

# FCC Test Report

Equipment : LCD Signature Pad  
Brand Name : Wacom  
Model No. : STU-530V  
FCC ID : HV4STU530V  
Standard : 47 CFR FCC Part 15.209  
Operating Band : 531.25kHz~593.75kHz  
FCC Classification : DCD  
Applicant : Wacom Co., Ltd.  
2-510-1, Toyonodai, Kazo-shi,  
Saitama, 349-1148 Japan  
Manufacturer : Please refer to section 1.1

The product sample received on Sep. 18, 2015 and completely tested on Oct. 16, 2015. 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

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## Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.3	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]:0.1650100MHz 52.68 (Margin 12.53dB) - QP 34.28 (Margin 20.93dB) - AV	FCC 15.207	Complied
3.2	15.209	Transmitter Radiated Emissions	[dBuV/m at 3m]:31.940MHz 30.72(Margin 9.28dB) - QP	FCC 15.209	Complied
3.3	15.215(c)	Emission Bandwidth	99% Bandwidth: 150.79 [kHz]	N/A	Complied



SPORTON INTERNATIONAL INC.  
TEL : 886-3-327-3456  
FAX : 886-3-327-0973

# 1 General Description

## 1.1 Information

### 1.1.1 Manufacturer Information

<b>Manufacturer 1</b>	Qisda Corporation 157 & 159, Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan
<b>Manufacturer 2</b>	Qisda (Suzhou) Co., Ltd. 169, Zhujiang Road, New District, Suzhou, Jiangsu Province, P.R. China
<b>Manufacturer 3</b>	Qisda Optronics (Suzhou) Co., Ltd. 169, Zhujiang Road, New District, Suzhou, Jiangsu 215129, P.R. China
<b>Manufacturer 4</b>	Qisda Mexicana S.A. De C.V. Calzada Venustiano Carranza, No. 88 Col. Plutarco Elias Calles, Mexicali B.C. Mexico C.P 21376 Mexico

### 1.1.2 RF General Information

RF General Information			
Frequency Range		531.25kHz~593.75kHz	
Modulation	Ch. Frequency (kHz)	Channel Number	Field Strength (dBuV/m)
Array Coil Pointing	531.25 / 562.5 / 593.75kHz	3	50.22
Note 1: Field strength performed peak level at 1m.			

### 1.1.3 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)

**1.1.4 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:

**1.1.5 Test Signal Duty Cycle**

Operated Mode for Worst Duty Cycle	
<input type="checkbox"/>	Operated normally mode for worst duty cycle
<input checked="" type="checkbox"/>	Operated test mode for worst duty cycle
Test Signal Duty Cycle (x)	
<input checked="" type="checkbox"/>	100.00%

**1.1.6 EUT Operational Condition**

<b>Supply Voltage</b>	<input type="checkbox"/> AC mains	<input checked="" type="checkbox"/> DC	
<b>Type of DC Source</b>	<input type="checkbox"/> From Battery	<input type="checkbox"/> External DC adapter	<input checked="" type="checkbox"/> From System

## 1.2 Accessory and Support Equipment

Accessories Information				
Digital Pen	Brand Name	Wacom	Model Name	UP-610
Panel	Brand Name	TIANMA	Model Name	TM050RDHG04
3M USB cable	Brand Name	-	Model Name	STJ-A337

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

Support Equipment - AC Conduction and Radiated Emission				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5530	DoC
2	Adapter	DELL	LA65NS2-01	DoC

Support Equipment - RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5540	DoC
2	Adapter	DELL	HA65NM130	DoC

## 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

## 1.4 Testing Location Information

Testing Location				
<input checked="" type="checkbox"/>	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	CO04-HY	Anthony	23°C / 60%	
RF Conducted	TH01-HY	Howard	23°C / 63%	
Radiated Emission	03CH02-HY	Daniel	24.2°C / 60%	
Test Site Registration Number				
636805				

## 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		±2.3 dB
Emission bandwidth, 6dB bandwidth		±0.6 %
RF output power, conducted		±0.1 dB
Power density, conducted		±0.6 dB
Unwanted emissions, conducted	9 – 150 kHz	±0.4 dB
	0.15 – 30 MHz	±0.4 dB
	30 – 1000 MHz	±0.6 dB
	1 – 18 GHz	±0.5 dB
	18 – 40 GHz	±0.5 dB
	40 – 200 GHz	N/A
All emissions, radiated	9 – 150 kHz	±2.5 dB
	0.15 – 30 MHz	±2.3 dB
	30 – 1000 MHz	±2.6 dB
	1 – 18 GHz	±3.6 dB
	18 – 40 GHz	±3.8 dB
	40 – 200 GHz	N/A
Temperature		±0.8 °C
Humidity		±5 %
DC and low frequency voltages		±0.9 %
Time		±1.4 %
Duty Cycle		±0.6 %



## 2 Test Configuration of EUT

### 2.1 The Worst Case Modulation Configuration




Modulation Mode	Field Strength (dBuV/m at 1m)
Array Coil Pointing	50.22

### 2.2 Test Channel Frequencies Configuration

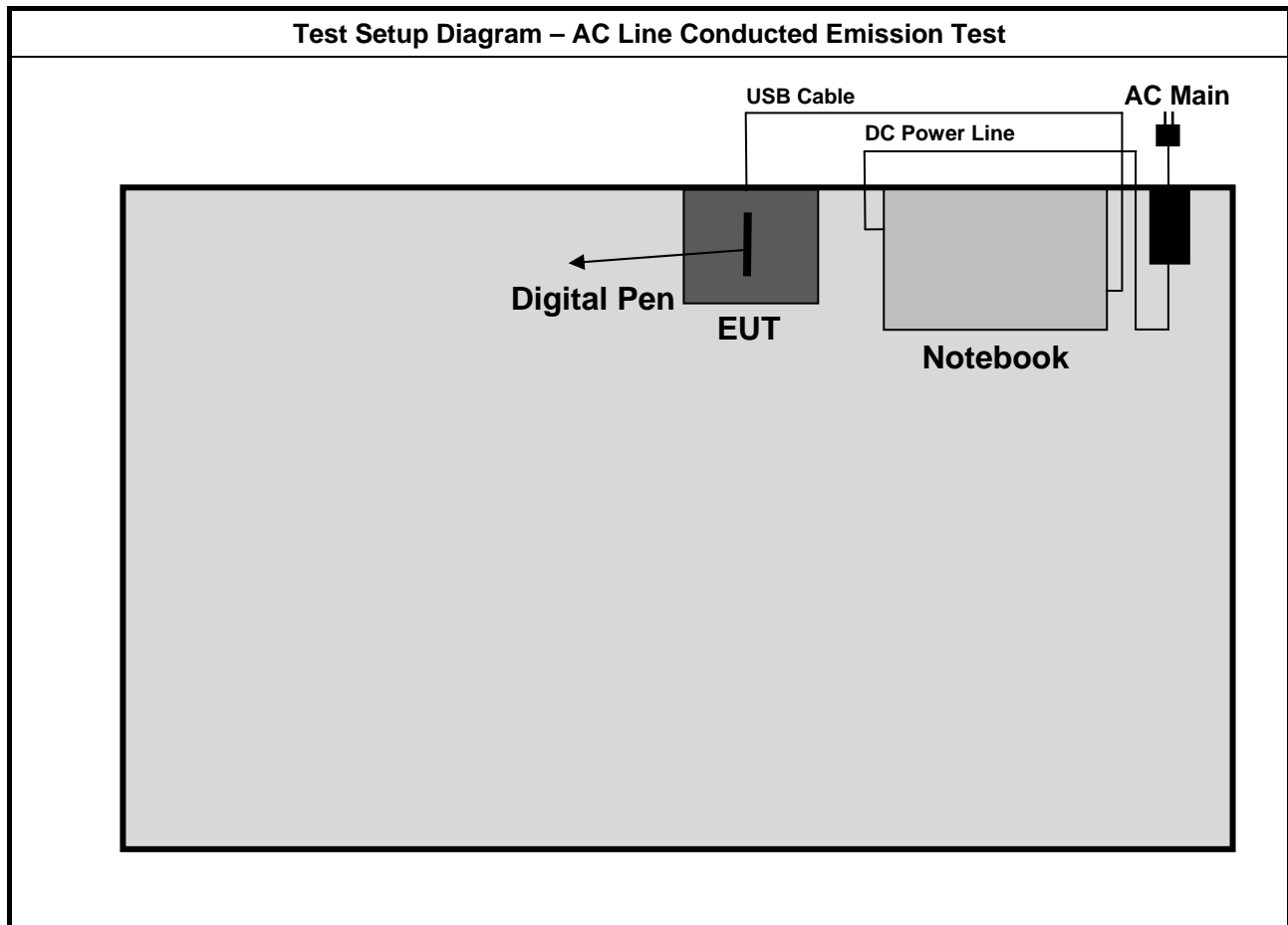
Modulation Mode	Test Channel Frequencies (kHz)
Array Coil Pointing	562.50

### 2.3 The Worst Case Measurement Configuration

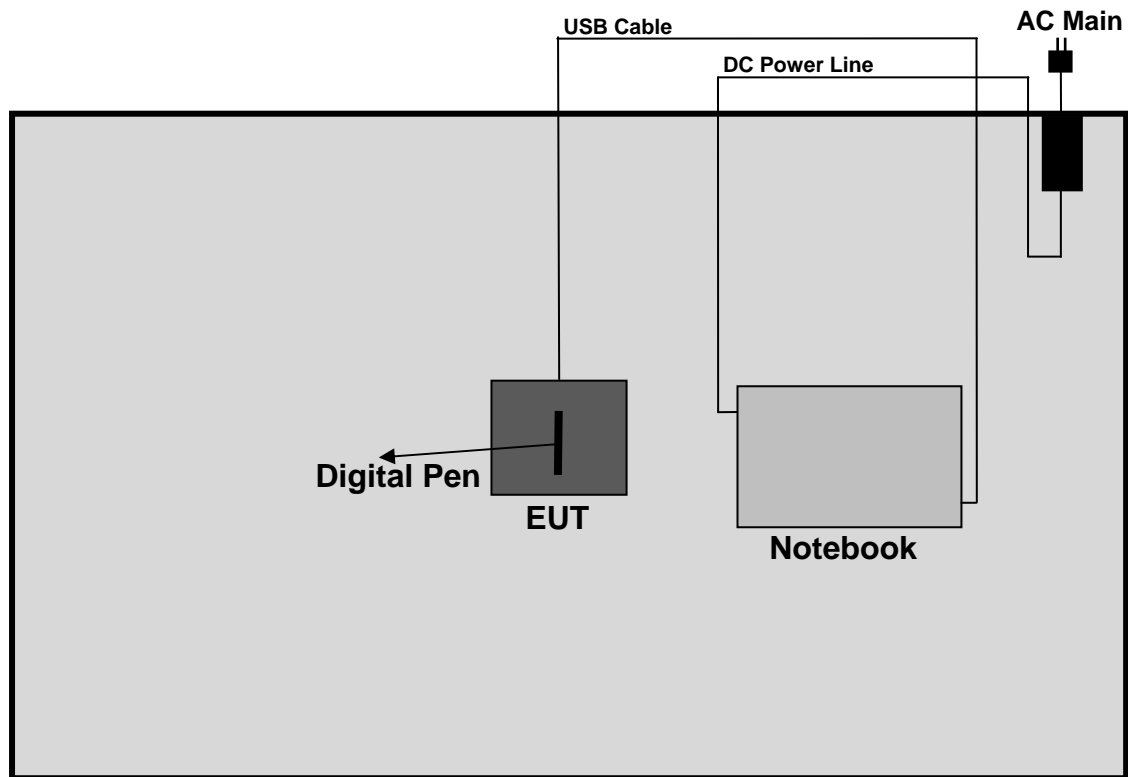
The Worst Case Mode for Following Conformance Tests	
<b>Tests Item</b>	AC power-line conducted emissions
<b>Condition</b>	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
<b>Operating Mode</b>	Operating Mode Description
<b>1</b>	EUT with Notebook via USB cable

The Worst Case Mode for Following Conformance Tests			
<b>Tests Item</b>	Emission Bandwidth, Field Strength of Fundamental Emissions Transmitter Radiated Unwanted Emissions		
<b>Test Condition</b>	Radiated measurement		
<b>User Position</b>	<input type="checkbox"/> EUT will be placed in fixed position.		
	<input checked="" type="checkbox"/> EUT will be placed in mobile position and operating multiple positions.		
	<input 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.		
<b>Operating Mode</b>	Operating Mode Description		
<b>1</b>	EUT with Notebook via USB Cable		
<b>Modulation Mode</b>	Array Coil Pointing		
<b>Orthogonal Planes of EUT</b>	<b>X Plane</b>	<b>Y Plane</b>	<b>Z Plane</b>
			
<b>Worst Planes of EUT</b>		V	

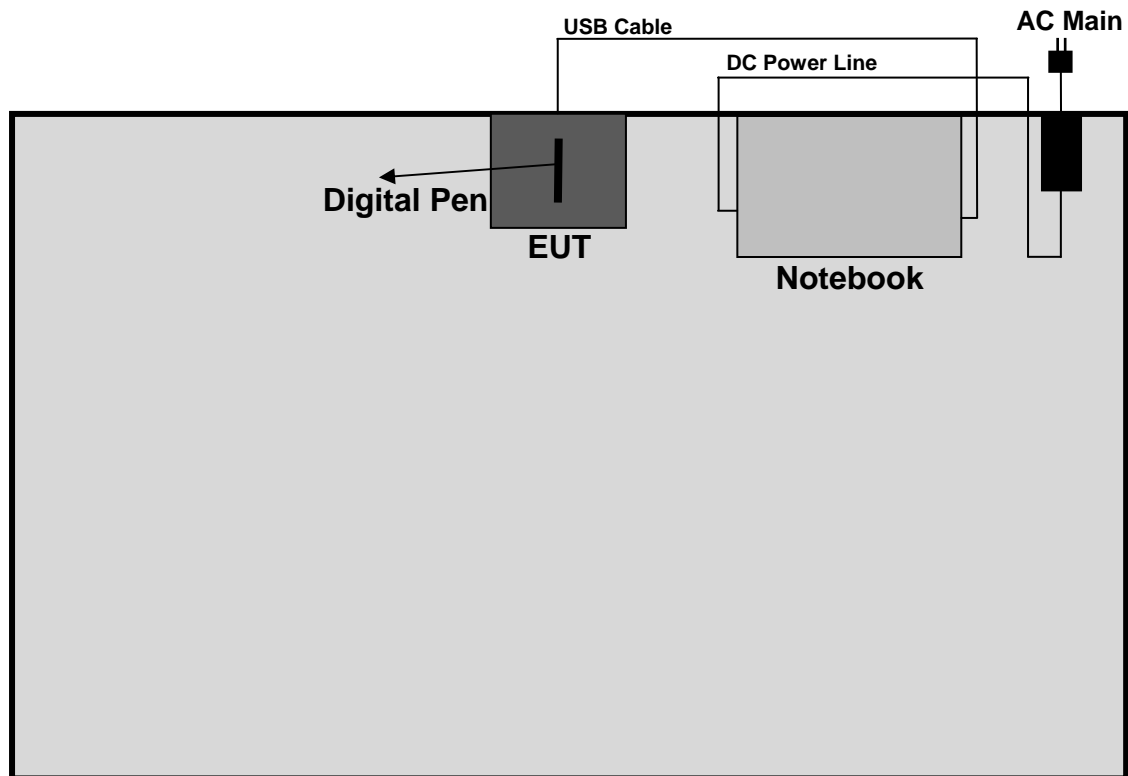
## 2.4 Test Setup Diagram



**Test Setup Diagram - Radiated Test (9kHz-30MHz)**



**Test Setup Diagram - Radiated Test (30MHz-1GHz)**



### 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.

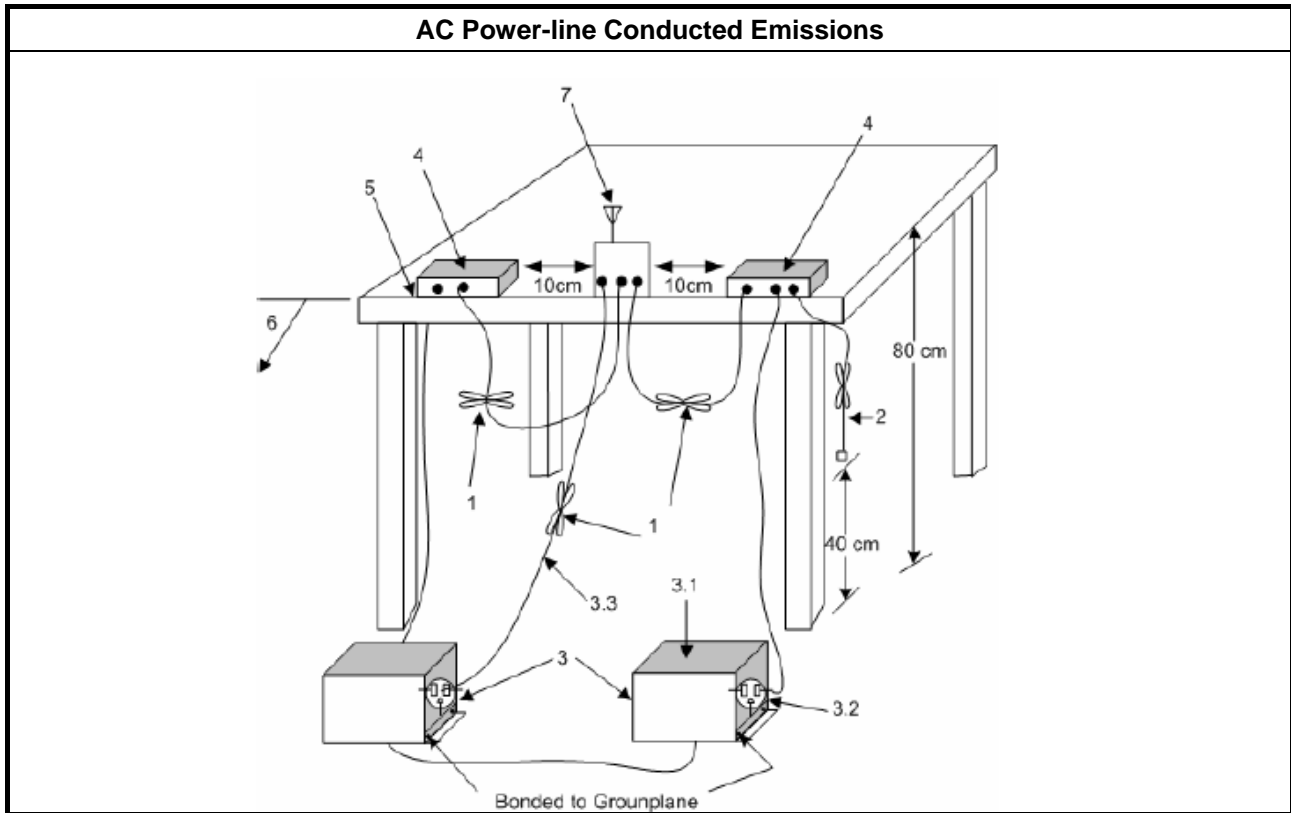
##### 3.1.2 Measuring Instruments

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

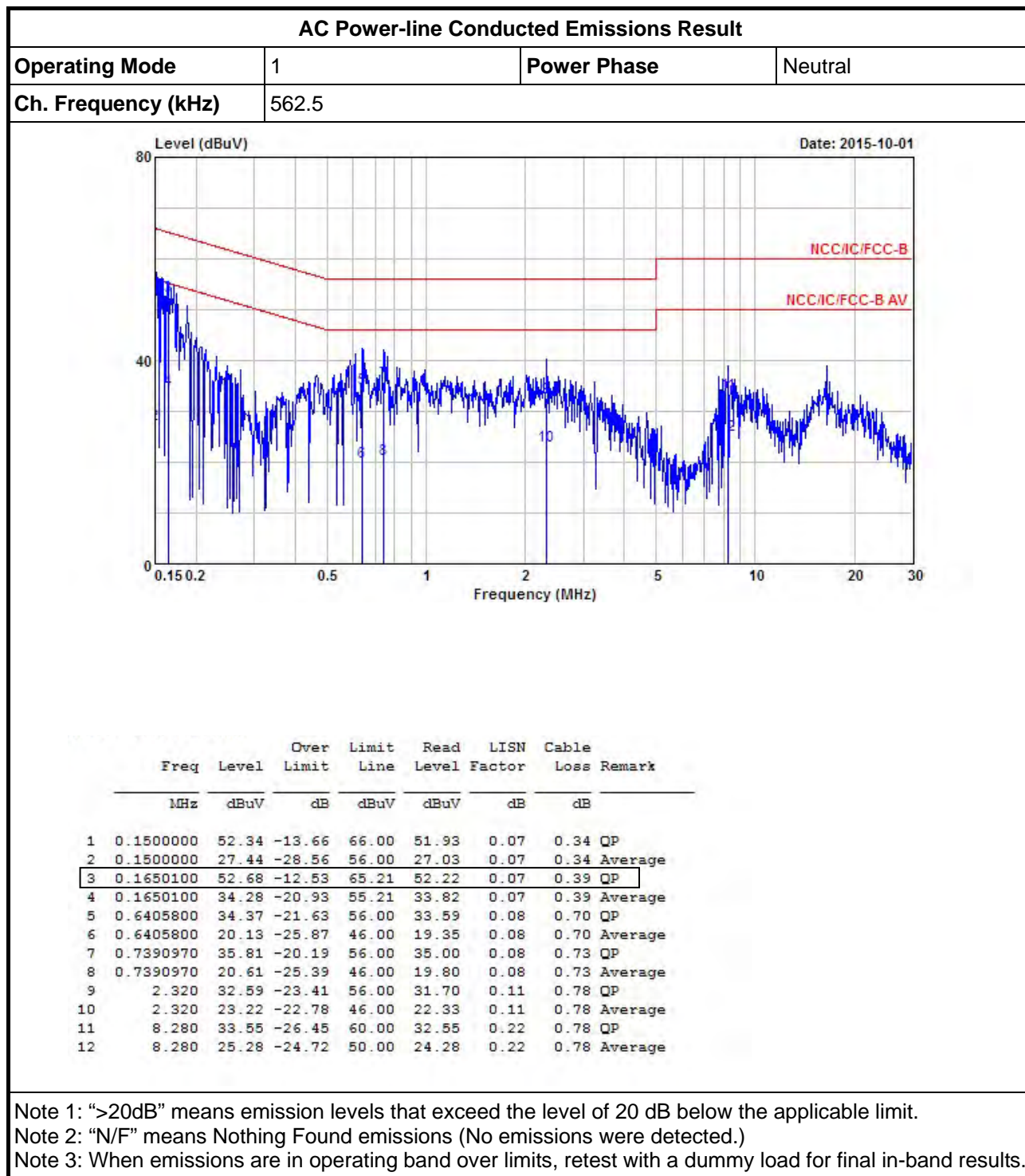
##### 3.1.3 Test Procedures

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 Test Setup

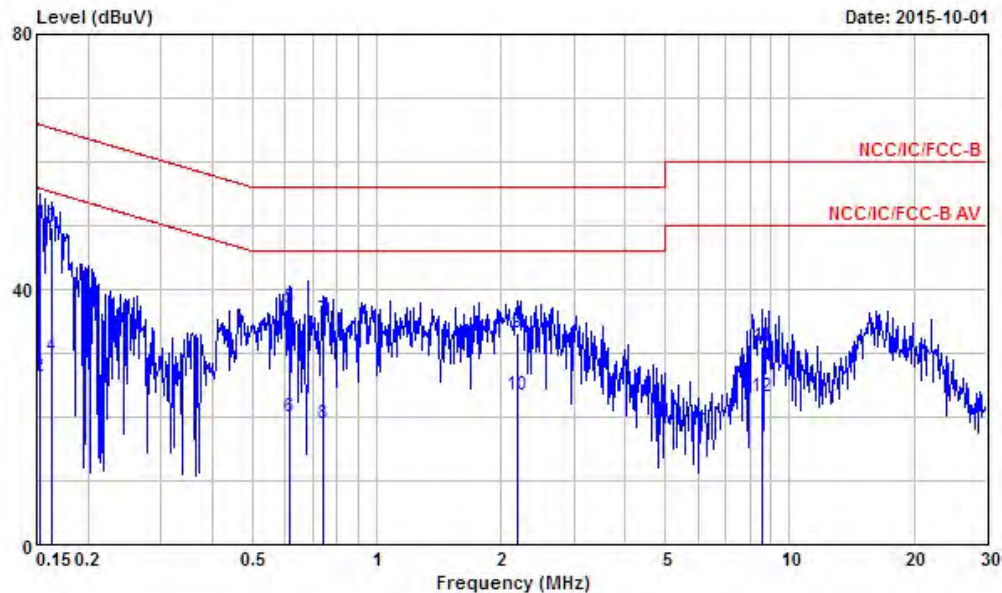


### 3.1.5 Test Result of AC Power-line Conducted Emissions



**AC Power-line Conducted Emissions Result**

<b>Operating Mode</b>	1	<b>Power Phase</b>	Line
<b>Ch. Frequency (kHz)</b>	562.5		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1532130	49.02	-16.80	65.82	48.63	0.05	0.34	QP
2	0.1532130	26.36	-29.46	55.82	25.97	0.05	0.34	Average
3	0.1624080	49.76	-15.58	65.34	49.33	0.05	0.38	QP
4	0.1624080	29.55	-25.79	55.34	29.12	0.05	0.38	Average
5	0.6139960	37.08	-18.92	56.00	36.32	0.07	0.69	QP
6	0.6139960	20.12	-25.88	46.00	19.36	0.07	0.69	Average
7	0.7430230	35.38	-20.62	56.00	34.57	0.08	0.73	QP
8	0.7430230	18.93	-27.07	46.00	18.12	0.08	0.73	Average
9	2.190	33.20	-22.80	56.00	32.31	0.10	0.79	QP
10	2.190	23.53	-22.47	46.00	22.64	0.10	0.79	Average
11	8.590	31.15	-28.85	60.00	30.16	0.21	0.78	QP
12	8.590	23.04	-26.96	50.00	22.05	0.21	0.78	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 Transmitter Radiated Emissions

### 3.2.1 Transmitter Radiated Emissions Limit

Transmitter Radiated 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.

Note 3: the frequency bands 9-90 kHz, 110-490 kHz measurements employing an average detector and other below 1GHz measurements employing a CISPR quasi-peak detector.

### 3.2.2 Measuring Instruments

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

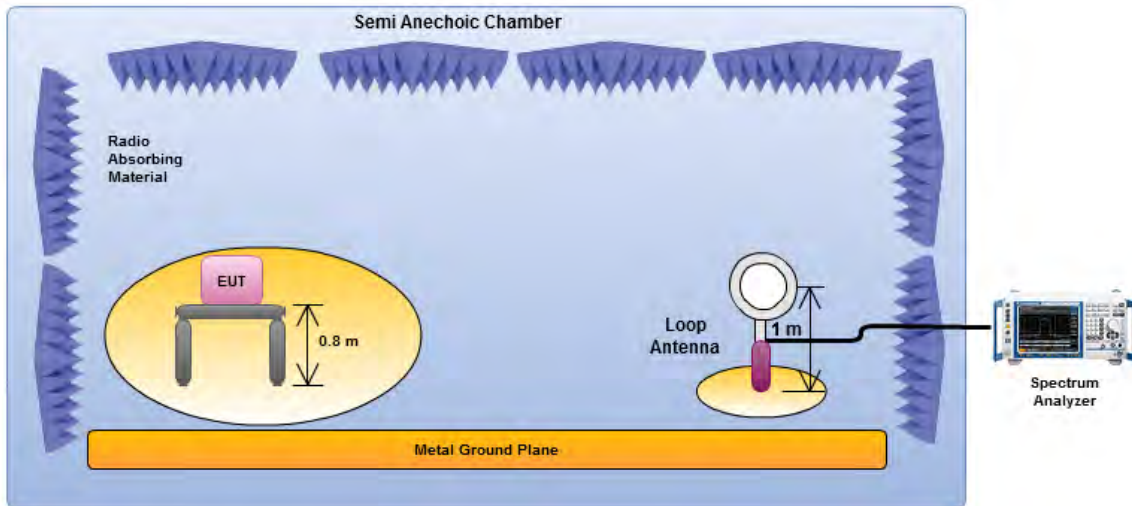


### 3.2.3 Test Procedures

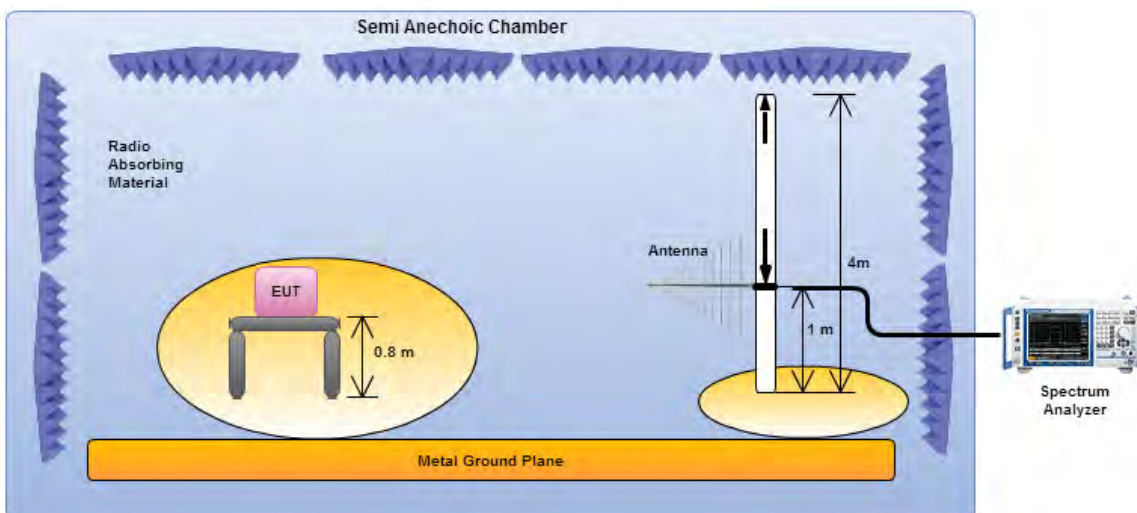
Test Method	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1 GHz and test distance is 3m.
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz. The frequency bands 9-90 kHz, 110-490 kHz measurements employing an average detector and other below 30MHz measurements employing a CISPR quasi-peak detector. 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.

### 3.2.4 Test Setup

#### Transmitter Radiated Emissions

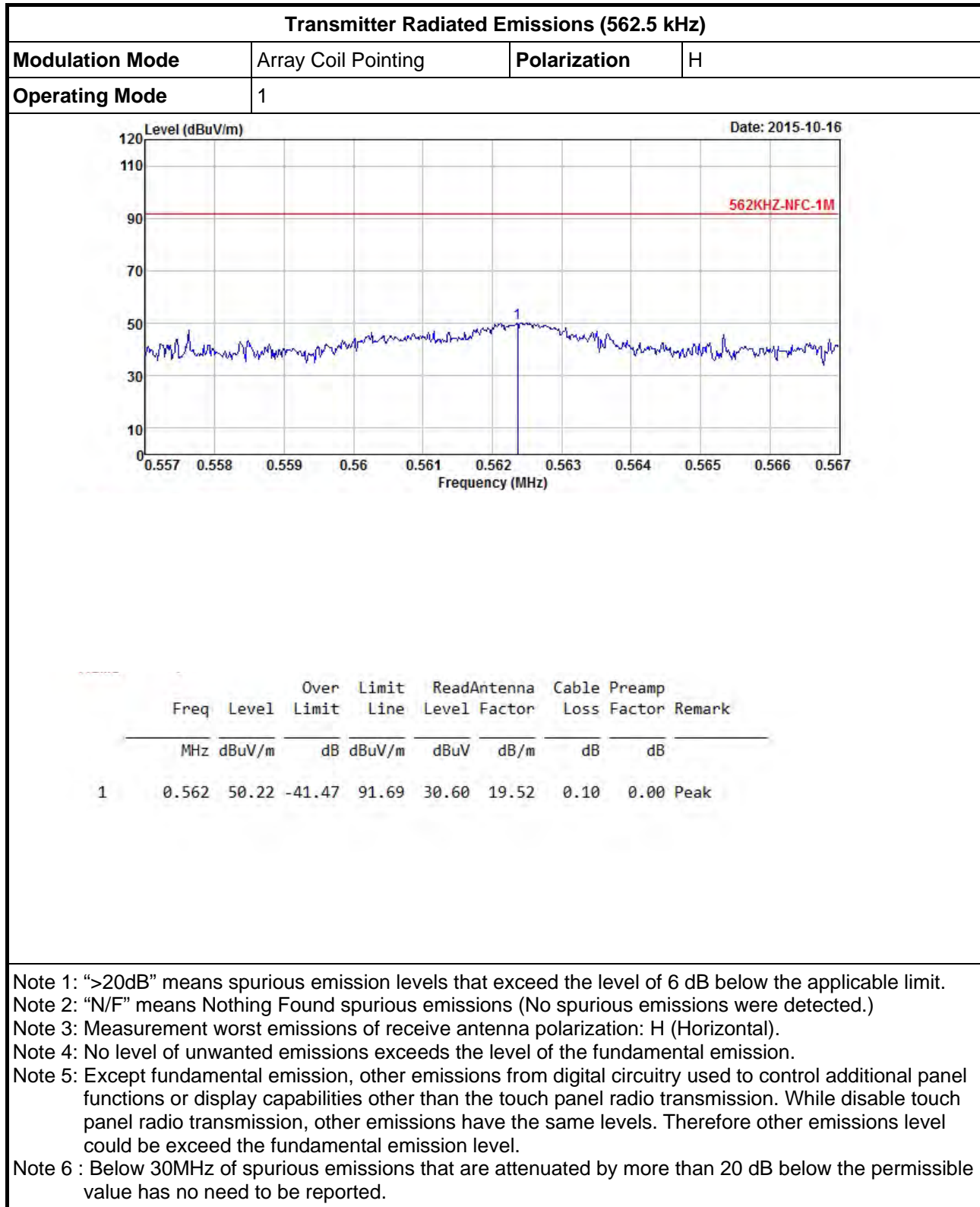


Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. The center of the loop shall be 1 m above the ground.



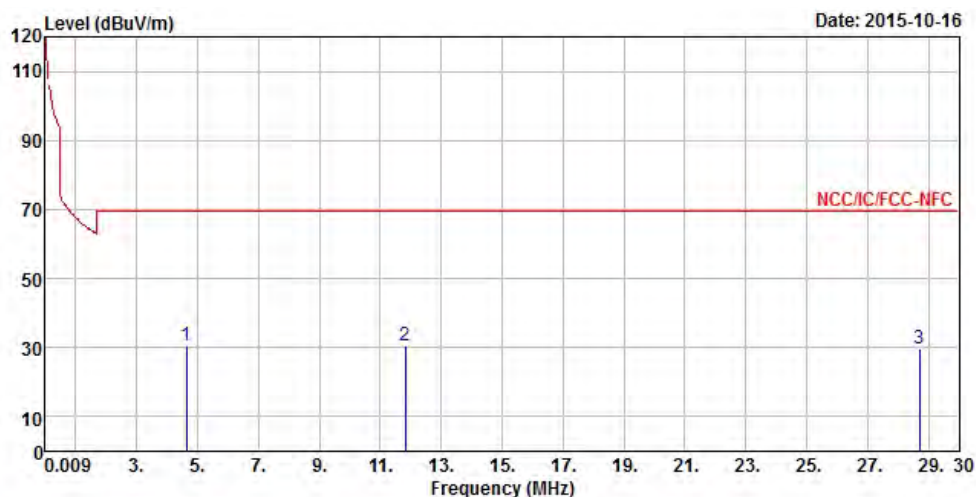
Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna. the antenna height shall be varied from 1 m to 4 m.

### 3.2.5 Transmitter Radiated Emissions (Below 30MHz)



**Transmitter Radiated Emissions (9kHz~30MHz)**

<b>Modulation Mode</b>	Array Coil Pointing	<b>Polarization</b>	H
<b>Operating Mode</b>	1		



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor
			dB	dBuV/m	dBuV	dB/m	dB	dB
1	4.628	30.69	-38.85	69.54	11.13	19.32	0.24	0.00
2	11.825	30.59	-38.95	69.54	9.34	20.83	0.42	0.00
3	28.705	29.80	-39.74	69.54	7.51	21.57	0.72	0.00

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.)

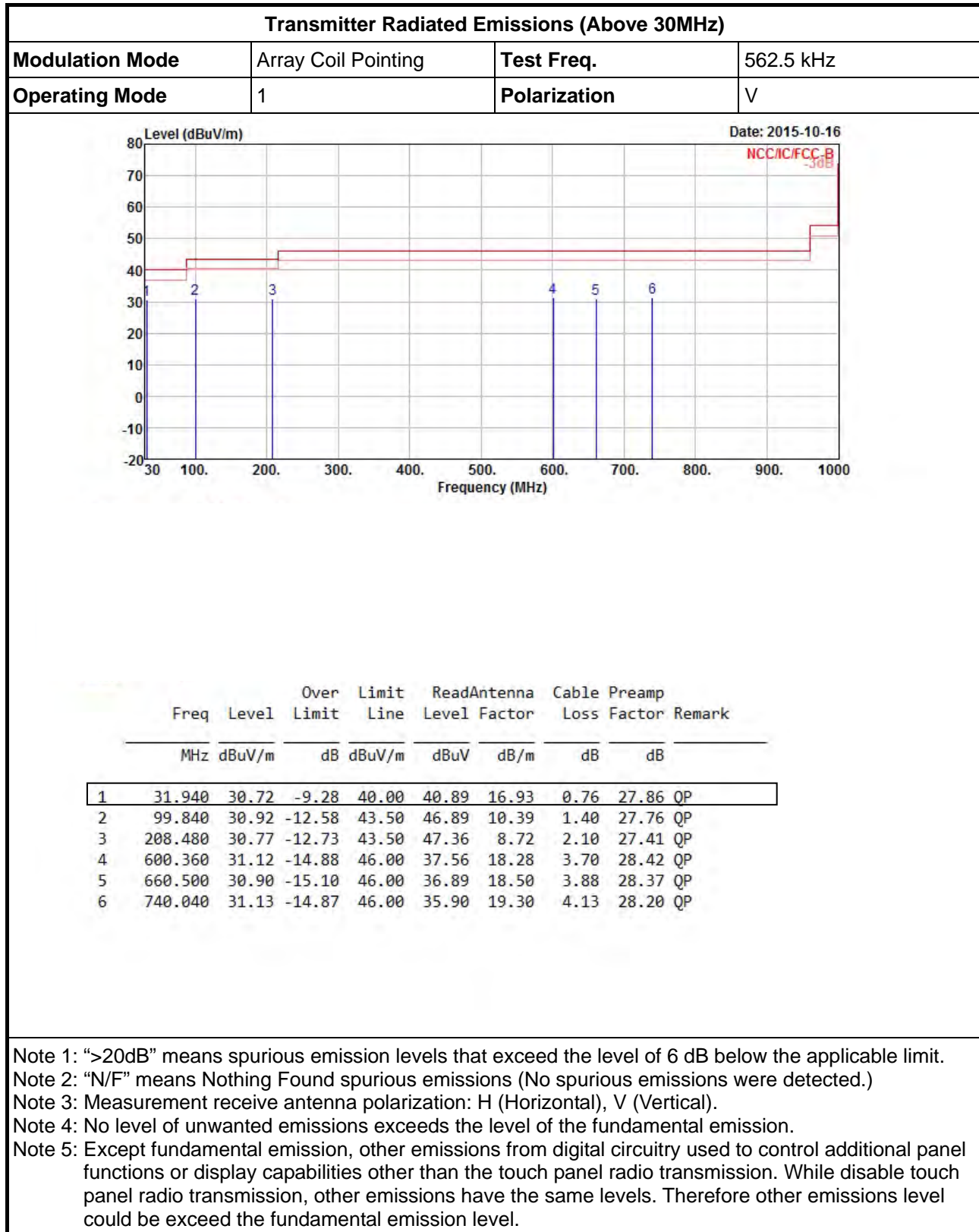
Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).

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

Note 5: Except fundamental emission, other emissions from digital circuitry used to control additional panel functions or display capabilities other than the touch panel radio transmission. While disable touch panel radio transmission, other emissions have the same levels. Therefore other emissions level could be exceed the fundamental emission level.

Note 6 : Below 30MHz of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

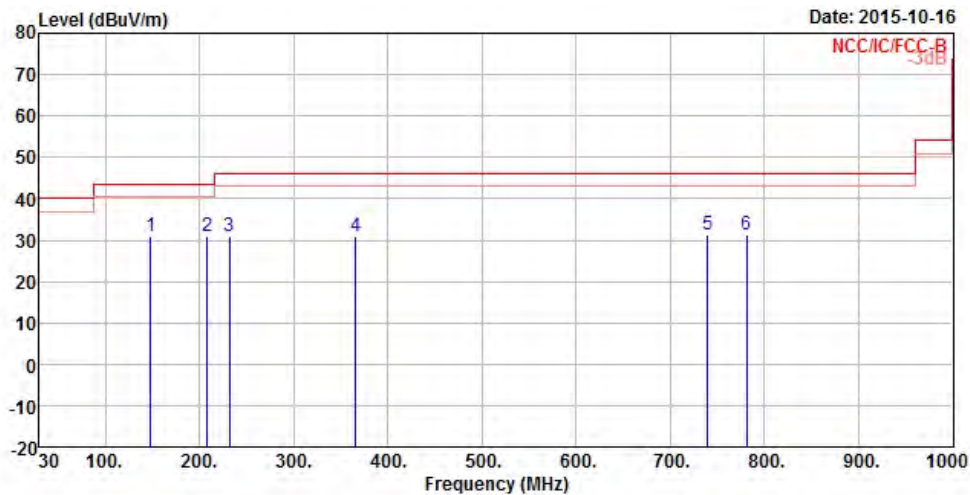
### 3.2.6 Transmitter Radiated Emissions (Above 30MHz)





**Transmitter Radiated Emissions (Above 30MHz)**

<b>Modulation Mode</b>	Array Coil Pointing	<b>Test Freq.</b>	562.5 kHz
<b>Operating Mode</b>	1	<b>Polarization</b>	H



	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	148.340	30.91	-12.59	43.50	46.45	10.31	1.76	27.61 QP
2	208.480	31.04	-12.46	43.50	47.63	8.72	2.10	27.41 QP
3	231.760	30.96	-15.04	46.00	46.01	10.03	2.23	27.31 QP
4	365.620	30.74	-15.26	46.00	41.00	14.50	2.83	27.59 QP
5	740.040	31.13	-14.87	46.00	35.90	19.30	4.13	28.20 QP
6	780.780	31.12	-14.88	46.00	35.41	19.49	4.27	28.05 QP

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.

Note 5: Except fundamental emission, other emissions from digital circuitry used to control additional panel functions or display capabilities other than the touch panel radio transmission. While disable touch panel radio transmission, other emissions have the same levels. Therefore other emissions level could be exceed the fundamental emission level.

### 3.3 Emission Bandwidth

#### 3.3.1 Emission Bandwidth Limit

Emission Bandwidth Limit
N/A

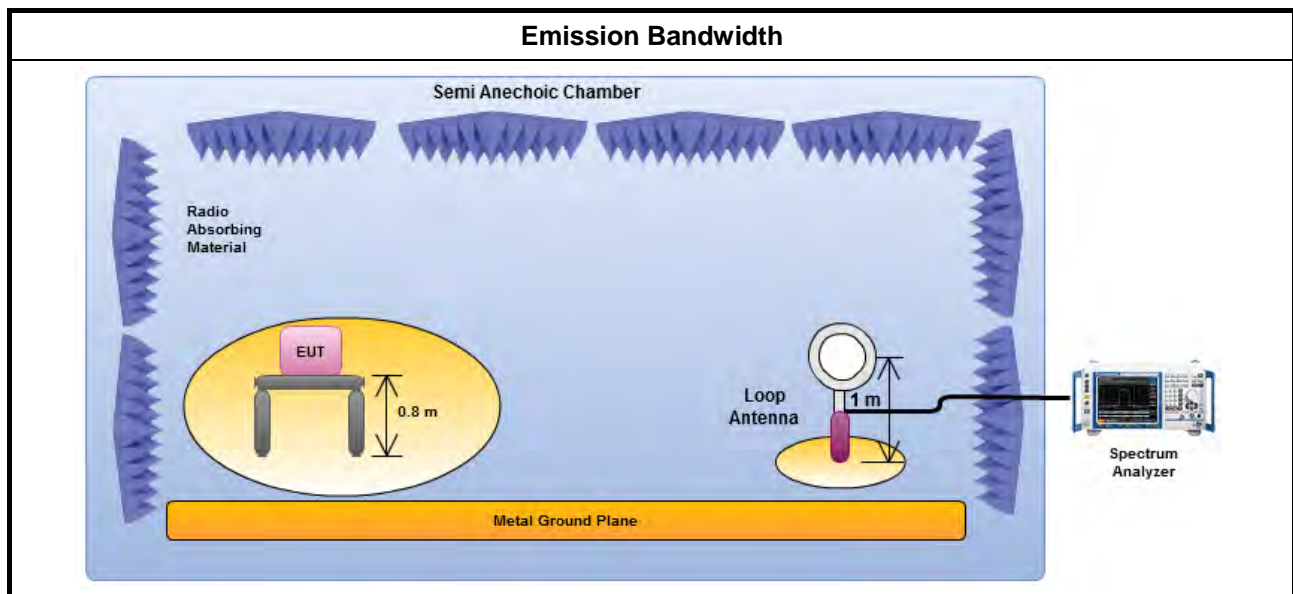
#### 3.3.2 Measuring Instruments

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

#### 3.3.3 Test Procedures

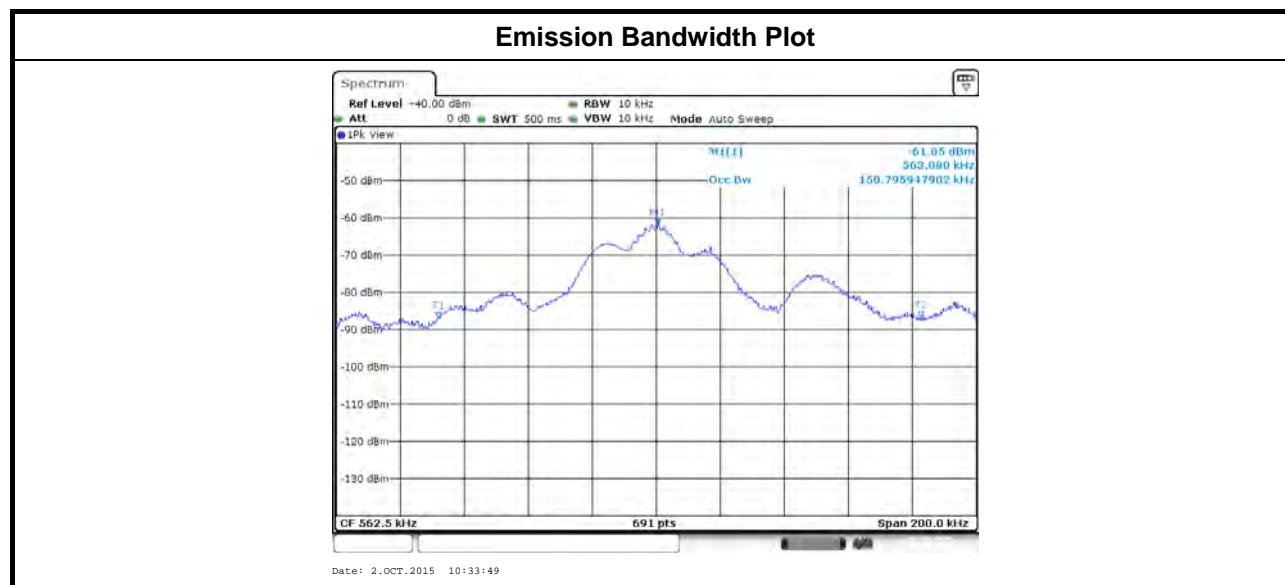
Test Method
<input checked="" type="checkbox"/> For the emission bandwidth refer ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
<input checked="" type="checkbox"/> For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and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

#### 3.3.4 Test Setup



### 3.3.5 Test Result of Emission Bandwidth

Occupied Channel Bandwidth Result		
Modulation Mode	Frequency (kHz)	99% Bandwidth (kHz)
Array Coil Pointing	562.5	150.79
Limit		N/A
Result		Complied





## 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. 15. 2015	AC Conduction
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 22, 2015	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	NA	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	101500	9KHz~40GHz	May 06, 2015	RF Conducted

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100593	9kHz ~ 40GHz	Oct. 20, 2014	Radiation
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	May 03, 2015	Radiation
Amplifier	Agilent	8447D	2944A11149	100kHz ~ 1.3GHz	Jul. 24, 2015	Radiation
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 08, 2014	Radiation
Bilog Antenna	SCHAFFNER	CBL 6112B	2723	30MHz ~ 1GHz	Oct. 05, 2015	Radiation
Turn Table	Chaintek Instruments	3000	MF7802058	0~ 360 degree	N/A	Radiation
Antenna Mast	MF	MF7802	MF780208205	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	R&S	HFH2-Z2	100330	9 kHz~30 MHz	Nov. 10, 2014	Radiation

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