FCC Test Report

Equipment	:	**PLAYR**
Brand Name	:	**Catapult**
Model No.	:	**PD001**
FCC ID	:	**2AELY-PD001**
Standard	:	**47 CFR FCC Part 15.209**
Operating Band	:	**110-205 kHz**
Equipment Type	:	**Wireless Power Transfer for Consumer Devices**
Applicant	:	**KODAPLAY LIMITED** Unit 1, Block 1, Quayside Business Park, Mill Street Dundalk, Co Louth Ireland
Manufacturer	:	**XAVi Technologies Corporation** 22F., No.69, Sec. 2, Guangfu Rd., Sanchong Dist., New Taipei City 241, Taiwan

The product sample received on Dec. 01, 2017 and completely tested on Dec. 13, 2017. 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:

Phoenix Chen / Assistant Manager

Testing Laboratory
1190

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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]:0.1976MHz 54.22 (Margin 9.49dB) - QP 44.67 (Margin 9.04dB) - AV	FCC 15.207	Complied
3.2	15.209	Transmitter Radiated Emissions	[dBuV/m at 3m]:40.670MHz 36.49 (Margin 3.51dB) - Peak	FCC 15.209	Complied
3.3	15.215(c)	Emission Bandwidth	20dB Bandwidth 2.48 [kHz]	N/A	Complied

Revision History

Report No.	Version	Description	Issued Date
FR7N2922-02	Rev. 01	Initial issue of report	Mar. 01, 2018
FR7N2922-02	Rev. 02	1. Update the contents of the report 2. Update Photographs of EUT	Mar. 05, 2018

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	ASK	145.4	74.25
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	16 cm^2	Client directly contact
Note 1: Field strength performed peak level at 1m.			

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	
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 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%

1.1.5 EUT Operational Condition

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

1.2 Testing Applied Standards

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- KDB680106 D01 RF Exposure Wireless Charging Apps v02

1.3 Testing Location Information

Testing Location					
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)			
		TEL : 886-3-327-3456	FAX : 886-3-327-0973		
Test site Designation No. TW1190 with FCC.					
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**	
RF Conducted	TH06-HY	Barry	23.7°C / 61%	13/Dec/2017	
AC Conduction	CO04-HY	Bear	24.5°C / 56%	12/Dec/2017	
Radiated Emission	03CH02-HY	Lynus	23.5°C / 65%	11/Dec/2017	

1.4 Measurement Uncertainty

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

Test Items	**Uncertainty**	**Remark**
Conducted Emission (150kHz ~ 30MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%

2 Test Configuration of EUT

2.1 The Worst Case Configuration

Modulation Mode	Field Strength (dBuV/m at 1m)	Field Strength (dBuV/m at 3m)
ASK	74.25	55.17
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)
ASK	145.4 kHz
Wireless charger frequencies are variable frequency range (110-205 kHz) and depend on charging loading. The charging frequency is 145.4 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	USB Mode

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 will be a hand-held or body-worn battery-powered devices and operating multiple positions.
Operating Mode < 1GHz	☒ 1. USB Mode
Modulation Mode	ASK
Orthogonal Planes of EUT	**Z Plane**
	
Worst Planes of EUT	V

2.4 Accessories and Support Equipment

Accessories				
USB Cable	**Brand Name**	-	**Model Name**	-
	Signal Line	0.36 meter, shielded cable, w/o ferrite core		
PLAYR	**Brand Name**	Catapult	**Model Name**	PR001
	FCC ID	2AELY-PR001		

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

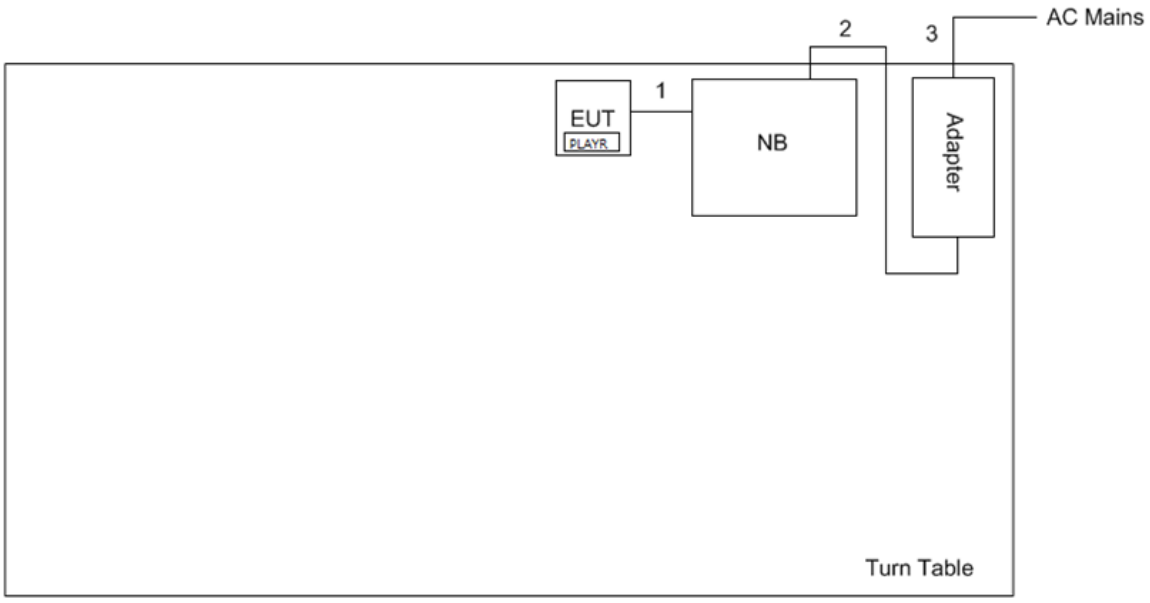
Support Equipment – AC Conduction				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5430	DoC
2	AC Adapter for NB	DELL	LA65NS2-01	DoC

Support Equipment – Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5410	DoC
2	AC Adapter for NB	DELL	HA65NM130	DoC

Support Equipment – Radiated				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5530	DoC
2	AC Adapter for NB	DELL	LA65NS2-01	DoC

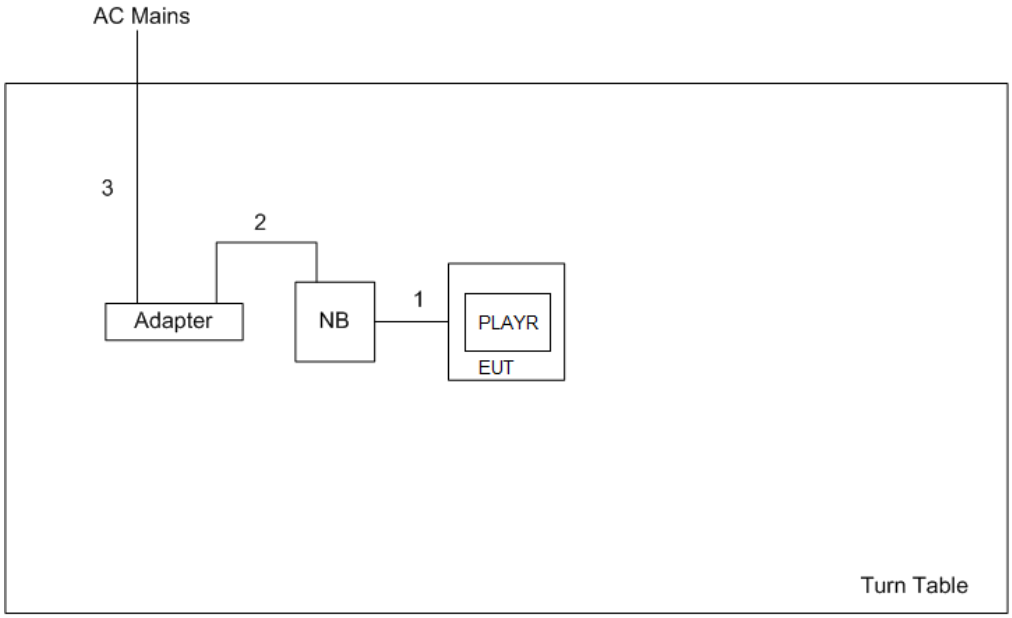
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	USB cable	No	0.36m	-
2	DC Power cable	No	1.5m	-
3	AC Power cable	No	1.8m	-

Test Setup Diagram - Radiated Test 9kHz~30MHz



Item	Connection	Shielded	Length(m)	Remark
1	USB cable	No	0.36m	-
2	DC Power cable	No	1.5m	-
3	AC Power cable	No	1.8m	-

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

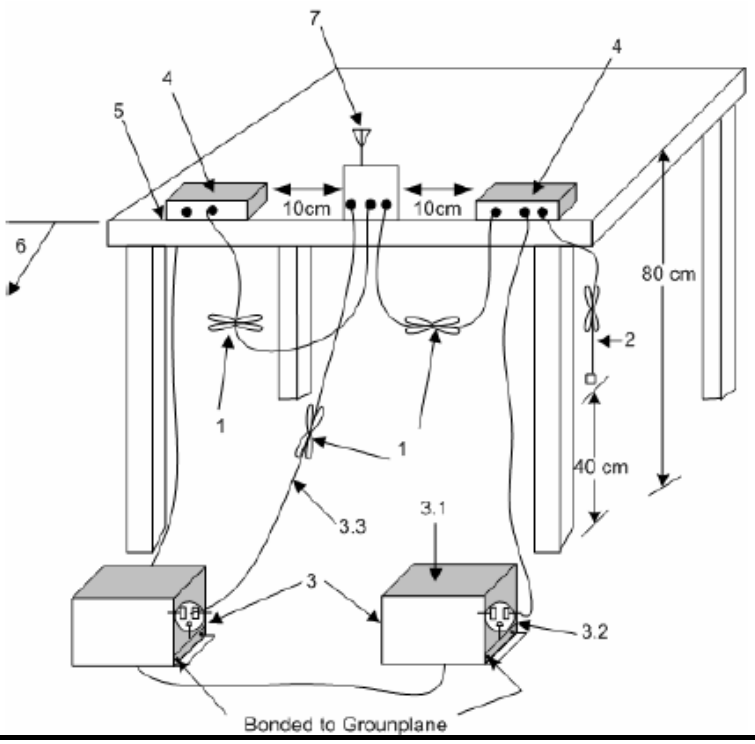
Refer a test equipment and calibration data table in this test report.

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.

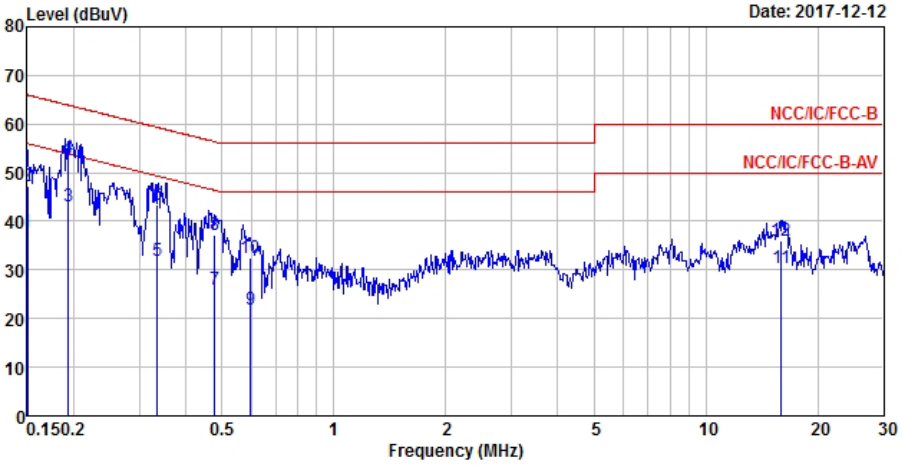
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

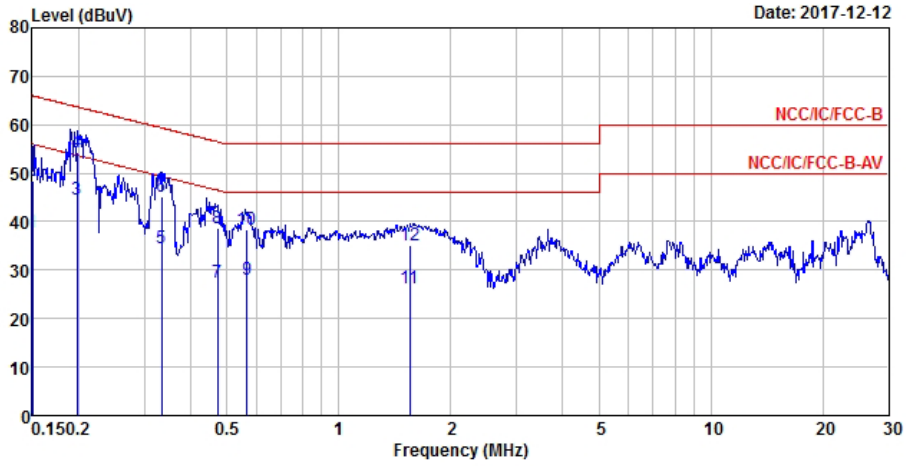
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	USB Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1500	37.78	-18.22	56.00	28.11	9.63	0.04	Average
2	0.1500	47.25	-18.75	66.00	37.58	9.63	0.04	QP
3 MAX	0.1934	43.07	-10.82	53.89	33.45	9.62	0.00	Average
4	0.1934	53.02	-10.87	63.89	43.40	9.62	0.00	QP
5	0.3356	32.03	-17.28	49.31	22.35	9.61	0.07	Average
6	0.3356	43.34	-15.97	59.31	33.66	9.61	0.07	QP
7	0.4786	26.09	-20.27	46.36	16.40	9.61	0.08	Average
8	0.4786	37.34	-19.02	56.36	27.65	9.61	0.08	QP
9	0.5979	21.73	-24.27	46.00	12.06	9.61	0.06	Average
10	0.5979	32.46	-23.54	56.00	22.79	9.61	0.06	QP
11	15.9698	30.37	-19.63	50.00	20.63	9.70	0.04	Average
12	15.9698	35.90	-24.10	60.00	26.16	9.70	0.04	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	1	**Power Phase**	Line
Operating Function	USB Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1500	37.91	-18.09	56.00	28.25	9.62	0.04	Average
2	0.1500	48.33	-17.67	66.00	38.67	9.62	0.04	QP
3 MAX	0.1976	44.67	-9.04	53.71	35.05	9.62	0.00	Average
4	0.1976	54.22	-9.49	63.71	44.60	9.62	0.00	QP
5	0.3338	34.64	-14.71	49.35	24.96	9.61	0.07	Average
6	0.3338	45.21	-14.14	59.35	35.53	9.61	0.07	QP
7	0.4711	27.39	-19.10	46.49	17.70	9.61	0.08	Average
8	0.4711	38.68	-17.81	56.49	28.99	9.61	0.08	QP
9	0.5671	27.90	-18.10	46.00	18.23	9.61	0.06	Average
10	0.5671	38.45	-17.55	56.00	28.78	9.61	0.06	QP
11	1.5518	26.14	-19.86	46.00	16.52	9.62	0.00	Average
12	1.5518	35.16	-20.84	56.00	25.54	9.62	0.00	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.

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

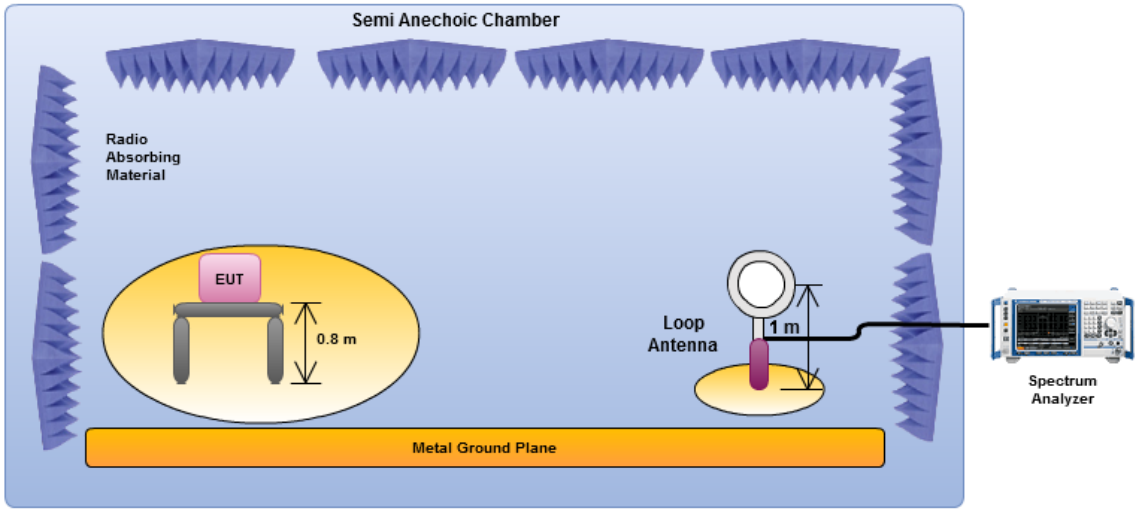
Refer a test equipment and calibration data table in this test report.

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 145.4 kHz, 110-205kHz measurements employing an average detector and other below 30MHz measurements employing a CISPR quasi-peak detector. Test distance is 1m.
☒	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.

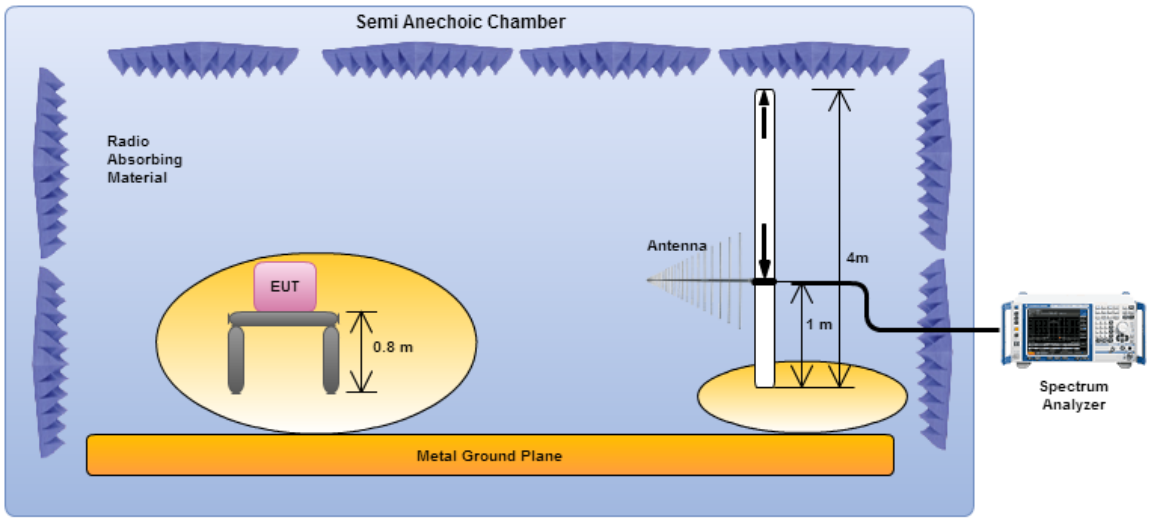
3.2.4 Test Setup

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.

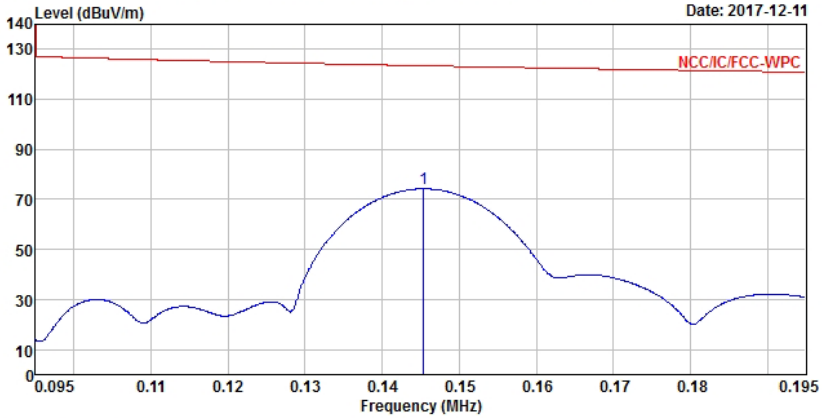
Transmitter Radiated Unwanted Emissions (Below 1GHz)



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)

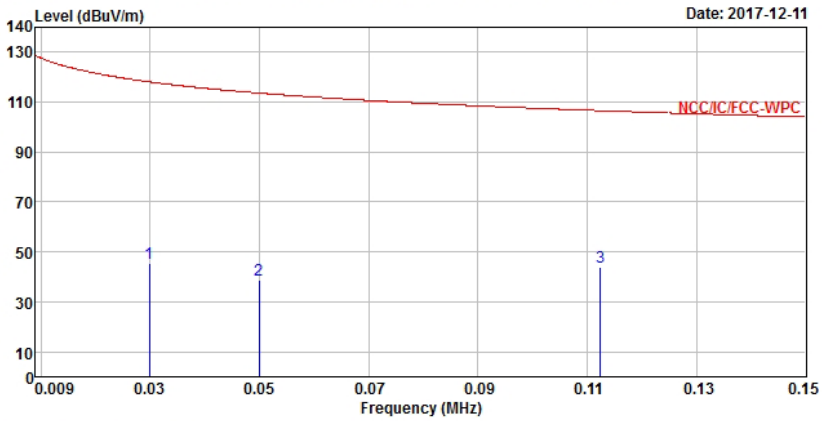
Transmitter Radiated Emissions (145.4 kHz)			
Modulation Mode	ASK	**Polarization**	Open
Operating Mode	1	**Operating Function**	Wireless Charger



	Freq	Level	Over Limit	Limit Line	Read 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	0.1454000	74.25	-49.19	123.44	53.52	20.65	0.08	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.
Note 6: The test result in peak detector is less than average limit , so that we tested in peak detector only.

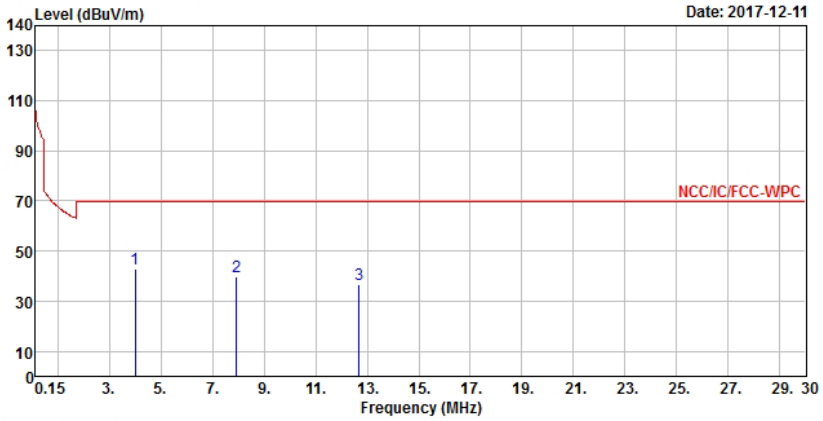
Transmitter Radiated Emissions (9 kHz – 150 kHz)			
Modulation Mode	ASK	**Polarization**	Open
Operating Mode	1	**Operating Function**	Wireless Charger



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	0.0298680	45.53	-72.57	118.10	23.47	22.00	0.06	0.00	Peak
2	0.0498900	38.78	-74.87	113.65	17.62	21.10	0.06	0.00	Peak
3	0.1123530	44.00	-62.60	106.60	23.24	20.69	0.07	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 – 30 MHz)			
Modulation Mode	ASK	**Polarization**	Open
Operating Mode	1	**Operating Function**	Wireless Charger

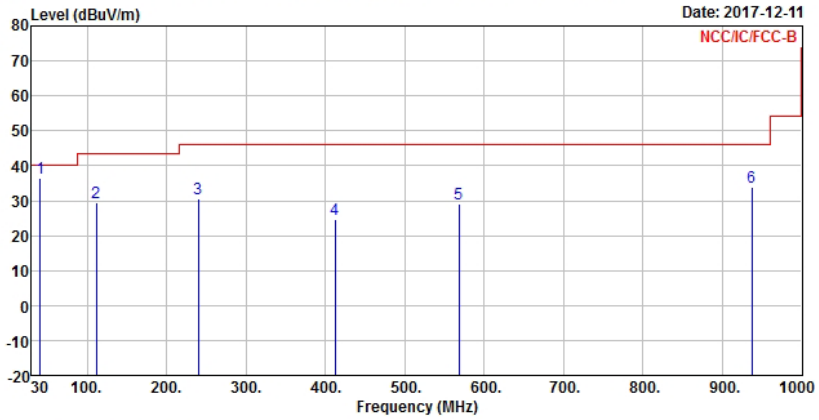


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	4.0006500	43.08	-26.46	69.54	22.21	20.55	0.32	0.00	Peak
2	7.9408500	39.74	-29.80	69.54	18.10	21.17	0.47	0.00	Peak
3	12.687000	36.55	-32.99	69.54	14.28	21.74	0.53	0.00	Peak

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)

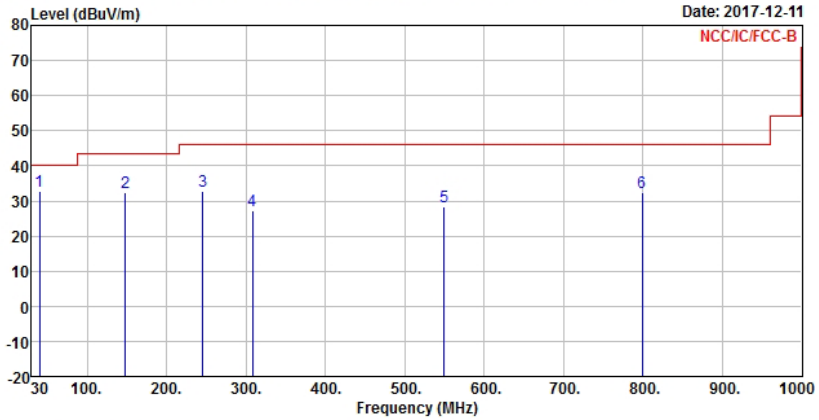
Transmitter Radiated Emissions (Above 30MHz)			
Modulation Mode	ASK	**Test Freq. (kHz)**	394 kHz
Operating Mode	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	40.670000	36.49	-3.51	40.00	46.13	17.21	0.85	27.70	Peak
2	111.48000	29.52	-13.98	43.50	38.62	17.15	1.52	27.77	Peak
3	239.52000	30.66	-15.34	46.00	39.07	16.53	2.41	27.35	Peak
4	412.18000	24.77	-21.23	46.00	27.96	21.73	3.10	28.02	Peak
5	568.35000	29.23	-16.77	46.00	30.18	23.91	3.68	28.54	Peak
6	936.95000	34.06	-11.94	46.00	30.64	26.10	4.82	27.50	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	ASK	**Test Freq. (kHz)**	394 kHz
Operating Mode	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	39.700000	32.68	-7.32	40.00	41.84	17.71	0.84	27.71	Peak
2	148.34000	32.35	-11.15	43.50	42.61	15.61	1.76	27.63	Peak
3	245.34000	32.82	-13.18	46.00	40.62	17.10	2.43	27.33	Peak
4	308.39000	27.15	-18.85	46.00	33.06	18.72	2.63	27.26	Peak
5	549.92000	28.29	-17.71	46.00	29.07	24.09	3.65	28.52	Peak
6	799.21000	32.53	-13.47	46.00	30.91	25.16	4.53	28.07	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

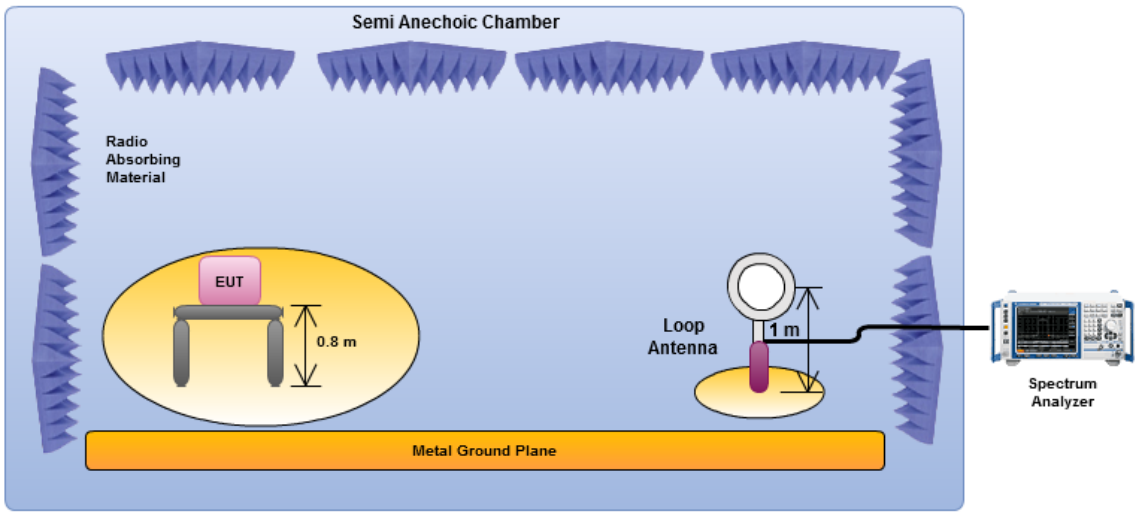
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
☒	For the emission bandwidth refer ANSI C63.10, clause 6.9.3 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

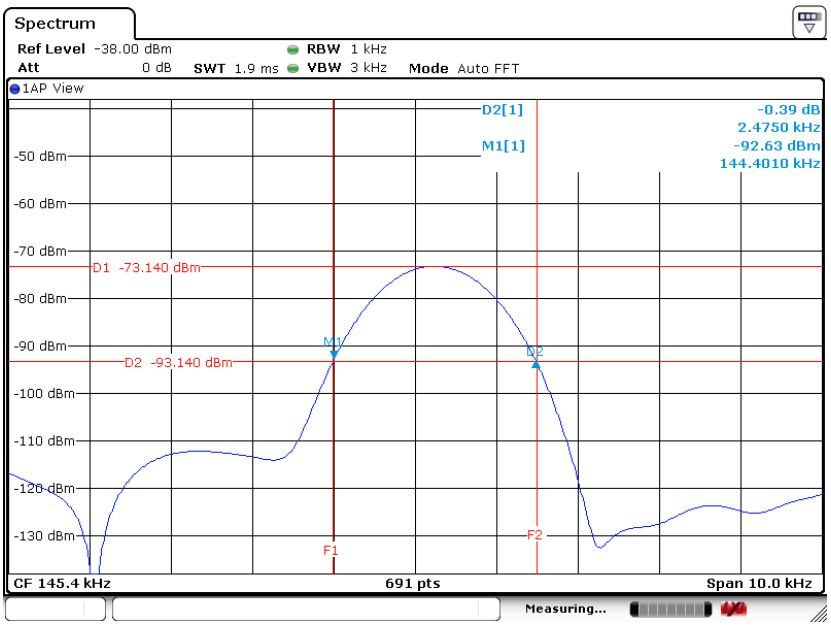
Emission Bandwidth



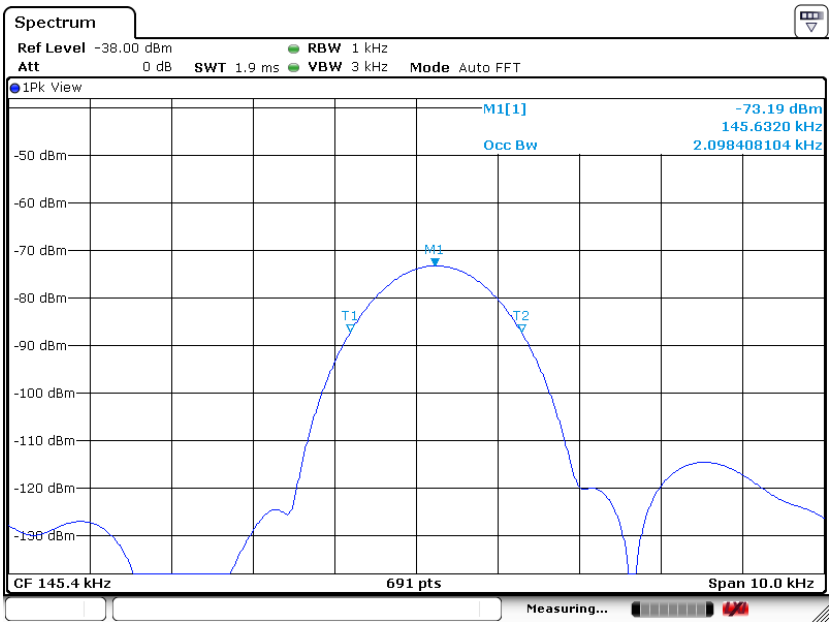
3.3.5 Test Result of Emission Bandwidth

Occupied Channel Bandwidth Result			
Modulation Mode	**Frequency (kHz)**	**20dB Bandwidth (kHz)**	**99% Bandwidth (kHz)**
ASK	145.4	2.48	2.10
Limit		**N/A**	**N/A**
Result		**Complied**	

Emission Bandwidth Plot 20dB Bandwidth (145.4 kHz)



Emission Bandwidth Plot 99% Bandwidth (145.4 kHz)



4 Test Equipment and Calibration Data

< AC Conduction >

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR3	102052	9 kHz ~ 3.6 GHz	29/Apr/2017	28/Apr/2018
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9 kHz ~ 30 MHz	06/Oct/2017	05/Oct/2018
AC POWER	APC	AFC-11005G	F310050055	47 Hz ~ 63 Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2017	11/Oct/2018
LISN	R&S	ENV216	101295	9 kHz ~ 30 MHz	17/Nov/2017	16/Nov/2018

NCR : Non-Calibration Require

< RF Conducted >

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101500	9KHz ~ 40 GHz	06/Feb/2017	05/Feb/2018
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz ~ 30 MHz	02/Mar/2017	01/Mar/2018

< Radiated Emission >

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSP 40	100305	9 kHz ~ 40 GHz	30/Dec/2016	29/Dec/2017
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz ~ 1 GHz 3m	20/Oct/2017	19/Oct/2018
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1 GHz ~ 18 GHz 3m	27/Oct/2017	26/Oct/2018
Amplifier	Agilent	8447D	2944A11149	100 kHz ~ 1.3 GHz	29/Jun/2017	28/Jun/2018
RF Cable-R03m	Jye Bao	RG142	CB017	9 kHz ~ 1GHz	26/Jan/2017	25/Jan/2018
Bilog Antenna	SCHAFFNER	CBL 6112B	2723	30 MHz ~ 1GHz	09/Sep/2017	8/Sep/2018
Receiver	R&S	ESU3	102052	9 kHz ~ 3. 6GHz	29/Apr/2017	28/Apr/2018
Loop Antenna	TESEQ	HLA 6120	24155	9 kHz ~ 30 MHz	03/Feb/2017	02/Feb/2018