

FCC Test Report

Equipment : Mobile EFT-POS
Brand Name : AEVI
Model No. : bbbcd(bbb-custom version of device, e.g. P01 for CBA specific unit, 0-9, A-Z; c-Wifi or 3G+Wifi version of device, W or G;d-0-9)
FCC ID : OHBMTPT10WBG
Standard : 47 CFR FCC Part 15.225
Operating Band : 13.553 – 13.567 MHz (channel freq. 13.56 MHz)
Applicant : AAEON Technology Inc.
Manufacturer : 5F, No. 135, Lane 235, Pao Chiao Rd., Taipei, Taiwan

The product sample received on May 10, 2016 and completely tested on Jun. 07, 2016. We, SPORTON, 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., the test report shall not be reproduced except in full.

Reviewed by:

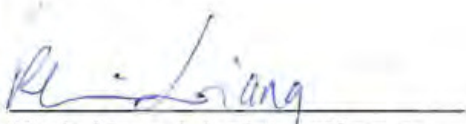

Kevin Liang / Assistant Manager



Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Accessories and Support Equipment	7
1.3	Testing Applied Standards	7
1.4	Testing Location Information	7
1.5	Measurement Uncertainty	8
2	TEST CONFIGURATION OF EUT.....	9
2.1	The Worst Case Modulation Configuration	9
2.2	Test Channel Frequencies Configuration.....	9
2.3	The Worst Case Measurement Configuration.....	10
2.4	Test Setup Diagram	11
3	TRANSMITTER TEST RESULT	12
3.1	AC Power-line Conducted Emissions	12
3.2	Emission Bandwidth	16
3.3	Field Strength of Fundamental Emissions and Spectrum Mask	18
3.4	Transmitter Radiated Unwanted Emissions	20
3.5	Frequency Stability.....	30
4	TEST EQUIPMENT AND CALIBRATION DATA.....	32
APPENDIX A. TEST PHOTOS		
APPENDIX B. PHOTOGRAPHS OF EUT		

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]: 0.466MHz 32.42(Margin 24.19dB) - QP 25.58(Margin 21.03dB) - AV	FCC 15.207	Complied
3.2	15.215(c)	Emission Bandwidth	20dB Bandwidth 2.62 [kHz] F_L : 13.55960 MHz F_H : 13.56222 MHz	Fall in band $F_L \geq 13.553$ MHz $F_H \leq 13.567$ MHz	Complied
3.3	15.225(a)~(d)	Field Strength of Fundamental Emissions and Spectrum Mask	Fundamental Emissions peak: 84.66 dBuV/m at 3m Device complies with spectrum mask – refer to test data	124 dBuV/m at 3	Complied
3.4	15.225(d)	Transmitter Radiated Unwanted Emissions	[dBuV/m at 3m]: 392.70MHz 42.88 (Margin 3.12dB) - PK	FCC 15.209	Complied
3.5	15.225(e)	Frequency Stability	72.57 ppm	$\pm 0.01\%$ (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)
13.553 – 13.567 MHz	ISO 14443-2 (ASK)	13.56	1	84.66
Note 1: Field strength performed peak level at 3m.				

1.1.2 Antenna Information

Antenna Category	
☐	Equipment placed on the market without antennas
☒	Integral antenna (antenna permanently attached)
☐	External antenna (dedicated antennas)

Antenna General Information			
No.	Ant. Cat.	Ant. Type	Brand Name
1	Integral	FPC	-

1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	☒ Production ; ☐ Pre-Production ; ☐ Prototype
Type of EUT	
☒	Stand-alone
☐	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: ...
☐	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.: ...
☐	Other:

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
☐ Operated normally mode for worst duty cycle	
☒ Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	Voltage Duty Factor [dB] – (20 log 1/x)
☒ 50%	3.01

1.1.5 EUT Operational Condition

Supply Voltage	☒ AC mains	☒ DC	
Type of DC Source	☐ Internal DC supply	☒ External AC adapter	☒ Battery
Test Voltage	☒ Vnom (7.4 V)	☒ Vmax (8.4 V)	☒ Vmin (6.0 V)
Test Climatic	☒ Tnom (20°C)	☒ Tmax (50°C)	☒ Tmin (-20°C)

1.2 Accessories and Support Equipment

Accessories

AC Adapter 1	Brand Name	AOEM	Model Name	A0605TD-120054
	Power Rating	I/P:100-240Vac, 1.8A, O/P: 12Vdc, 5.4A		
	Power Cord	0.2 meter, non-shielded cable, with w/o ferrite core		
Battery 1	Brand Name	Aaeon	Model Name	POS-5000B
	Power Rating	7.4Vdc, 4540 mAh	Type	Li-ion,NCA103450
Power Extend cable	Brand Name	AOEM	Model Name	A0605TD-120054
	Signal Line	1.5 meter, non-shielded cable, w/o ferrite core		
Singal cable	Brand Name	FLYINGWAY	Model Name	FWAA513
	Signal Line	3.1 meter, Braided-Shielded cable, with two ferrite core		

Support Equipment				
No.	Equipment	Brand Name	Model Name	Serial No.
1	1	NOTE BOOK	DELL	E5540
2	2	AC adapter for NB	DELL	LA65NS2-01

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 C63.10-2013
- ♦ FCC KDB 174176 D01

1.4 Testing Location Information

Testing Location				
☒	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.		
		TEL : 886-3-327-3456 FAX : 886-3-327-0973		
Test Condition		Test Site No.	Test Engineer	Test Environment
AC Conduction		CO01-HY	Willy	23°C / 56%
RF Conducted		TH01-HY	Howard	23.5°C / 65%
Radiated		03CH03-HY	Terry	22.1°C / 52%

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	±0.38 dB
	0.15 – 30 MHz	±0.42 dB
	30 – 1000 MHz	±0.51 dB
All emissions, radiated	9 – 150 kHz	±2.49 dB
	0.15 – 30 MHz	±2.28 dB
	30 – 1000 MHz	±2.56 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	84.66

2.2 Test Channel Frequencies Configuration

Modulation Mode	Test Channel Frequencies (MHz)
NFC-Read/Write	13.56-(F1)

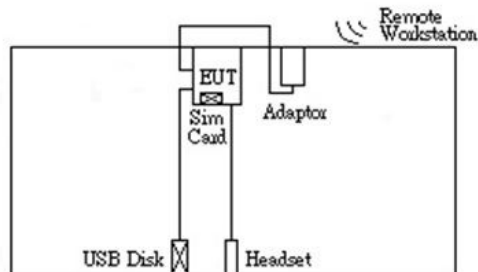
2.3 The Worst Case Measurement Configuration

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	Simple Tablet
2	Printer+Charging station
3	Charging module+Charging station
4	Pole mount
5	Printer only
For operating mode 2 is the worst case and it was record in this test report. This mode refer to EMC worst mode : Printer +Charging station R/W,H Pattern,Play MP3,Headset,WIFI,BT,NFC,Adapter WCDMA 2100 BAND 1 Idie	

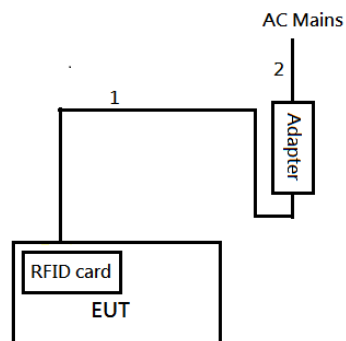
The Worst Case Mode for Following Conformance Tests			
Tests Item	Emission Bandwidth, Field Strength of Fundamental Emissions Spectrum Mask, Transmitter Radiated Unwanted Emissions, Frequency Stability		
Test Condition	Radiated measurement		
User Position	☐ EUT will be placed in fixed position.		
	☐ EUT will be placed in mobile position and operating multiple positions. EUT shall be performed three orthogonal planes.		
	☒ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed three orthogonal planes.		
Operating Mode < 1GHz	☒ 1. Simple Tablet		
	☒ 2. Printer+Charging station		
	☒ 3. Charging module+Charging station		
	☒ 4. Pole mount		
	☒ 5. Printer only		
For operating mode 2 is the worst case and it was record in this test report.			
Modulation Mode	NFC-Read/Write		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT		V	

2.4 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Test Setup Diagram - Radiated Test



1. Singal Cable , 3.1m ,Shielding
2. AC power line , 1.8m ,Non-shielding

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.

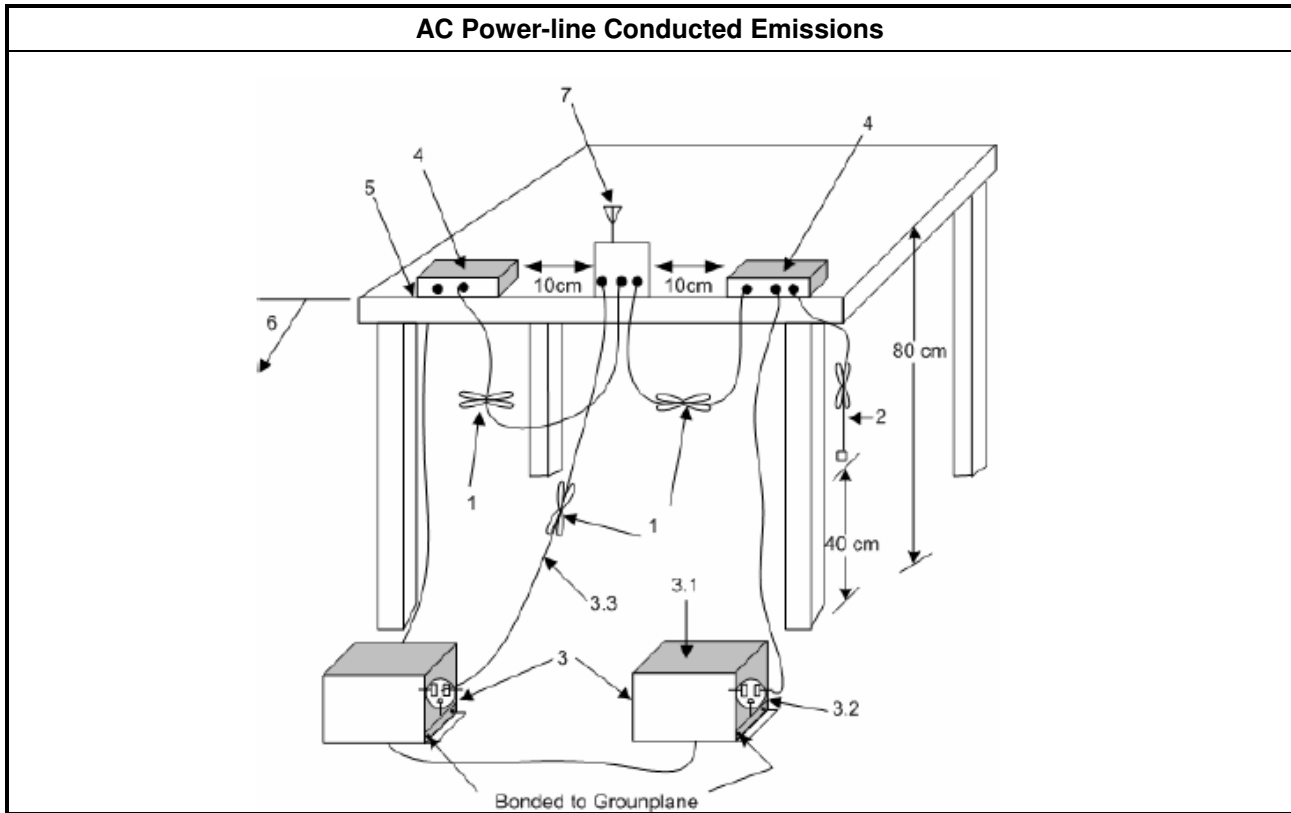
3.1.2 Measuring Instruments

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

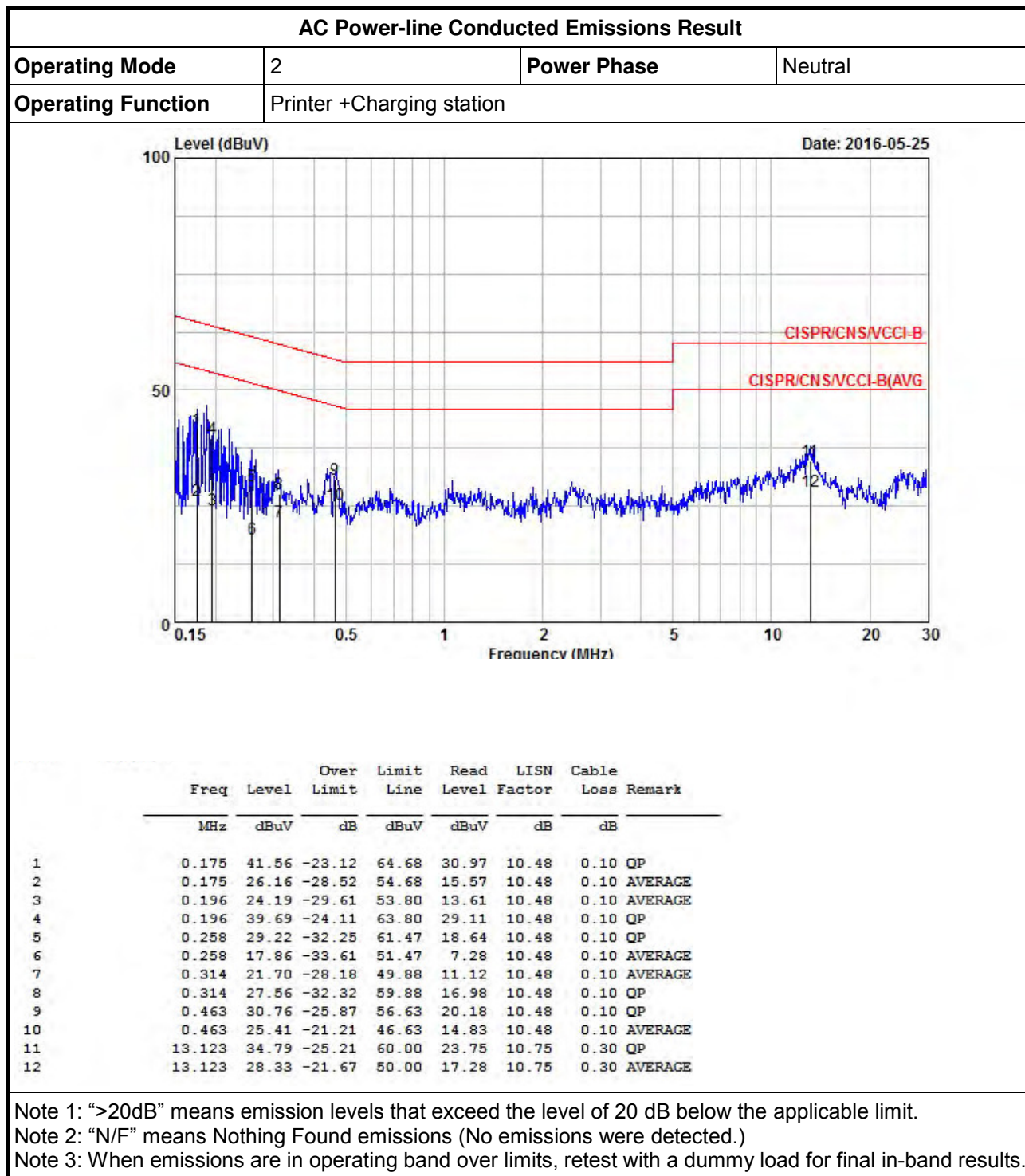
3.1.3 Test Procedures

Test Method	
☒	Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.
☒	If AC conducted emissions fall in operating band, then following below test method confirm final result.
☐	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.
☒	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

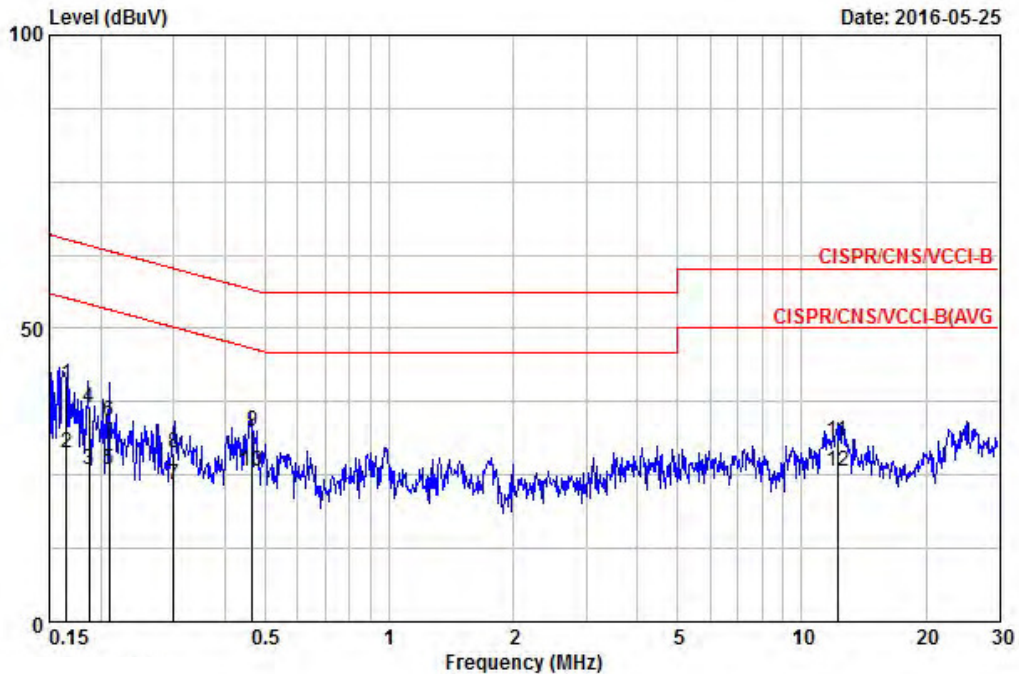


3.1.5 Test Result of AC Power-line Conducted Emissions



AC Power-line Conducted Emissions Result

Operating Mode	2	Power Phase	Line
Operating Function	Printer +Charging station		



	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.165	40.41	-24.84	65.25	30.25	10.06	0.10	QP
2	0.165	28.84	-26.41	55.25	18.68	10.06	0.10	AVERAGE
3	0.188	25.85	-28.30	54.15	15.70	10.05	0.10	AVERAGE
4	0.188	36.58	-27.57	64.15	26.43	10.05	0.10	QP
5	0.210	26.05	-27.18	53.23	15.90	10.05	0.10	AVERAGE
6	0.210	34.19	-29.04	63.23	24.04	10.05	0.10	QP
7	0.301	23.48	-26.75	50.24	13.34	10.04	0.10	AVERAGE
8	0.301	28.64	-31.60	60.24	18.49	10.04	0.10	QP
9	0.466	32.42	-24.19	56.60	22.27	10.04	0.10	QP
10	0.466	25.58	-21.03	46.60	15.43	10.04	0.10	AVERAGE
11	12.183	30.77	-29.23	60.00	20.20	10.27	0.30	QP
12	12.183	25.63	-24.37	50.00	15.06	10.27	0.30	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: When emissions are in operating band over limits, retest with a dummy load for final in-band results.

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

20dB Bandwidth Limit	
☒	Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (13.553 – 13.567 MHz).

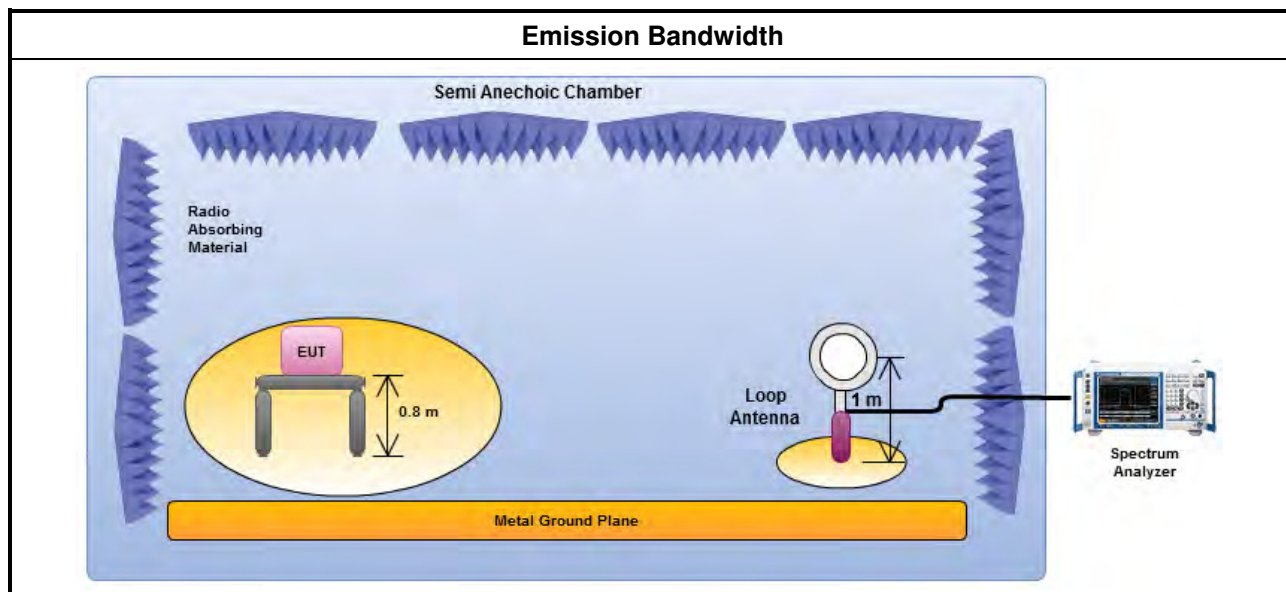
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

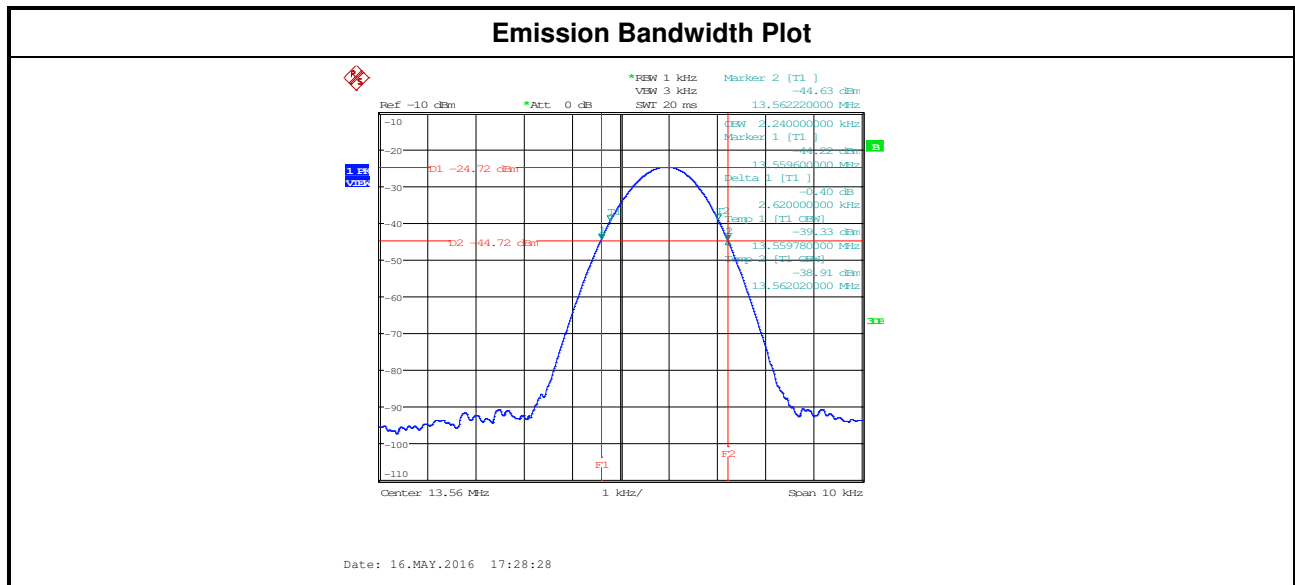
Test Method	
☒	For the emission bandwidth refer ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
☒	For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Occupied Channel Bandwidth Result					
Modulation Mode	Frequency (MHz)	20dB Bandwidth (kHz)	F _L at 20dB BW (MHz)	F _H at 20dB BW (MHz)	99% Bandwidth (kHz)
NFC-Read/Write	13.56	2.62000	2.24000	13.55960	13.56222
Limit		N/A	13.553	13.567	N/A
Result		Complied			



3.3 Field Strength of Fundamental Emissions and Spectrum Mask

3.3.1 Field Strength of Fundamental Emissions and Spectrum Mask Limit

Field Strength of Fundamental Emissions For FCC					
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 For FCC					
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

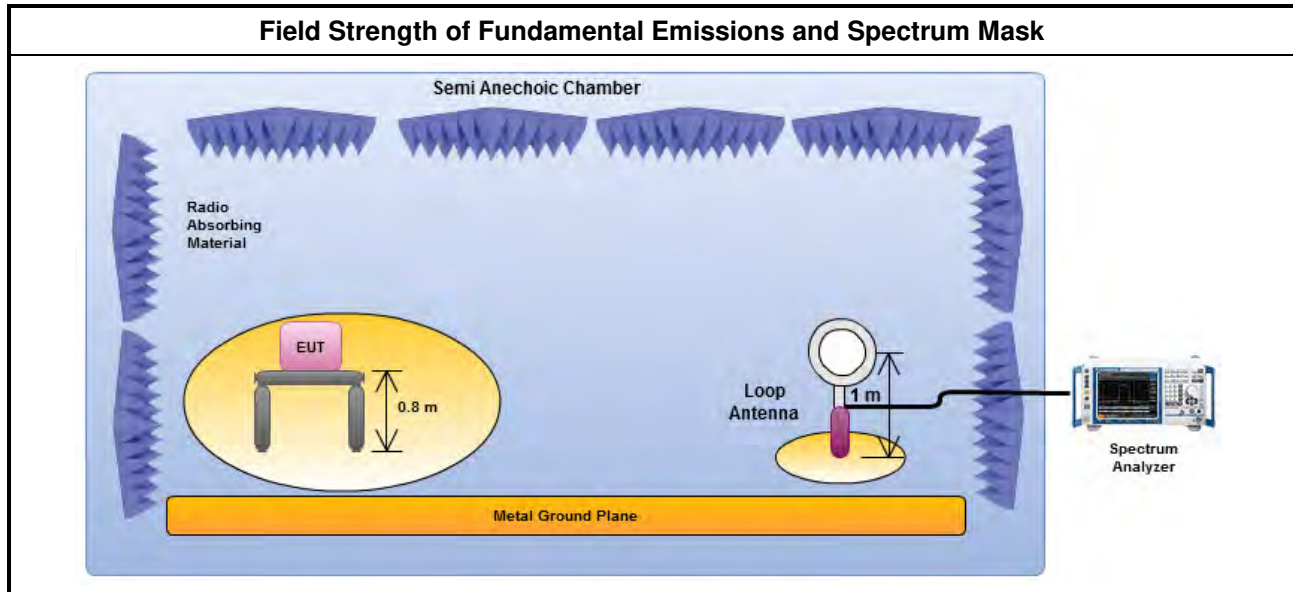
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

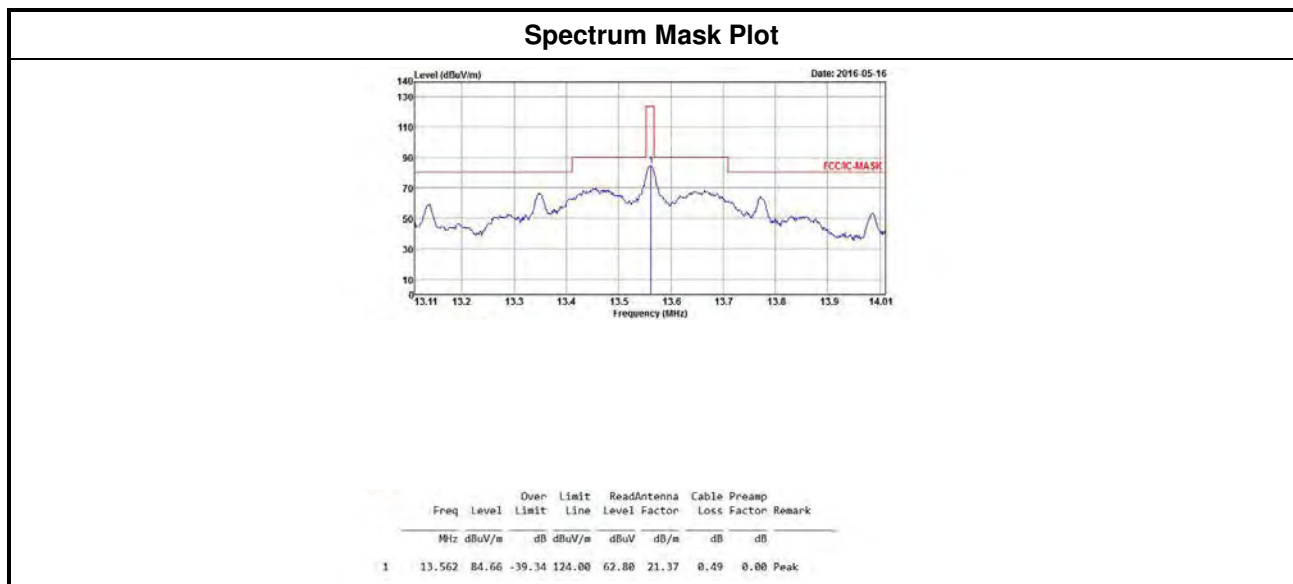
Test Method	
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz and test distance is 3m.
☒	At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the requirements; however, an attempt should be made to avoid making measurements 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.
☐	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.
☒	The results shall be by using the square of an inverse linear distance extrapolation factor (40 dB/decade).
☒	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.

3.3.4 Test Setup



3.3.5 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	F1	84.66	H	39.34	124.00
Result		Complied			
Note 1: Measurement worst emissions of receive antenna polarization: H(Horizontal).					



3.4 Transmitter Radiated Unwanted Emissions

3.4.1 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.

3.4.2 Measuring Instruments

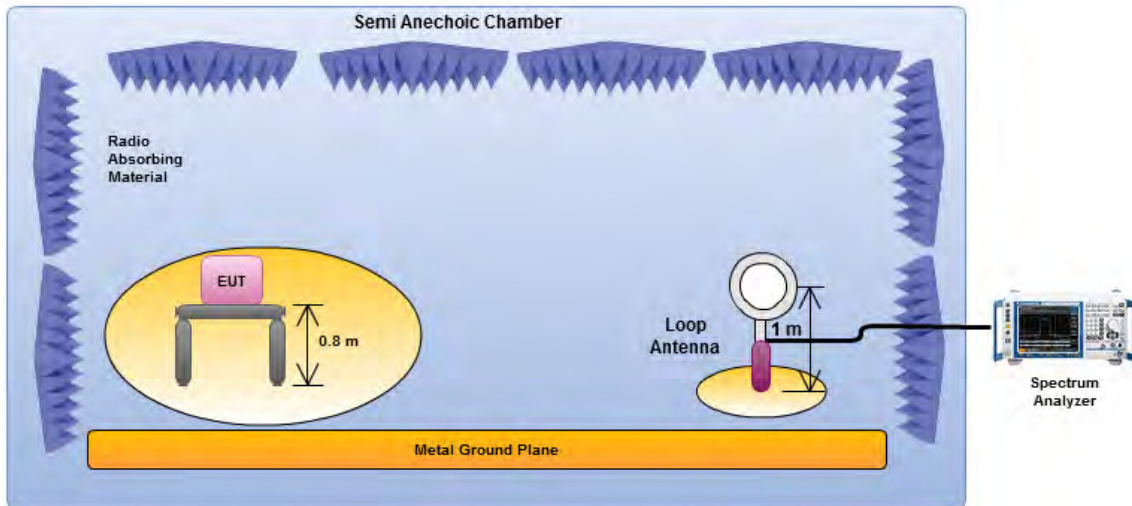
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method	
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1 GHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz and test distance is 3m.
☒	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.
☐	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.
☒	The results shall be by using the square of an inverse linear distance extrapolation factor (40 dB/decade).
☒	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.
☒	The any unwanted emissions level shall not exceed the fundamental emission level.
☒	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

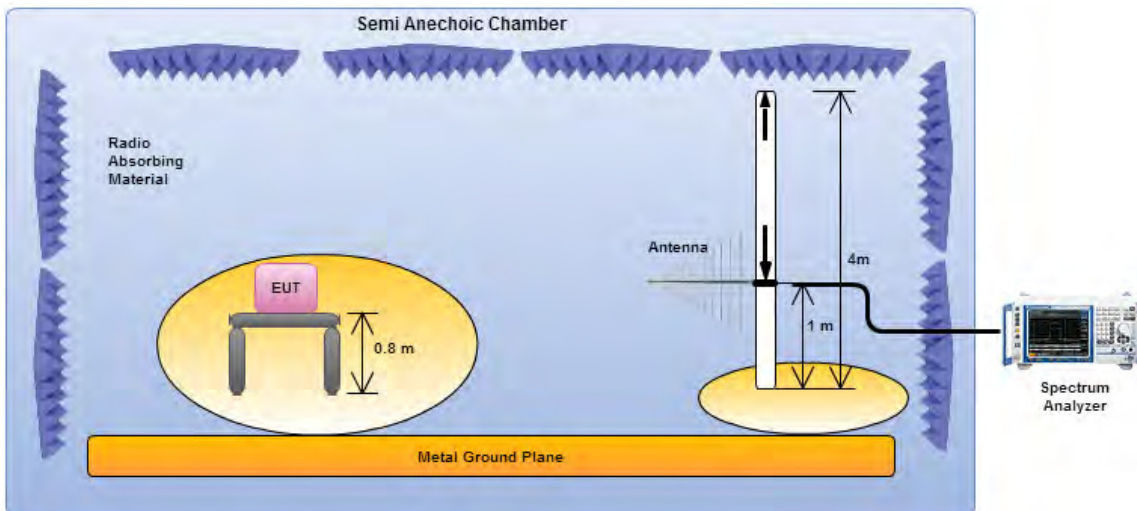
3.4.4 Test Setup

Transmitter Radiated Unwanted Emissions



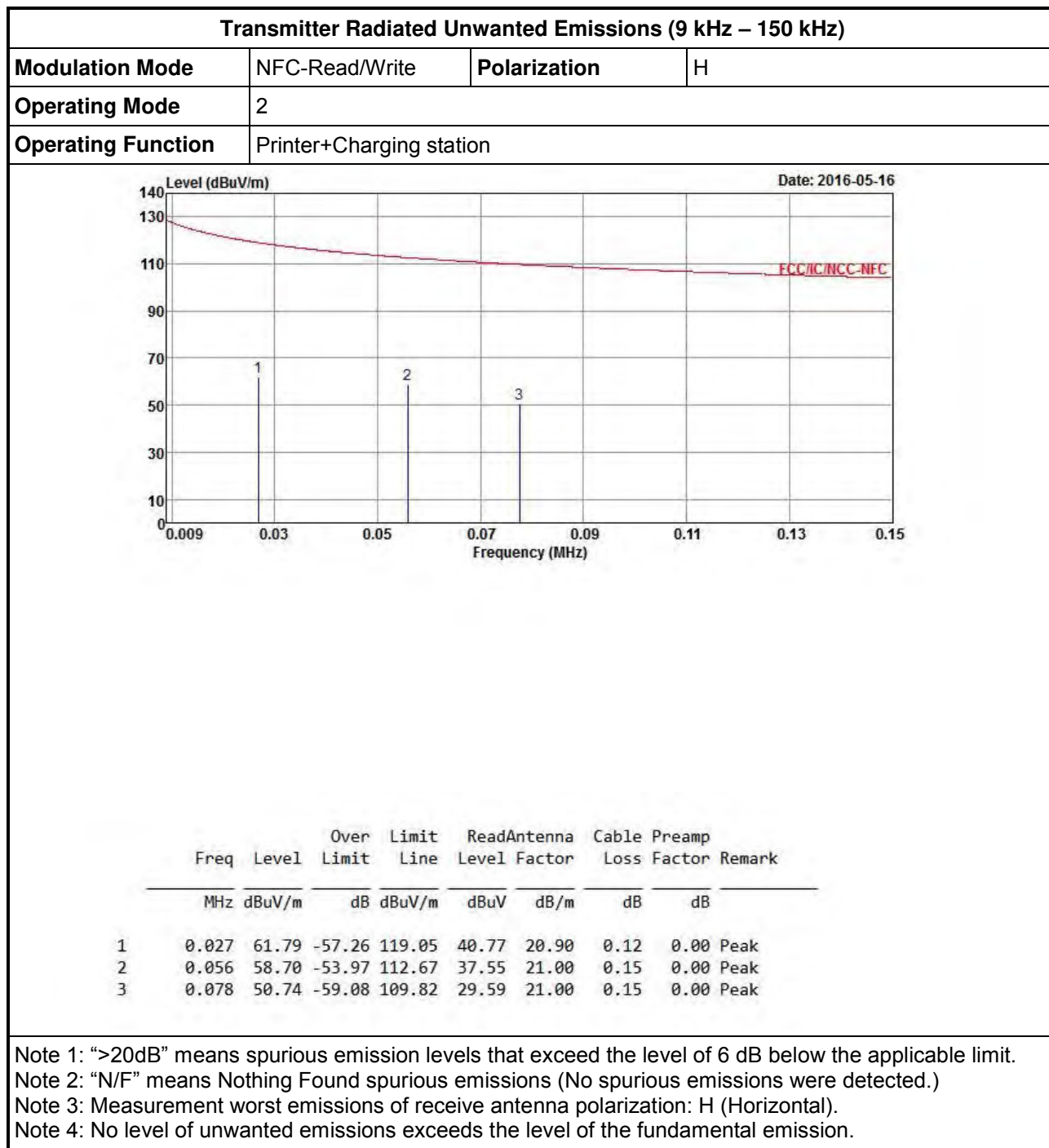
Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. The center of the loop shall be 1 m above the ground.

Transmitter Radiated Bandedge Emissions



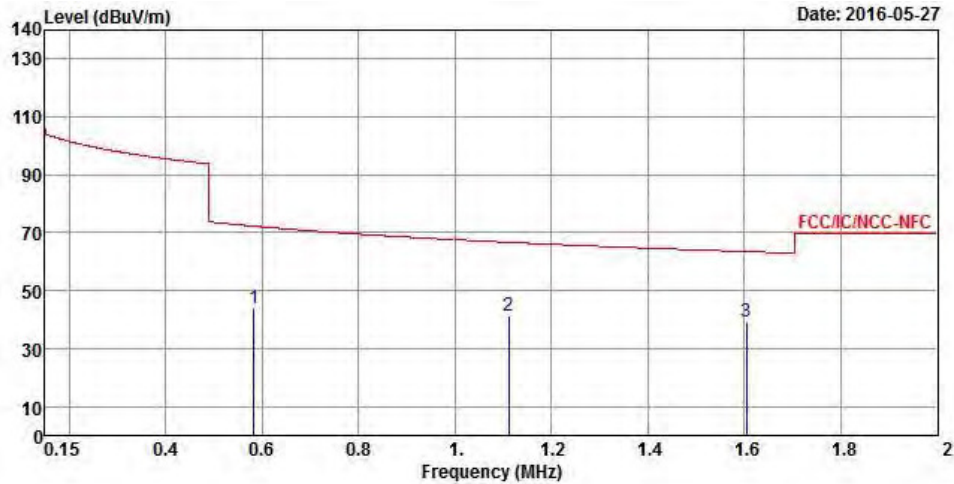
Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna. the antenna height shall be varied from 1 m to 4 m.

3.4.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)



Transmitter Radiated Unwanted Emissions (150 kHz –2 MHz)

Modulation Mode	NFC-Read/Write	Polarization	H
Operating Mode	2		
Operating Function	Printer+Charging station		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	0.583	43.80	-28.50	72.30	22.86	20.72	0.22	0.00	Peak
2	1.112	41.27	-25.42	66.69	20.24	20.76	0.27	0.00	Peak
3	1.604	39.34	-24.16	63.50	18.46	20.59	0.29	0.00	Peak

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

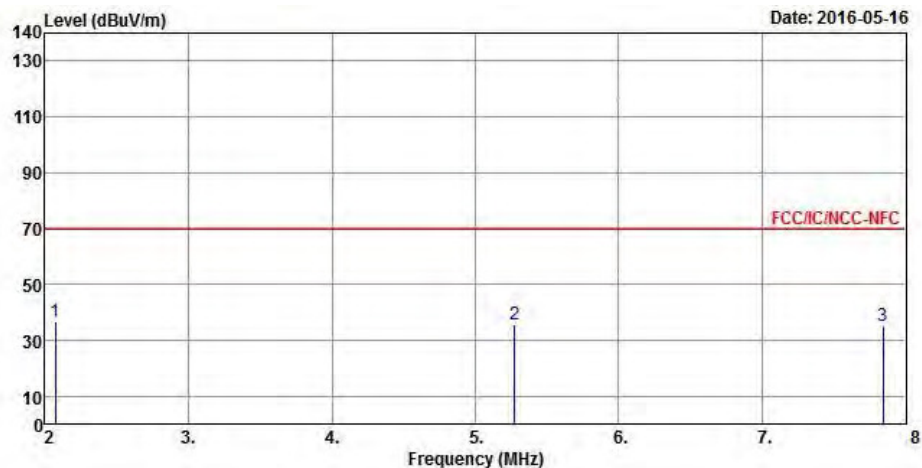
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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	2		
Operating Function	Printer+Charging station		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Factor	Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	2.072	36.43	-33.11	69.54	15.70	20.42	0.31	0.00	Peak
2	5.276	35.59	-33.95	69.54	14.29	20.92	0.38	0.00	Peak
3	7.844	34.89	-34.65	69.54	13.35	21.13	0.41	0.00	Peak

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

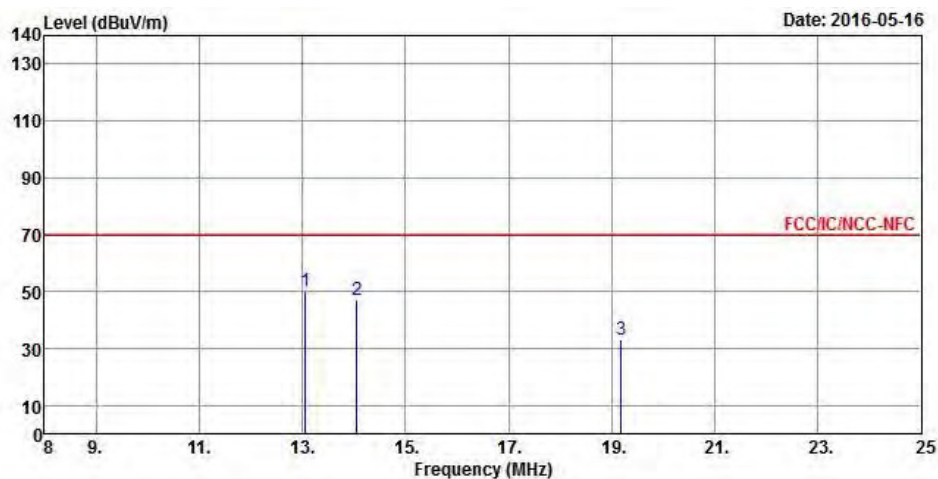
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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	2		
Operating Function	Printer+Charging station		



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Preamp Loss Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	
1	13.066	50.19	-19.35	69.54	28.34	21.36	0.49 0.00 Peak
2	14.052	46.85	-22.69	69.54	24.97	21.38	0.50 0.00 Peak
3	19.186	32.98	-36.56	69.54	10.86	21.48	0.64 0.00 Peak

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

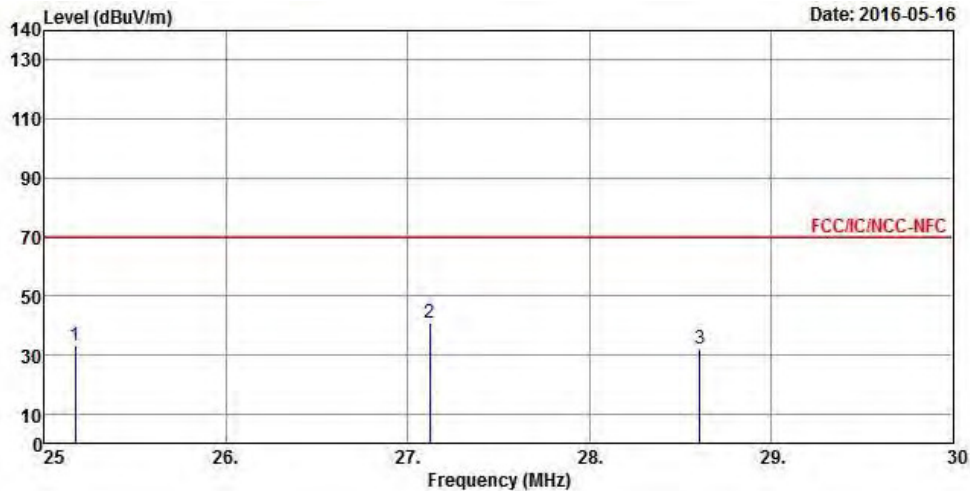
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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.

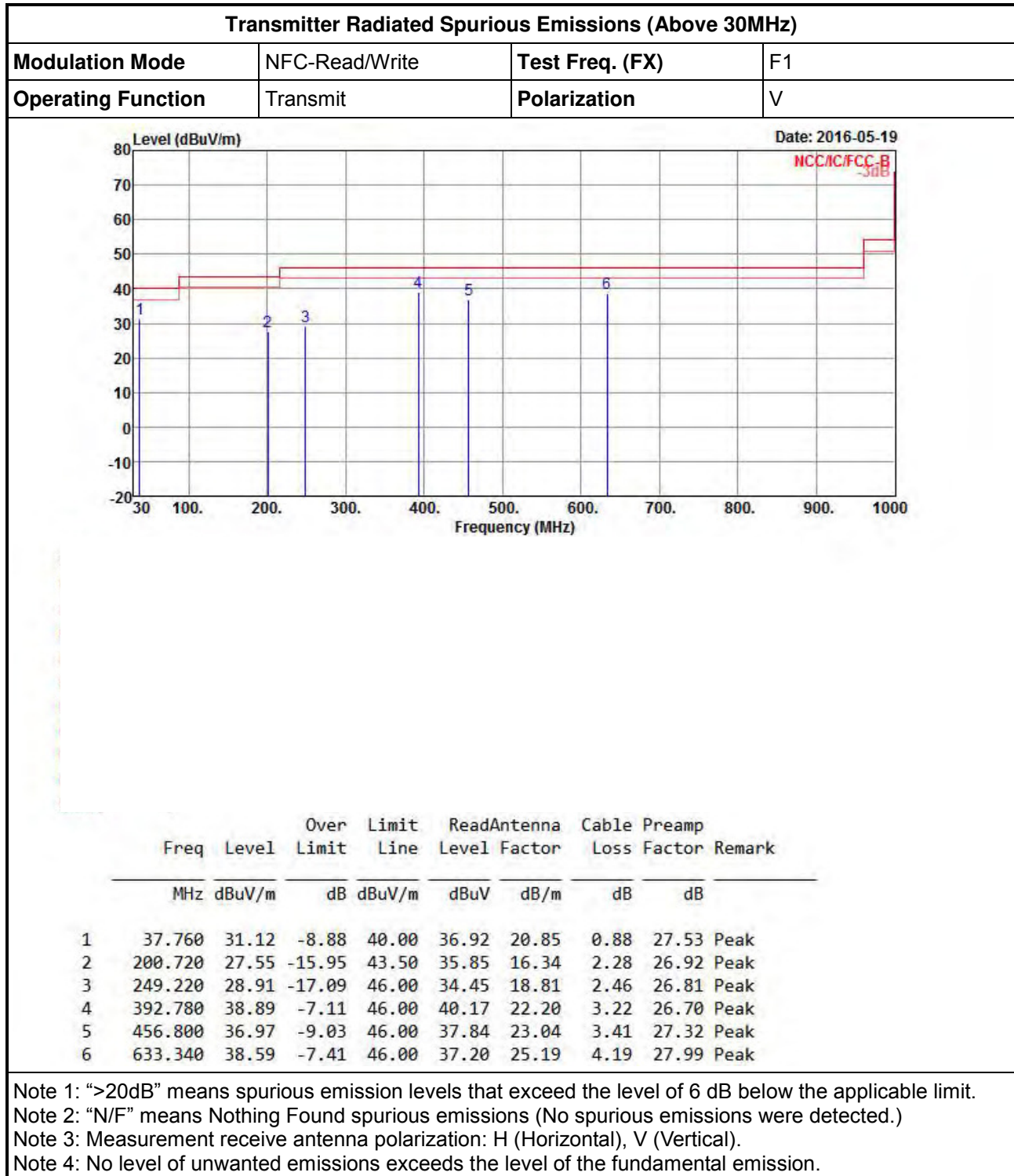
Transmitter Radiated Unwanted Emissions (25 MHz –30 MHz)

Modulation Mode	NFC-Read/Write	Polarization	H
Operating Mode	2		
Operating Function	Printer+Charging station		



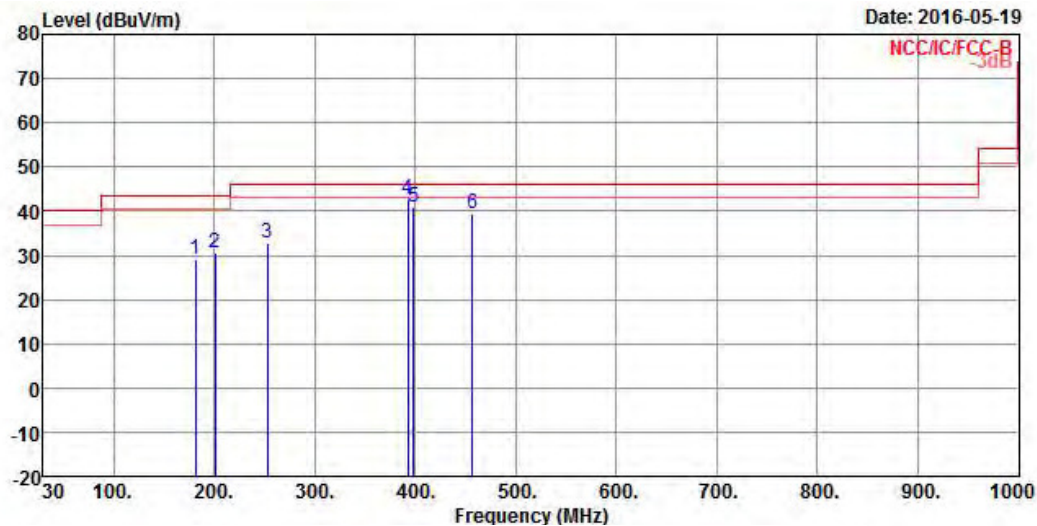
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB
1	25.170	33.20	-36.34	69.54	10.85	21.60	0.75	0.00 Peak
2	27.120	41.07	-28.47	69.54	18.67	21.64	0.76	0.00 Peak
3	28.610	31.79	-37.75	69.54	9.35	21.67	0.77	0.00 Peak

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.

3.4.6 Transmitter Radiated Unwanted Emissions (Above 30MHz)


Transmitter Radiated Spurious Emissions (Above 30MHz)

Modulation Mode	NFC-Read/Write	Test Freq. (FX)	F1
Operating Function	Transmit	Polarization	H



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	181.320	28.95	-14.55	43.50	38.25	15.57	2.14	27.01 Peak
2	200.720	30.69	-12.81	43.50	38.99	16.34	2.28	26.92 Peak
3	253.100	32.77	-13.23	46.00	37.95	19.15	2.47	26.80 Peak
4	392.780	42.88	-3.12	46.00	44.16	22.20	3.22	26.70 Peak
5	398.600	40.82	-5.18	46.00	41.95	22.33	3.24	26.70 Peak
6	456.800	39.59	-6.41	46.00	40.46	23.04	3.41	27.32 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 receive antenna polarization: H (Horizontal), V (Vertical).

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

3.5 Frequency Stability

3.5.1 Frequency Stability Limit

Frequency Stability Limit	
☒	Carrier frequency stability shall be maintained to $\pm 0.01\%$ (± 100 ppm).

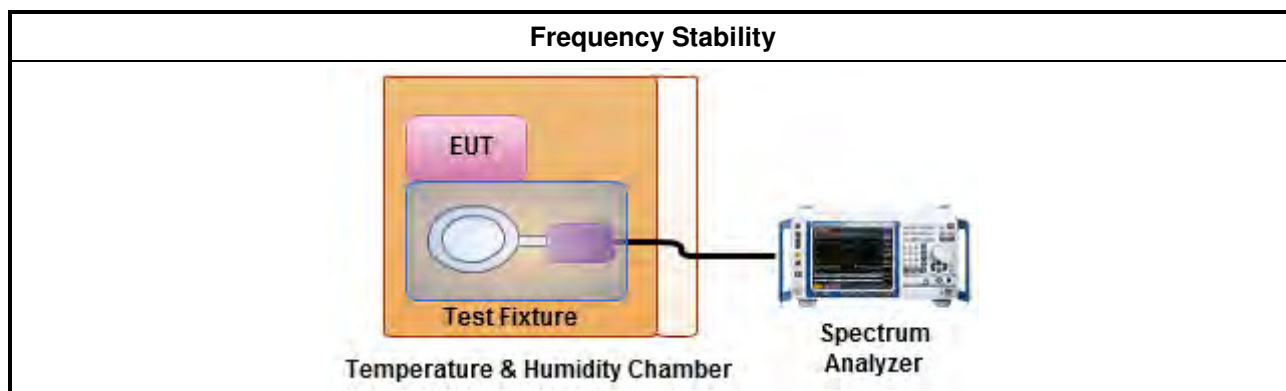
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of Frequency Stability

Frequency Stability Result									
Condition	Ch. Freq. (MHz)	Frequency Stability (ppm)							
		Test Frequency (MHz)				Frequency Stability (ppm)			
		0 min	2 min	5 min	10 min	0 min	2 min	5 min	10 min
T _{20°C} Vmax	13.56	13.56094	13.56094	13.56094	13.56094	69.32	69.62	69.54	69.32
T _{20°C} Vmin	13.56	13.56094	13.56094	13.56094	13.56094	69.62	69.54	69.32	69.32
T _{50°C} Vnom	13.56	13.56098	13.56098	13.56098	13.56098	72.27	72.42	72.57	72.42
T _{40°C} Vnom	13.56	13.56096	13.56096	13.56096	13.56096	70.80	70.80	70.94	71.09
T _{30°C} Vnom	13.56	13.56094	13.56094	13.56094	13.56094	69.47	69.40	69.32	69.40
T _{20°C} Vnom	13.56	13.56094	13.56094	13.56094	13.56094	69.47	69.54	69.32	69.62
T _{10°C} Vnom	13.56	13.56094	13.56094	13.56094	13.56094	69.32	69.54	69.54	69.40
T _{0°C} Vnom	13.56	13.56096	13.56096	13.56096	13.56096	70.80	70.94	70.87	70.80
T _{-10°C} Vnom	13.56	13.56097	13.56097	13.56098	13.56098	71.53	71.68	72.27	72.49
T _{-20°C} Vnom	13.56	13.56096	13.56096	13.56097	13.56097	70.80	71.09	71.24	71.31
Limit (ppm)		100							
Result		Complied							
Note 1: Measure at 85 % [Vmin] and 115 % [Vmax] of the nominal voltage [Vnom]. The nominal voltage refer test report clause 1.1.5 for EUT operational condition.									
Note 2: Measure maximum deviation frequency at operating frequency at startup and two, five, and ten min.									

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Next Calibration Date
EMC Receiver	KETSIGHT	N9038A	MY54130031	20Hz ~ 8.4GHz	Apr. 14, 2016	Apr. 13, 2017
LISN	SCHAFFNER	NNB41	06/10024	9kHz - 30MHz	Dec. 14, 2015	Dec. 13, 2016
Power Filter	CORCOM	MR12030	N/A	30A*2	NCR	NCR
RF Cable-CON	Suhner Switzerland	RG223/U	CB004	9kHz - 30MHz	Dec. 10, 2015	Dec. 9, 2016

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Next Calibration Date
Spectrum Analyzer	R&S	FSV 40	101013	9KHz~40GHz	Feb 16, 2016	Feb 15, 2017
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20 ~ 100℃	Apr. 25, 2016	Apr. 24, 2017
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Jul. 22, 2015	Jul. 21, 2016

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Next Calibration Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Nov. 28, 2015	Nov. 27, 2016
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	Dec. 16, 2015	Dec. 15, 2016
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	MaY 10, 2016	May 09, 2017
Spectrum	R&S	FSV40	101513	9kHz ~ 40GHz	Feb. 16, 2016	Feb. 15, 2017
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30MHz ~ 1GHz	Sep. 18, 2015	Sep. 17, 2016
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Feb.02.2015	Feb.01.2017