

FCC Test Report

Equipment : WPC TX
Brand Name : acer
Model No. : WPC-W-A-TX-A11-006
FCC ID : HLZWPC1
Standard : 47 CFR FCC Part 15.209
Operating Band : 110-205 kHz
FCC Classification : DCD (for 110-205kHz only)
Equipment Type : Wireless Power Transfer for Consumer Devices
Output power : <5W (from Each Primary Coil)
Applicant : Acer Incorporated
8F., No. 88, Sec. 1, Xintai 5th Rd., Xizhi Dist.,
New Taipei City 22181, Taiwan (R.O.C)
Manufacturer : INPAQ Technology Co., Ltd.
No. 11, Ke-Yi St., Chunan, Miaoli 350 Taiwan R.O.C.

The product sample received on Nov. 17, 2015 and completely tested on Dec. 09, 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:

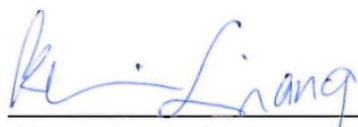

Kevin Liang / Assistant Manager

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Summary of Test Result

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Measured	Limit	Result
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]:0.1973370MHz 48.89 (Margin 14.83dB) - QP 44.30 (Margin 9.42dB) - AV	FCC 15.207	Complied
3.2	15.209	Transmitter Radiated Emissions	[dBuV/m at 3m]:309.360MHz 42.89 (Margin 3.11dB) - QP	FCC 15.209	Complied
3.3	15.215(c)	Emission Bandwidth	20dB Bandwidth 2.79 [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 General Information

Wireless Power Transfer General Information			
Frequency Range	Modulation	Charging Freq. (kHz)	Field Strength (dBuV/m)
110-205 kHz	FSK	110-205	80.64
Power Transfer Method	Output power from each primary coil	Max. coupling surface area	Charging Method
Magnetic induction and only single primary coil coupling secondary coil	<5W	63.6 cm ²	Client directly contact
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)

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: The EUT place with the platform.

1.1.4 Platform Details

Host No.	Equipment Name	Brand Name	Model No.
Host 1	PC	acer	AT5W2, Aspire T3-710, Aspire T3-780, Aspire T3-715
Host 2	PC	acer	AX5W2, Aspire X3-710, Aspire X3-780

Note 1: There have two difference housing of product. The differences are housing, PCB location and wireless charger coil location.

Note 2: The difference of above models is in sales marketing.

1.1.5 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)	
☒	100%

1.1.6 EUT Operational Condition

Supply Voltage	☐ AC mains	☒ DC	
Type of DC Source	☐ Internal DC supply	☐ External DC adapter	☒ From System

1.2 Accessories and Support Equipment

Accessories Information				
PC	Brand Name	acer	Model Name	Aspire T3-715
PC	Brand Name	acer	Model Name	Aspire X3-710

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

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Test Fixture	-	-	-

Note : The Test Fixture provides is by customer.

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				
☒	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 Site Registration Number: 636805				
Test Condition		Test Site No.	Test Engineer	Test Environment
AC Conduction		CO04-HY	Anthony	22°C / 62%
RF Conducted		TH01-HY	Howard	21.5°C / 63%
Radiated Emission		03CH03-HY	Joe	22.6°C / 58.2%

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		±0.6 %
Unwanted emissions, conducted	9 – 150 kHz	±0.4 dB
	0.15 – 30 MHz	±0.4 dB
	30 – 1000 MHz	±0.6 dB
All emissions, radiated	9 – 150 kHz	±2.5 dB
	0.15 – 30 MHz	±2.3 dB
	30 – 1000 MHz	±2.6 dB
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 Configuration

Modulation Mode	Field Strength (dBuV/m at 3m)
FSK	80.64
Wireless charger were performed all charging conditions including variable loading and non-charging operation, the worst mode is full charging loading.	

2.2 The Worst Charger Frequencies Configuration

Modulation Mode	Charger Frequencies (kHz)
FSK	135 kHz
Wireless charger frequencies are variable frequency range (110-205 kHz) and depend on charging loading. The charging frequency is 135 kHz.	

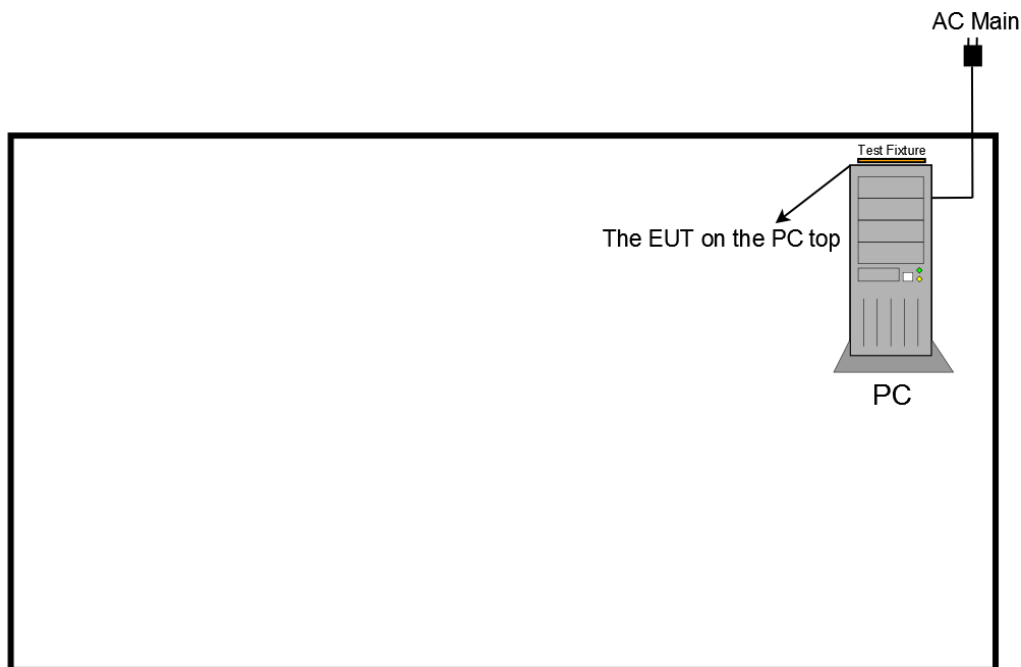
2.3 The Worst Case Measurement Configuration

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: 110Vac / 60Hz
Operating Mode	Operating Mode Description
1	EUT with Host 1 via wireless charger
2	EUT with Host 2 via wireless charger

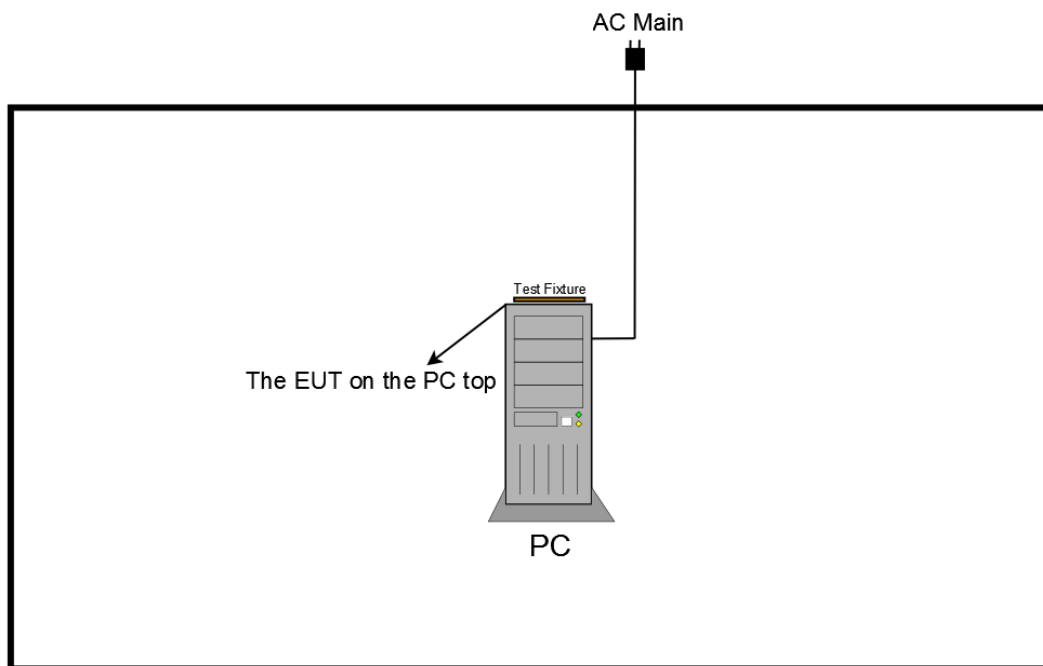
The Worst Case Mode for Following Conformance Tests	
Tests Item	Transmitter Radiated Emissions, Emission Bandwidth
Test Condition	Radiated measurement
User Position	☐ EUT will be placed in fixed position.
	☐ EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes.
	☒ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.
Operating Mode < 1GHz	☒ 1. EUT with Host 1 via wireless charger
	☒ 2. EUT with Host 2 via wireless charger
Modulation Mode	FSK
Orthogonal Planes of EUT	X Plane
	

2.4 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Test Setup Diagram - Radiated Test 9kHz~30MHz



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.

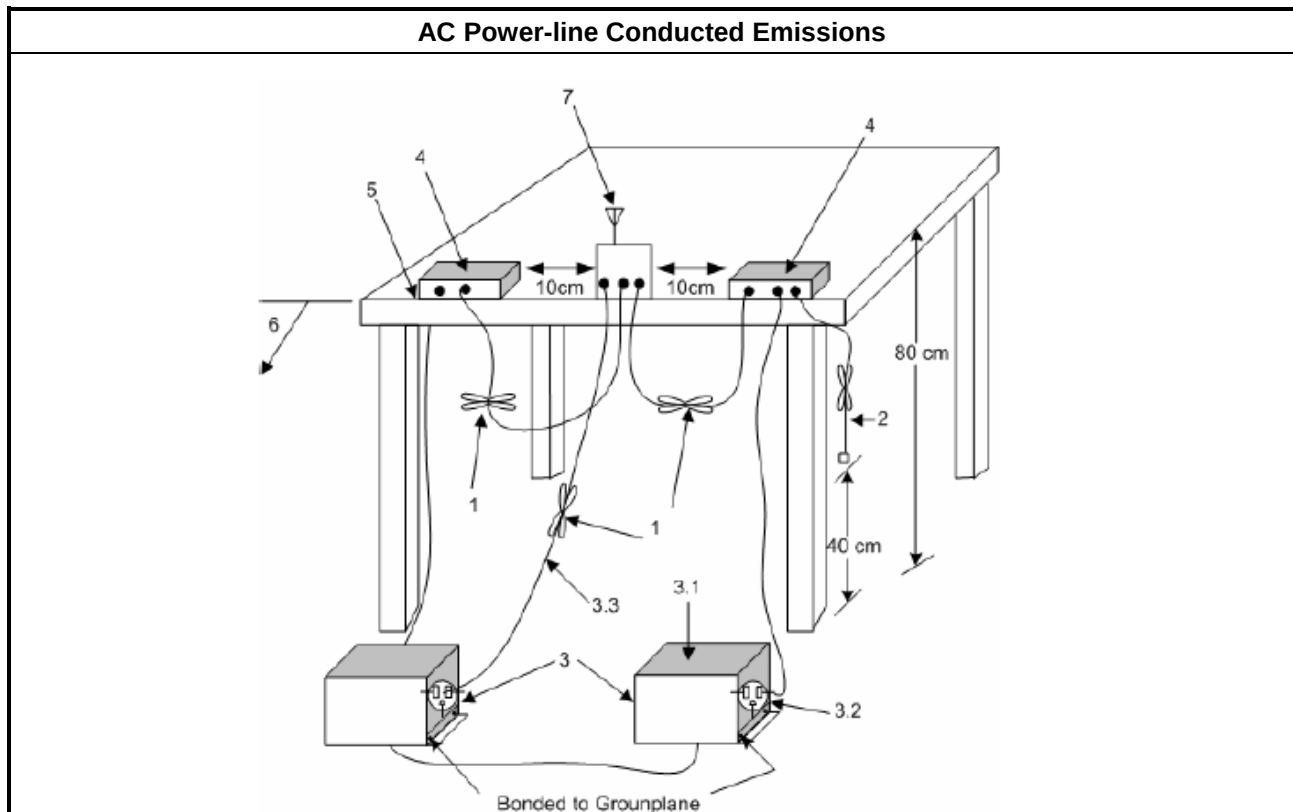
3.1.2 Measuring Instruments

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

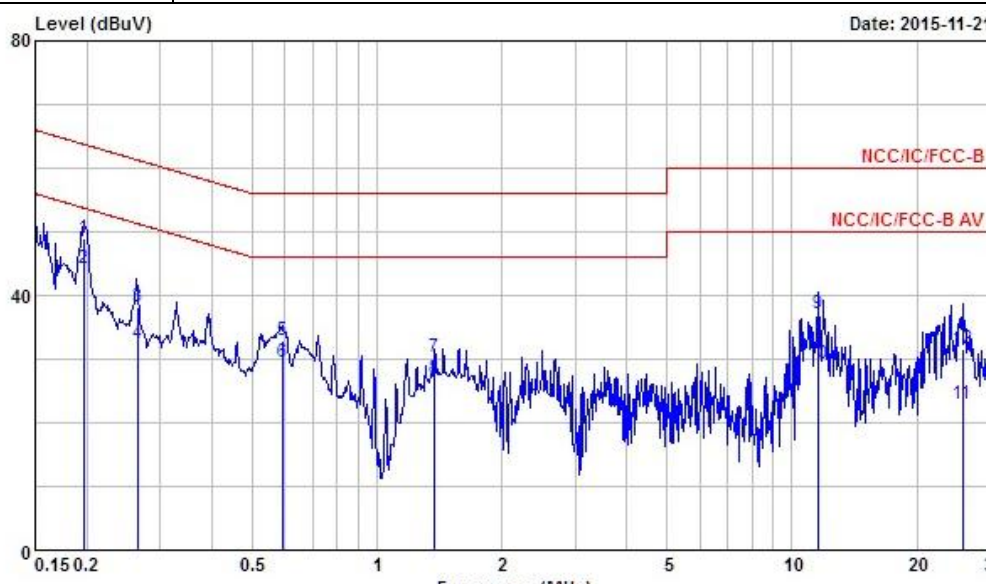
3.1.3 Test Procedures

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

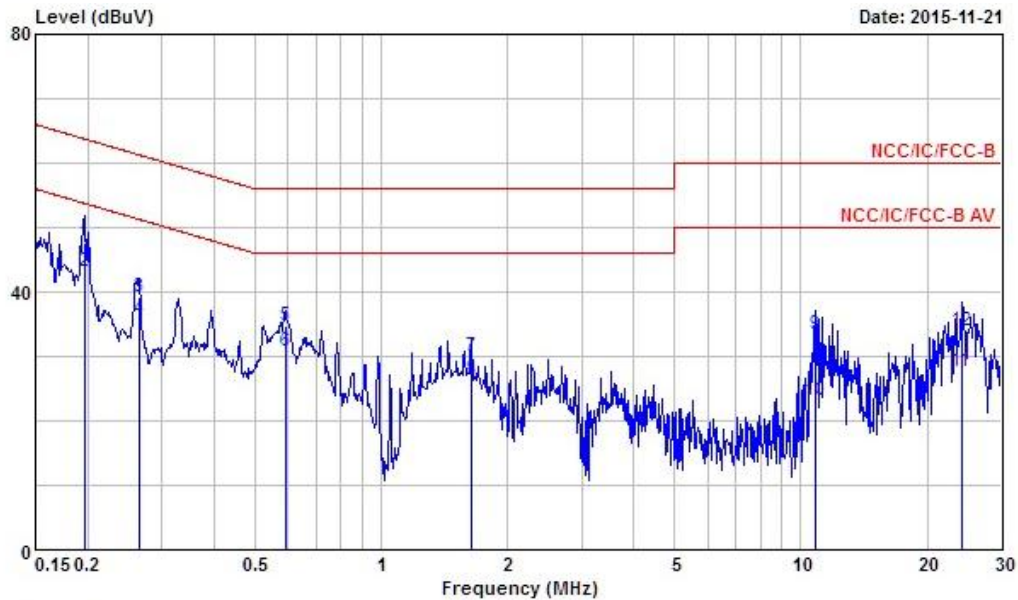


3.1.5 Test Result of AC Power-line Conducted Emissions

AC Power-line Conducted Emissions Result																																																																																																																																					
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Level (dBuV)  Frequency (MHz) Date: 2015-11-21																																																																																																																																					
<table><tr><th></th><th>Freq</th><th>Level</th><th>Over Limit</th><th>Limit Line</th><th>Read Level</th><th>LISN Factor</th><th>Cable Loss</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV</th><th>dB</th><th>dBuV</th><th>dBuV</th><th>dB</th><th>dB</th><th></th></tr><tr><td>1</td><td>0.1973370</td><td>48.89</td><td>-14.83</td><td>63.72</td><td>48.52</td><td>0.07</td><td>0.30</td><td>QP</td></tr><tr><td>2</td><td>0.1973370</td><td>44.30</td><td>-9.42</td><td>53.72</td><td>43.93</td><td>0.07</td><td>0.30</td><td>Average</td></tr><tr><td>3</td><td>0.2642270</td><td>38.18</td><td>-23.12</td><td>61.30</td><td>37.89</td><td>0.07</td><td>0.22</td><td>QP</td></tr><tr><td>4</td><td>0.2642270</td><td>32.33</td><td>-18.97</td><td>51.30</td><td>32.04</td><td>0.07</td><td>0.22</td><td>Average</td></tr><tr><td>5</td><td>0.5916410</td><td>32.97</td><td>-23.03</td><td>56.00</td><td>32.79</td><td>0.08</td><td>0.10</td><td>QP</td></tr><tr><td>6</td><td>0.5916410</td><td>29.44</td><td>-16.56</td><td>46.00</td><td>29.26</td><td>0.08</td><td>0.10</td><td>Average</td></tr><tr><td>7</td><td>1.377</td><td>30.25</td><td>-25.75</td><td>56.00</td><td>29.97</td><td>0.09</td><td>0.19</td><td>QP</td></tr><tr><td>8</td><td>1.377</td><td>26.80</td><td>-19.20</td><td>46.00</td><td>26.52</td><td>0.09</td><td>0.19</td><td>Average</td></tr><tr><td>9</td><td>11.543</td><td>37.03</td><td>-22.97</td><td>60.00</td><td>36.56</td><td>0.27</td><td>0.20</td><td>QP</td></tr><tr><td>10</td><td>11.543</td><td>29.17</td><td>-20.83</td><td>50.00</td><td>28.70</td><td>0.27</td><td>0.20</td><td>Average</td></tr><tr><td>11</td><td>25.751</td><td>22.86</td><td>-27.14</td><td>50.00</td><td>22.19</td><td>0.46</td><td>0.21</td><td>Average</td></tr><tr><td>12</td><td>25.751</td><td>31.70</td><td>-28.30</td><td>60.00</td><td>31.03</td><td>0.46</td><td>0.21</td><td>QP</td></tr></table>									Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark		MHz	dBuV	dB	dBuV	dBuV	dB	dB		1	0.1973370	48.89	-14.83	63.72	48.52	0.07	0.30	QP	2	0.1973370	44.30	-9.42	53.72	43.93	0.07	0.30	Average	3	0.2642270	38.18	-23.12	61.30	37.89	0.07	0.22	QP	4	0.2642270	32.33	-18.97	51.30	32.04	0.07	0.22	Average	5	0.5916410	32.97	-23.03	56.00	32.79	0.08	0.10	QP	6	0.5916410	29.44	-16.56	46.00	29.26	0.08	0.10	Average	7	1.377	30.25	-25.75	56.00	29.97	0.09	0.19	QP	8	1.377	26.80	-19.20	46.00	26.52	0.09	0.19	Average	9	11.543	37.03	-22.97	60.00	36.56	0.27	0.20	QP	10	11.543	29.17	-20.83	50.00	28.70	0.27	0.20	Average	11	25.751	22.86	-27.14	50.00	22.19	0.46	0.21	Average	12	25.751	31.70	-28.30	60.00	31.03	0.46	0.21	QP
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AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	EUT with Host 1 via wireless charger		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1971810	47.72	-16.01	63.73	47.36	0.06	0.30	QP
2	0.1971810	43.03	-10.70	53.73	42.67	0.06	0.30	Average
3	0.2640240	39.15	-22.15	61.30	38.87	0.06	0.22	QP
4	0.2640240	35.78	-15.52	51.30	35.50	0.06	0.22	Average
5	0.5916410	34.69	-21.31	56.00	34.52	0.07	0.10	QP
6	0.5916410	30.78	-15.22	46.00	30.61	0.07	0.10	Average
7	1.640	30.00	-26.00	56.00	29.67	0.09	0.24	QP
8	1.640	26.41	-19.59	46.00	26.08	0.09	0.24	Average
9	10.828	33.39	-26.61	60.00	32.95	0.24	0.20	QP
10	10.828	23.24	-26.76	50.00	22.80	0.24	0.20	Average
11	24.146	27.50	-22.50	50.00	26.91	0.39	0.20	Average
12	24.146	33.94	-26.06	60.00	33.35	0.39	0.20	QP

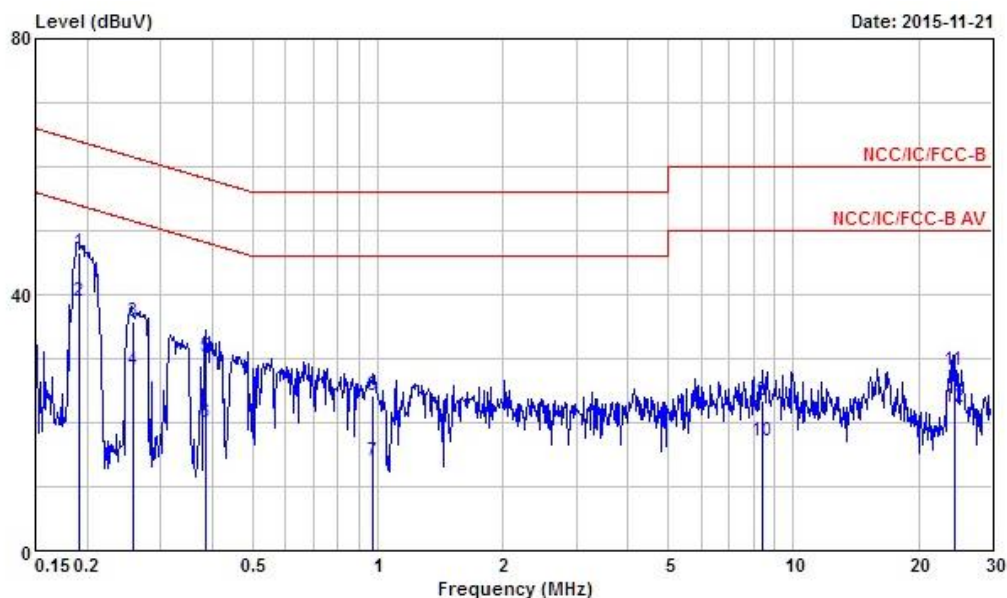
Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

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.

AC Power-line Conducted Emissions Result

Operating Mode	2	Power Phase	Neutral
Operating Function	EUT with Host 3 via wireless charger		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1915800	46.64	-17.33	63.97	46.28	0.07	0.29	QP
2	0.1915800	38.98	-14.99	53.97	38.62	0.07	0.29	Average
3	0.2571970	35.91	-25.61	61.52	35.61	0.07	0.23	QP
4	0.2571970	28.18	-23.34	51.52	27.88	0.07	0.23	Average
5	0.3867900	30.28	-27.85	58.13	30.10	0.07	0.11	QP
6	0.3867900	19.89	-28.24	48.13	19.71	0.07	0.11	Average
7	0.9735420	14.05	-31.95	46.00	13.86	0.09	0.10	Average
8	0.9735420	24.33	-31.67	56.00	24.14	0.09	0.10	QP
9	8.410	23.36	-36.64	60.00	22.96	0.22	0.18	QP
10	8.410	17.15	-32.85	50.00	16.75	0.22	0.18	Average
11	24.356	28.13	-31.87	60.00	27.49	0.44	0.20	QP
12	24.356	22.40	-27.60	50.00	21.76	0.44	0.20	Average

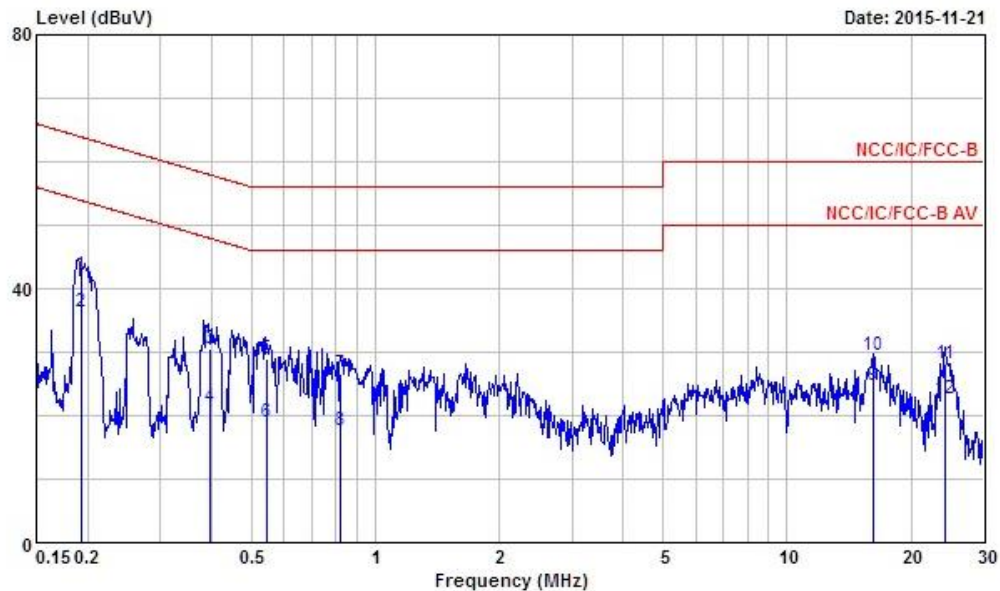
Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

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.

AC Power-line Conducted Emissions Result

Operating Mode	2	Power Phase	Line
Operating Function	EUT with Host 3 via wireless charger		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1929810	42.19	-21.72	63.91	41.84	0.06	0.29	QP
2	0.1929810	36.38	-17.53	53.91	36.03	0.06	0.29	Average
3	0.3955540	30.59	-27.36	57.95	30.42	0.07	0.10	QP
4	0.3955540	21.38	-26.57	47.95	21.21	0.07	0.10	Average
5	0.5448230	28.91	-27.09	56.00	28.74	0.07	0.10	QP
6	0.5448230	19.00	-27.00	46.00	18.83	0.07	0.10	Average
7	0.8217160	26.49	-29.51	56.00	26.31	0.08	0.10	QP
8	0.8217160	17.54	-28.46	46.00	17.36	0.08	0.10	Average
9	16.230	24.75	-25.25	50.00	24.23	0.32	0.20	Average
10	16.230	29.49	-30.51	60.00	28.97	0.32	0.20	QP
11	24.270	28.20	-31.80	60.00	27.61	0.39	0.20	QP
12	24.270	22.72	-27.28	50.00	22.13	0.39	0.20	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

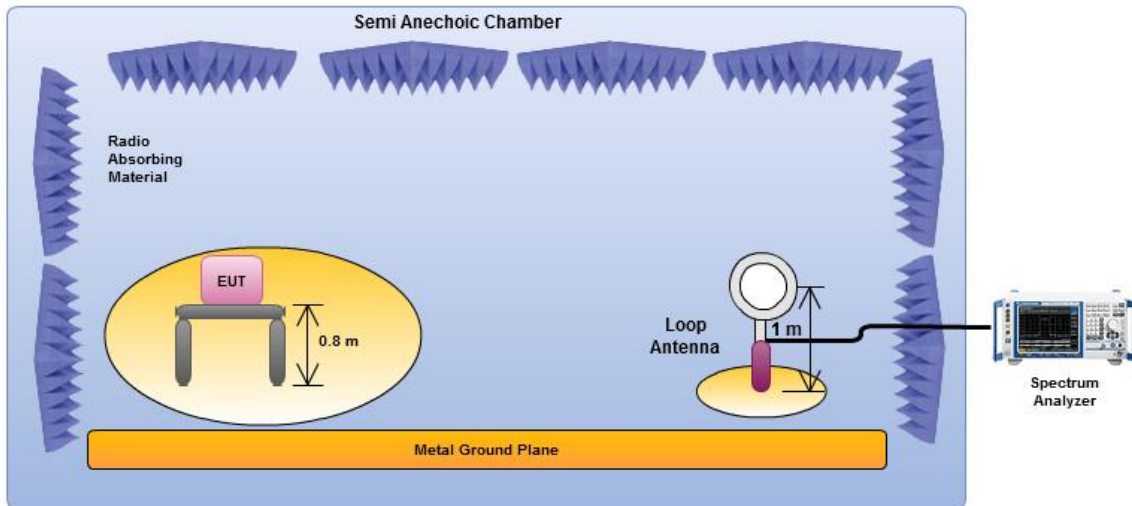
Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
☒	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 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.
☒	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.

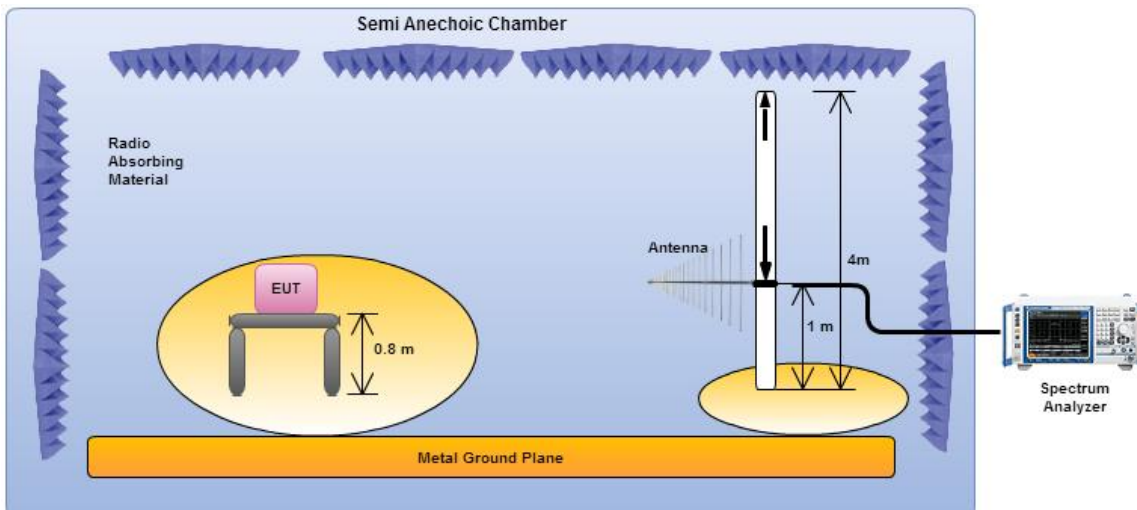
3.2.4 Test Setup

Transmitter Radiated Emissions (Below 30MHz)



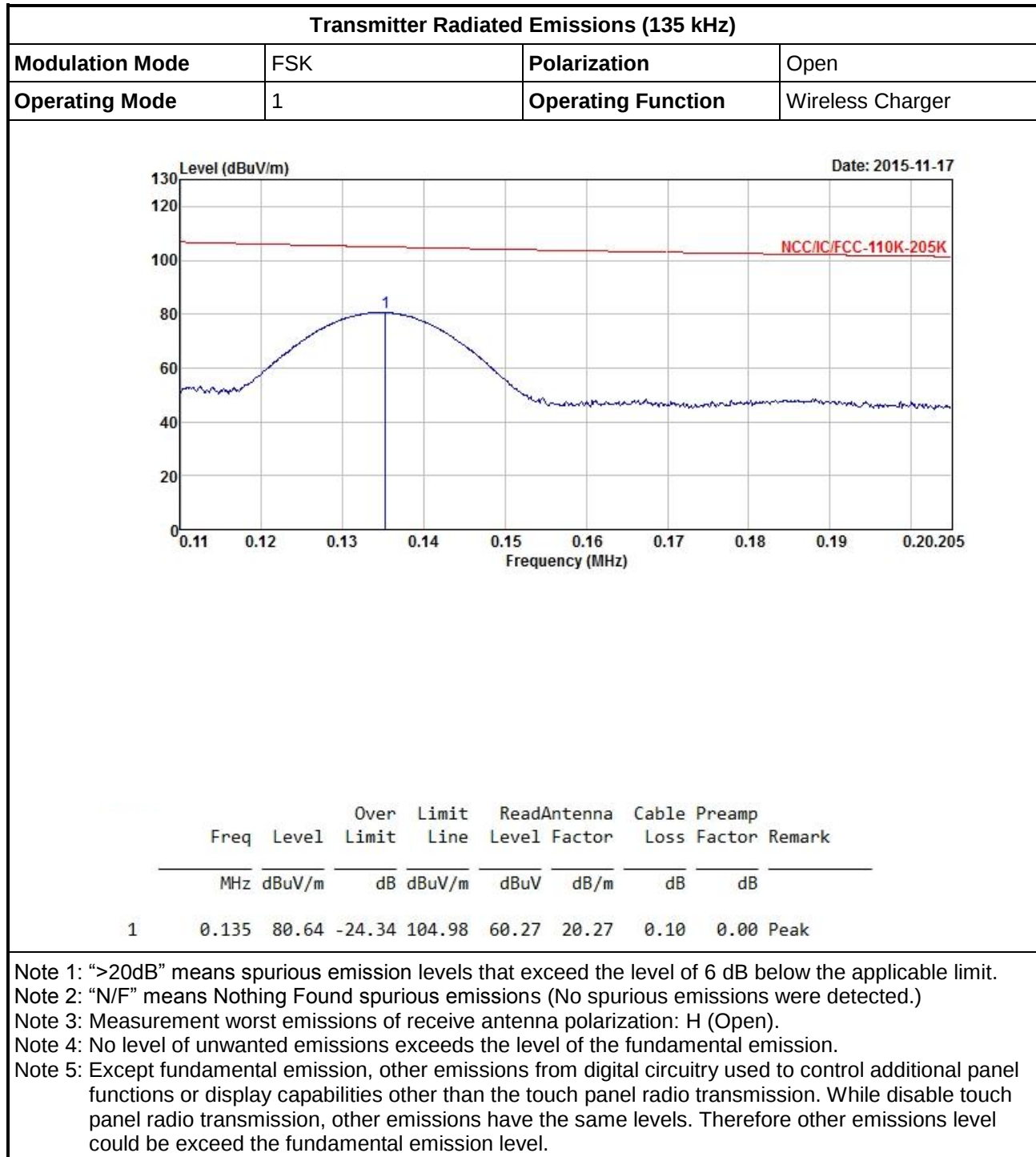
Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. The center of the loop shall be 1 m above the ground. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna. the antenna height shall be varied from 1 m to 4 m.

Transmitter Radiated Unwanted Emissions (Below 1GHz)



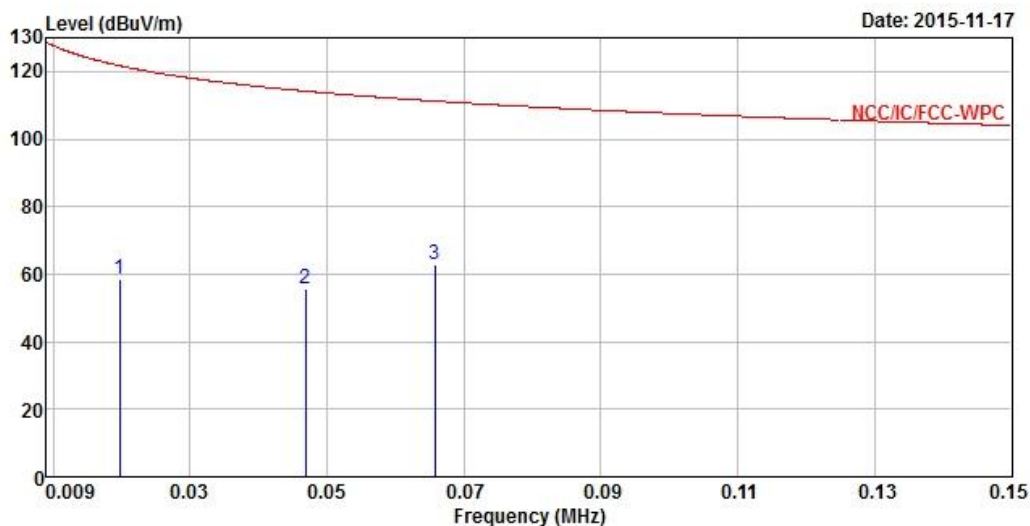
Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna.

3.2.5 Transmitter Radiated Emissions (Below 30MHz)



Transmitter Radiated Emissions (9 kHz – 150 kHz)

Modulation Mode	FSK	Polarization	Open
Operating Mode	1	Operating Function	Wireless Charger



	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	0.020	58.63	-63.08	121.71	37.03	21.50	0.10	0.00 Peak
2	0.047	55.86	-58.34	114.20	35.06	20.70	0.10	0.00 Peak
3	0.066	62.61	-48.65	111.26	42.01	20.50	0.10	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.)

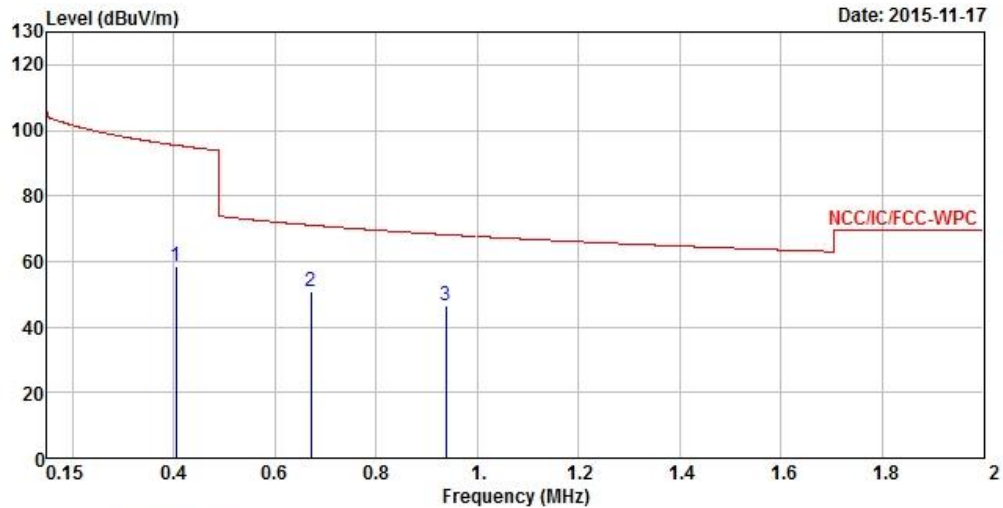
Note 3: Measurement worst emissions of receive antenna polarization: H (Open).

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.

Transmitter Radiated Emissions (150 kHz – 2 MHz)

Modulation Mode	FSK	Polarization	Open
Operating Mode	1	Operating Function	Wireless Charger



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamplifier Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	
1	0.405	58.55	-36.91	95.46	38.40	20.05	0.10	Peak
2	0.672	50.73	-20.34	71.07	30.56	20.07	0.10	Peak
3	0.938	46.30	-21.87	68.17	26.02	20.18	0.10	Peak

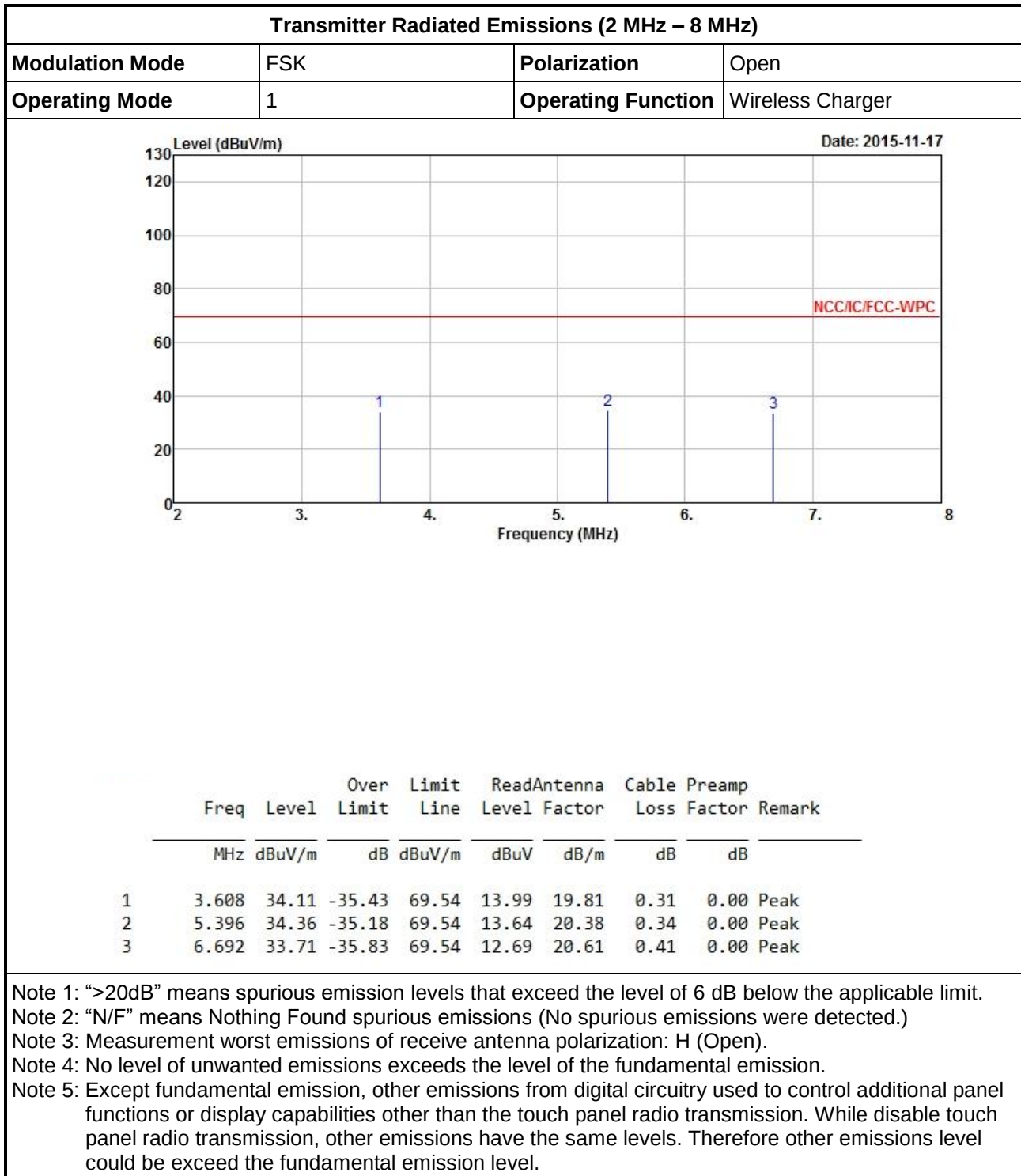
Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

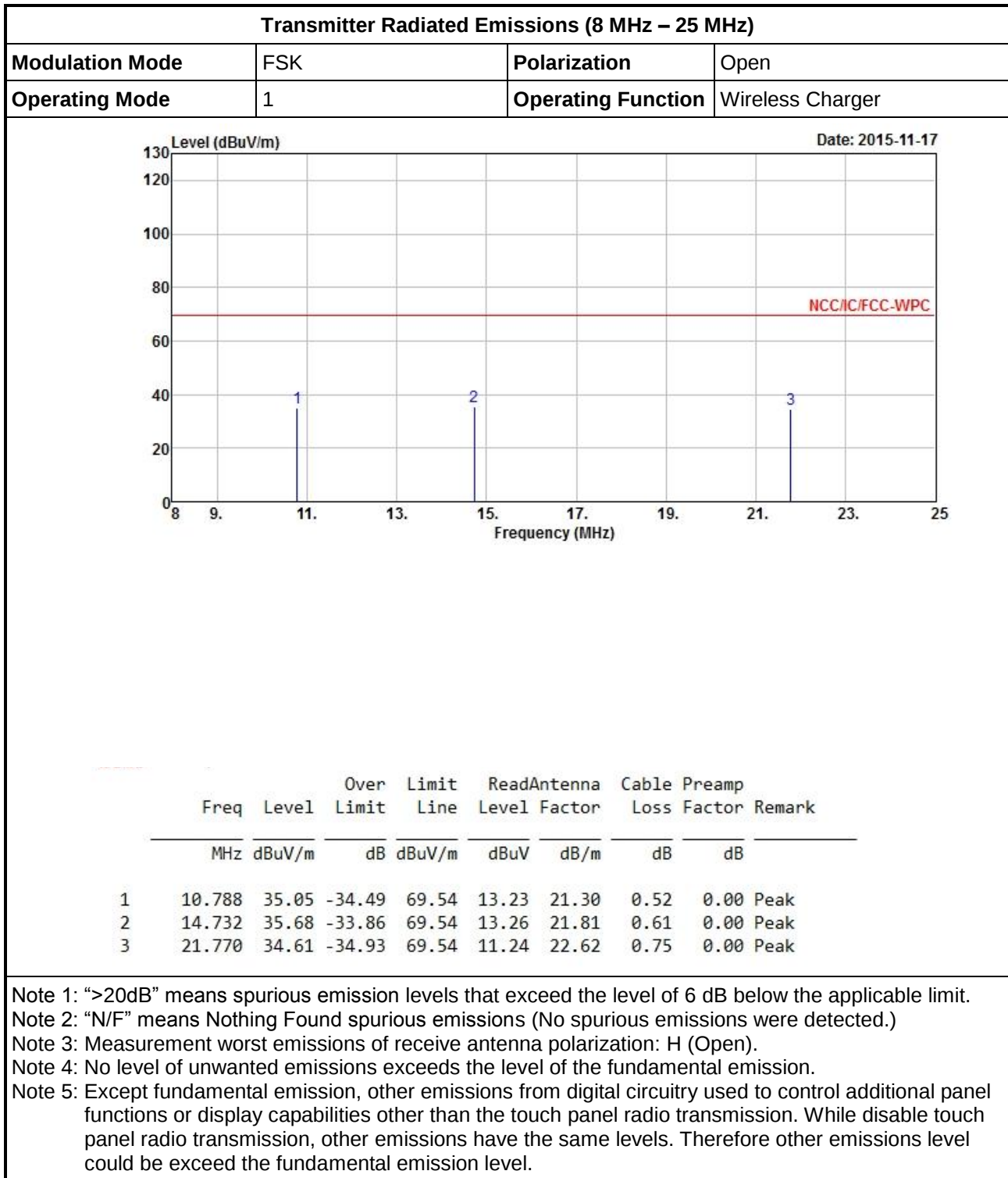
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

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

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

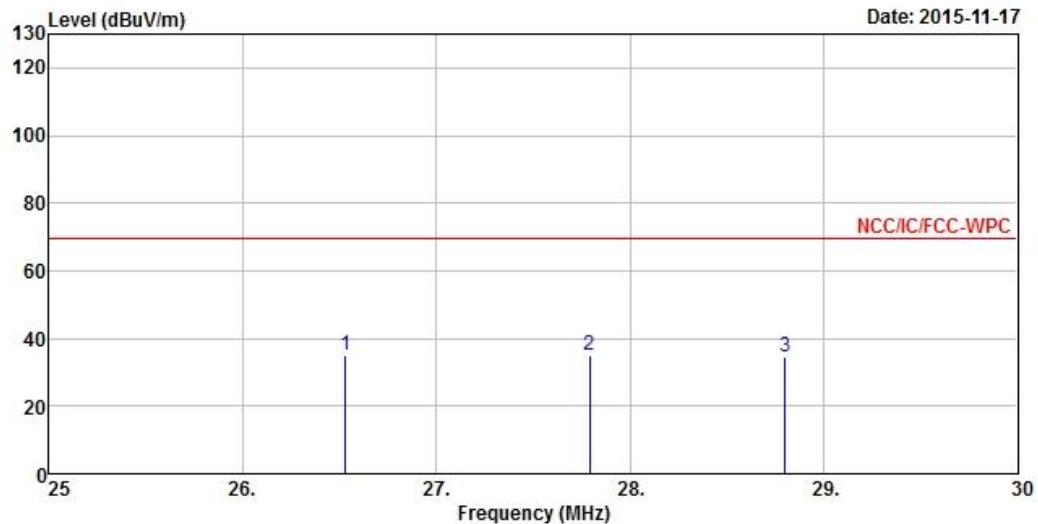
Note 5: Except fundamental emission, other emissions from digital circuitry used to control additional panel functions or display capabilities other than the touch panel radio transmission. While disable touch panel radio transmission, other emissions have the same levels. Therefore other emissions level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





Transmitter Radiated Emissions (25 MHz – 30 MHz)

Modulation Mode	FSK	Polarization	Open
Operating Mode	1	Operating Function	Wireless Charger



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	26.530	34.92	-34.62	69.54	11.15	22.96	0.81	0.00	Peak
2	27.790	35.22	-34.32	69.54	11.37	23.04	0.81	0.00	Peak
3	28.800	34.57	-34.97	69.54	10.63	23.12	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.)

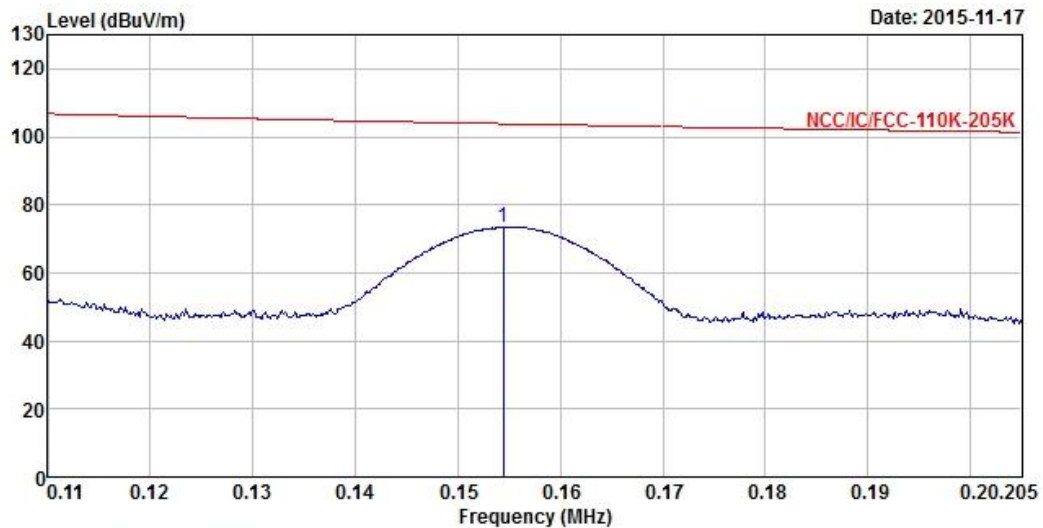
Note 3: Measurement worst emissions of receive antenna polarization: H (Open).

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.

Transmitter Radiated Emissions (135 kHz)

Modulation Mode	FSK	Polarization	Open
Operating Mode	2	Operating Function	Wireless Charger



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamplifier Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	0.154	73.50	-30.33	103.83	53.16	20.24	0.10	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.)

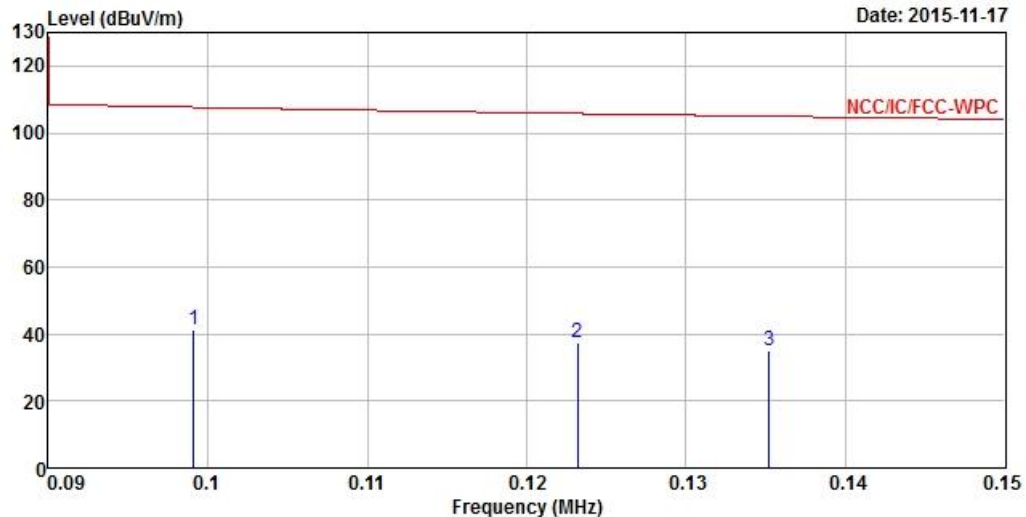
Note 3: Measurement worst emissions of receive antenna polarization: H (Open).

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.

Transmitter Radiated Emissions (9 kHz – 150 kHz)

Modulation Mode	FSK	Polarization	Open
Operating Mode	2	Operating Function	Wireless Charger



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp	Loss Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	0.099	41.42	-66.27	107.69	21.02	20.30	0.10	0.00 Peak
2	0.123	37.25	-68.55	105.80	16.88	20.27	0.10	0.00 Peak
3	0.135	35.05	-69.94	104.99	14.68	20.27	0.10	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.)

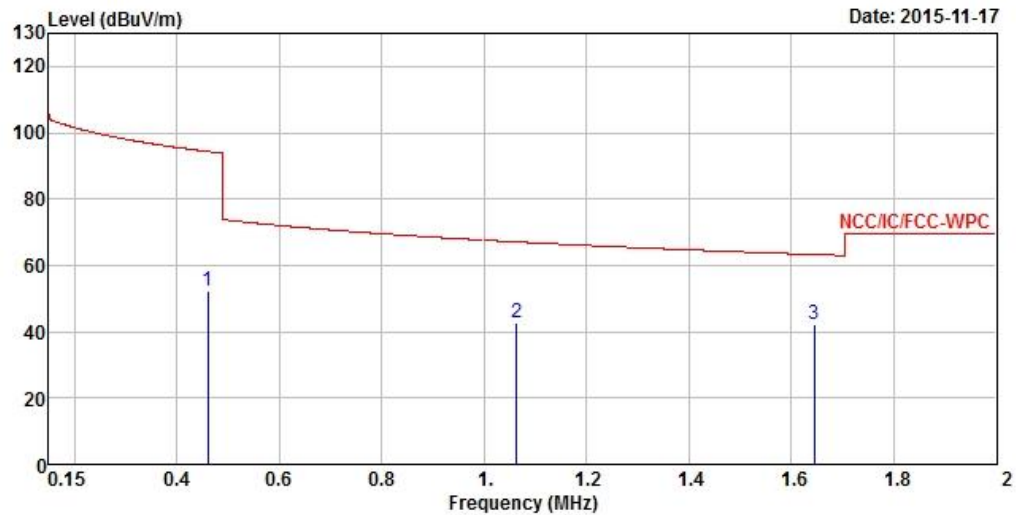
Note 3: Measurement worst emissions of receive antenna polarization: H (Open).

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.

Transmitter Radiated Emissions (150 kHz – 2 MHz)

Modulation Mode	FSK	Polarization	Open
Operating Mode	2	Operating Function	Wireless Charger



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	0.461	52.38	-41.96	94.34	32.26	20.02	0.10	0.00	Peak
2	1.064	42.85	-24.22	67.07	22.57	20.18	0.10	0.00	Peak
3	1.645	42.45	-20.83	63.28	22.25	20.00	0.20	0.00	Peak

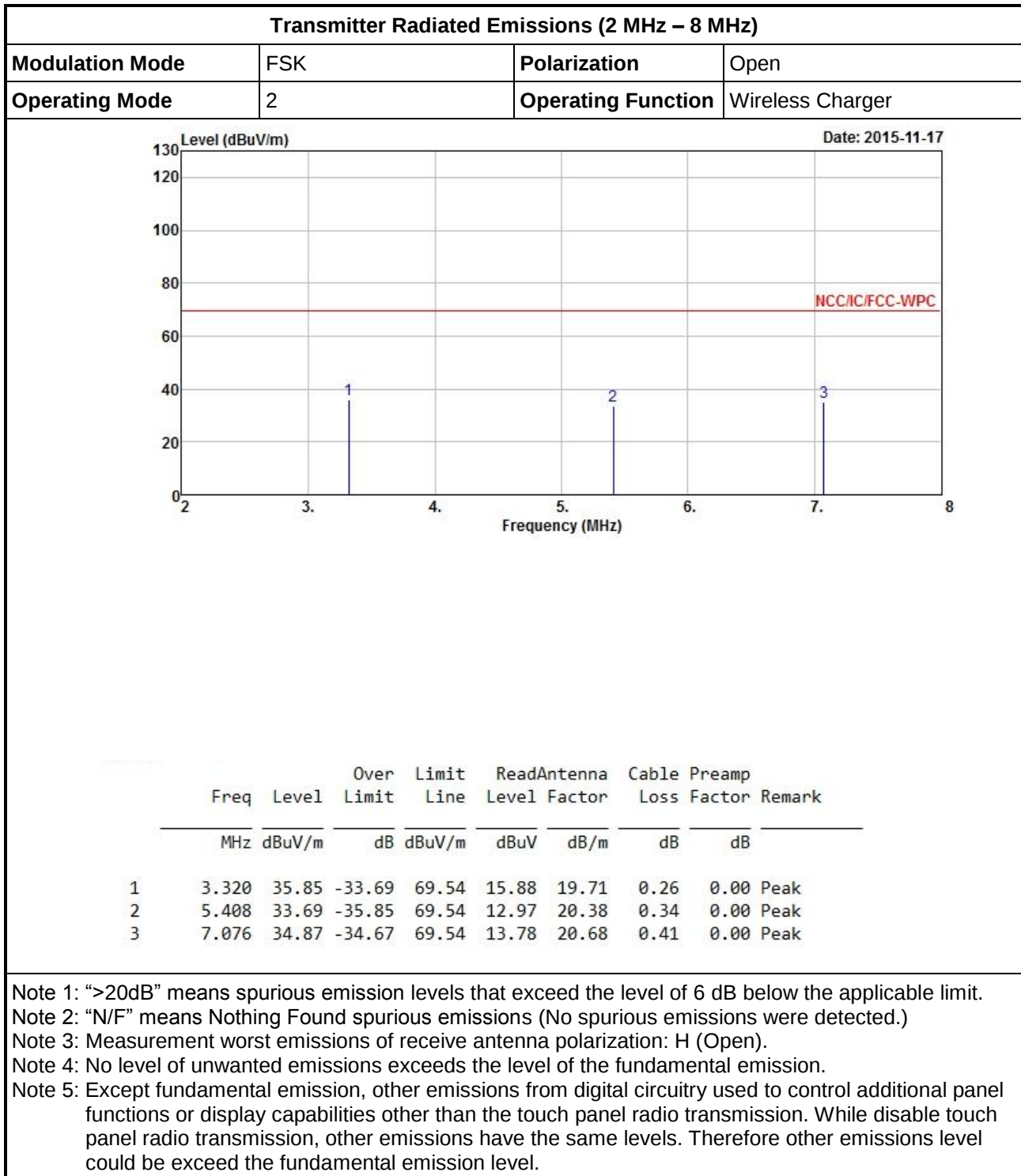
Note 1: ">20dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.

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

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

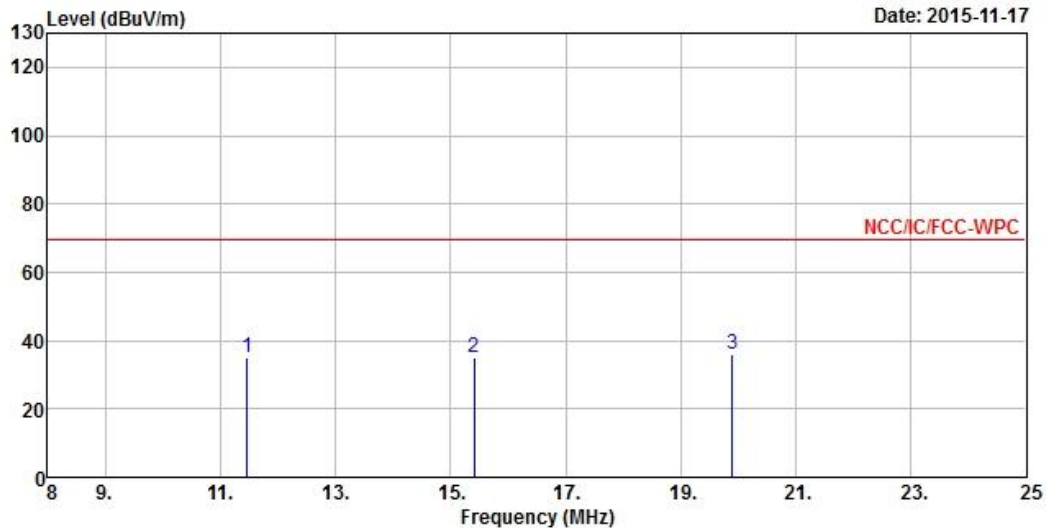
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.

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.



Transmitter Radiated Emissions (8 MHz – 25 MHz)

Modulation Mode	FSK	Polarization	Open
Operating Mode	2	Operating Function	Wireless Charger



	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	11.468	35.15	-34.39	69.54	13.24	21.39	0.52	0.00 Peak
2	15.412	35.24	-34.30	69.54	12.73	21.90	0.61	0.00 Peak
3	19.900	35.74	-33.80	69.54	12.54	22.48	0.72	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.)

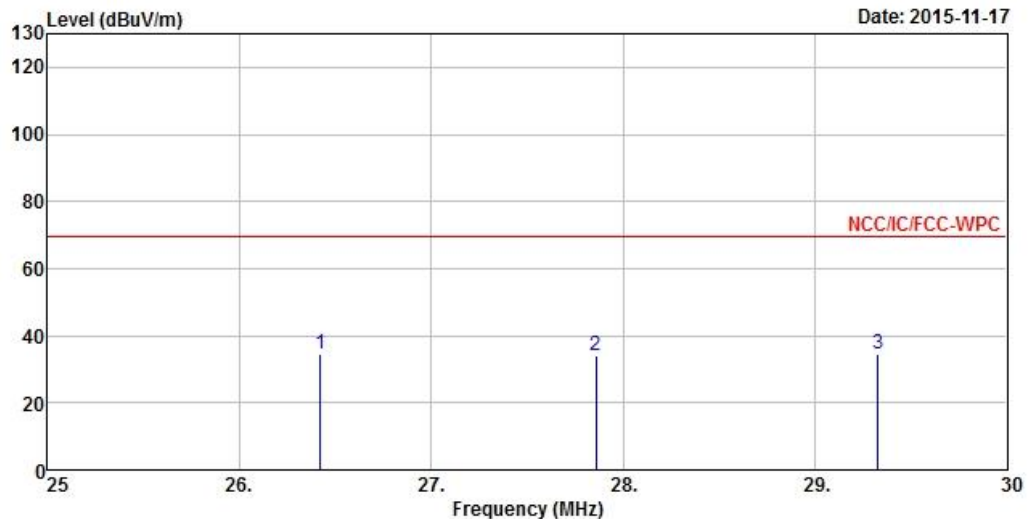
Note 3: Measurement worst emissions of receive antenna polarization: H (Open).

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.

Transmitter Radiated Emissions (25 MHz – 30 MHz)

Modulation Mode	FSK	Polarization	Open
Operating Mode	2	Operating Function	Wireless Charger



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	26.420	34.77	-34.77	69.54	11.02	22.95	0.80	0.00	Peak
2	27.860	33.97	-35.57	69.54	10.11	23.05	0.81	0.00	Peak
3	29.330	34.30	-35.24	69.54	10.33	23.15	0.82	0.00	Peak

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

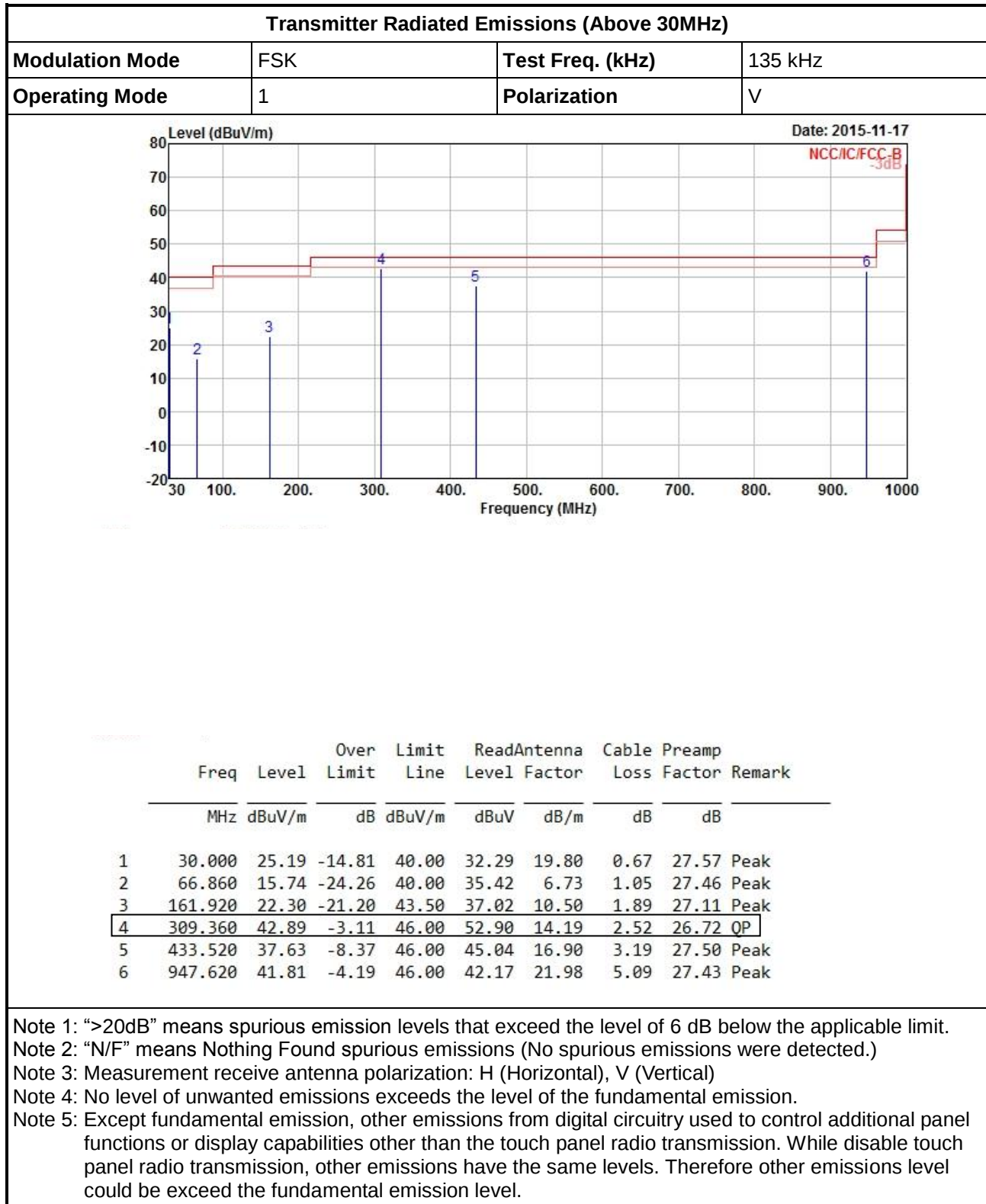
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

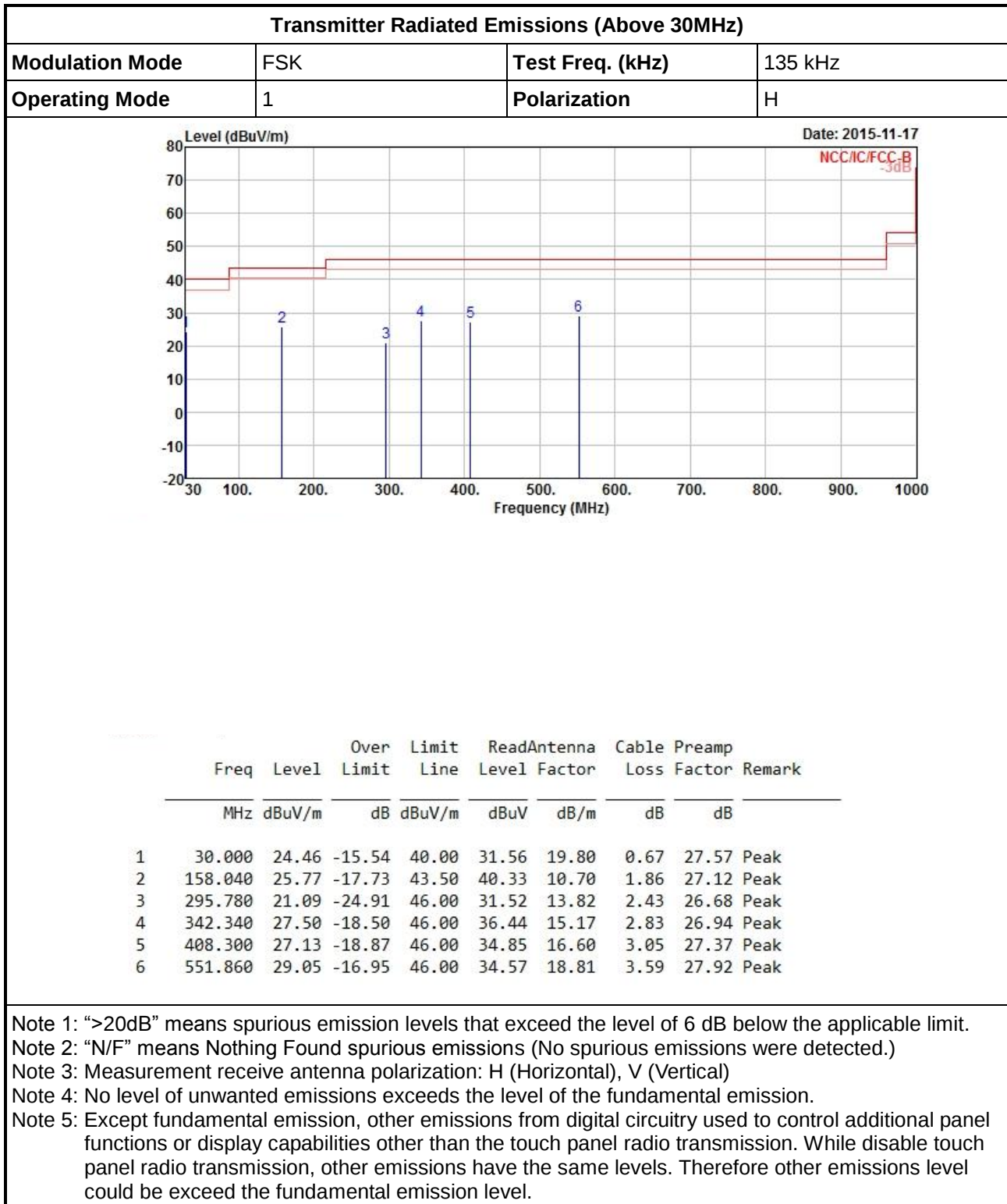
Note 3: Measurement worst emissions of receive antenna polarization: H (Open).

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.

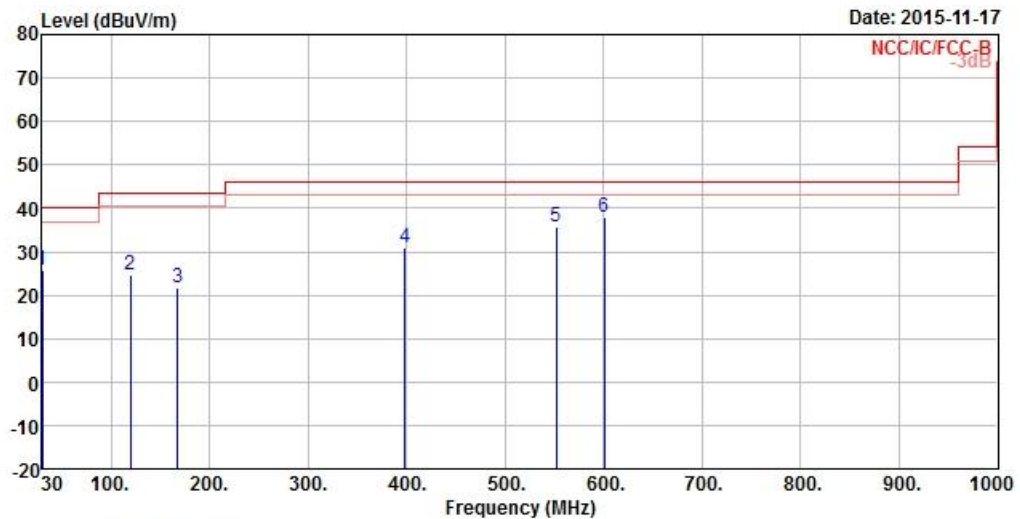
3.2.6 Transmitter Radiated Emissions (Above 30MHz)





Transmitter Radiated Emissions (Above 30MHz)

Modulation Mode	FSK	Test Freq. (kHz)	135 kHz
Operating Mode	2	Polarization	V



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1	30.000	25.61	-14.39	40.00	32.71	19.80	0.67	27.57 Peak
2	119.240	24.75	-18.75	43.50	37.50	12.96	1.56	27.27 Peak
3	167.740	21.52	-21.98	43.50	36.47	10.20	1.93	27.08 Peak
4	398.600	31.02	-14.98	46.00	38.85	16.48	3.01	27.32 Peak
5	551.860	35.89	-10.11	46.00	41.41	18.81	3.59	27.92 Peak
6	600.360	37.99	-8.01	46.00	43.18	19.00	3.80	27.99 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.)

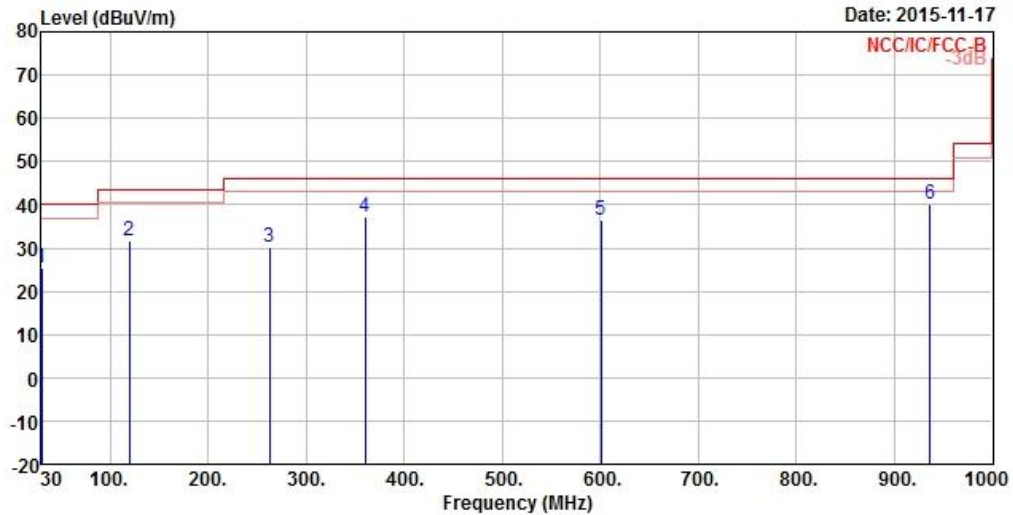
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

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

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.

Transmitter Radiated Emissions (Above 30MHz)

Modulation Mode	FSK	Test Freq. (kHz)	135 kHz
Operating Mode	2	Polarization	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	30.000	25.24	-14.76	40.00	32.34	19.80	0.67	27.57 Peak
2	119.240	31.84	-11.66	43.50	44.59	12.96	1.56	27.27 Peak
3	262.800	30.11	-15.89	46.00	40.78	13.78	2.32	26.77 Peak
4	359.800	37.26	-8.74	46.00	45.77	15.62	2.93	27.06 Peak
5	600.360	36.56	-9.44	46.00	41.75	19.00	3.80	27.99 Peak
6	935.980	39.97	-6.03	46.00	40.58	21.86	5.01	27.48 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.

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

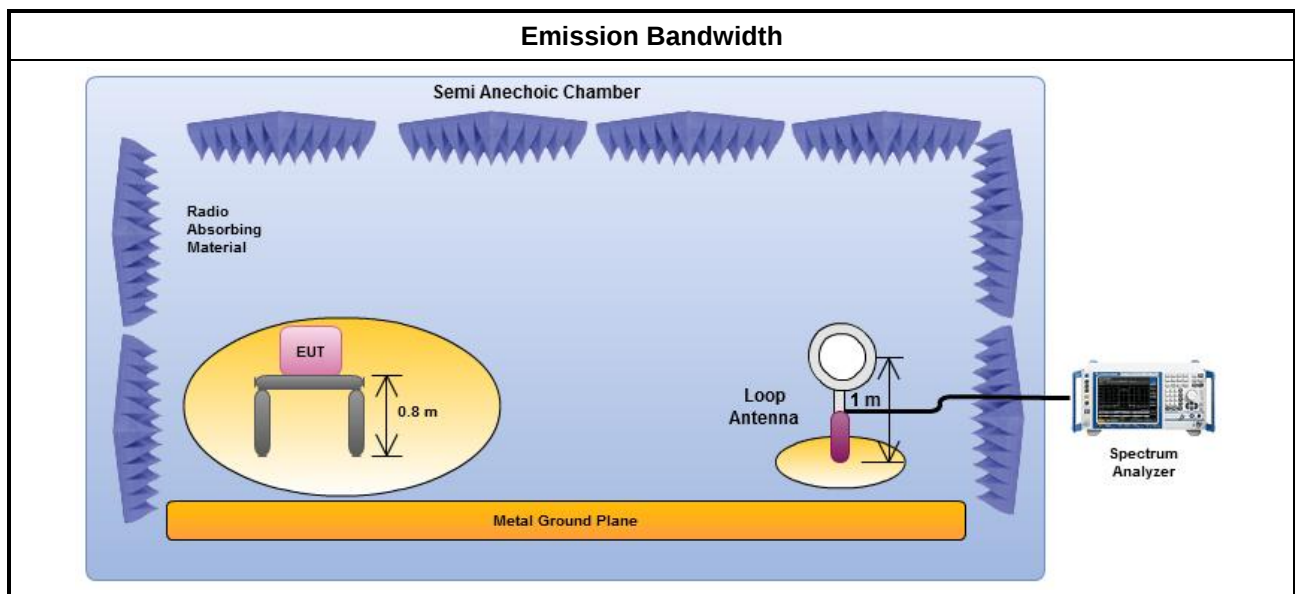
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

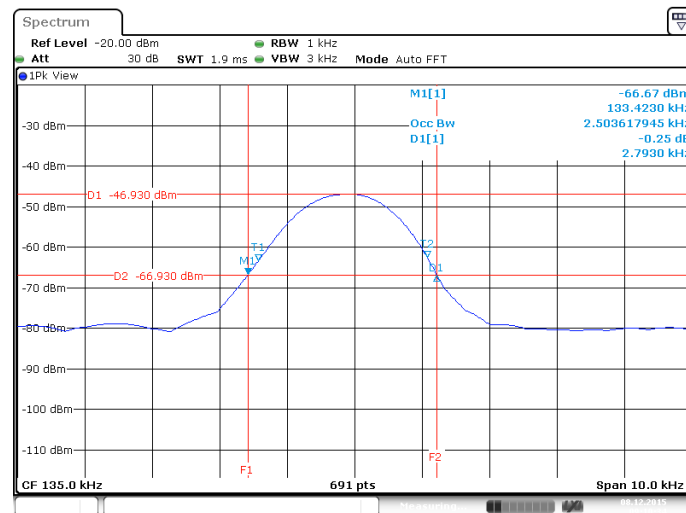
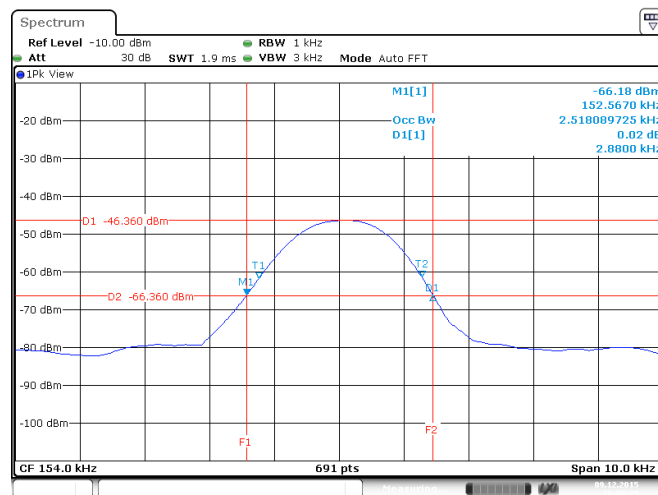
Test Method
☒ For the emission bandwidth refer ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.
☒ For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field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

3.3.4 Test Setup



3.3.5 Test Result of Emission Bandwidth

Occupied Channel Bandwidth Result					
Modulation Mode	Frequency (kHz)	20dB Bandwidth (kHz)	F _L at 20dB BW (kHz)	F _H at 20dB BW (kHz)	99% Bandwidth (kHz)
FSK	100-205	2.79	133.4230	135	2.50
FSK	100-205	2.88	152.5670	154	2.51
Limit		N/A	110	205	N/A
Result		Complied			

Emission Bandwidth Plot (135 kHz)

Emission Bandwidth Plot (154 kHz)


Date: 9.DEC.2015 16:00:29

4 Test Equipment and Calibration Data

< AC Conduction >

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz ~ 2.75GHz	Apr. 15, 2015	Apr. 14, 2016
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 22, 2015	Jan. 21, 2016
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	Oct. 30, 2015	Oct. 29, 2016
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	NA	NA

< RF Conducted >

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101500	9KHz~40GHz	May 06, 2015	May 05, 2016

< Radiated Emission >

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Apr. 24, 2015	Apr. 23, 2016
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	May 11, 2015	May 10, 2016
Spectrum	R&S	FSP40	100004	9kHz ~ 40GHz	Apr. 02, 2015	Apr. 01, 2016
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30MHz ~ 1GHz	Sep. 18, 2015	Sep. 17, 2016
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Oct. 28, 2015	Oct. 27, 2016
Turn Table	EM Electronics	EM Electronics	060615	0 ~ 360 degree	N/A	N/A
Antenna Mast	MF	MF-7802	MF780208179	1 ~ 4 m	N/A	N/A

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
Loop Antenna	TESEQ	HLA6120	24155	9 kHz~30 MHz	Mar.12, 2015	Mar.11, 2017

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