report

**FCC ID** : 2AVPL-CUBSCOUT  
**Equipment** : Server  
**Brand Name** : AWS  
**Model Name** : CubScout  
**Applicant** : Amazon Data Services, Inc.  
410 Terry Ave N Seattle Washington United States 98109  
**Manufacturer** : Foxconn Interconnect Technology Limited Taiwan Branch  
NO.66-1, JHONGSHAN RD., TUCHENG DIST., NEW TAIPEI  
CITY 236, TAIWAN (R.O.C.)  
**Standard** : 47 CFR FCC Part 15.225

The product was received on Dec. 21, 2021, and testing was started from Dec. 27, 2021 and completed on Dec. 31, 2021. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.

Approved by: Jackson Tsai

**SPORTON INTERNATIONAL INC. Hsinhua Laboratory**  
No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)



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**PHOTOGRAPHS OF EUT V01**



### History of this test report

Report No.	Version	Description	Issued Date
FR181018AR	01	Initial issue of report	Jan. 19, 2022



### Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.215(c)	Emission Bandwidth	PASS	-
3.3	15.225(e)	Frequency Stability	PASS	-
3.4	15.225(a)~(d)	Field Strength of Fundamental Emissions and Spectrum Mask	PASS	-
3.5	15.225(d)	Transmitter Radiated Unwanted Emissions	PASS	-

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and explanations:**

The EUT is considered a class A digital device according to the FCC 15.3 definition, Please refer to the Appendix H for the analysis method to exclude the non-RF signal.

**Reviewed by: Ben Tseng**

**Report Producer: Ann Hou**



# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

RF General Information					
Frequency Range(MHz)	Type	Mode	Ch. Frequency (MHz)	Channel Number	Field Strength (dBuV/m)
13.553 – 13.567	NFC-A (ISO 14443-3A)	NFC	13.56	1	57.02

Note :

- ◆ Field strength performed peak level at 3m.
- ◆ Uses a ASK modulation.

### 1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type
1	Smart Approach Co., Ltd.	Macaron N Series SM-MFAD4-C02	Loop
2	Smart Approach Co., Ltd.	Macaron N Series SM-MFAD4-C02	Loop

Note 1: The EUT has two antennas.

#### For NFC mode (2T/2R)

Ant. 1 and Ant. 2 could transmit/receive simultaneously.

### 1.1.3 EUT Information

Operational Condition	
EUT Power Type	From Switching Power Supply / DC Power supply
Type of EUT	
<input checked="" type="checkbox"/>	Stand-alone
<input type="checkbox"/>	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.:
<input type="checkbox"/>	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.:
<input type="checkbox"/>	Other:



1.1.4 Test Signal Duty Cycle

Duty Cycle Operation Restriction	
The transmitter is used for	The transmitter is operated
<input checked="" type="checkbox"/> Inductive applications	<input checked="" type="checkbox"/> Automatically triggered
<input type="checkbox"/> Duty cycle fixed mode	<input checked="" type="checkbox"/> Duty cycle random mode
<input checked="" type="checkbox"/> <b>Duty cycle mode - NFC-A (ISO 14443-3A)</b>	
Declare transmitter duty cycle / 1 hour =	100%
<input type="checkbox"/> <b>Duty cycle mode - NFC-B (ISO 14443-3B)</b>	
Declare transmitter duty cycle / 1 hour =	100%
<input type="checkbox"/> <b>Duty cycle mode - NFC-F (ISO 18092)</b>	
Declare transmitter duty cycle / 1 hour =	100%
<input type="checkbox"/> <b>Duty cycle mode - NFC-V (ISO 15693)</b>	
Declare transmitter duty cycle / 1 hour =	100%

1.1.5 Table for Multiple Listing

Configuration 1

Component	Manufacturer	Model / Description	Qty
Chassis	Foxconn	1U Chassis	1
Mother Board	Foxconn	SPARROW, 1 Socket	1
CPU	Annapurna	Carmel-SoC, 2.5GHz, 64C, 225W	1
Memory	Hynix	RDIMM, 16G, 3200, DDR4	8
HDD Drive	Intel	S4510 SSD,1.0TB	1
PCIE card	Annapurna	K2V4-N NIC Card	1
	Annapurna	K2C-AB, Storage Card	1
	Marvell	VDU-CNF95350-PCIE / Marvell Olympus Accelerator, CNF95O card	1
NFC Module	SMART	Atlanta NFC Reader	1
PSU	Delta	DPS-1300AB-36 B (1300W)	2

**Configuration 2**

Component	Manufacturer	Model / Description	Qty
Chassis	Foxconn	1U Chassis	1
Mother Board	Foxconn	SPARROW, 1 Socket	1
CPU	Annapurna	Carmel-SoC, 2.5GHz, 64C, 225W	1
Memory	Hynix	RDIMM, 16G, 3200, DDR4	8
HDD Drive	Samsung	PM883 SSD,1.92TB	2
PCIE card	Annapurna	K2V4-N NIC Card	1
	Annapurna	K2C-AB, Storage Card	1
	Hyve	Scout LAN SWITCH / 1GbE LAN Switch board	1
NFC Module	SMART	Atlanta NFC Reader	1
PSU	Liteon	PS-2162-6H2R (1600W)	2

**Configuration 3**

Component	Manufacturer	Model / Description	Qty
Chassis	Foxconn	1U Chassis	1
Mother Board	Foxconn	SPARROW, 1 Socket	1
CPU	Annapurna	Carmel-SoC, 2.5GHz, 64C, 225W	1
Memory	Hynix	RDIMM, 16G, 3200, DDR4	8
HDD Drive	Samsung	PM883 SSD,1.92TB	1
PCIE card	Annapurna	K2V4-N NIC Card	1
	Annapurna	K2C-AB, Storage Card	1
	Hyve	Scout LAN SWITCH / 1GbE LAN Switch board	1
NFC Module	SMART	Atlanta NFC Reader	1
PSU	Liteon	DD-2162-18LR (DC1600W)	2

All configurations were pretested and config #2 & #3 was found to be the worst case and measured during the test.



## 1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF:

- ◆ KDB 414788 D01 v01r01

## 1.3 Testing Location Information

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
<input checked="" type="checkbox"/>	Hsinhua (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)		
		TEL: 886-3-327-3456	FAX: 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Daniel Lin	21.7~22.1°C / 51~54%	31/Dec/2021
RF Conducted	TH07-HY	Vivi Jiang	20.1~26.9°C / 50~60%	30/Dec/2021
Radiated	03CH02-HY	Daniel Lin	20.3~21.2°C / 56~60%	27/Dec/2021~29/Dec/2021
<input type="checkbox"/>	Wen 33rd.St. (TAF: 3785)	ADD: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)		
		TEL: 886-3-318-0787	FAX: 886-3-318-0287	
Test site Designation No. TW0008 with FCC.				

## 1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	0.9 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.7 dB	Confidence levels of 95%
Conducted Emission	1.0 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%





## 2 Test Configuration of EUT

### 2.1 Test Condition

Condition Item	Abbreviation/Remark	Remark
TnomVnom	Tnom	20°C
	Vnom	220V
Freq. Stability	Abbreviation	Remark
-20°C	-	-
-10°C	-	-
0°C	-	-
10°C	-	-
20°C	-	-
30°C	-	-
40°C	-	-
50°C	-	-
20°C-253V	-	-
20°C-220V	-	-
20°C-187V	-	-

### 2.2 Test Channel Mode


Test Software Version	Dos v6.1
-----------------------	----------

Mode	Power Setting
NFC	-
13.56MHz	default

### 2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
<b>Tests Item</b>	AC power-line conducted emissions
<b>Condition</b>	AC power-line conducted measurement for line and neutral Test Voltage: 220Vac / 60Hz
<b>Operating Mode</b>	CTX
	1. Switching Power Supply mode
	2. DC Power Supply mode

The Worst Case Mode for Following Conformance Tests	
<b>Tests Item</b>	Emission Bandwidth, Frequency Stability
<b>Test Condition</b>	Conducted measurement

The Worst Case Mode for Following Conformance Tests	
<b>Tests Item</b>	Field Strength of Fundamental Emissions Transmitter Radiated Unwanted Emissions
<b>Test Condition</b>	Radiated measurement
<b>Pretest Mode</b>	<input checked="" type="checkbox"/> 1. NFC-A (ISO 14443-3A)
	<input type="checkbox"/> 2. NFC-B (ISO 14443-3B)
	<input type="checkbox"/> 3. NFC-F (ISO 18092)
	<input type="checkbox"/> 4. NFC-V (ISO 15693)
<b>Operating Mode</b>	CTX
	1. Switching Power Supply mode
	2. DC Power Supply mode
<b>Orthogonal Planes of EUT</b>	<b>Z Plane</b>
	



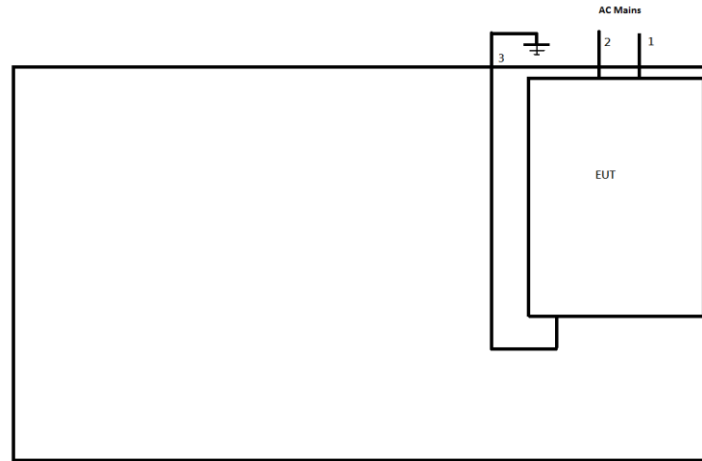
## 2.4 Support Equipment

Support Equipment – AC Conduction					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Programmable DC power supply	Chroma	62024P-100-50	-	-
2	AC Power cable*2	Power sync	PW-GPC180-3	-	-
3	GND Cable	Sporton	Sporton	-	-

Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Programmable DC power supply	Chroma	62024P-100-50	-	-
2	AC Power cable*2	Power sync	PW-GPC180-3	-	-
3	GND Cable	Sporton	Sporton	-	-

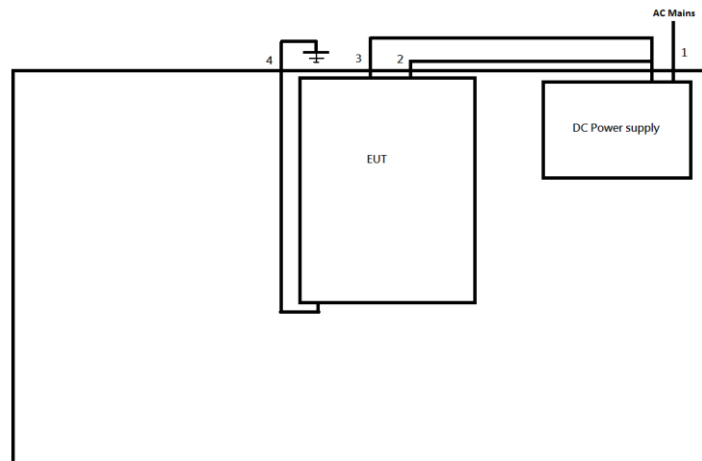
## 2.5 Test Setup Diagram

**Test Setup Diagram – AC Line Conducted Emission Test (Switching Power Supply mode)**



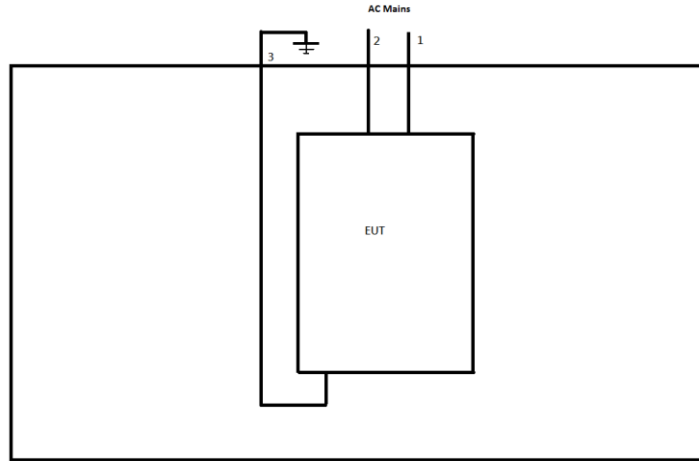
Item	Connection	Shielded	Length(m)
1	AC Power Cable	No	1.8
2	AC Power Cable	No	1.8
3	GND Cable	No	2.0

**Test Setup Diagram – AC Line Conducted Emission Test (DC Power Supply mode)**



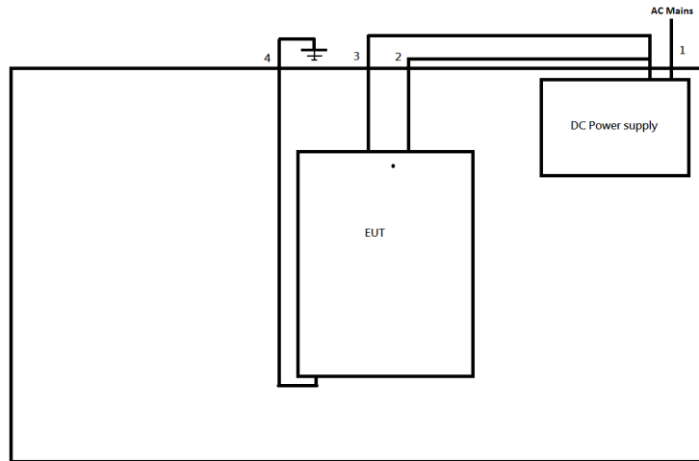
Item	Connection	Shielded	Length(m)
1	AC Power Cable	No	1.8
2	DC Power Cable	No	3.0
3	DC Power Cable	No	3.0
4	GND Cable	No	2.0

**Test Setup Diagram - Radiated Test (Switching Power Supply mode)**



Item	Connection	Shielded	Length(m)
1	AC Power Cable	No	1.8
2	AC Power Cable	No	1.8
3	GND Cable	No	2.0

**Test Setup Diagram - Radiated Test (DC Power Supply mode)**



Item	Connection	Shielded	Length(m)
1	AC Power Cable	No	1.8
2	DC Power Cable	No	3.0
3	DC Power Cable	No	3.0
4	GND Cable	No	2.0



### 3 Transmitter Test Result

#### 3.1 AC Power-line Conducted Emissions

##### 3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: \* Decreases with the logarithm of the frequency.

##### 3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

##### 3.1.3 Test Procedures

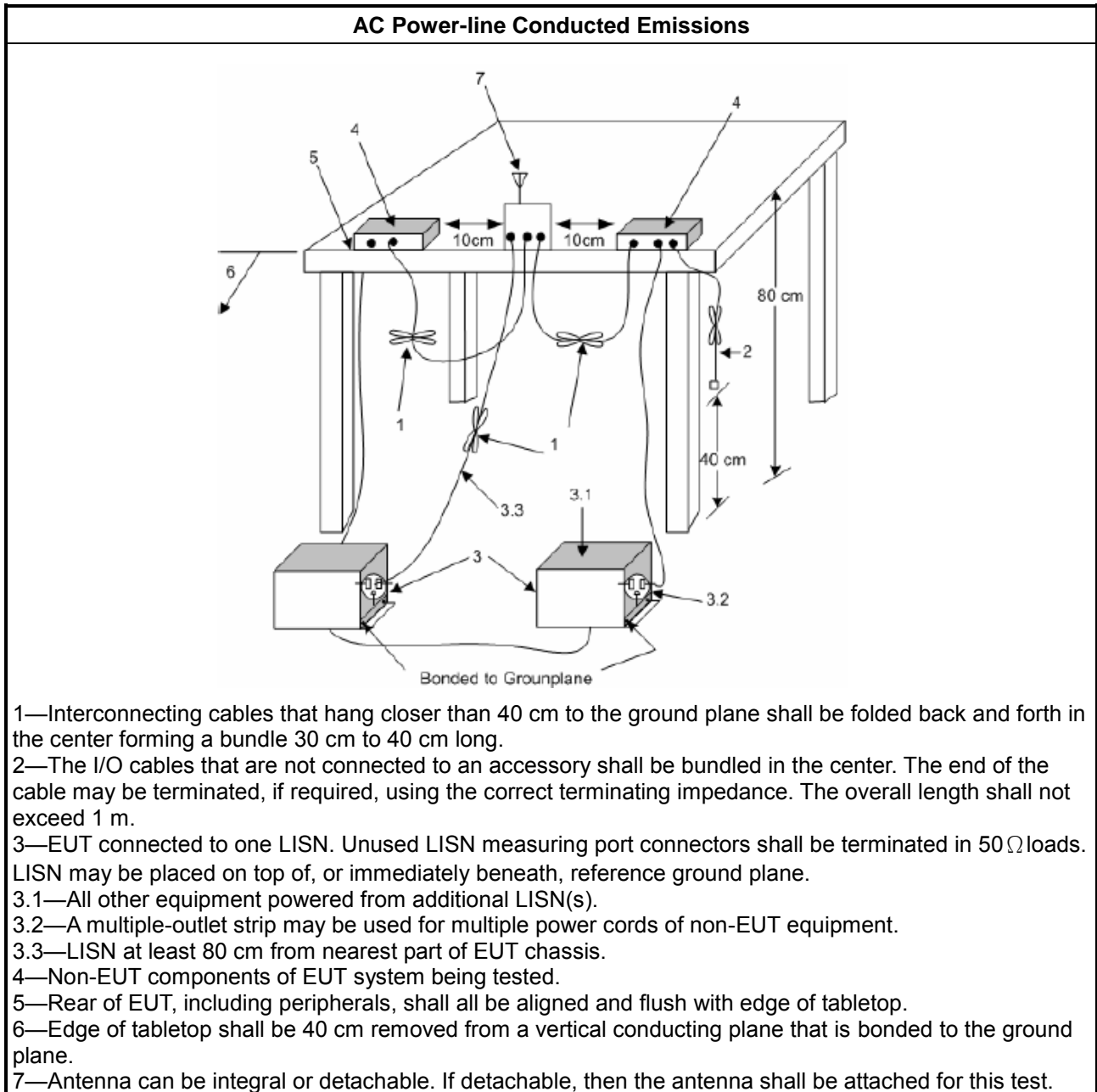
Test Method	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.
<input checked="" type="checkbox"/>	If AC conducted emissions fall in operating band, then following below test method confirm final result.
<input type="checkbox"/>	Accept measurements done with a suitable dummy load replacing the antenna under the following conditions: (1) Perform the AC line conducted tests with the antenna connected to determine compliance with FCC 15.207 limits outside the transmitter's fundamental emission band; (2) Retest with a dummy load to determine compliance with FCC 15.207 limits within the transmitter's fundamental emission band.
<input checked="" type="checkbox"/>	For a device with a permanent antenna operating at or below 30 MHz, accept measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) Perform the AC line conducted tests with the permanent antenna to determine compliance with the FCC 15.207 limits outside the transmitter's fundamental emission band; (2) Retest with a dummy load in lieu of the permanent antenna to determine compliance with the FCC 15.207 limits within the transmitter's fundamental emission band.

##### 3.1.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + LISN(LISN Factor) + CL(Cable Loss) + AT(Attenuator).

### 3.1.5 Test Setup



### 3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

### 3.2 Emission Bandwidth

#### 3.2.1 Emission Bandwidth Limit

20dB Bandwidth Limit	
<input checked="" type="checkbox"/>	Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (13.553 – 13.567).

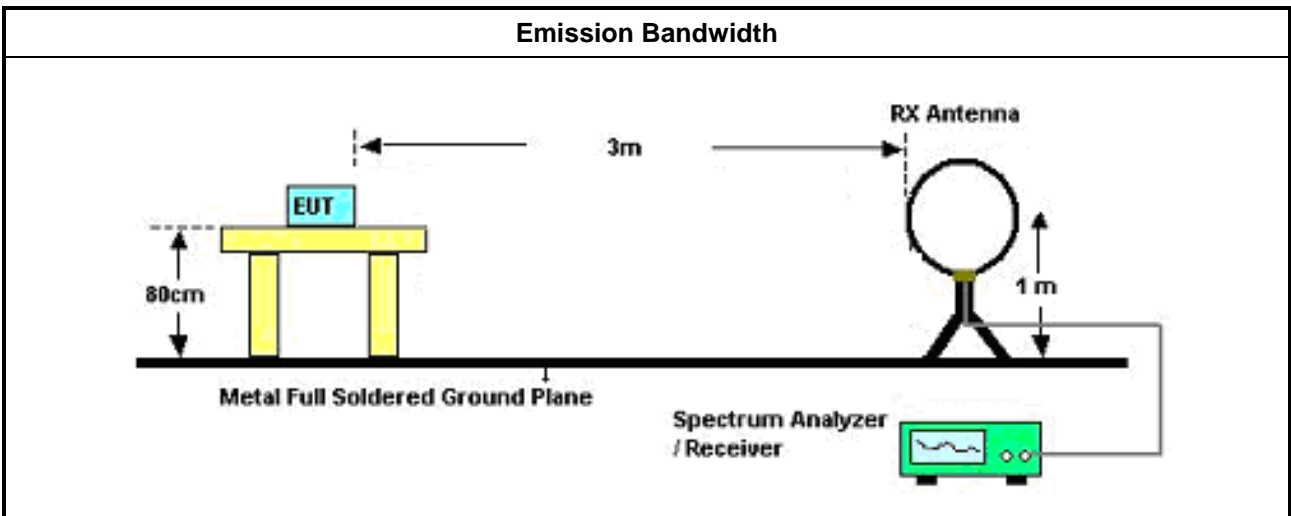
#### 3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

#### 3.2.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Because the measured signal is CW or CW-like adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.
<input checked="" type="checkbox"/>	For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.

#### 3.2.4 Test Setup



#### 3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B



### 3.3 Frequency Stability

#### 3.3.1 Frequency Stability Limit

Frequency Stability Limit	
<input checked="" type="checkbox"/>	Carrier frequency stability shall be maintained to $\pm 0.01\%$ ( $\pm 100$ ppm).

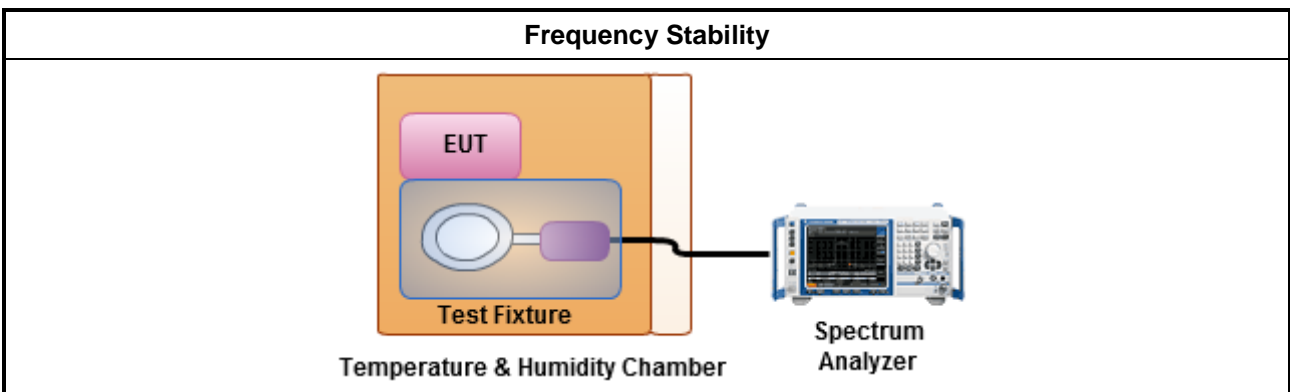
#### 3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

#### 3.3.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.8 for frequency stability tests
<input checked="" type="checkbox"/>	Frequency stability with respect to ambient temperature
<input checked="" type="checkbox"/>	Frequency stability when varying supply voltage
<input type="checkbox"/>	For conducted measurement.
<input checked="" type="checkbox"/>	For radiated measurement. The equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted power level.

#### 3.3.4 Test Setup



#### 3.3.5 Test Result of Frequency Stability

Refer as Appendix D



### 3.4 Field Strength of Fundamental Emissions and Spectrum Mask

#### 3.4.1 Field Strength of Fundamental Emissions and Spectrum Mask Limit

Field Strength of Fundamental Emissions					
Emissions	(uV/m)@30m	(dBuV/m)@30m	(dBuV/m)@10m	(dBuV/m)@3m	(dBuV/m)@1m
fundamental	15848	84.0	103.1	124.0	143.1
Quasi peak measurement of the fundamental.					

Spectrum Mask					
Freq. of Emission (MHz)	(uV/m)@30m	(dBuV/m)@30m	(dBuV/m)@10m	(dBuV/m)@3m	(dBuV/m)@1m
1.705~13.110	30	29.5	48.6	69.5	88.6
13.110~13.410	106	40.5	59.6	80.5	99.6
13.410~13.553	334	50.5	69.6	90.5	109.6
13.553~13.567	15848	84.0	103.1	124.0	143.1
13.567~13.710	334	50.5	69.6	90.5	109.6
13.710~14.010	106	40.5	59.6	80.5	99.6
14.010~30.000	30	29.5	48.6	69.5	88.6

#### 3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

#### 3.4.3 Test Procedures

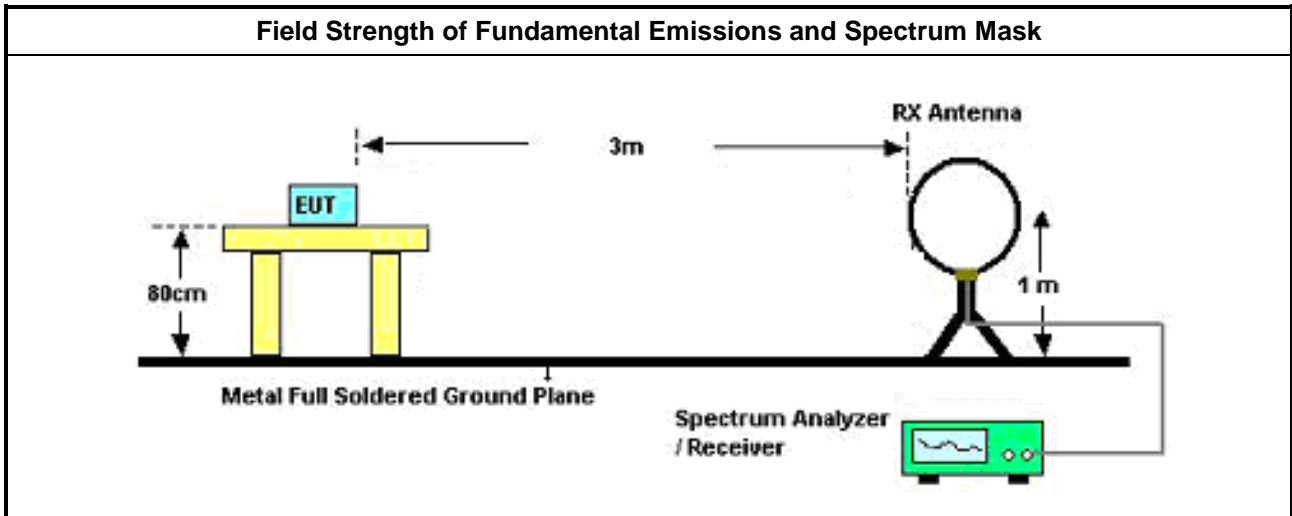
Test Method	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz and test distance is 3m.
<input checked="" type="checkbox"/>	At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the requirements; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be following below methods.
<input type="checkbox"/>	The results shall be extrapolated to the specified distance by making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.
<input checked="" type="checkbox"/>	The results shall be by using the square of an inverse linear distance extrapolation factor (40 dB/decade).
<input checked="" type="checkbox"/>	For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.

#### 3.4.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor).

### 3.4.5 Test Setup



### 3.4.6 Test Result of Field Strength of Fundamental Emissions and Spectrum Mask

Refer as Appendix C



### 3.5 Transmitter Radiated Unwanted Emissions

#### 3.5.1 Transmitter Radiated Unwanted Emissions Limit

Transmitter Radiated Unwanted Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

#### 3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.



3.5.3 Test Procedures

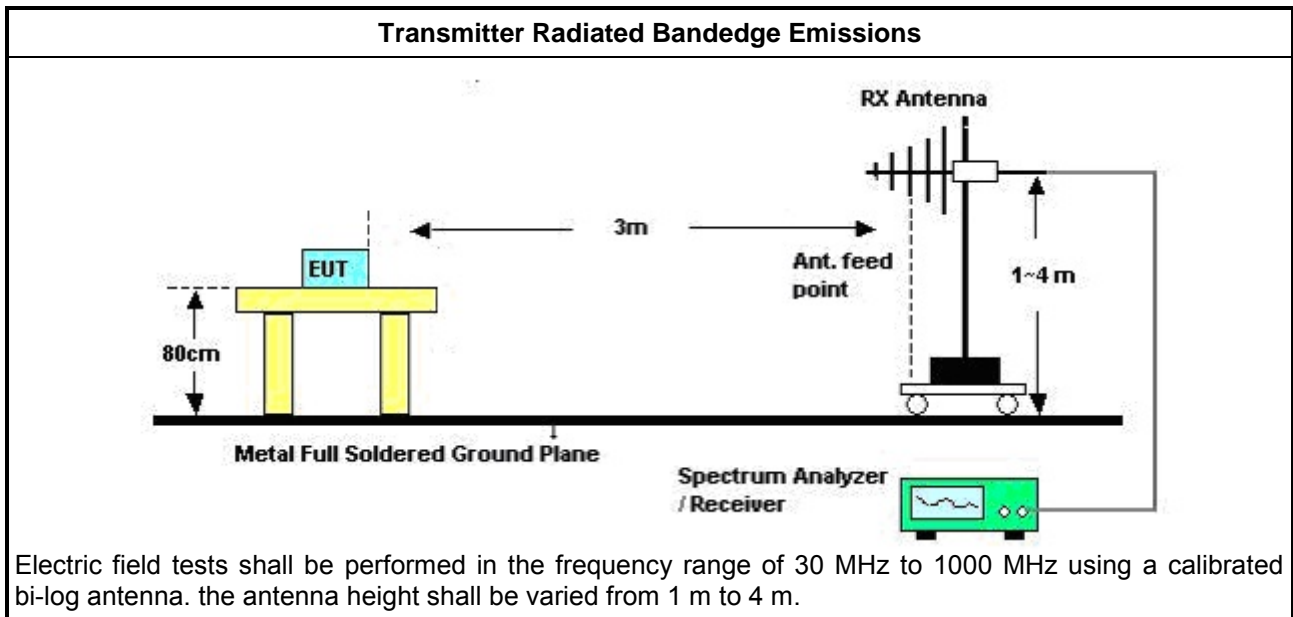
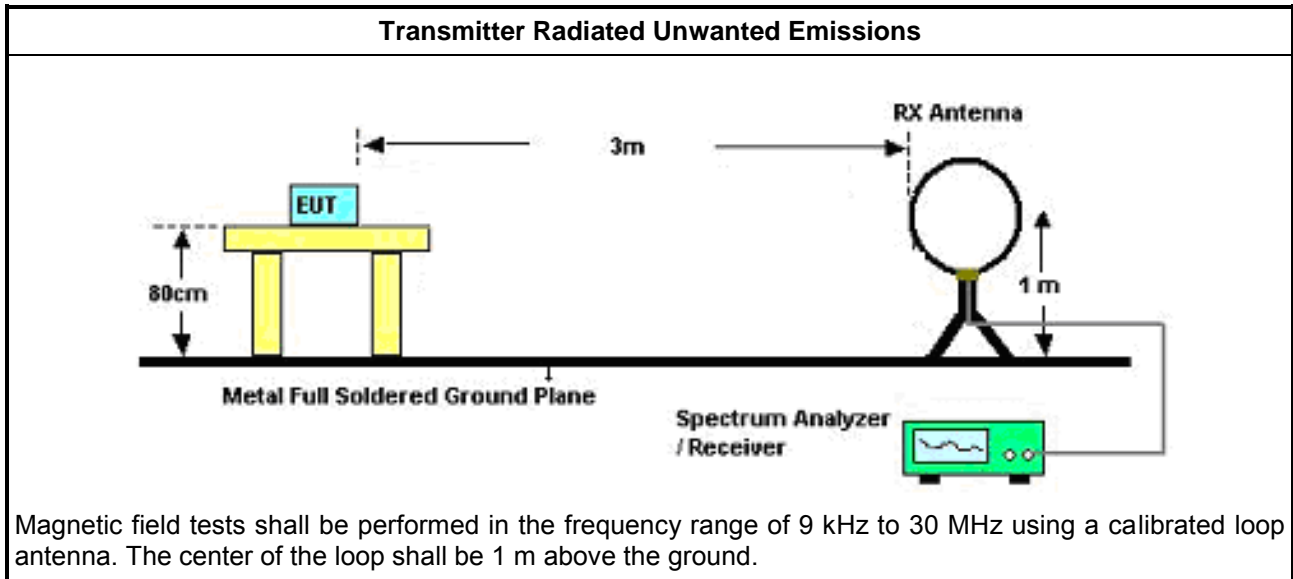
Test Method	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz and test distance is 3m.
<input checked="" type="checkbox"/>	At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the requirements; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be following below methods.
<input type="checkbox"/>	The results shall be extrapolated to the specified distance by making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.
<input checked="" type="checkbox"/>	The results shall be by using the square of an inverse linear distance extrapolation factor (40 dB/decade).
<input checked="" type="checkbox"/>	For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.
<input checked="" type="checkbox"/>	The any unwanted emissions level shall not exceed the fundamental emission level.
<input checked="" type="checkbox"/>	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.
<input checked="" type="checkbox"/>	KDB 414788 D01 v01r01 Open-Field Test Sites and Chamber Correlation Justification.
<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Based on FCC 15.31(f)(2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field.</li> </ul>
<input type="checkbox"/>	<ul style="list-style-type: none"> <li>Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.</li> </ul>

3.5.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

### 3.5.5 Test Setup



### 3.5.6 Transmitter Radiated Unwanted Emissions

Refer as Appendix C



## 4 Test Equipment and Calibration Data

### Instrument for AC Conduction

Instrument	Manufacturer / Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR	102052	9kHz ~ 3.6GHz	19/Apr/2021	18/Apr/2022
LISN	R&S	ENV216	100003	9kHz ~ 30MHz	23/Dec/2021	22/Dec/2022
RF Cable 5m	TITAN	TITAN	CO04-cable-01	0.1MHz~200MHz	03/Mar/2021	02/Mar/2022
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	26/Oct/2021	25/Oct/2022
SENSE-EMI	Sporton	V5.10.7.14	N/A	N/A	N/A	N/A

### Instrument for Conducted Test

Instrument	Manufacturer / Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	13/Aug/2021	12/Aug/2022
Programmable Temp. & Humi. Chamber	Giant Force	GTH-225-40-CP-AR	MAA1311-008	-40~100°C	08/Jun/2021	07/Jun/2022
SENSE-NFC	Sporton	v5.10.4	N/A	N/A	N/A	N/A

### Instrument for Radiated Test

Instrument	Manufacturer / Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	02/Aug/2021	01/Aug/2022
Signal Analyzer	R&S	FSP40	100593	9kHz~40GHz	12/Mar/2021	11/Mar/2022
Amplifier	Agilent	8447D	2944A11149	100kHz~1.3GHz	29/Jun/2021	28/Jun/2022
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz~1GHz	04/Sep/2021	03/Sep/2022
RF Cable	MVE	400LL	MVE-1-0802	9kHz~30MHz	05/May/2021	04/May/2022
RF Cable	MVE	400LL	MVE-1-0802	30MHz~1GHz	05/May/2021	04/May/2022
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2021	15/Mar/2022
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	19/Apr/2021	18/Apr/2022
SENSE-NFC	Sporton	v5.10.4	N/A	N/A	N/A	N/A



**Summary**

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	490.912k	42.25	46.15	-3.90	Line
Mode 2	Pass	AV	2.283M	42.13	46.00	-3.87	Neutral





Result

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	207.263k	62.54	-	-	Line	-
Mode 1	Pass	AV	207.263k	54.53	-	-	Line	-
Mode 1	Pass	QP	275.179k	52.97	60.95	-7.98	Line	-
Mode 1	Pass	AV	275.179k	41.43	50.95	-9.52	Line	-
Mode 1	Pass	QP	342.744k	42.30	59.14	-16.84	Line	-
Mode 1	Pass	AV	342.744k	33.07	49.14	-16.07	Line	-
Mode 1	Pass	QP	490.912k	45.71	56.15	-10.44	Line	-
Mode 1	Pass	AV	490.912k	42.25	46.15	-3.90	Line	-
Mode 1	Pass	QP	1.275M	41.02	56.00	-14.98	Line	-
Mode 1	Pass	AV	1.275M	37.56	46.00	-8.44	Line	-
Mode 1	Pass	QP	2.202M	49.59	56.00	-6.41	Line	-
Mode 1	Pass	AV	2.202M	39.73	46.00	-6.27	Line	-
Mode 1	Pass	QP	10.532M	30.79	60.00	-29.21	Line	-
Mode 1	Pass	AV	10.532M	25.46	50.00	-24.54	Line	-
Mode 1	Pass	QP	205.615k	62.14	-	-	Neutral	-
Mode 1	Pass	AV	205.615k	53.95	-	-	Neutral	-
Mode 1	Pass	QP	276.28k	53.30	60.93	-7.63	Neutral	-
Mode 1	Pass	AV	276.28k	41.97	50.93	-8.96	Neutral	-
Mode 1	Pass	QP	344.115k	44.38	59.10	-14.72	Neutral	-
Mode 1	Pass	AV	344.115k	35.11	49.10	-13.99	Neutral	-
Mode 1	Pass	QP	490.912k	44.88	56.15	-11.27	Neutral	-
Mode 1	Pass	AV	490.912k	41.44	46.15	-4.71	Neutral	-
Mode 1	Pass	QP	1.078M	40.06	56.00	-15.94	Neutral	-
Mode 1	Pass	AV	1.078M	36.36	46.00	-9.64	Neutral	-
Mode 1	Pass	QP	2.194M	38.65	56.00	-17.35	Neutral	-
Mode 1	Pass	AV	2.194M	31.48	46.00	-14.52	Neutral	-
Mode 1	Pass	QP	25.652M	42.23	60.00	-17.77	Neutral	-
Mode 1	Pass	AV	25.652M	35.86	50.00	-14.14	Neutral	-
Mode 2	Pass	QP	150k	59.25	66.00	-6.75	Line	-
Mode 2	Pass	AV	150k	50.30	56.00	-5.70	Line	-
Mode 2	Pass	QP	169.76k	46.32	64.97	-18.65	Line	-
Mode 2	Pass	AV	169.76k	31.54	54.97	-23.43	Line	-
Mode 2	Pass	QP	197.568k	38.57	63.71	-25.14	Line	-
Mode 2	Pass	AV	197.568k	17.78	53.71	-35.93	Line	-
Mode 2	Pass	QP	447.846k	35.06	56.92	-21.86	Line	-
Mode 2	Pass	AV	447.846k	32.93	46.92	-13.99	Line	-
Mode 2	Pass	QP	761.574k	56.15	-	-	Line	-
Mode 2	Pass	AV	761.574k	56.12	-	-	Line	-
Mode 2	Pass	QP	929.818k	58.79	-	-	Line	-
Mode 2	Pass	AV	929.818k	58.48	-	-	Line	-
Mode 2	Pass	QP	1.015M	59.22	-	-	Line	-
Mode 2	Pass	AV	1.015M	59.01	-	-	Line	-
Mode 2	Pass	QP	1.181M	58.77	-	-	Line	-
Mode 2	Pass	AV	1.181M	58.61	-	-	Line	-
Mode 2	Pass	QP	1.437M	54.29	-	-	Line	-
Mode 2	Pass	AV	1.437M	54.21	-	-	Line	-
Mode 2	Pass	QP	4.816M	48.25	56.00	-7.75	Line	-
Mode 2	Pass	AV	4.816M	39.58	46.00	-6.42	Line	-
Mode 2	Pass	QP	9.723M	43.15	60.00	-16.85	Line	-
Mode 2	Pass	AV	9.723M	34.37	50.00	-15.63	Line	-

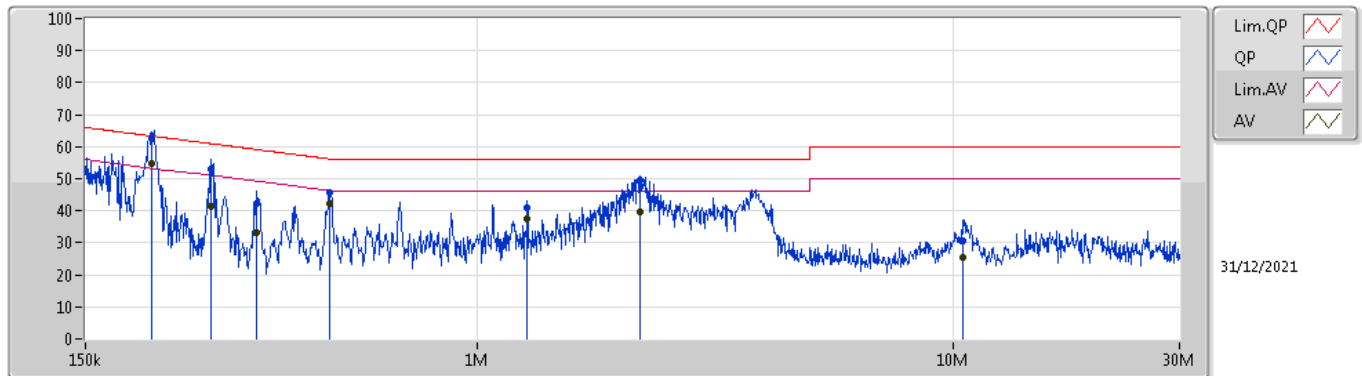


**Conducted Emissions at Powerline**

**Appendix A**

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 2	Pass	QP	150.6k	58.89	65.96	-7.07	Neutral	-
Mode 2	Pass	AV	150.6k	49.23	55.96	-6.73	Neutral	-
Mode 2	Pass	QP	173.183k	47.48	64.80	-17.32	Neutral	-
Mode 2	Pass	AV	173.183k	35.13	54.80	-19.67	Neutral	-
Mode 2	Pass	QP	201.551k	37.23	63.55	-26.32	Neutral	-
Mode 2	Pass	AV	201.551k	23.16	53.55	-30.39	Neutral	-
Mode 2	Pass	QP	446.062k	36.14	56.96	-20.82	Neutral	-
Mode 2	Pass	AV	446.062k	34.25	46.96	-12.71	Neutral	-
Mode 2	Pass	QP	929.818k	58.81	-	-	Neutral	-
Mode 2	Pass	AV	929.818k	58.78	-	-	Neutral	-
Mode 2	Pass	QP	979.346k	56.77	-	-	Neutral	-
Mode 2	Pass	AV	979.346k	55.92	-	-	Neutral	-
Mode 2	Pass	QP	1.015M	57.22	-	-	Neutral	-
Mode 2	Pass	AV	1.015M	57.21	-	-	Neutral	-
Mode 2	Pass	QP	1.181M	57.53	-	-	Neutral	-
Mode 2	Pass	AV	1.181M	57.34	-	-	Neutral	-
Mode 2	Pass	QP	2.283M	42.61	56.00	-13.39	Neutral	-
Mode 2	Pass	AV	2.283M	42.13	46.00	-3.87	Neutral	-
Mode 2	Pass	QP	4.797M	56.72	-	-	Neutral	-
Mode 2	Pass	AV	4.797M	50.37	-	-	Neutral	-
Mode 2	Pass	QP	9.723M	45.61	60.00	-14.39	Neutral	-
Mode 2	Pass	AV	9.723M	37.07	50.00	-12.93	Neutral	-

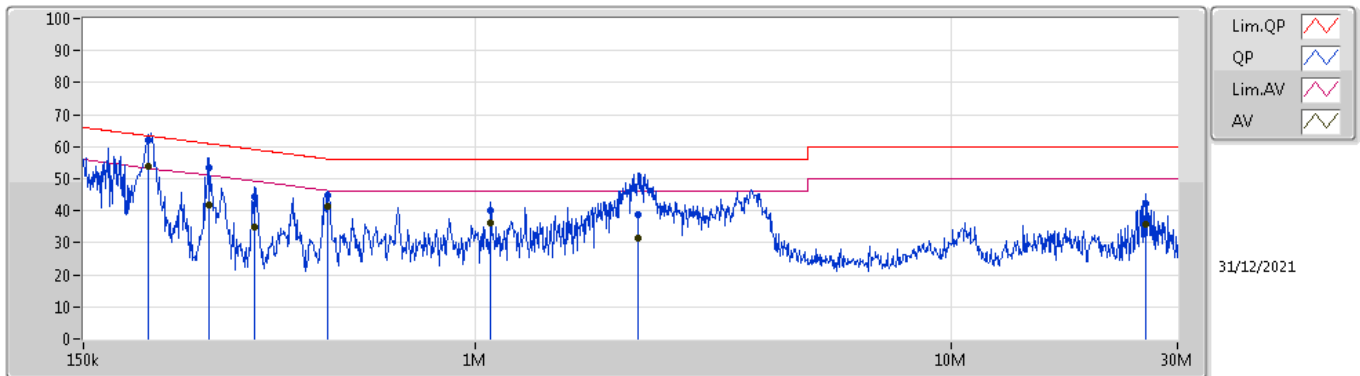
### Conducted Emissions at Powerline\_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	207.263k	62.54	-	-	19.56	Line	-	42.98	9.61	0.04	9.91
AV	207.263k	54.53	-	-	19.56	Line	-	34.97	9.61	0.04	9.91
QP	275.179k	52.97	60.95	-7.98	19.57	Line	-	33.40	9.61	0.05	9.91
AV	275.179k	41.43	50.95	-9.52	19.57	Line	-	21.86	9.61	0.05	9.91
QP	342.744k	42.30	59.14	-16.84	19.57	Line	-	22.73	9.60	0.06	9.91
AV	342.744k	33.07	49.14	-16.07	19.57	Line	-	13.50	9.60	0.06	9.91
QP	490.912k	45.71	56.15	-10.44	19.57	Line	-	26.14	9.60	0.06	9.91
AV	490.912k	42.25	46.15	-3.90	19.57	Line	-	22.68	9.60	0.06	9.91
QP	1.275M	41.02	56.00	-14.98	19.63	Line	-	21.39	9.62	0.09	9.92
AV	1.275M	37.56	46.00	-8.44	19.63	Line	-	17.93	9.62	0.09	9.92
QP	2.202M	49.59	56.00	-6.41	19.66	Line	-	29.93	9.63	0.11	9.92
AV	2.202M	39.73	46.00	-6.27	19.66	Line	-	20.07	9.63	0.11	9.92
QP	10.532M	30.79	60.00	-29.21	19.88	Line	-	10.91	9.74	0.21	9.93
AV	10.532M	25.46	50.00	-24.54	19.88	Line	-	5.58	9.74	0.21	9.93

Note: After verification, the signal 207.263k is not generated by the RF transmitter. Please refer to Appendix H. Non-RF Signal Exclusion.

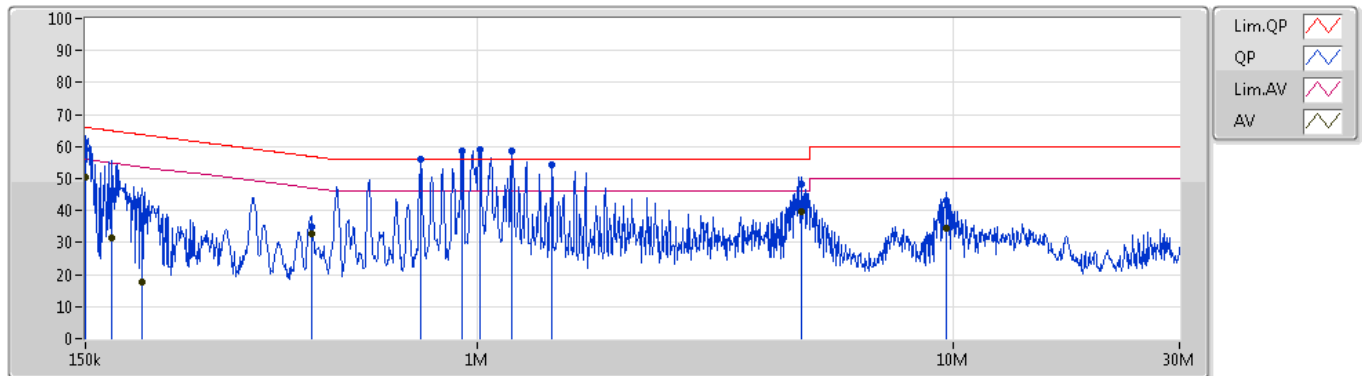
### Conducted Emissions at Powerline\_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	205.615k	62.14	-	-	19.55	Neutral	-	42.59	9.60	0.04	9.91
AV	205.615k	53.95	-	-	19.55	Neutral	-	34.40	9.60	0.04	9.91
QP	276.28k	53.30	60.93	-7.63	19.56	Neutral	-	33.74	9.60	0.05	9.91
AV	276.28k	41.97	50.93	-8.96	19.56	Neutral	-	22.41	9.60	0.05	9.91
QP	344.115k	44.38	59.10	-14.72	19.57	Neutral	-	24.81	9.60	0.06	9.91
AV	344.115k	35.11	49.10	-13.99	19.57	Neutral	-	15.54	9.60	0.06	9.91
QP	490.912k	44.88	56.15	-11.27	19.57	Neutral	-	25.31	9.60	0.06	9.91
AV	490.912k	41.44	46.15	-4.71	19.57	Neutral	-	21.87	9.60	0.06	9.91
QP	1.078M	40.06	56.00	-15.94	19.62	Neutral	-	20.44	9.62	0.08	9.92
AV	1.078M	36.36	46.00	-9.64	19.62	Neutral	-	16.74	9.62	0.08	9.92
QP	2.194M	38.65	56.00	-17.35	19.65	Neutral	-	19.00	9.62	0.11	9.92
AV	2.194M	31.48	46.00	-14.52	19.65	Neutral	-	11.83	9.62	0.11	9.92
QP	25.652M	42.23	60.00	-17.77	20.20	Neutral	-	22.03	9.95	0.32	9.93
AV	25.652M	35.86	50.00	-14.14	20.20	Neutral	-	15.66	9.95	0.32	9.93

Note: After verification, the signal 205.615k is not generated by the RF transmitter. Please refer to Appendix H. Non-RF Signal Exclusion.

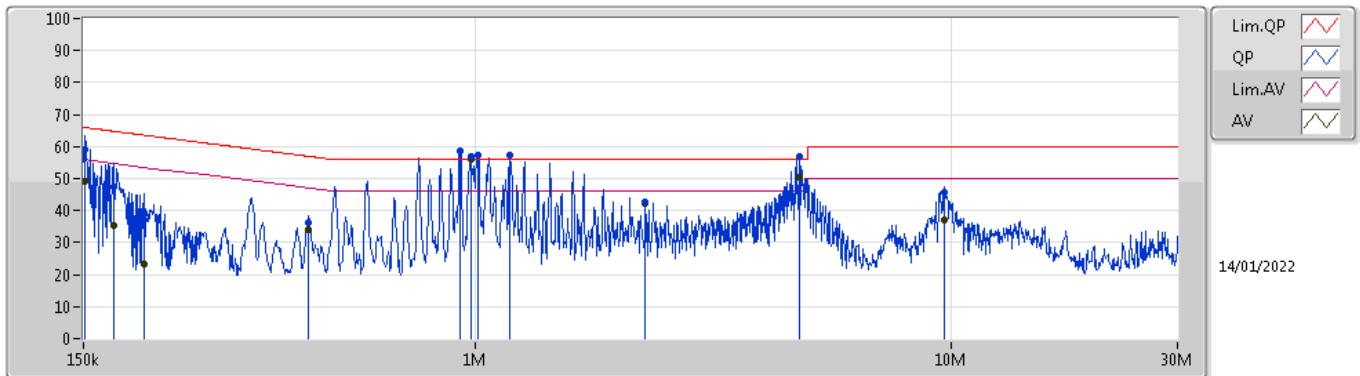
Conducted Emissions at Powerline\_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	150k	59.25	66.00	-6.75	19.56	Line	-	39.69	9.61	0.04	9.91
AV	150k	50.30	56.00	-5.70	19.56	Line	-	30.74	9.61	0.04	9.91
QP	169.76k	46.32	64.97	-18.65	19.56	Line	-	26.76	9.61	0.04	9.91
AV	169.76k	31.54	54.97	-23.43	19.56	Line	-	11.98	9.61	0.04	9.91
QP	197.568k	38.57	63.71	-25.14	19.56	Line	-	19.01	9.61	0.04	9.91
AV	197.568k	17.78	53.71	-35.93	19.56	Line	-	-1.78	9.61	0.04	9.91
QP	447.846k	35.06	56.92	-21.86	19.57	Line	-	15.49	9.60	0.06	9.91
AV	447.846k	32.93	46.92	-13.99	19.57	Line	-	13.36	9.60	0.06	9.91
QP	761.574k	56.15	-	-	19.60	Line	-	36.55	9.61	0.07	9.92
AV	761.574k	56.12	-	-	19.60	Line	-	36.52	9.61	0.07	9.92
QP	929.818k	58.79	-	-	19.61	Line	-	39.18	9.61	0.08	9.92
AV	929.818k	58.48	-	-	19.61	Line	-	38.87	9.61	0.08	9.92
QP	1.015M	59.22	-	-	19.61	Line	-	39.61	9.61	0.08	9.92
AV	1.015M	59.01	-	-	19.61	Line	-	39.40	9.61	0.08	9.92
QP	1.181M	58.77	-	-	19.61	Line	-	39.16	9.61	0.08	9.92
AV	1.181M	58.61	-	-	19.61	Line	-	39.00	9.61	0.08	9.92
QP	1.437M	54.29	-	-	19.63	Line	-	34.66	9.62	0.09	9.92
AV	1.437M	54.21	-	-	19.63	Line	-	34.58	9.62	0.09	9.92
QP	4.816M	48.25	56.00	-7.75	19.73	Line	-	28.52	9.66	0.15	9.92
AV	4.816M	39.58	46.00	-6.42	19.73	Line	-	19.85	9.66	0.15	9.92
QP	9.723M	43.15	60.00	-16.85	19.87	Line	-	23.28	9.74	0.20	9.93
AV	9.723M	34.37	50.00	-15.63	19.87	Line	-	14.50	9.74	0.20	9.93

Note: After verification, the signal 761.574k, 929.818k, 1.015M, 1.181M, 1.437M is not generated by the RF transmitter. Please refer to Appendix H. Non-RF Signal Exclusion.

### Conducted Emissions at Powerline\_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	150.6k	58.89	65.96	-7.07	19.55	Neutral	-	39.34	9.60	0.04	9.91
AV	150.6k	49.23	55.96	-6.73	19.55	Neutral	-	29.68	9.60	0.04	9.91
QP	173.183k	47.48	64.80	-17.32	19.55	Neutral	-	27.93	9.60	0.04	9.91
AV	173.183k	35.13	54.80	-19.67	19.55	Neutral	-	15.58	9.60	0.04	9.91
QP	201.551k	37.23	63.55	-26.32	19.55	Neutral	-	17.68	9.60	0.04	9.91
AV	201.551k	23.16	53.55	-30.39	19.55	Neutral	-	3.61	9.60	0.04	9.91
QP	446.062k	36.14	56.96	-20.82	19.57	Neutral	-	16.57	9.60	0.06	9.91
AV	446.062k	34.25	46.96	-12.71	19.57	Neutral	-	14.68	9.60	0.06	9.91
QP	929.818k	58.81	-	-	19.62	Neutral	-	39.19	9.62	0.08	9.92
AV	929.818k	58.78	-	-	19.62	Neutral	-	39.16	9.62	0.08	9.92
QP	979.346k	56.77	-	-	19.62	Neutral	-	37.15	9.62	0.08	9.92
AV	979.346k	55.92	-	-	19.62	Neutral	-	36.30	9.62	0.08	9.92
QP	1.015M	57.22	-	-	19.62	Neutral	-	37.60	9.62	0.08	9.92
AV	1.015M	57.21	-	-	19.62	Neutral	-	37.59	9.62	0.08	9.92
QP	1.181M	57.53	-	-	19.62	Neutral	-	37.91	9.62	0.08	9.92
AV	1.181M	57.34	-	-	19.62	Neutral	-	37.72	9.62	0.08	9.92
QP	2.283M	42.61	56.00	-13.39	19.66	Neutral	-	22.95	9.63	0.11	9.92
AV	2.283M	42.13	46.00	-3.87	19.66	Neutral	-	22.47	9.63	0.11	9.92
QP	4.797M	56.72	-	-	19.74	Neutral	-	36.98	9.67	0.15	9.92
AV	4.797M	50.37	-	-	19.74	Neutral	-	30.63	9.67	0.15	9.92
QP	9.723M	45.61	60.00	-14.39	19.90	Neutral	-	25.71	9.77	0.20	9.93
AV	9.723M	37.07	50.00	-12.93	19.90	Neutral	-	17.17	9.77	0.20	9.93

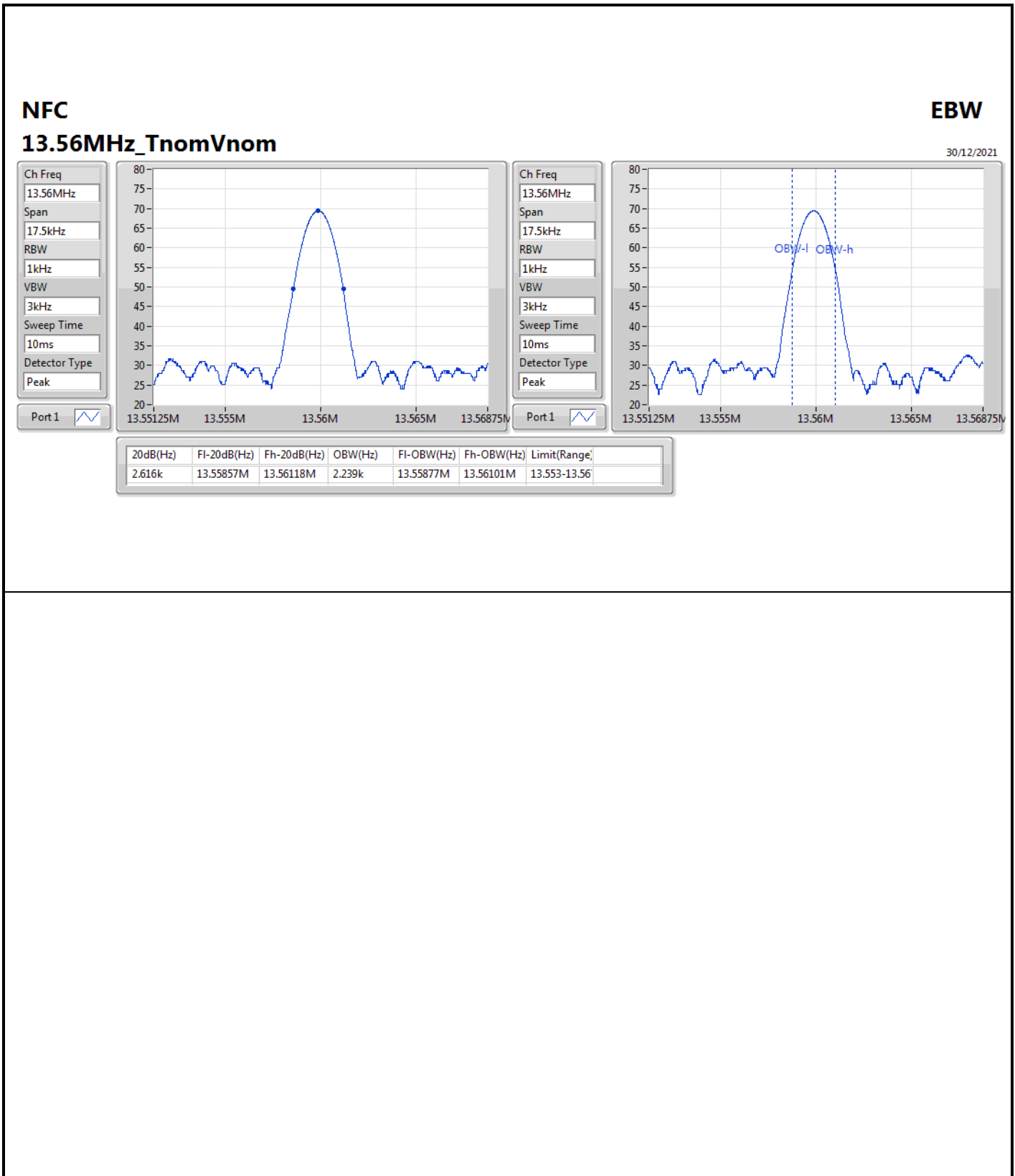
Note: After verification, the signal 929.818k, 979.346k, 1.015M, 1.181M, 4.797M is not generated by the RF transmitter. Please refer to Appendix H. Non-RF Signal Exclusion.

**Summary**

Mode	20dB (Hz)	FI-20dB (Hz)	Fh-20dB (Hz)	OBW (Hz)	Limit (Range)
13.553-13.567MHz	-	-	-	-	-
NFC	2.616k	13.55857M	13.56118M	2.239k	13.553-13.567

**Result**

Mode	Result	20dB (Hz)	FI-20dB (Hz)	Fh-20dB (Hz)	OBW (Hz)	FI-OBW (Hz)	Fh-OBW (Hz)	Limit (Range)
NFC	-	-	-	-	-	-	-	-
13.56MHz_TnomVnom	Pass	2.616k	13.55857M	13.56118M	2.239k	13.55877M	13.56101M	13.553-13.567







Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
13.553-13.567MHz	-	-	-	-	-	-	-	-	-	-	-
NFC	Pass	PK	1.702M	49.65	63.02	-13.37	20.61	3	0	1.00	-



Result

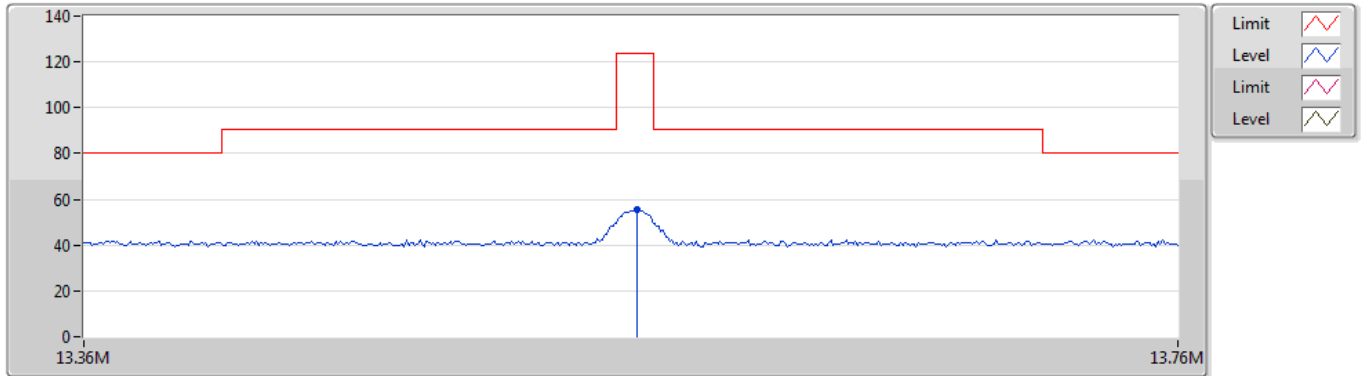
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
NFC	-	-	-	-	-	-	-	-	-	-	-
13.56MHz_Switching Power Supply	Pass	PK	13.561M	55.23	124.00	-68.77	23.33	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	45.096k	52.83	114.51	-61.68	21.28	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	63.144k	47.66	111.59	-63.93	20.85	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	108.264k	42.43	106.91	-64.48	20.17	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	806.7k	51.27	69.48	-18.21	20.70	3	360	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	1.463M	48.61	64.34	-15.73	20.65	3	360	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	18.776M	43.10	69.50	-26.40	23.33	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	13.559M	57.02	124.00	-66.98	23.25	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	14.64k	59.13	124.26	-65.13	20.08	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	36.354k	59.54	116.37	-56.83	21.41	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	111.93k	49.97	106.61	-56.64	20.19	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	627.6k	50.16	71.65	-21.49	20.69	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	1.702M	49.65	63.02	-13.37	20.61	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	4.747M	45.03	69.50	-24.47	20.86	3	0	1.00	-



### NFC Operating below 30MHz

28/12/2021

### 13.56MHz\_Switching Power Supply

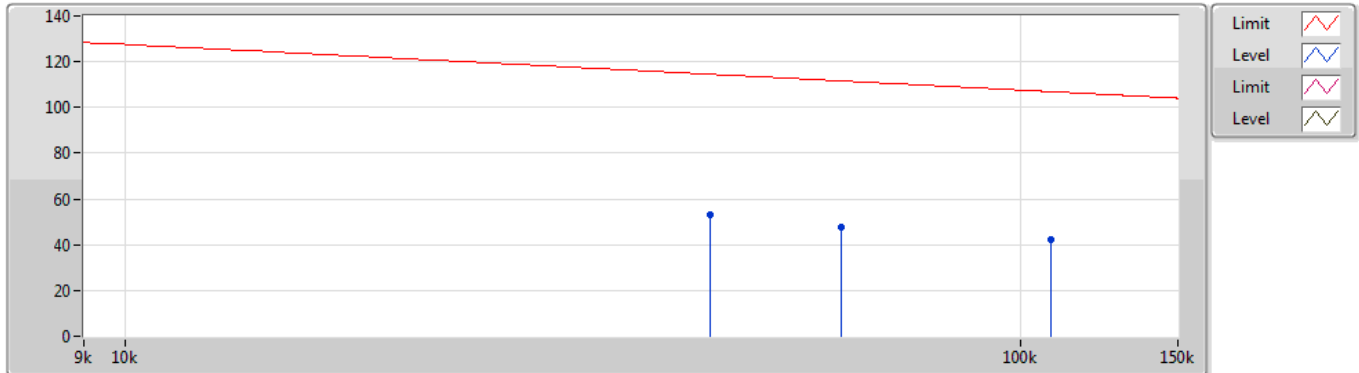


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	13.561M	55.23	124.00	-68.77	23.33	3	Horizontal	0	1.00	-	31.90	22.65	0.68	-

### NFC Operating below 30MHz

28/12/2021

### 13.56MHz\_Switching Power Supply

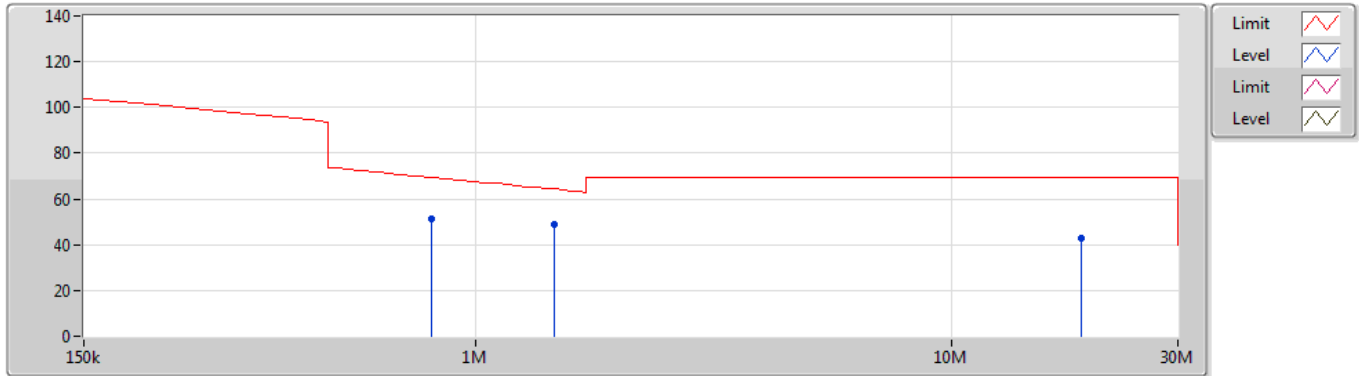


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	45.096k	52.83	114.51	-61.68	21.28	3	Horizontal	0	1.00	-	31.55	21.06	0.22	-
PK	63.144k	47.66	111.59	-63.93	20.85	3	Horizontal	0	1.00	-	26.81	20.63	0.22	-
PK	108.264k	42.43	106.91	-64.48	20.17	3	Horizontal	0	1.00	-	22.26	19.94	0.23	-

### NFC Operating below 30MHz

28/12/2021

### 13.56MHz\_Switching Power Supply

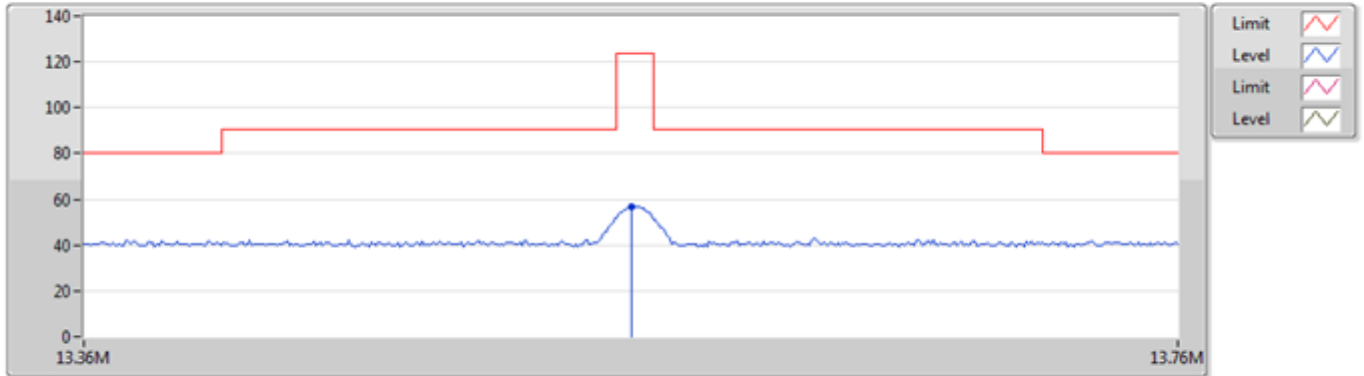


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	806.7k	51.27	69.48	-18.21	20.70	3	Horizontal	360	1.00	-	30.57	20.40	0.30	-
PK	1.463M	48.61	64.34	-15.73	20.65	3	Horizontal	360	1.00	-	27.96	20.30	0.35	-
PK	18.776M	43.10	69.50	-26.40	23.80	3	Horizontal	360	1.00	-	19.30	23.03	0.77	-

### NFC Operating below 30MHz

29/12/2021

### 13.56MHz\_DC Power Supply

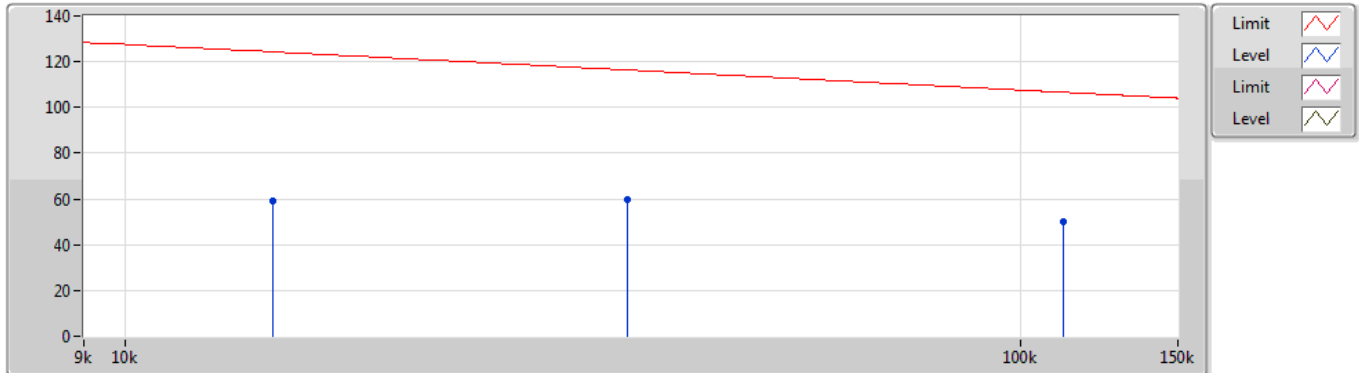


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	13.559M	57.02	124.00	-66.98	23.33	3	Horizontal	0	1.00	-	33.69	22.65	0.68	-

### NFC Operating below 30MHz

29/12/2021

#### 13.56MHz\_DC Power Supply

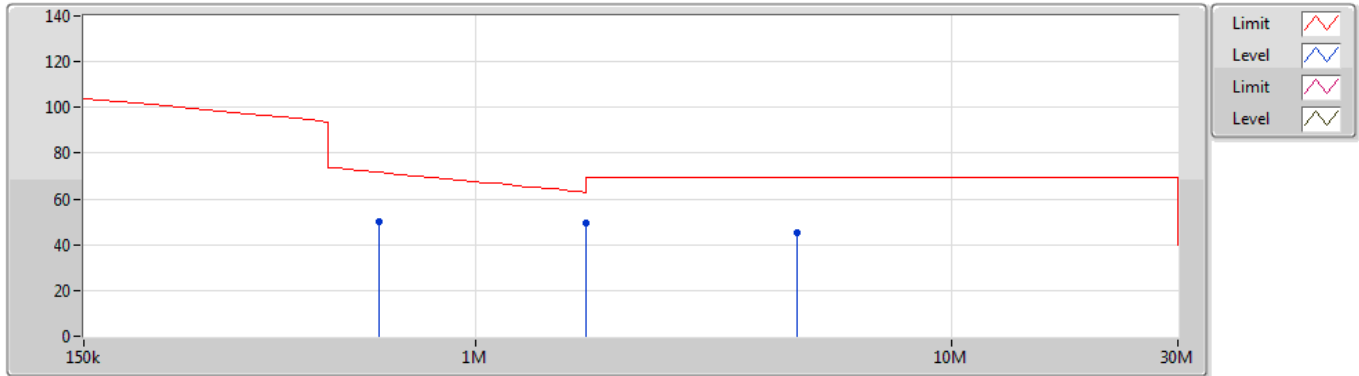


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	14.64k	59.13	124.26	-65.13	20.08	3	Horizontal	360	1.00	-	39.05	19.87	0.21	-
PK	36.354k	59.54	116.37	-56.83	21.41	3	Horizontal	360	1.00	-	38.13	21.19	0.22	-
PK	111.93k	49.97	106.61	-56.64	20.19	3	Horizontal	360	1.00	-	29.78	19.96	0.23	-

### NFC Operating below 30MHz

29/12/2021

### 13.56MHz\_DC Power Supply



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	627.6k	50.16	71.65	-21.49	20.69	3	Horizontal	0	1.00	-	29.47	20.40	0.29	-
PK	1.702M	49.65	63.02	-13.37	20.61	3	Horizontal	0	1.00	-	29.04	20.25	0.36	-
PK	4.747M	45.03	69.50	-24.47	20.86	3	Horizontal	0	1.00	-	24.17	20.37	0.49	-





Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
13.553-13.567MHz	-	-	-	-	-	-	-	-	-	-	-
NFC	Pass	PK	367.56M	42.40	46.00	-3.60	-4.89	3	360	1.00	-



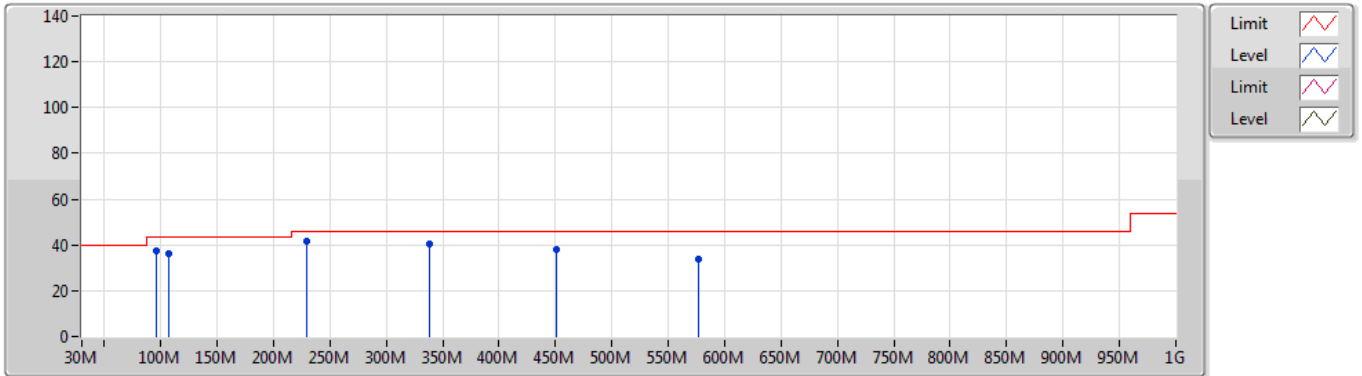
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
NFC	-	-	-	-	-	-	-	-	-	-	-
13.56MHz_Switching Power Supply	Pass	PK	95.96M	37.33	43.50	-6.17	-11.00	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	107.6M	36.08	43.50	-7.42	-9.36	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	229.82M	41.87	46.00	-4.13	-9.77	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	338.46M	40.58	46.00	-5.42	-5.66	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	450.98M	38.25	46.00	-7.75	-3.25	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	577.08M	34.08	46.00	-11.92	-1.18	3	0	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	95.96M	38.27	43.50	-5.23	-11.00	3	360	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	113.42M	38.20	43.50	-5.30	-9.02	3	360	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	284.14M	41.96	46.00	-4.04	-6.69	3	360	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	433.52M	37.75	46.00	-8.25	-3.36	3	360	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	499.48M	40.97	46.00	-5.03	-2.52	3	360	1.00	-
13.56MHz_Switching Power Supply	Pass	PK	577.08M	36.20	46.00	-9.80	-1.18	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	84.32M	32.78	40.00	-7.22	-13.72	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	95.96M	35.66	43.50	-7.84	-11.00	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	262.8M	39.36	46.00	-6.64	-6.16	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	400.54M	38.35	46.00	-7.65	-3.99	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	577.08M	34.81	46.00	-11.19	-1.18	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	672.14M	33.31	46.00	-12.69	-0.51	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	39.7M	35.94	40.00	-4.06	-8.49	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	107.6M	38.55	43.50	-4.95	-9.36	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	245.34M	40.69	46.00	-5.31	-7.89	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	367.56M	42.40	46.00	-3.60	-4.89	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	499.48M	40.39	46.00	-5.61	-2.52	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	577.08M	37.74	46.00	-8.26	-1.18	3	360	1.00	-

### NFC Operating above 30MHz

29/12/2021

### 13.56MHz\_Switching Power Supply

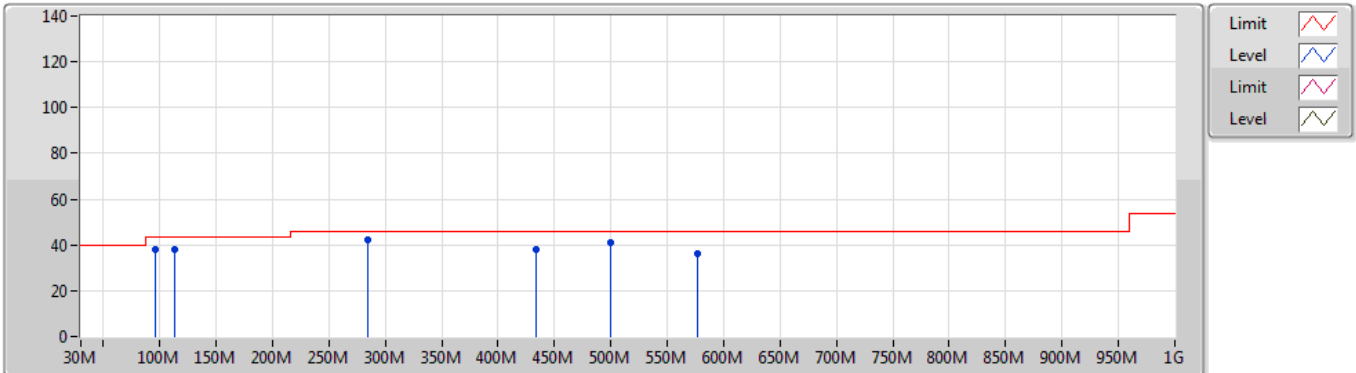


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	95.96M	37.33	43.50	-6.17	-11.00	3	Vertical	0	1.00	-	48.33	15.37	1.40	27.77
PK	107.6M	36.08	43.50	-7.42	-9.36	3	Vertical	0	1.00	-	45.44	16.95	1.47	27.78
PK	229.82M	41.87	46.00	-4.13	-9.77	3	Vertical	0	1.00	-	51.64	15.30	2.07	27.14
PK	338.46M	40.58	46.00	-5.42	-5.66	3	Vertical	0	1.00	-	46.24	19.10	2.51	27.27
PK	450.98M	38.25	46.00	-7.75	-3.25	3	Vertical	0	1.00	-	41.50	21.93	2.90	28.08
PK	577.08M	34.08	46.00	-11.92	-1.18	3	Vertical	0	1.00	-	35.26	23.91	3.29	28.38

### NFC Operating above 30MHz

29/12/2021

### 13.56MHz\_Switching Power Supply

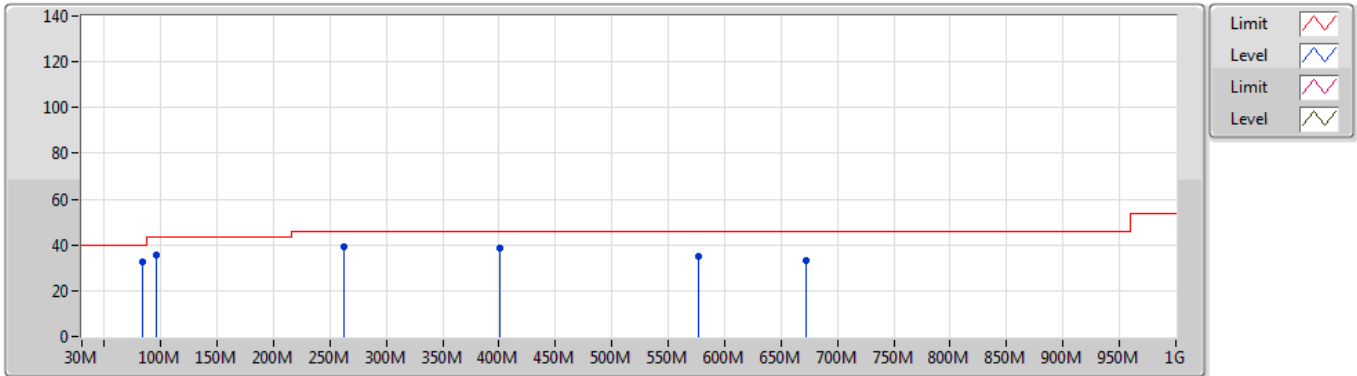


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	95.96M	38.27	43.50	-5.23	-11.00	3	Horizontal	360	1.00	-	49.27	15.37	1.40	27.77
PK	113.42M	38.20	43.50	-5.30	-9.02	3	Horizontal	360	1.00	-	47.22	17.27	1.50	27.79
PK	284.14M	41.96	46.00	-4.04	-6.69	3	Horizontal	360	1.00	-	48.65	18.07	2.29	27.05
PK	433.52M	37.75	46.00	-8.25	-3.36	3	Horizontal	360	1.00	-	41.11	21.76	2.85	27.97
PK	499.48M	40.97	46.00	-5.03	-2.52	3	Horizontal	360	1.00	-	43.49	22.75	3.08	28.35
PK	577.08M	36.20	46.00	-9.80	-1.18	3	Horizontal	360	1.00	-	37.38	23.91	3.29	28.38

### NFC Operating above 30MHz

29/12/2021

#### 13.56MHz\_DC Power Supply

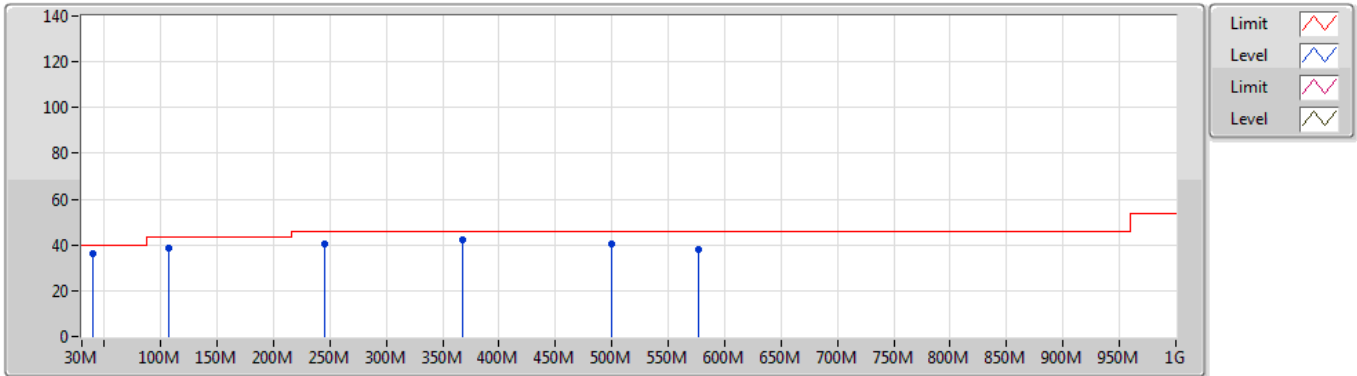


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	84.32M	32.78	40.00	-7.22	-13.72	3	Vertical	0	1.00	-	46.50	12.80	1.33	27.85
PK	95.96M	35.66	43.50	-7.84	-11.00	3	Vertical	0	1.00	-	46.66	15.37	1.40	27.77
PK	262.8M	39.36	46.00	-6.64	-6.16	3	Vertical	0	1.00	-	45.52	18.67	2.20	27.03
PK	400.54M	38.35	46.00	-7.65	-3.99	3	Vertical	0	1.00	-	42.34	21.05	2.74	27.78
PK	577.08M	34.81	46.00	-11.19	-1.18	3	Vertical	0	1.00	-	35.99	23.91	3.29	28.38
PK	672.14M	33.31	46.00	-12.69	-0.51	3	Vertical	0	1.00	-	33.82	24.19	3.52	28.22

### NFC Operating above 30MHz

29/12/2021

#### 13.56MHz\_DC Power Supply



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	39.7M	35.94	40.00	-4.06	-8.49	3	Horizontal	360	1.00	-	44.43	17.92	0.96	27.37
PK	107.6M	38.55	43.50	-4.95	-9.36	3	Horizontal	360	1.00	-	47.91	16.95	1.47	27.78
PK	245.34M	40.69	46.00	-5.31	-7.89	3	Horizontal	360	1.00	-	48.58	17.03	2.13	27.05
PK	367.56M	42.40	46.00	-3.60	-4.89	3	Horizontal	360	1.00	-	47.29	19.98	2.62	27.49
PK	499.48M	40.39	46.00	-5.61	-2.52	3	Horizontal	360	1.00	-	42.91	22.75	3.08	28.35
PK	577.08M	37.74	46.00	-8.26	-1.18	3	Horizontal	360	1.00	-	38.92	23.91	3.29	28.38



**Summary**

Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port	Remark
13.553-13.567MHz	-	-	-	-	-	-	-
NFC	Pass	13.56M	13.559862M	10.1942	100	1	5 min



Result

Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port	Remark
NFC	-	-	-	-	-	-	-
13.56MHz_-20°C	Pass	13.56M	13.559941M	4.3228	100	1	0 min
13.56MHz_-20°C	Pass	13.56M	13.559939M	4.5164	100	1	2 min
13.56MHz_-20°C	Pass	13.56M	13.559924M	5.6132	100	1	5 min
13.56MHz_-20°C	Pass	13.56M	13.559928M	5.2906	100	1	10 min
13.56MHz_-10°C	Pass	13.56M	13.559928M	5.2906	100	1	0 min
13.56MHz_-10°C	Pass	13.56M	13.559933M	4.968	100	1	2 min
13.56MHz_-10°C	Pass	13.56M	13.559926M	5.4842	100	1	5 min
13.56MHz_-10°C	Pass	13.56M	13.559932M	5.0326	100	1	10 min
13.56MHz_0°C	Pass	13.56M	13.559892M	7.936	100	1	0 min
13.56MHz_0°C	Pass	13.56M	13.559894M	7.8069	100	1	2 min
13.56MHz_0°C	Pass	13.56M	13.559884M	8.5812	100	1	5 min
13.56MHz_0°C	Pass	13.56M	13.55989M	8.1295	100	1	10 min
13.56MHz_10°C	Pass	13.56M	13.559881M	8.7747	100	1	0 min
13.56MHz_10°C	Pass	13.56M	13.559867M	9.807	100	1	2 min
13.56MHz_10°C	Pass	13.56M	13.559874M	9.2909	100	1	5 min
13.56MHz_10°C	Pass	13.56M	13.559881M	8.7747	100	1	10 min
13.56MHz_20°C	Pass	13.56M	13.559872M	9.4199	100	1	0 min
13.56MHz_20°C	Pass	13.56M	13.559873M	9.3554	100	1	2 min
13.56MHz_20°C	Pass	13.56M	13.559878M	8.9683	100	1	5 min
13.56MHz_20°C	Pass	13.56M	13.559877M	9.0973	100	1	10 min
13.56MHz_30°C	Pass	13.56M	13.559878M	8.9683	100	1	0 min
13.56MHz_30°C	Pass	13.56M	13.559879M	8.9038	100	1	2 min
13.56MHz_30°C	Pass	13.56M	13.559862M	10.1942	100	1	5 min
13.56MHz_30°C	Pass	13.56M	13.559869M	9.678	100	1	10 min
13.56MHz_40°C	Pass	13.56M	13.559863M	10.1296	100	1	0 min
13.56MHz_40°C	Pass	13.56M	13.559865M	9.9361	100	1	2 min
13.56MHz_40°C	Pass	13.56M	13.559875M	9.2264	100	1	5 min
13.56MHz_40°C	Pass	13.56M	13.559874M	9.2909	100	1	10 min
13.56MHz_50°C	Pass	13.56M	13.559868M	9.7425	100	1	0 min
13.56MHz_50°C	Pass	13.56M	13.559878M	9.0328	100	1	2 min
13.56MHz_50°C	Pass	13.56M	13.559868M	9.7425	100	1	5 min
13.56MHz_50°C	Pass	13.56M	13.559876M	9.1618	100	1	10 min
13.56MHz_20°C-253V	Pass	13.56M	13.559868M	9.7425	100	1	0 min
13.56MHz_20°C-253V	Pass	13.56M	13.55987M	9.6135	100	1	2 min
13.56MHz_20°C-253V	Pass	13.56M	13.559866M	9.8716	100	1	5 min
13.56MHz_20°C-253V	Pass	13.56M	13.559876M	9.1618	100	1	10 min
13.56MHz_20°C-220V	Pass	13.56M	13.559875M	9.2264	100	1	0 min
13.56MHz_20°C-220V	Pass	13.56M	13.559865M	9.9361	100	1	2 min
13.56MHz_20°C-220V	Pass	13.56M	13.55988M	8.8392	100	1	5 min
13.56MHz_20°C-220V	Pass	13.56M	13.559874M	9.2909	100	1	10 min
13.56MHz_20°C-187V	Pass	13.56M	13.559875M	9.2264	100	1	0 min
13.56MHz_20°C-187V	Pass	13.56M	13.559872M	9.4199	100	1	2 min
13.56MHz_20°C-187V	Pass	13.56M	13.559883M	8.6457	100	1	5 min



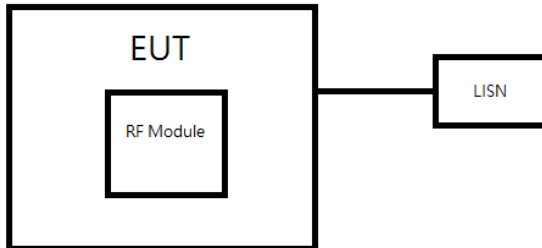


Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port	Remark
13.56MHz_20°C-187V	Pass	13.56M	13.559871M	9.4844	100	1	10 min

Please refer to the following steps.

Step 1: Set the EUT to the test frequency and transmit RF signal.

Test Setup Diagram:

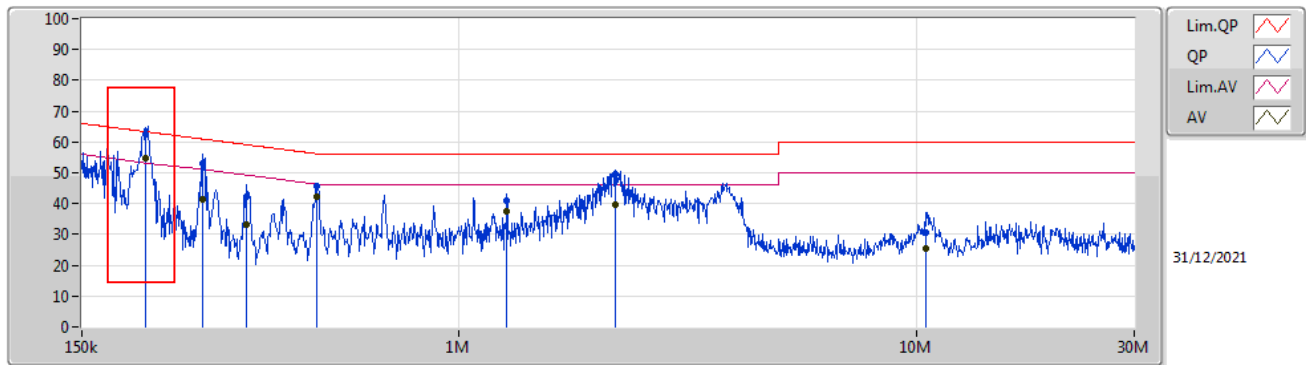


Test Result of AC Power-line Conducted Emissions

Mode 1:

Line

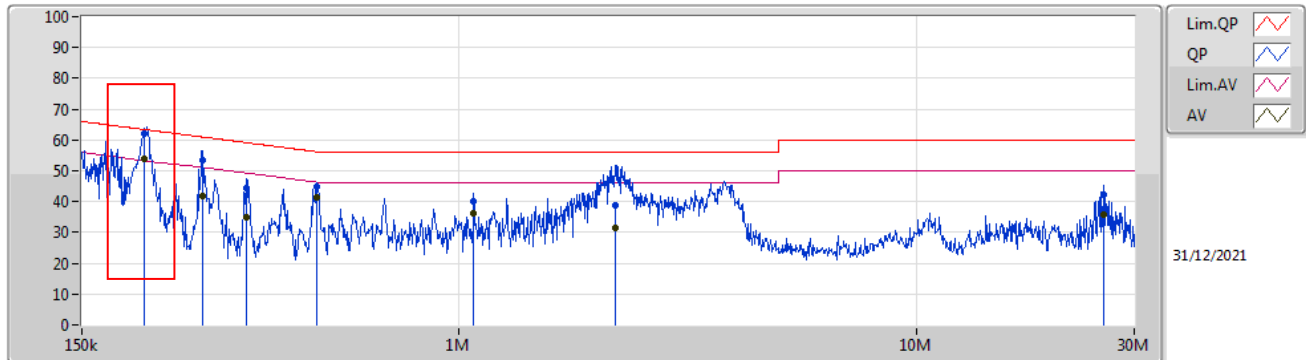
Conducted Emissions at Powerline\_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	207.263k	62.54	-	-	19.56	Line	-	42.98	9.61	0.04	9.91
AV	207.263k	54.53	-	-	19.56	Line	-	34.97	9.61	0.04	9.91
QP	275.179k	52.97	60.95	-7.98	19.57	Line	-	33.40	9.61	0.05	9.91
AV	275.179k	41.43	50.95	-9.52	19.57	Line	-	21.86	9.61	0.05	9.91
QP	342.744k	42.30	59.14	-16.84	19.57	Line	-	22.73	9.60	0.06	9.91
AV	342.744k	33.07	49.14	-16.07	19.57	Line	-	13.50	9.60	0.06	9.91
QP	490.912k	45.71	56.15	-10.44	19.57	Line	-	26.14	9.60	0.06	9.91
AV	490.912k	42.25	46.15	-3.90	19.57	Line	-	22.68	9.60	0.06	9.91
QP	1.275M	41.02	56.00	-14.98	19.63	Line	-	21.39	9.62	0.09	9.92
AV	1.275M	37.56	46.00	-8.44	19.63	Line	-	17.93	9.62	0.09	9.92
QP	2.202M	49.59	56.00	-6.41	19.66	Line	-	29.93	9.63	0.11	9.92
AV	2.202M	39.73	46.00	-6.27	19.66	Line	-	20.07	9.63	0.11	9.92
QP	10.532M	30.79	60.00	-29.21	19.88	Line	-	10.91	9.74	0.21	9.93
AV	10.532M	25.46	50.00	-24.54	19.88	Line	-	5.58	9.74	0.21	9.93

Neutral

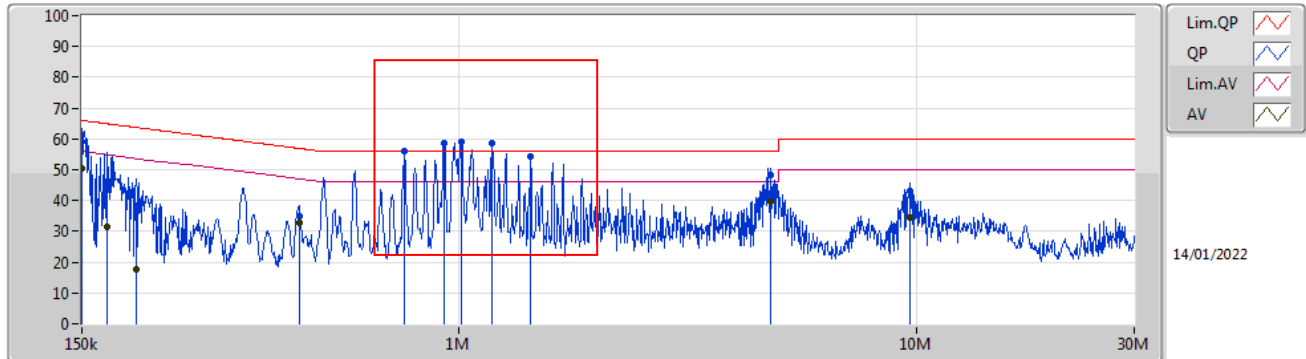
Conducted Emissions at Powerline\_Mode 1







Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	205.615k	62.14	-	-	19.55	Neutral	-	42.59	9.60	0.04	9.91
AV	205.615k	53.95	-	-	19.55	Neutral	-	34.40	9.60	0.04	9.91
QP	276.28k	53.30	60.93	-7.63	19.56	Neutral	-	33.74	9.60	0.05	9.91
AV	276.28k	41.97	50.93	-8.96	19.56	Neutral	-	22.41	9.60	0.05	9.91
QP	344.115k	44.38	59.10	-14.72	19.57	Neutral	-	24.81	9.60	0.06	9.91
AV	344.115k	35.11	49.10	-13.99	19.57	Neutral	-	15.54	9.60	0.06	9.91
QP	490.912k	44.88	56.15	-11.27	19.57	Neutral	-	25.31	9.60	0.06	9.91
AV	490.912k	41.44	46.15	-4.71	19.57	Neutral	-	21.87	9.60	0.06	9.91
QP	1.078M	40.06	56.00	-15.94	19.62	Neutral	-	20.44	9.62	0.08	9.92
AV	1.078M	36.36	46.00	-9.64	19.62	Neutral	-	16.74	9.62	0.08	9.92
QP	2.194M	38.65	56.00	-17.35	19.65	Neutral	-	19.00	9.62	0.11	9.92
AV	2.194M	31.48	46.00	-14.52	19.65	Neutral	-	11.83	9.62	0.11	9.92
QP	25.652M	42.23	60.00	-17.77	20.20	Neutral	-	22.03	9.95	0.32	9.93
AV	25.652M	35.86	50.00	-14.14	20.20	Neutral	-	15.66	9.95	0.32	9.93

Mode 2:  
Line

Conducted Emissions at Powerline\_Mode 2



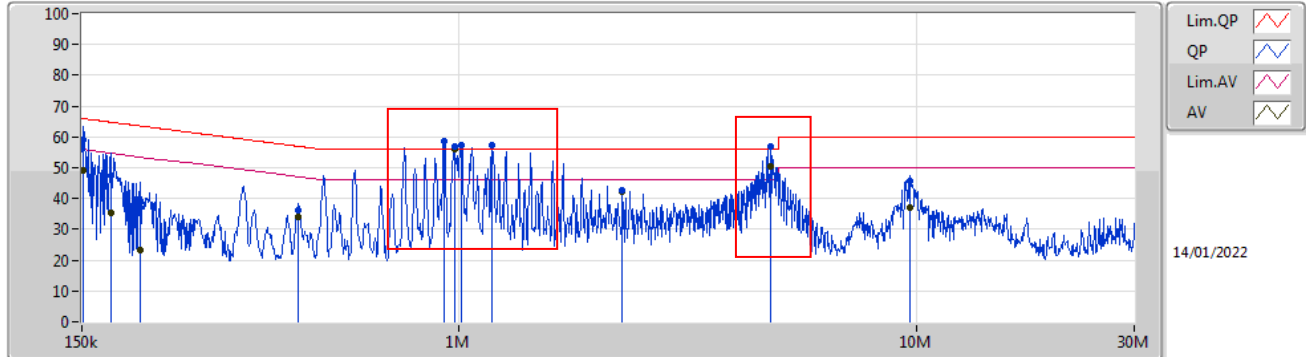
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Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	150k	59.25	66.00	-6.75	19.56	Line	-	39.69	9.61	0.04	9.91
AV	150k	50.30	56.00	-5.70	19.56	Line	-	30.74	9.61	0.04	9.91
QP	169.76k	46.32	64.97	-18.65	19.56	Line	-	26.76	9.61	0.04	9.91
AV	169.76k	31.54	54.97	-23.43	19.56	Line	-	11.98	9.61	0.04	9.91
QP	197.568k	38.57	63.71	-25.14	19.56	Line	-	19.01	9.61	0.04	9.91
AV	197.568k	17.78	53.71	-35.93	19.56	Line	-	-1.78	9.61	0.04	9.91
QP	447.846k	35.06	56.92	-21.86	19.57	Line	-	15.49	9.60	0.06	9.91
AV	447.846k	32.93	46.92	-13.99	19.57	Line	-	13.36	9.60	0.06	9.91
QP	761.574k	56.15	-	-	19.60	Line	-	36.55	9.61	0.07	9.92
AV	761.574k	56.12	-	-	19.60	Line	-	36.52	9.61	0.07	9.92
QP	929.818k	58.79	-	-	19.61	Line	-	39.18	9.61	0.08	9.92
AV	929.818k	58.48	-	-	19.61	Line	-	38.87	9.61	0.08	9.92
QP	1.015M	59.22	-	-	19.61	Line	-	39.61	9.61	0.08	9.92
AV	1.015M	59.01	-	-	19.61	Line	-	39.40	9.61	0.08	9.92
QP	1.181M	58.77	-	-	19.61	Line	-	39.16	9.61	0.08	9.92
AV	1.181M	58.61	-	-	19.61	Line	-	39.00	9.61	0.08	9.92
QP	1.437M	54.29	-	-	19.63	Line	-	34.66	9.62	0.09	9.92
AV	1.437M	54.21	-	-	19.63	Line	-	34.58	9.62	0.09	9.92
QP	4.816M	48.25	56.00	-7.75	19.73	Line	-	28.52	9.66	0.15	9.92
AV	4.816M	39.58	46.00	-6.42	19.73	Line	-	19.85	9.66	0.15	9.92
QP	9.723M	43.15	60.00	-16.85	19.87	Line	-	23.28	9.74	0.20	9.93
AV	9.723M	34.37	50.00	-15.63	19.87	Line	-	14.50	9.74	0.20	9.93

Neutral

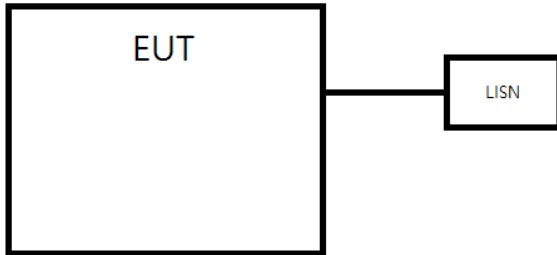
Conducted Emissions at Powerline\_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	150.6k	58.89	65.96	-7.07	19.55	Neutral	-	39.34	9.60	0.04	9.91
AV	150.6k	49.23	55.96	-6.73	19.55	Neutral	-	29.68	9.60	0.04	9.91
QP	173.183k	47.48	64.80	-17.32	19.55	Neutral	-	27.93	9.60	0.04	9.91
AV	173.183k	35.13	54.80	-19.67	19.55	Neutral	-	15.58	9.60	0.04	9.91
QP	201.551k	37.23	63.55	-26.32	19.55	Neutral	-	17.68	9.60	0.04	9.91
AV	201.551k	23.16	53.55	-30.39	19.55	Neutral	-	3.61	9.60	0.04	9.91
QP	446.062k	36.14	56.96	-20.82	19.57	Neutral	-	16.57	9.60	0.06	9.91
AV	446.062k	34.25	46.96	-12.71	19.57	Neutral	-	14.68	9.60	0.06	9.91
QP	929.818k	58.81	-	-	19.62	Neutral	-	39.19	9.62	0.08	9.92
AV	929.818k	58.78	-	-	19.62	Neutral	-	39.16	9.62	0.08	9.92
QP	979.346k	56.77	-	-	19.62	Neutral	-	37.15	9.62	0.08	9.92
AV	979.346k	55.92	-	-	19.62	Neutral	-	36.30	9.62	0.08	9.92
QP	1.015M	57.22	-	-	19.62	Neutral	-	37.60	9.62	0.08	9.92
AV	1.015M	57.21	-	-	19.62	Neutral	-	37.59	9.62	0.08	9.92
QP	1.181M	57.53	-	-	19.62	Neutral	-	37.91	9.62	0.08	9.92
AV	1.181M	57.34	-	-	19.62	Neutral	-	37.72	9.62	0.08	9.92
QP	2.283M	42.61	56.00	-13.39	19.66	Neutral	-	22.95	9.63	0.11	9.92
AV	2.283M	42.13	46.00	-3.87	19.66	Neutral	-	22.47	9.63	0.11	9.92
QP	4.797M	56.72	-	-	19.74	Neutral	-	36.98	9.67	0.15	9.92
AV	4.797M	50.37	-	-	19.74	Neutral	-	30.63	9.67	0.15	9.92
QP	9.723M	45.61	60.00	-14.39	19.90	Neutral	-	25.71	9.77	0.20	9.93
AV	9.723M	37.07	50.00	-12.93	19.90	Neutral	-	17.17	9.77	0.20	9.93

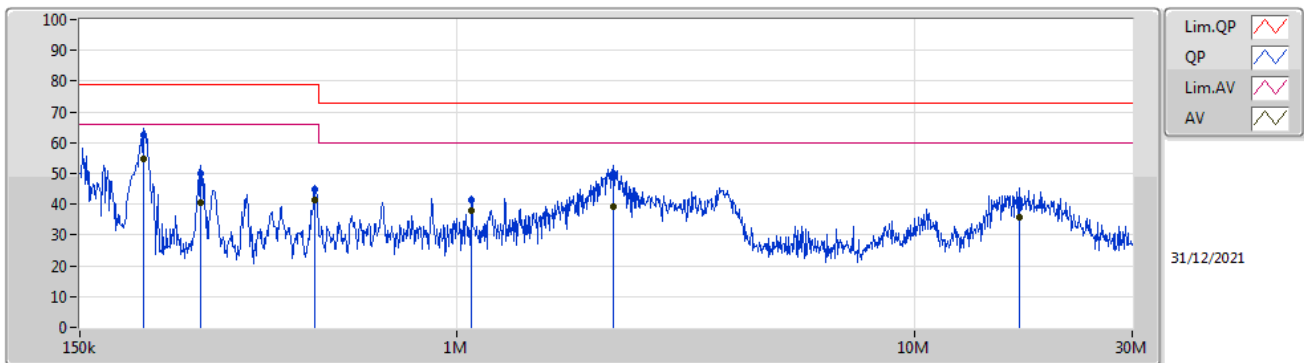
Step 2: Remove the RF radio components, perform a test, and get the same result.

2.1 Test Setup Diagram:



Test Result of AC Power-line Conducted Emissions:  
Mode 1  
Line

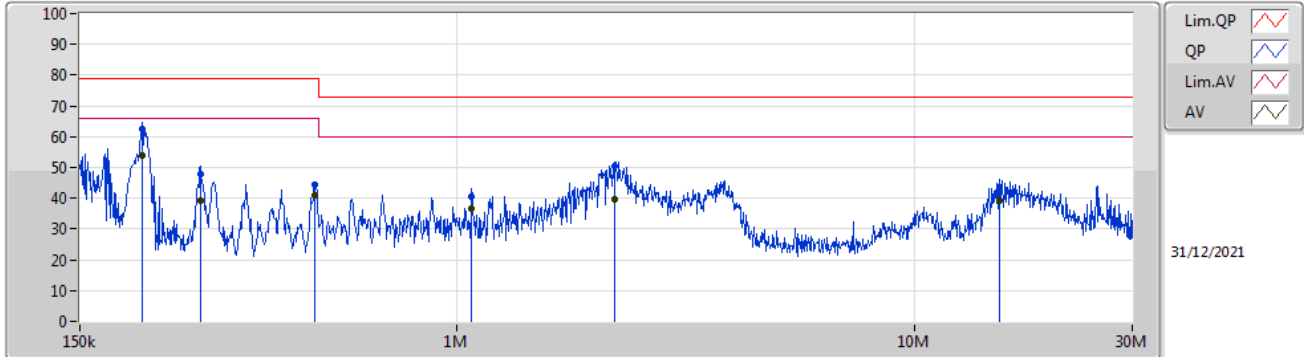
Conducted Emissions at Powerline\_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	207.263k	62.66	79.00	-16.34	19.56	Line	-	43.10	9.61	0.04	9.91
AV	207.263k	54.62	66.00	-11.38	19.56	Line	-	35.06	9.61	0.04	9.91
QP	276.28k	50.16	79.00	-28.84	19.57	Line	-	30.59	9.61	0.05	9.91
AV	276.28k	40.68	66.00	-25.32	19.57	Line	-	21.11	9.61	0.05	9.91
QP	490.912k	45.04	79.00	-33.96	19.57	Line	-	25.47	9.60	0.06	9.91
AV	490.912k	41.57	66.00	-24.43	19.57	Line	-	22.00	9.60	0.06	9.91
QP	1.078M	41.23	73.00	-31.77	19.61	Line	-	21.62	9.61	0.08	9.92
AV	1.078M	37.94	60.00	-22.06	19.61	Line	-	18.33	9.61	0.08	9.92
QP	2.202M	49.82	73.00	-23.18	19.66	Line	-	30.16	9.63	0.11	9.92
AV	2.202M	39.32	60.00	-20.68	19.66	Line	-	19.66	9.63	0.11	9.92
QP	17.004M	41.25	73.00	-31.75	19.93	Line	-	21.32	9.73	0.27	9.93
AV	17.004M	35.99	60.00	-24.01	19.93	Line	-	16.06	9.73	0.27	9.93

Neutral

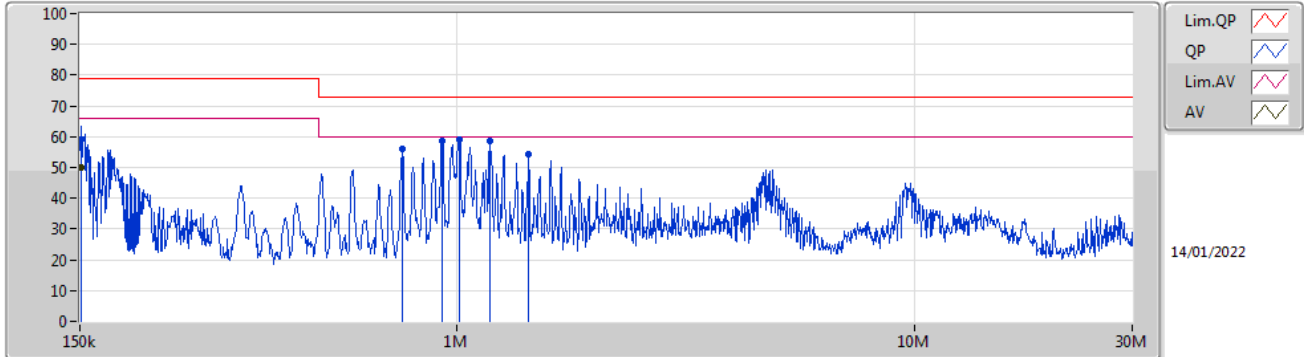
Conducted Emissions at Powerline\_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	205.615k	62.34	79.00	-16.66	19.55	Neutral	-	42.79	9.60	0.04	9.91
AV	205.615k	54.06	66.00	-11.94	19.55	Neutral	-	34.51	9.60	0.04	9.91
QP	275.179k	47.67	79.00	-31.33	19.56	Neutral	-	28.11	9.60	0.05	9.91
AV	275.179k	39.06	66.00	-26.94	19.56	Neutral	-	19.50	9.60	0.05	9.91
QP	490.912k	44.20	79.00	-34.80	19.57	Neutral	-	24.63	9.60	0.06	9.91
AV	490.912k	40.74	66.00	-25.26	19.57	Neutral	-	21.17	9.60	0.06	9.91
QP	1.078M	40.59	73.00	-32.41	19.62	Neutral	-	20.97	9.62	0.08	9.92
AV	1.078M	36.77	60.00	-23.23	19.62	Neutral	-	17.15	9.62	0.08	9.92
QP	2.22M	50.39	73.00	-22.61	19.65	Neutral	-	30.74	9.62	0.11	9.92
AV	2.22M	39.62	60.00	-20.38	19.65	Neutral	-	19.97	9.62	0.11	9.92
QP	15.389M	43.52	73.00	-29.48	20.01	Neutral	-	23.51	9.83	0.25	9.93
AV	15.389M	39.41	60.00	-20.59	20.01	Neutral	-	19.40	9.83	0.25	9.93

Mode 2:  
Line

Conducted Emissions at Powerline\_Mode 2

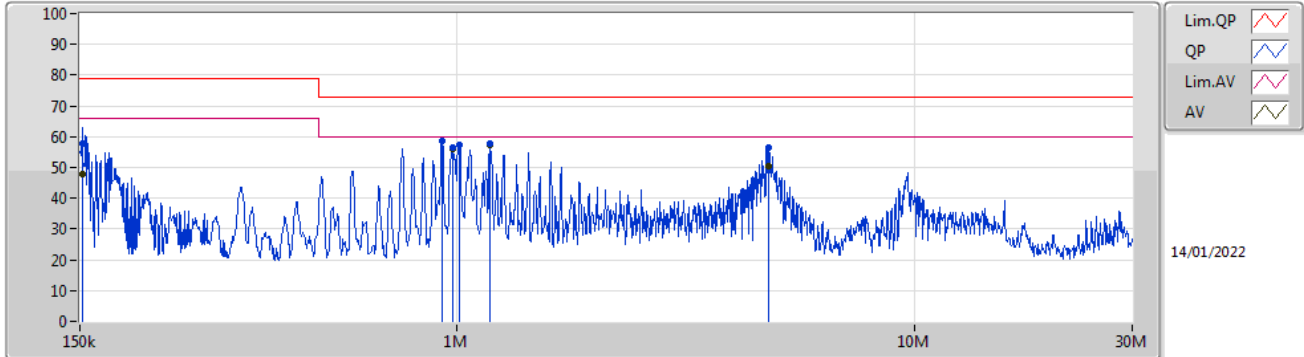


Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	150.6k	58.96	79.00	-20.04	19.56	Line	-	39.40	9.61	0.04	9.91
AV	150.6k	50.11	66.00	-15.89	19.56	Line	-	30.55	9.61	0.04	9.91
QP	761.574k	56.07	73.00	-16.93	19.60	Line	-	36.47	9.61	0.07	9.92
AV	761.574k	56.01	60.00	-3.99	19.60	Line	-	36.41	9.61	0.07	9.92
QP	929.818k	58.83	73.00	-14.17	19.61	Line	-	39.22	9.61	0.08	9.92
AV	929.818k	58.62	60.00	-1.38	19.61	Line	-	39.01	9.61	0.08	9.92
QP	1.015M	59.15	73.00	-13.85	19.61	Line	-	39.54	9.61	0.08	9.92
AV	1.015M	58.92	60.00	-1.08	19.61	Line	-	39.31	9.61	0.08	9.92
QP	1.181M	58.78	73.00	-14.22	19.61	Line	-	39.17	9.61	0.08	9.92
AV	1.181M	58.66	60.00	-1.34	19.61	Line	-	39.05	9.61	0.08	9.92
QP	1.437M	54.33	73.00	-18.67	19.63	Line	-	34.70	9.62	0.09	9.92
AV	1.437M	54.31	60.00	-5.69	19.63	Line	-	34.68	9.62	0.09	9.92



Neutral

Conducted Emissions at Powerline\_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	151.807k	57.86	79.00	-21.14	19.55	Neutral	-	38.31	9.60	0.04	9.91
AV	151.807k	47.77	66.00	-18.23	19.55	Neutral	-	28.22	9.60	0.04	9.91
QP	929.818k	58.70	73.00	-14.30	19.62	Neutral	-	39.08	9.62	0.08	9.92
AV	929.818k	58.69	60.00	-1.31	19.62	Neutral	-	39.07	9.62	0.08	9.92
QP	979.346k	56.64	73.00	-16.36	19.62	Neutral	-	37.02	9.62	0.08	9.92
AV	979.346k	55.84	60.00	-4.16	19.62	Neutral	-	36.22	9.62	0.08	9.92
QP	1.015M	57.35	73.00	-15.65	19.62	Neutral	-	37.73	9.62	0.08	9.92
AV	1.015M	57.33	60.00	-2.67	19.62	Neutral	-	37.71	9.62	0.08	9.92
QP	1.181M	57.62	73.00	-15.38	19.62	Neutral	-	38.00	9.62	0.08	9.92
AV	1.181M	57.46	60.00	-2.54	19.62	Neutral	-	37.84	9.62	0.08	9.92
QP	4.797M	56.61	73.00	-16.39	19.74	Neutral	-	36.87	9.67	0.15	9.92
AV	4.797M	50.23	60.00	-9.77	19.74	Neutral	-	30.49	9.67	0.15	9.92



Step 3: EUT is a Class A equipment and has been integrated with the chip onboard NFC solution. Therefore, we distinguish between Unintentional Radiators (non-RF) and Intentional Radiators (RF).

Step 4: Compare signals and exclude Unintentional Radiators (non-RF)

Unintentional Radiators: Part 15.107(b)

(b) For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms LISN. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Emission (MHz)	Conducted limit (dBμV)	
	Quasi-Peak	Average
0.15-0.5	79	66
0.5-30	73	60

Compared results as below:

Mode 1

Step1. Result				Step2. Result				Condition	Different (dB)
Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)		
207.263k	62.54	-	-	207.263k	62.66	79.00	-16.34	Line	-0.12
207.263k	54.53	-	-	207.263k	54.62	66.00	-11.38	Line	-0.09
205.615k	62.14	-	-	205.615k	62.34	79.00	-16.66	Neutral	-0.2
205.615k	53.95	-	-	205.615k	54.06	66.00	-11.94	Neutral	-0.11

The final result compares the failed data and successfully excludes non-RF signals.

Mode 2

Step1. Result				Step2. Result				Condition	Different (dB)
Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)		
761.574k	56.15	-	-	761.574k	56.07	73.00	-16.93	Line	0.08
761.574k	56.12	-	-	761.574k	56.01	60.00	-3.99	Line	0.11
929.818k	58.79	-	-	929.818k	58.83	73.00	-14.17	Line	-0.04
929.818k	58.48	-	-	929.818k	58.62	60.00	-1.38	Line	-0.14
1.015M	59.22	-	-	1.015M	59.15	73.00	-13.85	Line	0.07
1.015M	59.01	-	-	1.015M	58.92	60.00	-1.08	Line	0.09
1.181M	58.77	-	-	1.181M	58.78	73.00	-14.22	Line	-0.01
1.181M	58.61	-	-	1.181M	58.66	60.00	-1.34	Line	-0.05
1.437M	54.29	-	-	1.437M	54.33	73.00	-18.67	Line	-0.04
1.437M	54.21	-	-	1.437M	54.31	60.00	-5.69	Line	-0.1
929.818k	58.81	-	-	929.818k	58.70	73.00	-14.30	Neutral	0.11
929.818k	58.78	-	-	929.818k	58.69	60.00	-1.31	Neutral	0.09
979.346k	56.77	-	-	979.346k	56.64	73.00	-16.36	Neutral	0.13
979.346k	55.92	-	-	979.346k	55.84	60.00	-4.16	Neutral	0.08
1.015M	57.22	-	-	1.015M	57.35	73.00	-15.65	Neutral	-0.13
1.015M	57.21	-	-	1.015M	57.33	60.00	-2.67	Neutral	-0.12
1.181M	57.53	-	-	1.181M	57.62	73.00	-15.38	Neutral	-0.09
1.181M	57.34	-	-	1.181M	57.46	60.00	-2.54	Neutral	-0.12
4.797M	56.72	-	-	4.797M	56.61	73.00	-16.39	Neutral	0.11
4.797M	50.37	-	-	4.797M	50.23	60.00	-9.77	Neutral	0.14

The final result compares the failed data and successfully excludes non-RF signals.

—————THE END—————