

FCC Test Report

Equipment : Rugged Tablet Computer
Brand Name : AAEON
Model No. : xxxRTC-900B-WBGzxxx-xxx
1. xxx=TF-(TF: Toxic Free) or blank
2. xxx is for marketing purpose
3. xxx=SW revision, ex: 1110=rev1, x:0~9
FCC ID : OHBRTC900BWBGB
Standard : 47 CFR FCC Part 15.225
Operating Band : 13.110 – 14.010 MHz (channel freq. 13.56 MHz)
FCC Classification : DXX
Applicant : AAEON Technology Inc.
Manufacturer : 2651 Satellite Blvd. Duluth, GA 30096 USA

The product sample received on Oct. 24, 2014 and completely tested on Dec. 05, 2014. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 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., the test report shall not be reproduced except in full.

Reviewed by:


Vic Hsiao / Supervisor

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Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]: 0.558145MHz 34.58 (Margin 21.42dB) - QP 28.35 (Margin 17.65dB) - AV	FCC 15.207	Complied
3.2	15.225 (a)~(d)	Field Strength of Fundamental Emissions and Spectrum Mask	Fundamental Emissions peak:49.13 dBuV/m at 3m Device complies with spectrum mask – refer to test data	124 dBuV/m at 3	Complied
3.3	15.225(d)	Transmitter Radiated Unwanted Emissions	[dBuV/m at 3m]: 901.06MHz 40.44 (Margin 5.56dB) - Peak	FCC 15.209	Complied
3.4	15.225(e)	Frequency Stability	36.87 ppm	± 0.01% (100ppm)	Complied

Revision History

[illegible]

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range	Modulation	Ch. Frequency (MHz)	Channel Number	Field Strength (dBuV/m)
13.110 – 14.010 MHz	ISO 14443-2 (ASK)	13.56	1	49.13
Note 1: Field strength performed peak level at 3m.				

1.1.2 Antenna Information

Antenna Category	
<input type="checkbox"/>	Equipment placed on the market without antennas
<input checked="" type="checkbox"/>	Integral antenna (antenna permanently attached)
<input type="checkbox"/>	External antenna (dedicated antennas)

1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	<input checked="" type="checkbox"/> Production ; <input type="checkbox"/> Pre-Production ; <input type="checkbox"/> Prototype
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
Duty cycle mode - ISO 14443 Type A			
Declare transmitter duty cycle / 1 hour =		100%	
Duty cycle Limit			
<input type="checkbox"/>	Class 1 - < 0.1 %	<input type="checkbox"/>	Class 2 - < 1.0 %
<input type="checkbox"/>	Class 3 - < 10 %	<input checked="" type="checkbox"/>	Class 4 - Up to 100 %
Duty cycle mode - ISO 14443 Type B			
Declare transmitter duty cycle / 1 hour =		100%	
Duty cycle Limit			
<input type="checkbox"/>	Class 1 - < 0.1 %	<input type="checkbox"/>	Class 2 - < 1.0 %
<input type="checkbox"/>	Class 3 - < 10 %	<input checked="" type="checkbox"/>	Class 4 - Up to 100 %
Duty cycle mode - ISO18092 Type F			
Declare transmitter duty cycle / 1 hour =		100%	
Duty cycle Limit			
<input type="checkbox"/>	Class 1 - < 0.1 %	<input type="checkbox"/>	Class 2 - < 1.0 %
<input type="checkbox"/>	Class 3 - < 10 %	<input checked="" type="checkbox"/>	Class 4 - Up to 100 %
Remark: Type F was the worst case and it was recorded in this report.			
Duty cycle mode - ISO15693 Type V			
Declare transmitter duty cycle / 1 hour =		100%	
Duty cycle Limit			
<input type="checkbox"/>	Class 1 - < 0.1 %	<input type="checkbox"/>	Class 2 - < 1.0 %
<input type="checkbox"/>	Class 3 - < 10 %	<input checked="" type="checkbox"/>	Class 4 - Up to 100 %

Operated Mode for Worst Duty Cycle				
<input checked="" type="checkbox"/> Operated test mode for worst duty cycle				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Test Signal Duty Cycle (x)</th> <th style="width: 50%;">Voltage Duty Factor [dB] – (20 log 1/x)</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> 100%</td> <td style="text-align: center;">0</td> </tr> </tbody> </table>	Test Signal Duty Cycle (x)	Voltage Duty Factor [dB] – (20 log 1/x)	<input checked="" type="checkbox"/> 100%	0
Test Signal Duty Cycle (x)	Voltage Duty Factor [dB] – (20 log 1/x)			
<input checked="" type="checkbox"/> 100%	0			

1.1.5 EUT Operational Condition

Supply Voltage	<input checked="" type="checkbox"/> AC mains	<input checked="" type="checkbox"/> DC	-
Type of DC Source	<input type="checkbox"/> Internal DC supply	<input checked="" type="checkbox"/> From Adapter	<input checked="" type="checkbox"/> From Li-ion Battery

1.2 Accessories and Support Equipment

Accessories				
AC Adapter	Brand Name	AOEM	Model Name	A048112-TD2
	Power Rating	I/P: 100 - 240 Vac, 1.5A, O/P: 12 Vdc, 4A		
	Power Cord	1.8 meter, non-shielded cable, w/o ferrite core		
Li-ion Battery	Brand Name	Panasonic	Model Name	103450
	Power Rating	7.4V  6810mAh		
LCD Panel	Brand Name	InnoLux	Model Name	EJ101IA-01G

Reminder: Regarding to more detail and other information, please refer to user manual.

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Identity Badge	-	-	-

1.3 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 C63.10-2009
- ♦ FCC KDB 174176

1.4 Testing Location Information

Testing Location						
<input checked="" type="checkbox"/>	HWA YA	ADD	:	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.		
		TEL	:	886-3-327-3456	FAX	: 886-3-327-0973
Test Site Registration Number: FCC 636805						
Test Condition		Test Site No.		Test Engineer		Test Environment
AC Conduction		CO04-HY		Zeus		21°C / 51%
RF Conducted		TH01-HY		Candy		25.5°C / 61%
Radiated Emission		03CH03-HY		Hunter		23.4°C / 53%

1.5 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))

Measurement Uncertainty		
Test Item		Uncertainty
AC power-line conducted emissions		±2.2 dB
Emission bandwidth		±1.4 %
Unwanted emissions, conducted	9 – 150 kHz	±0.3 dB
	0.15 – 30 MHz	±0.4 dB
	30 – 1000 MHz	±0.5 dB
All emissions, radiated	9 – 150 kHz	±2.4 dB
	0.15 – 30 MHz	±2.2 dB
	30 – 1000 MHz	±2.5 dB
Temperature		±0.8 °C
Humidity		±3 %
DC and low frequency voltages		±3 %
Time		±1.4 %
Duty Cycle		±1.4 %

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration




Modulation Used for Conformance Testing	
Modulation Mode	Field Strength (dBuV/m at 3 m)
NFC-Read/Write	49.13

2.2 Test Channel Frequencies Configuration

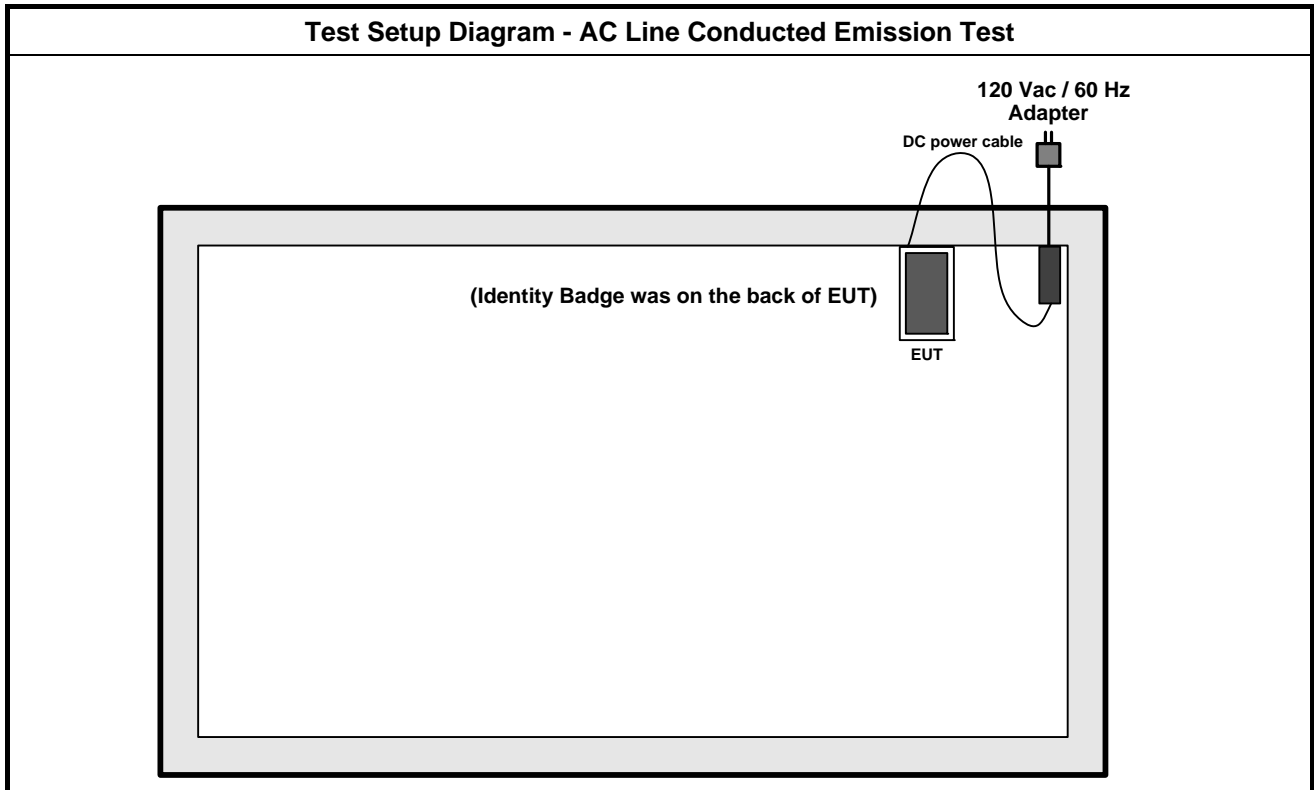
Test Channel Frequencies Configuration	
Modulation Mode	Test Channel Frequencies (MHz) – FX (Frequencies Abbreviations)
NFC-Read/Write	13.56

2.3 The Worst Case Measurement Configuration

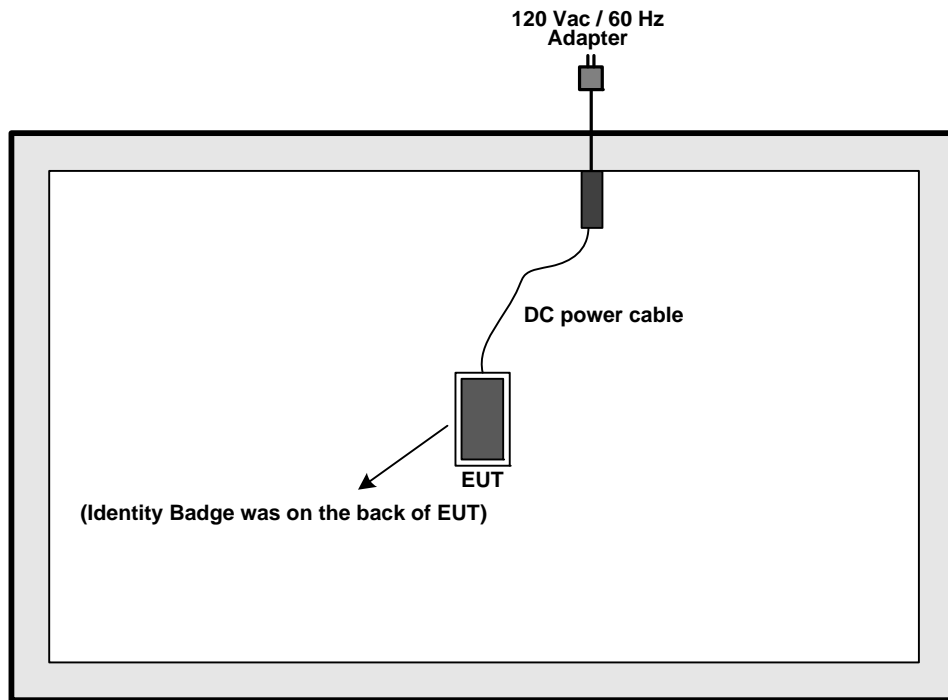
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	Operating Mode Description
	1. Adapter mode and Transmitter

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emission Bandwidth, Field Strength of Fundamental Emissions Spectrum Mask, Transmitter Radiated Unwanted Emissions Frequency Stability		
Test Condition	Radiated measurement		
User Position	<input type="checkbox"/> EUT will be placed in fixed position.		
	<input type="checkbox"/> EUT will be placed in mobile position and operating multiple positions.		
	<input checked="" type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed three orthogonal planes. The worst planes is Z.		
Operating Mode	Operating Mode Description		
	1. Adapter mode and Transmitter		
Modulation Mode	NFC-Read/Write		
Remark	NFC Type A, B, F, V were all evaluated here. Type F was the worst case so it was recorded in this report.		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			

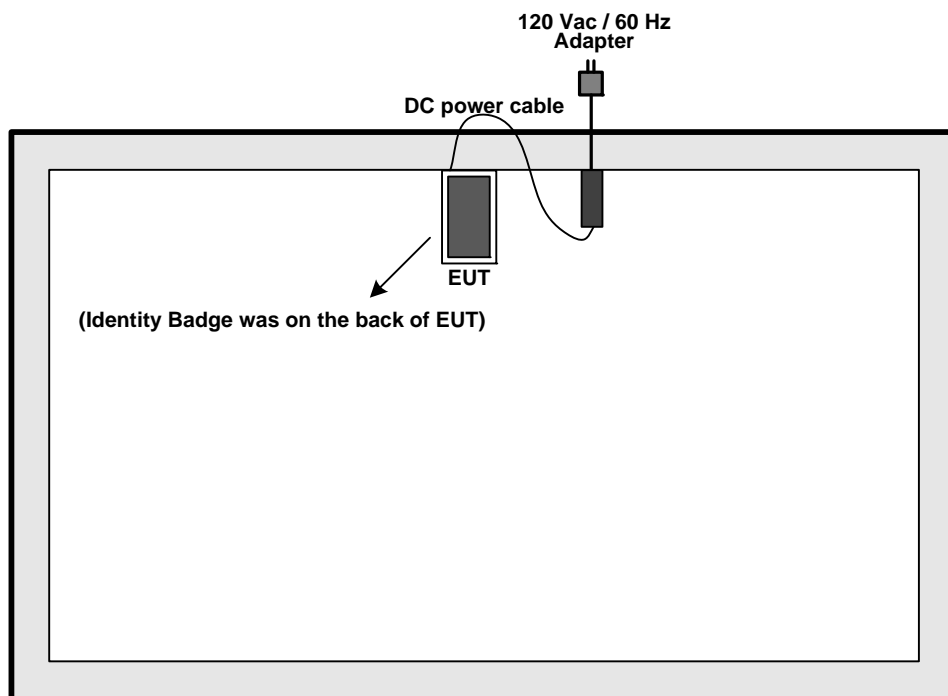
2.4 Test Setup Diagram



Test Setup Diagram - Radiated 9kHz~30MHz Test



Test Setup Diagram - Radiated 30MHz~1GHz Test



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.

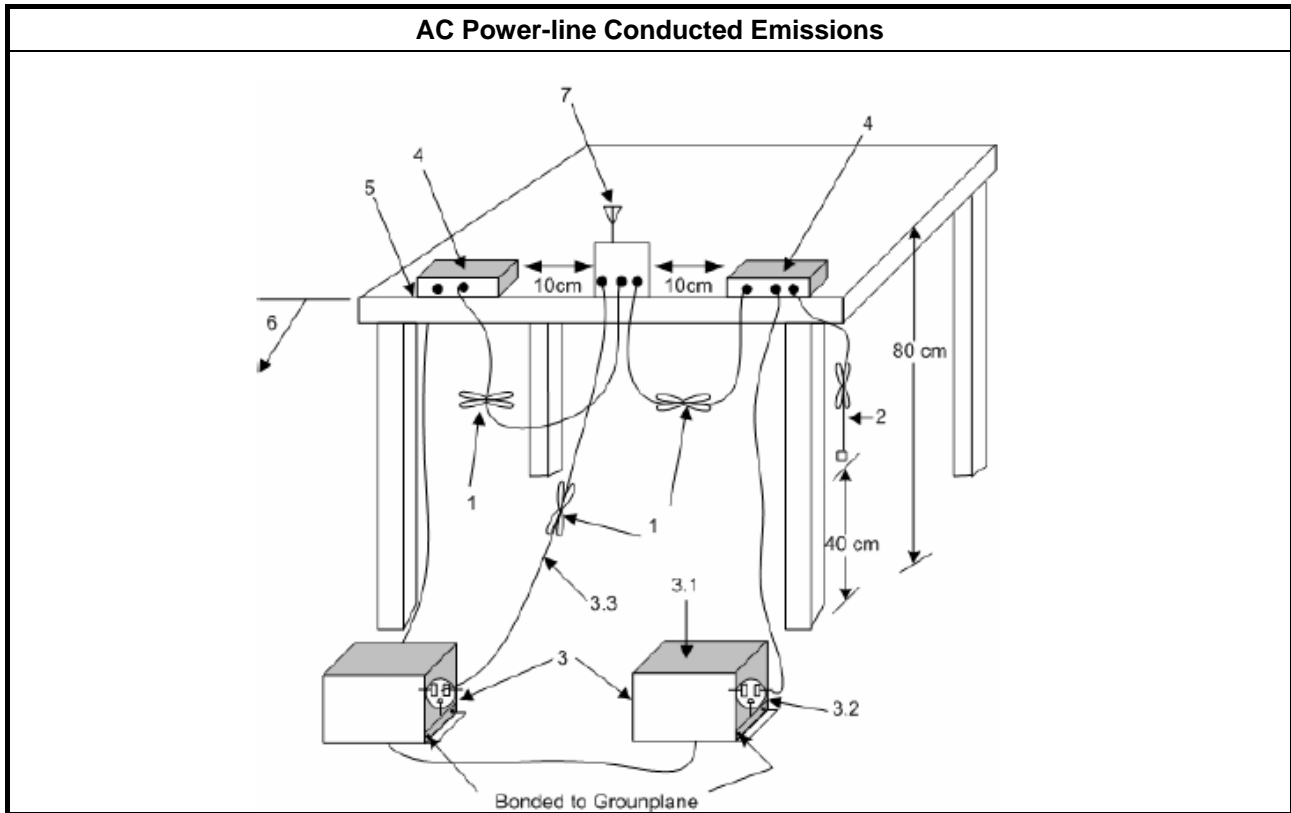
3.1.2 Measuring Instruments

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

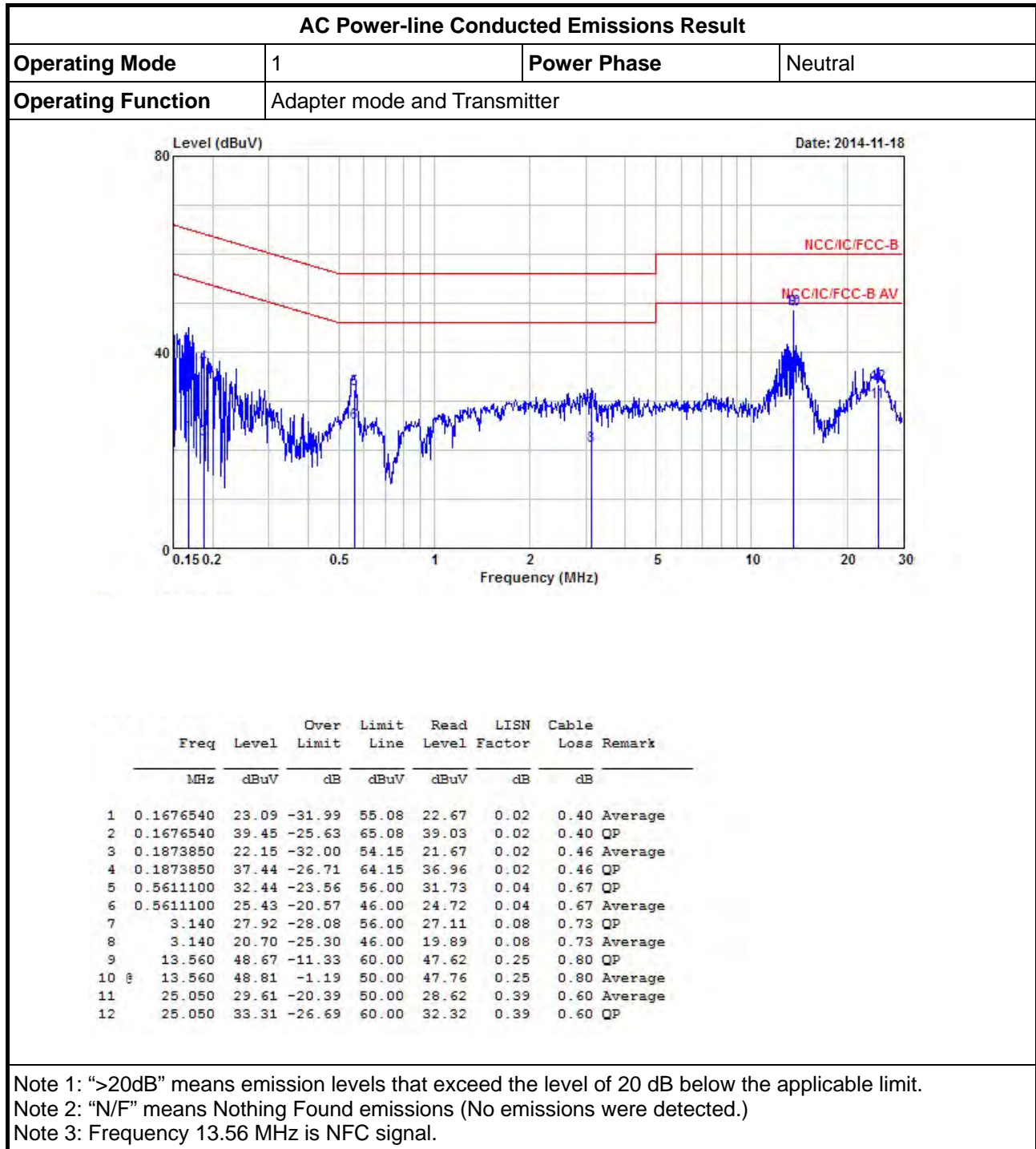
3.1.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10-2009, 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 Test Setup

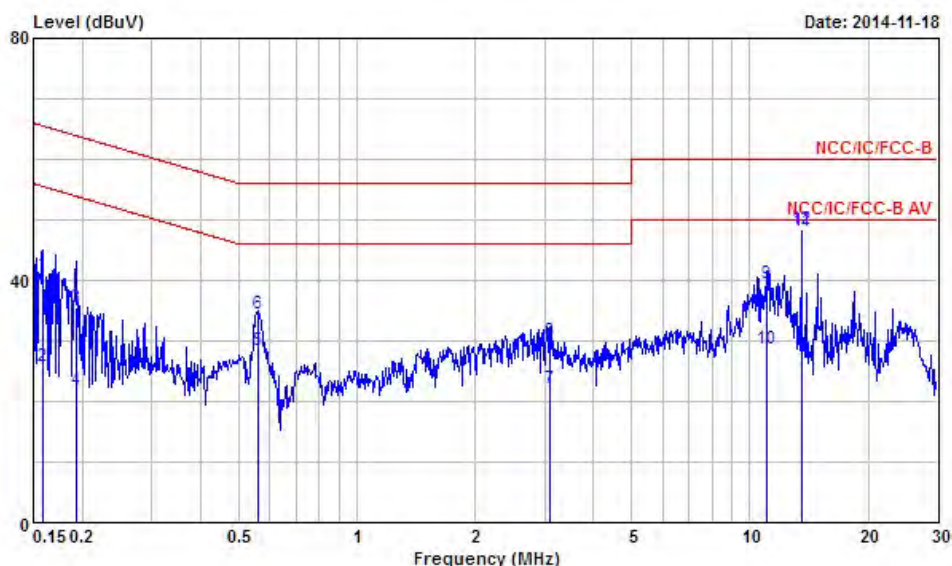


3.1.5 Test Result of AC Power-line Conducted Emissions



AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Adapter mode and Transmitter		



	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1581620	40.95	-24.61	65.56	40.56	0.03	0.36	QP
2	0.1581620	25.89	-29.67	55.56	25.50	0.03	0.36	Average
3	0.1924150	35.50	-28.43	63.93	34.99	0.03	0.48	QP
4	0.1924150	21.90	-32.03	53.93	21.39	0.03	0.48	Average
5	0.5581450	28.35	-17.65	46.00	27.64	0.04	0.67	Average
6	0.5581450	34.58	-21.42	56.00	33.87	0.04	0.67	QP
7	3.090	21.98	-24.02	46.00	21.15	0.09	0.74	Average
8	3.090	30.12	-25.88	56.00	29.29	0.09	0.74	QP
9	11.020	39.60	-20.40	60.00	38.59	0.21	0.80	QP
10	11.020	28.66	-21.34	50.00	27.65	0.21	0.80	Average
11	13.560	48.24	-11.76	60.00	47.20	0.24	0.80	QP
12	13.560	48.34	-1.66	50.00	47.30	0.24	0.80	Average

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

Note 3: Frequency 13.56 MHz is NFC signal.

3.2 Field Strength of Fundamental Emissions and Spectrum Mask

3.2.1 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

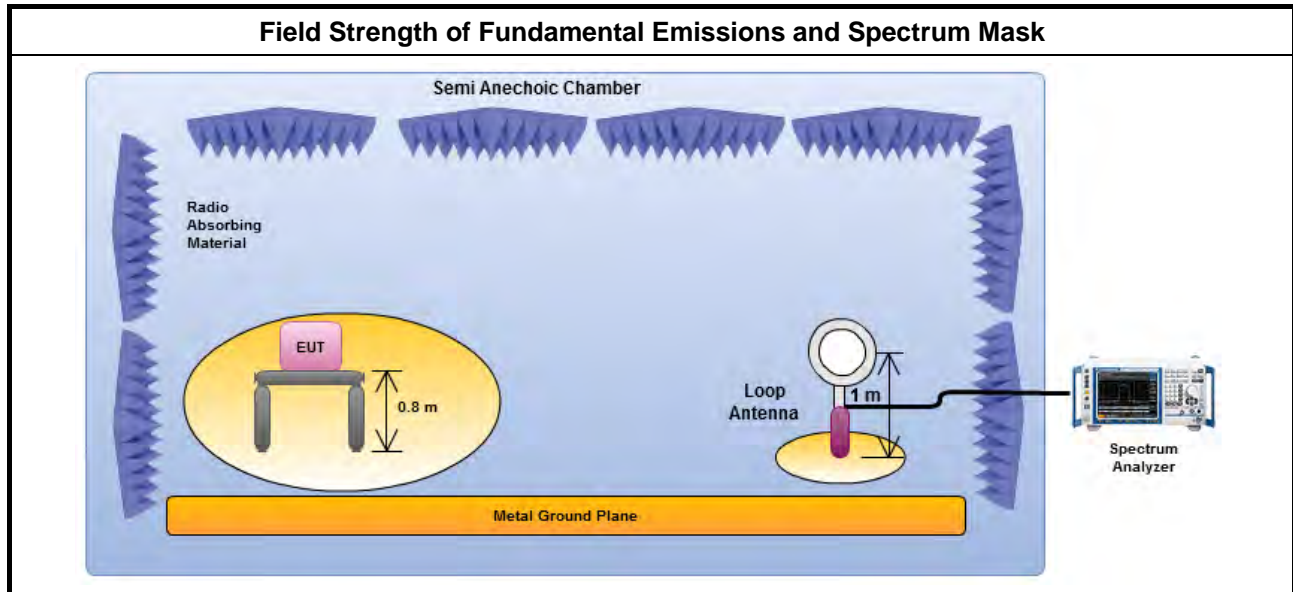
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

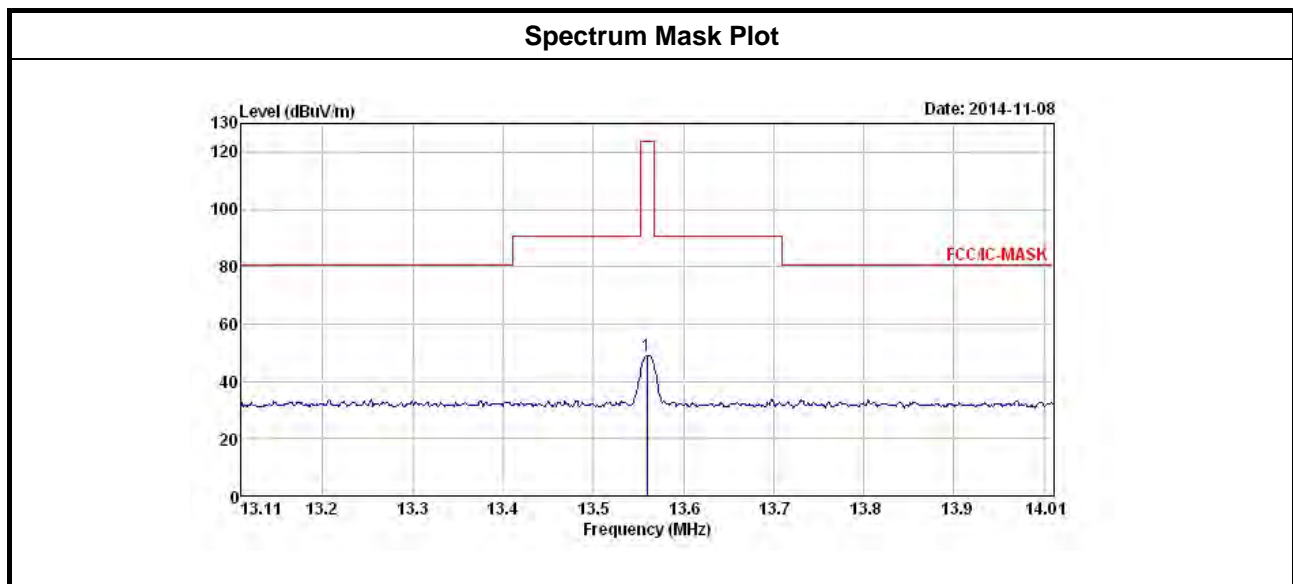
Test Method	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz and test distance is 3m.
<input checked="" type="checkbox"/>	At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the requirements; 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.

3.2.4 Test Setup



3.2.5 Test Result of Field Strength of Fundamental Emissions and Spectrum Mask

Field Strength of Fundamental Emissions Result					
Modulation Mode	Frequency (MHz)	Fundamental (dBuV/m)@3m	Polarization	Margin (dB)	Limit (dBuV/m)@3m
NFC-Read/Write	13.56	49.13	H	74.87	124.00
Result		Complied			
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal).					



3.3 Transmitter Radiated Unwanted Emissions

3.3.1 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.

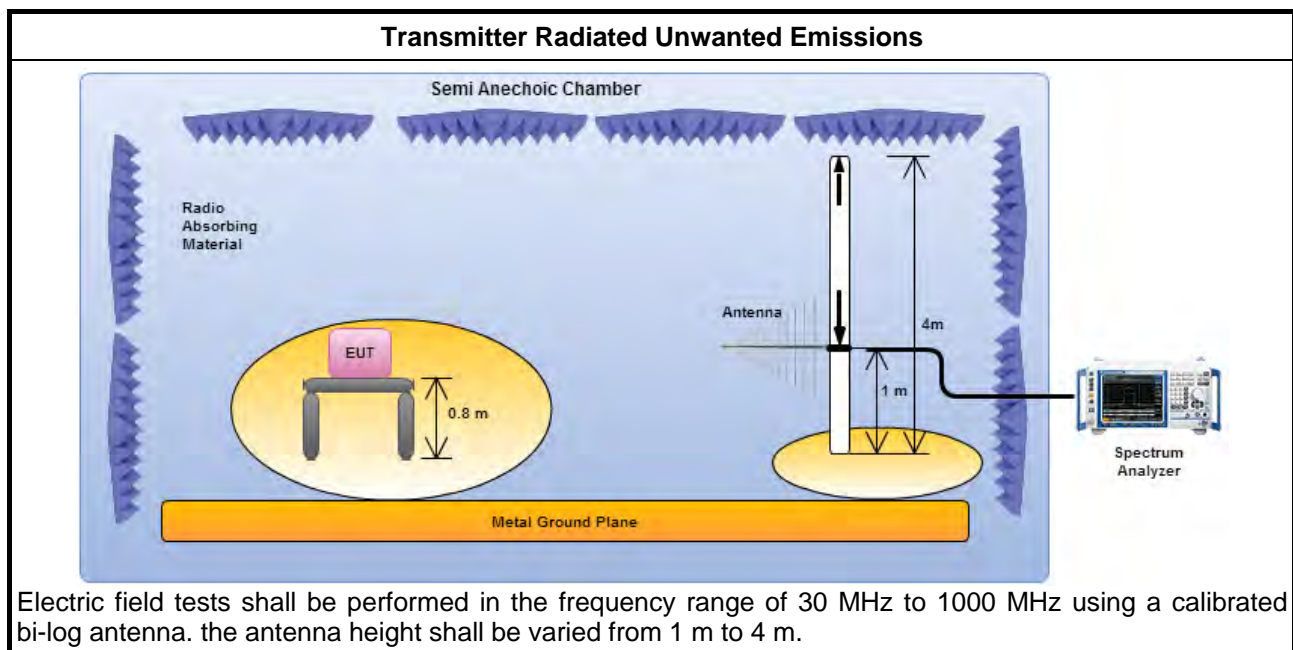
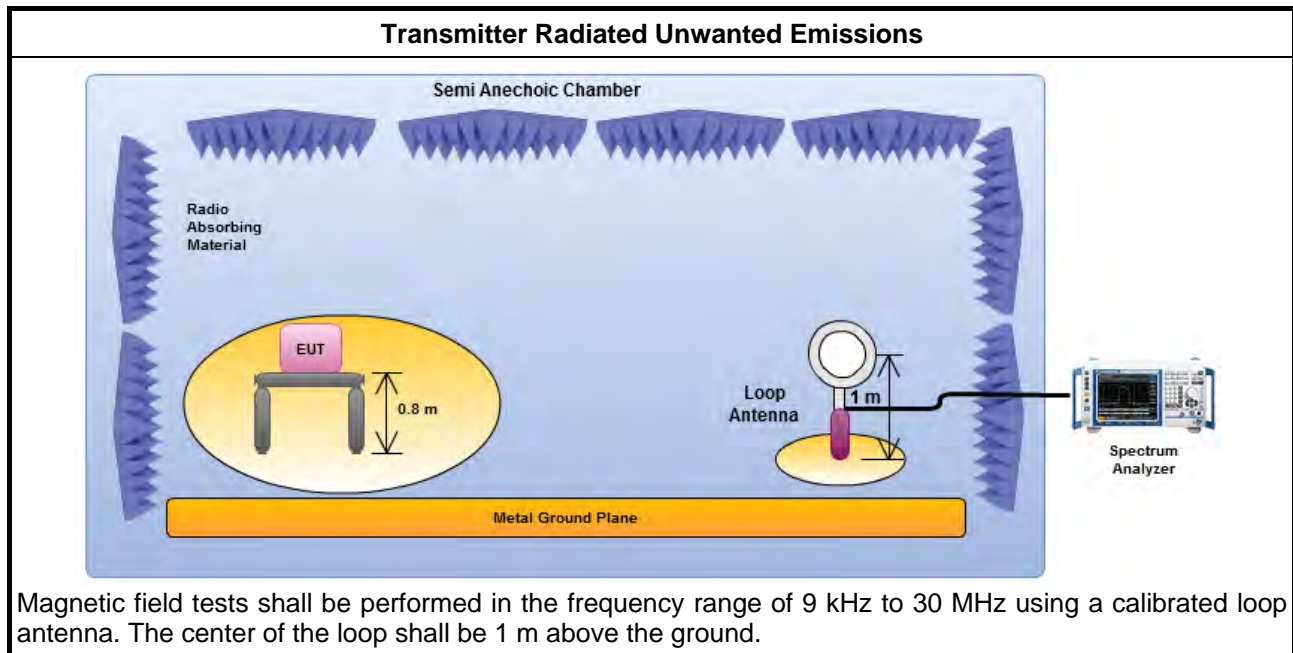
3.3.2 Measuring Instruments

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

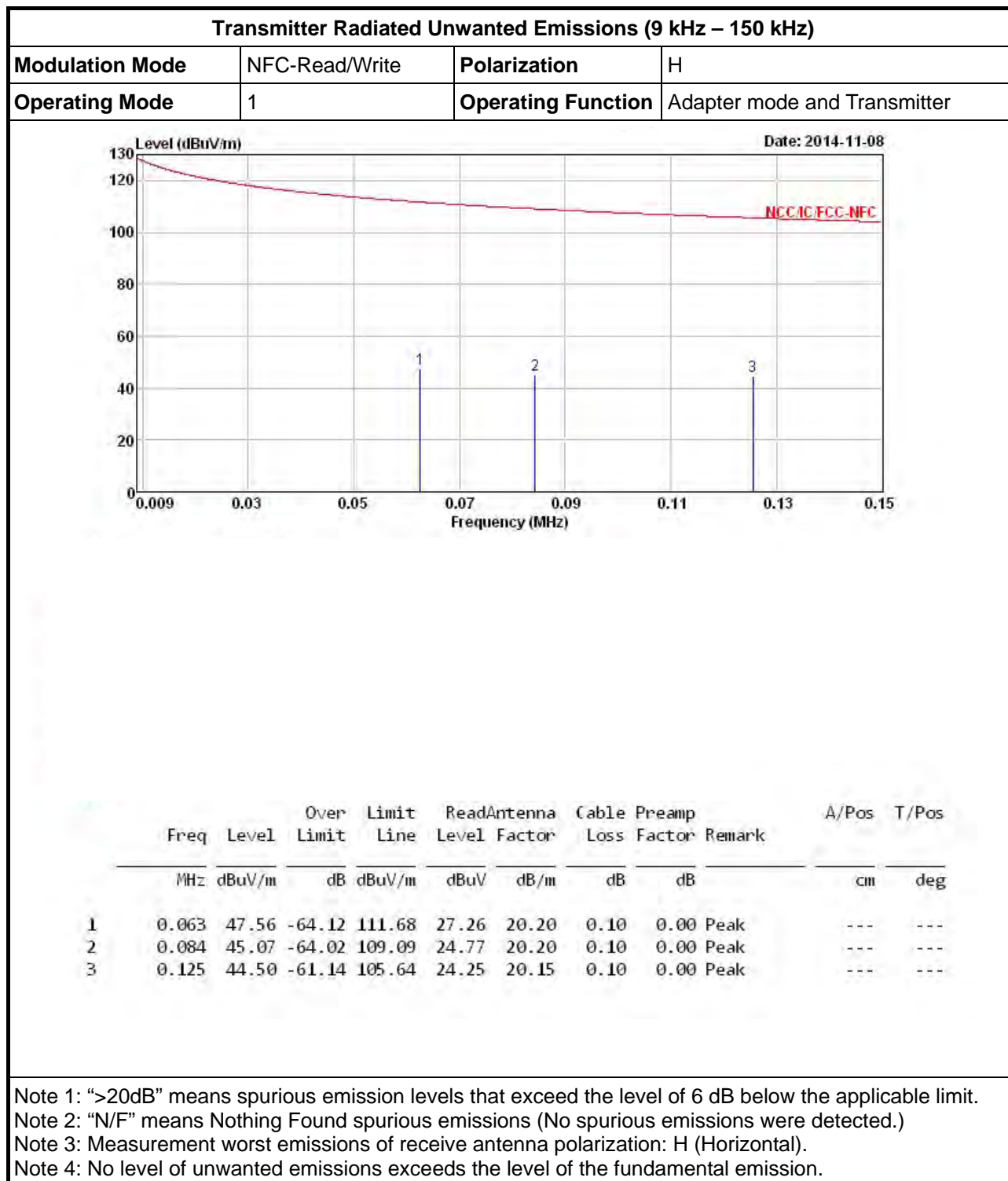
3.3.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 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.

3.3.4 Test Setup

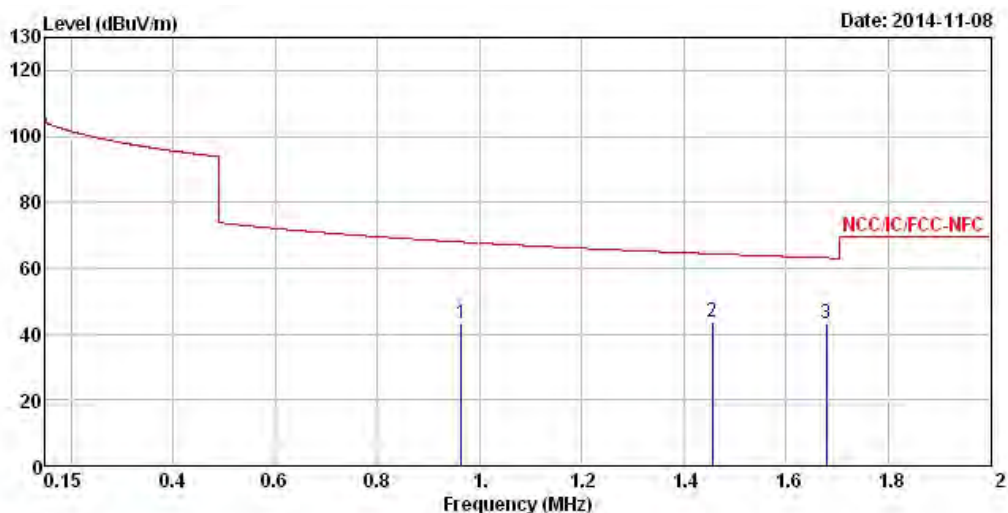


3.3.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)



Transmitter Radiated Unwanted Emissions (150 kHz –2 MHz)

Modulation Mode	NFC-Read/Write	Polarization	H
Operating Mode	1	Operating Function	Adapter mode and Transmitter



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Preamp Loss Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg
1	0.964	43.08	-24.85	67.93	23.07	19.91	0.10 0.00	Peak	---
2	1.456	43.43	-20.91	64.34	23.34	19.99	0.10 0.00	Peak	---
3	1.678	43.33	-19.78	63.11	23.13	20.00	0.20 0.00	Peak	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

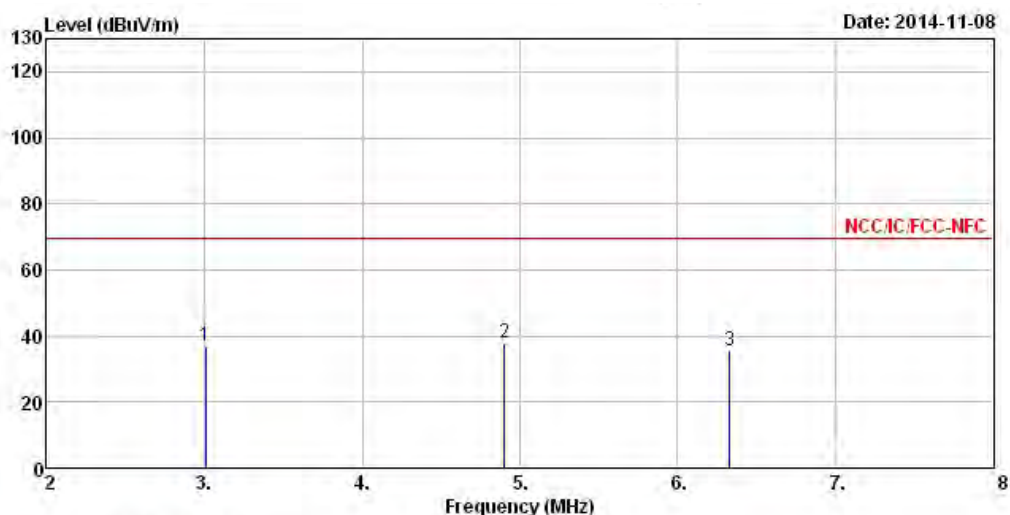
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).

Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (2 MHz –8 MHz)

Modulation Mode	NFC-Read/Write	Polarization	H
Operating Mode	1	Operating Function	Adapter mode and Transmitter



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	3.008	37.12	-32.42	69.54	16.86	20.00	0.26	0.00	Peak	---	---
2	4.904	37.77	-31.77	69.54	17.43	20.00	0.34	0.00	Peak	---	---
3	6.332	35.54	-34.00	69.54	15.10	20.07	0.37	0.00	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

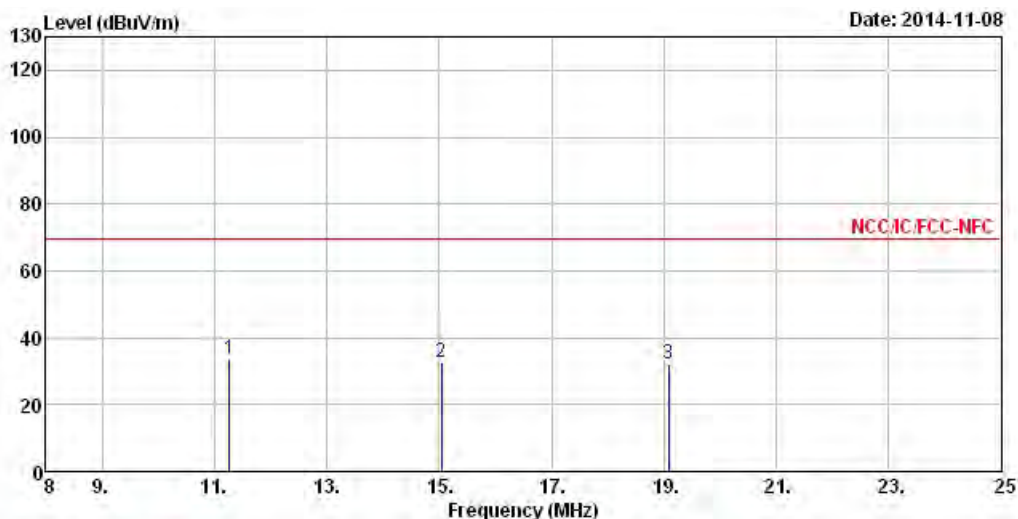
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).

Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (8 MHz –25 MHz)

Modulation Mode	NFC-Read/Write	Polarization	H
Operating Mode	1	Operating Function	Adapter mode and Transmitter



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	11.264	33.56	-35.98	69.54	12.94	20.10	0.52	0.00	Peak	---
2	15.038	32.84	-36.70	69.54	12.13	20.10	0.61	0.00	Peak	---
3	19.084	32.35	-37.19	69.54	11.47	20.18	0.70	0.00	Peak	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

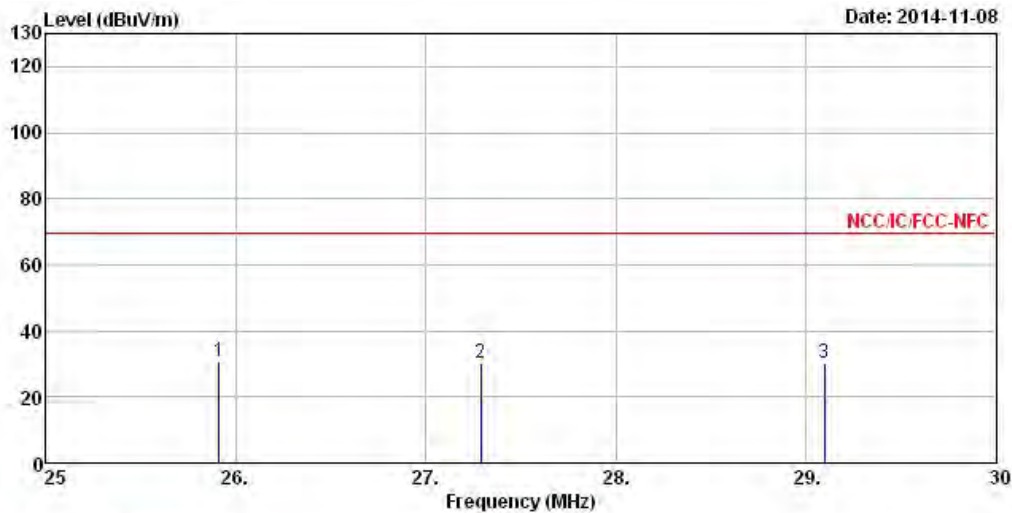
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).

Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

Transmitter Radiated Unwanted Emissions (25 MHz –30 MHz)

Modulation Mode	NFC-Read/Write	Polarization	H
Operating Mode	1	Operating Function	Adapter mode and Transmitter



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	25.910	30.94	-38.60	69.54	10.04	20.10	0.80	0.00	Peak	---	---
2	27.290	30.35	-39.19	69.54	9.44	20.10	0.81	0.00	Peak	---	---
3	29.100	30.09	-39.45	69.54	9.17	20.10	0.82	0.00	Peak	---	---

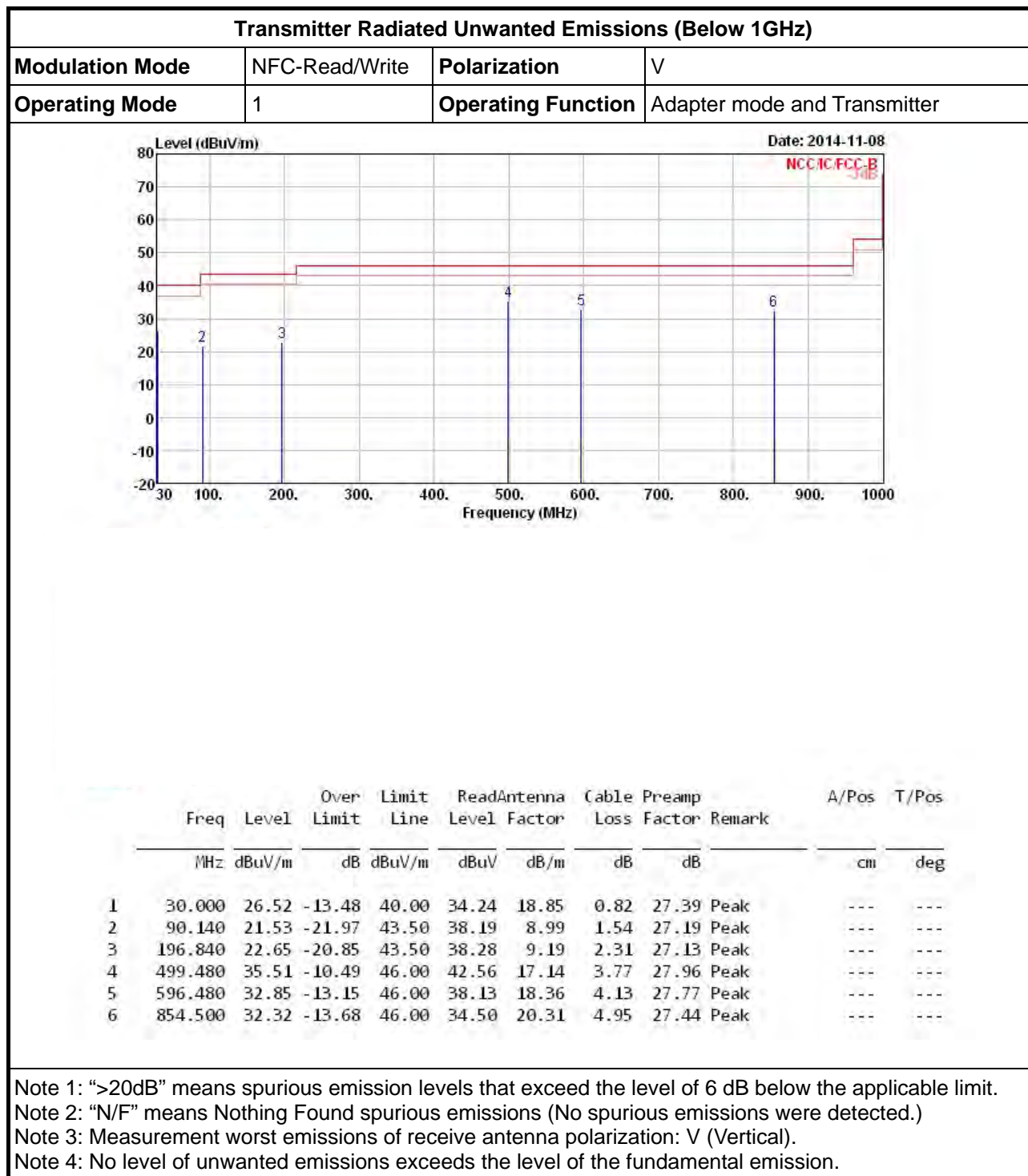
Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).

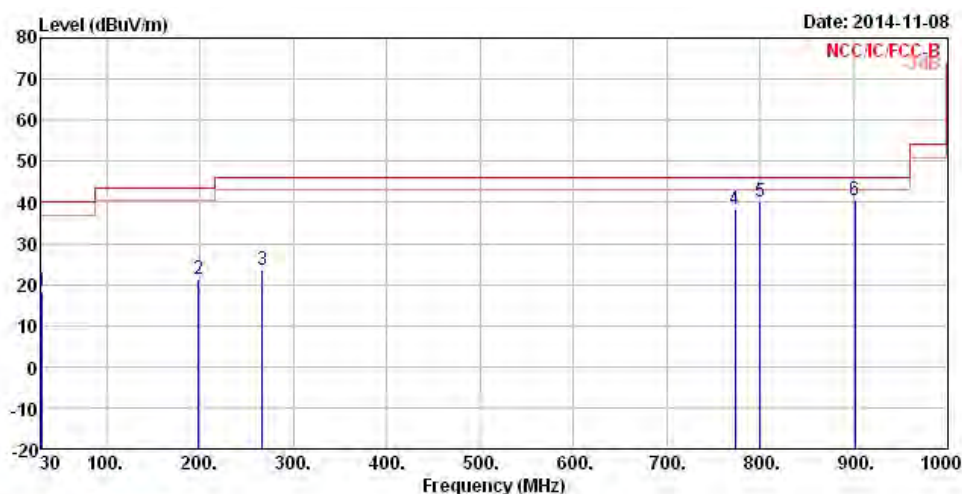
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

3.3.6 Transmitter Radiated Unwanted Emissions (Above 30MHz)



Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation Mode	NFC-Read/Write	Polarization	H
Operating Mode	1	Operating Function	Adapter mode and Transmitter



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	30.970	18.52	-21.48	40.00	26.71	18.31	0.85	27.35	Peak	---	---
2	198.780	21.18	-22.32	43.50	36.77	9.22	2.32	27.13	Peak	---	---
3	266.680	23.64	-22.36	46.00	34.52	13.24	2.71	26.83	Peak	---	---
4	773.020	38.35	-7.65	46.00	41.49	19.75	4.78	27.67	Peak	---	---
5	800.180	39.97	-6.03	46.00	43.04	19.64	4.92	27.63	Peak	---	---
6	901.060	40.44	-5.56	46.00	42.01	20.53	5.19	27.29	Peak	---	---

Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).

Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

3.4 Frequency Stability

3.4.1 Frequency Stability Limit

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

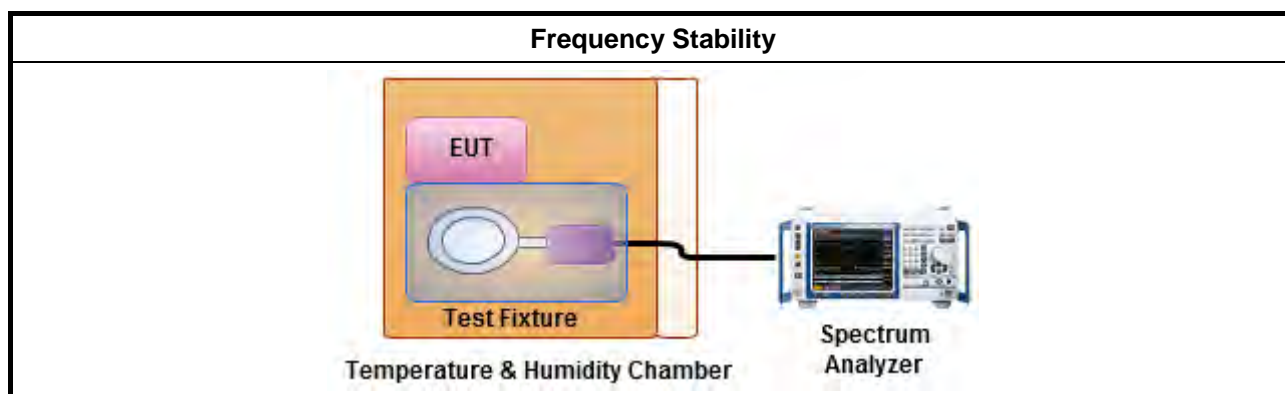
3.4.2 Measuring Instruments

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 6.8 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 checked="" type="checkbox"/>	For conducted measurement.
<input type="checkbox"/>	For radiated measurement. The equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted power level.

3.4.4 Test Setup



3.4.5 Test Result of Frequency Stability

Test date: Dec. 05, 2014		Frequency Stability Result
Power Level	1	Frequency Stability Max. Deviation Limit < 100 ppm
Condition	Freq. (MHz)	10 min
T _{20°C} V _{max}	13.56040	32.45
T _{20°C} V _{min}	13.56050	36.87
T _{50°C} V _{nom}	13.56040	25.07
T _{40°C} V _{nom}	13.56050	-11.06
T _{30°C} V _{nom}	13.56050	19.17
T _{20°C} V _{nom}	13.56050	-2.95
T _{10°C} V _{nom}	13.56040	-30.97
T _{0°C} V _{nom}	13.56050	36.87
T _{-10°C} V _{nom}	13.56050	19.17
T _{-20°C} V _{nom}	13.56040	32.45
Result		Complied
Note 1: Measure at 85 % [V _{min}] and 115 % [V _{max}] of the nominal voltage [V _{nom}]. The nominal voltage refer test report clause 1.1.2 for EUT operational condition.		

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz ~ 2.75GHz	Apr. 14, 2014	AC Conduction
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 22, 2014	AC Conduction
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	Oct. 31, 2014	AC Conduction
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	AC Conduction

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSV 40	101013	9KHz~40GHz	Jan. 25, 2014	RF Conducted
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Jul. 26, 2014	RF Conducted
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100℃	Nov. 19, 2014	RF Conducted

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Nov. 30, 2013	Radiation
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	May 05, 2014	Radiation
Amplifier	Agilent	8449B	3008A02120	1GHz ~ 26.5GHz	Sep. 01, 2014	Radiation
Spectrum	R&S	FSP40	100004	9kHz ~ 40GHz	Mar. 27, 2014	Radiation
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30MHz ~ 1GHz	Sep. 20, 2014	Radiation
Horn Antenna	ETS · LINDGREN	3115	6741	1GHz ~ 18GHz	Jun. 11, 2014	Radiation
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz ~ 40GHz	Jan. 10, 2014	Radiation
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 16, 2013	Radiation
RF Cable-high	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz ~ 40GHz	Dec. 11, 2013	Radiation
Turn Table	EM Electronics	EM Electronics	060615	0 ~ 360 degree	N/A	Radiation
Antenna Mast	MF	MF-7802	MF780208179	1 ~ 4 m	N/A	Radiation

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	Dec. 02, 2012	Radiation

Note: Calibration Interval of instruments listed above is two year.