FCC RADIO TEST REPORT

FCC ID	:	**2APYSG019C**
Equipment	:	**Wireless Charger**
Model Name	:	**G019C**
Applicant	:	**Lanto Electronic Ltd** **No.399 baisheng Road, jinxi Town, Kunshan City,** **Jiangsu, 215324, China**
Standard	:	**47 CFR FCC Part 15.209**

The product was received on Jun. 11, 2018, and testing was started from Jun. 13, 2018 and completed on Jul. 24, 2018. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR861107AW	01	Initial issue of report	Jul. 02, 2018
FR861107AW	02	Revise typo	Jul. 05, 2018
FR861107AW	03	Remove Brand Name	Jul. 13, 2018
FR861107AW	04	2m USB Cable is replaced to 1.5m USB Cable	Jul. 27, 2018
FR861107AW	05	Revise typo for Mode 4 Test Result of Emission Bandwidth	Aug. 08, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.209	Transmitter Radiated Emissions	PASS	-
3.3	15.215(c)	Emission Bandwidth	PASS	-

Reviewed by: Sam Tsai

Report Producer: Jenny Yang

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)**
110-148.5 kHz	ASK	122	97.19
		139	92.09
		133	70.26
		133	74.45
Power Transfer Method	**Output power from each primary coil**	**That may have multiple primary coils**	**Charging Method**
Magnetic induction and only single primary coil coupling secondary coil	<15W	Yes	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

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
- KDB 680106 D01 RF Exposure Wireless Charging Apps v03

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.			
☐	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)	
		TEL : 886-3-656-9065	FAX : 886-3-656-9085
Test site Designation No. TW0006 with FCC.			

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Terry	22.2°C / 23%	24/Jul/2018
RF Conducted	TH01-HY	Randy	21.5°C / 62%	29/Jun/2018
Radiated Emission	03CH02-HY	Terry	22.8°C / 52.3%	23/Jul/2018

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)

Measurement Uncertainty			
Test Item		**Uncertainty**	**Limit**
Radio Frequency		± 6.7 X 10^{-8}	± 1 X 10^{-7}
All emissions, radiated	9 – 150 kHz	±2.5 dB	±6 dB
	0.15 – 30 MHz	±2.3 dB	±6 dB
	30 – 1000 MHz	±2.6 dB	±6 dB
Temperature		±0.8 °C	±1 °C
Humidity		±5 %	±5 %
DC and low frequency voltages		±0.9%	±3 %

2 Test Configuration of EUT

2.1 The Worst Case Configuration

Modulation Mode	Field Strength (dBuV/m at 3m)
ASK	97.19
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	122 kHz
Wireless charger frequencies are variable frequency range (110-148.5 kHz) and depend on charging loading. The charging frequency is 122 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	TX 122kHz, EUT (Z-Axis), charging with the Load (X-Axis)
2	TX 139kHz, EUT (Z-Axis), charging with the Load (Y-Axis)
3	TX 133kHz, EUT (Z-Axis), charging with the Phone (X-Axis)
4	TX 133kHz, EUT (Z-Axis), charging with the Phone (Y-Axis)

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. TX 122kHz, EUT (Z-Axis), charging with the Load (X-Axis)
	☒ 2. TX 139kHz, EUT (Z-Axis), charging with the Load (Y-Axis)
	☒ 3. TX 133kHz, EUT (Z-Axis), charging with the Phone (X-Axis)
	☒ 4. TX 133kHz, EUT (Z-Axis), charging with the Phone (Y-Axis)
Modulation Mode	ASK
Orthogonal Planes of EUT	**Z Plane**
	
Worst Planes of EUT	V

2.4 Accessories and Support Equipment

Accessories Information				
AC Adapter	**Brand Name**	flextronics	**Model Name**	G1000-US
	Power Rating	I/P: 100- 240Vac, 1.7 A, O/P: 5Vdc, 3A, O/P: 9Vdc, 2A		
Type-C USB Cable	**Brand Name**	-	**In/Out door**	Indoor
	Signal Line	1.5 meter, non-shielded cable, with w/o ferrite core		

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	RX Load	-	-	-
2	Load	SSR	400W	-
3	Phone	Apple	MRRM2TA/A	-

Note: Support equipment No.1 was provided by customer.

Support Equipment – Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	RX Load	-	-	-
2	DC power supply	GW	GPS-3030DD	-
3	Load	SSR	400W	-
4	Phone	Apple	MRRM2TA/A	-

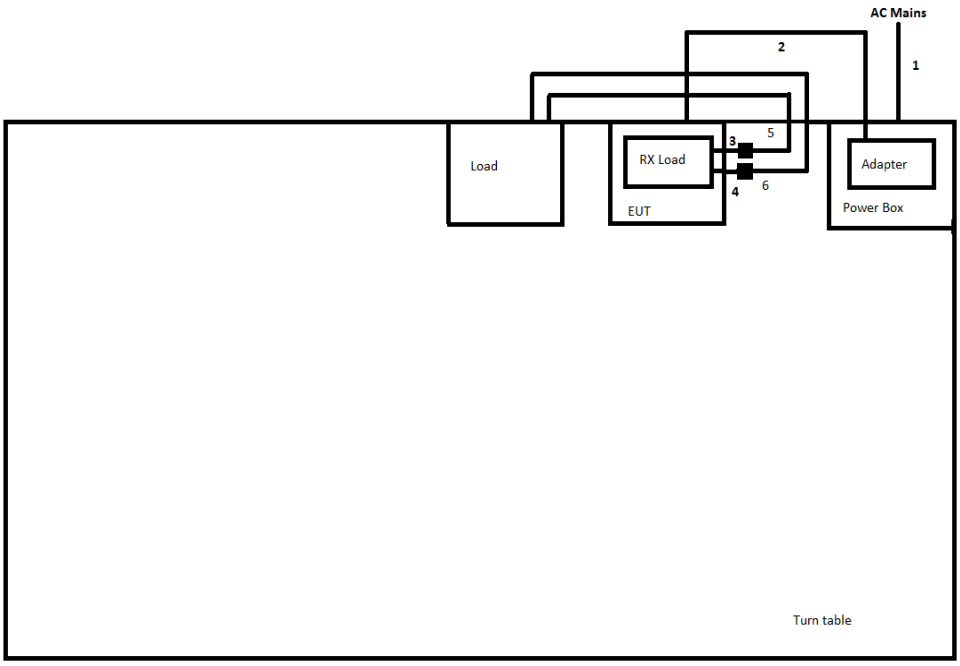
Note: Support equipment No.1 was provided by customer.

Support Equipment – Radiated				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	RX Load	-	-	-
2	Load	SSR	400W	-
3	Phone	Apple	MRRM2TA/A	-

Note: Support equipment No.1 was provided by customer.

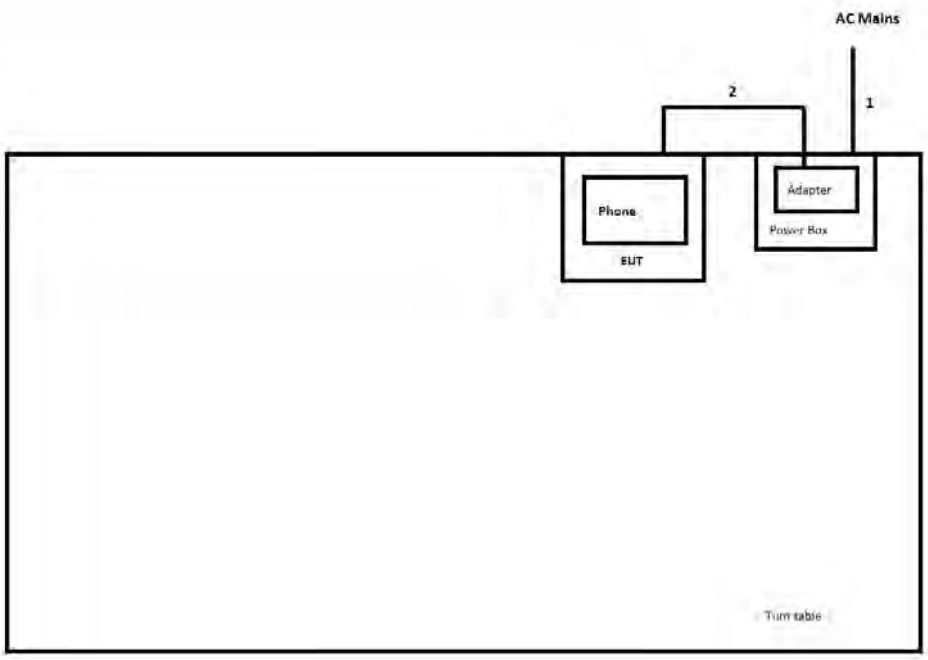
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test – Mode 1 & 2



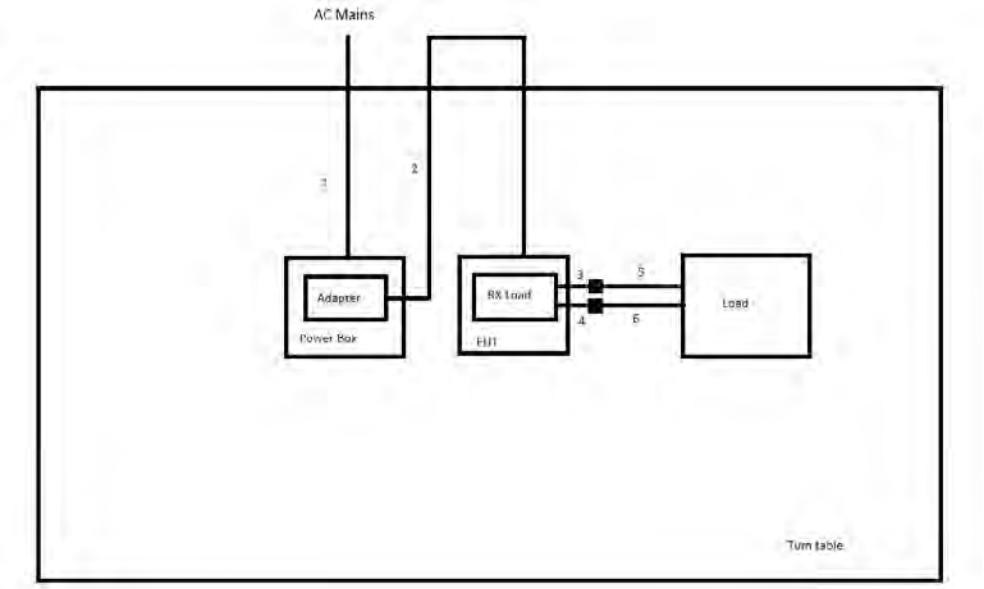
Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.5m	-
2	USB cable	No	1.5 m	-
3	DC Power line	No	0.1m	-
4	DC Power line	No	0.1m	-
5	DC Power line	No	1.0m	-
6	DC Power line	No	1.0m	-

Test Setup Diagram – AC Line Conducted Emission Test – Mode 3 & 4



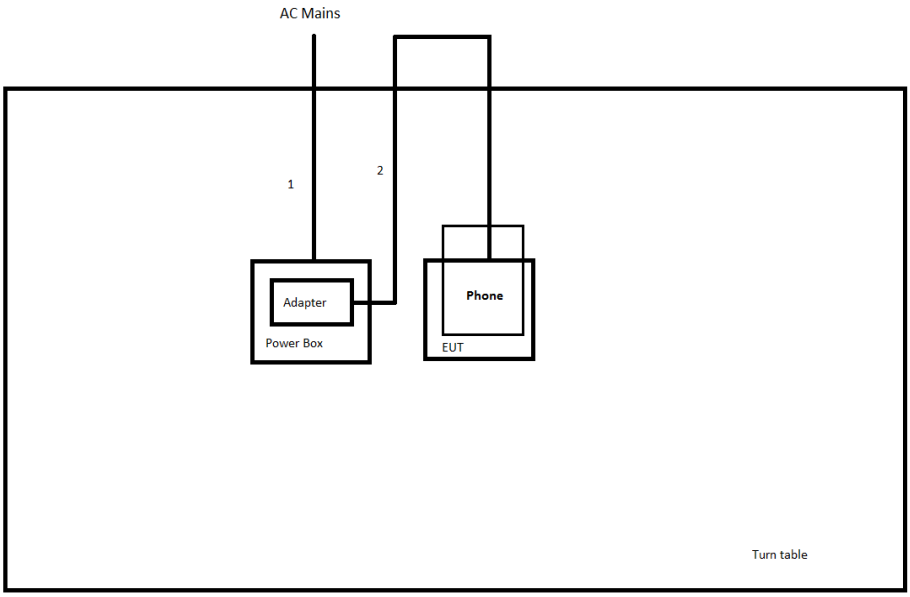
Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.5m	-
2	USB cable	No	1.5m	-

Test Setup Diagram - Radiated Test – Mode 1 & 2



Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.5m	-
2	USB cable	No	1.5 m	-
3	DC Power line	No	0.1m	-
4	DC Power line	No	0.1m	-
5	DC Power line	No	1.0m	-
6	DC Power line	No	1.0m	-

Test Setup Diagram - Radiated Test – Mode 3 & 4



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

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

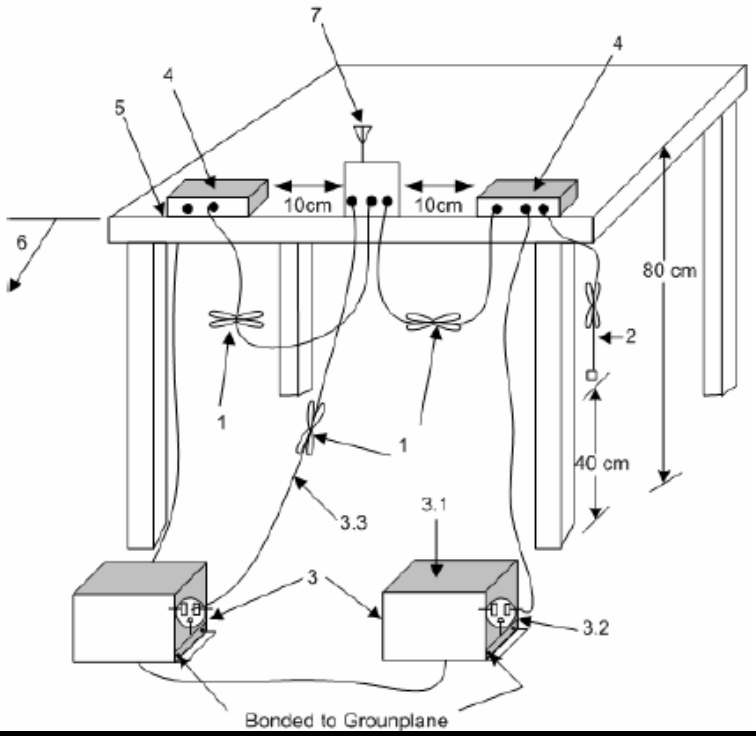
Refer a test equipment and calibration data table in this test report.

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.

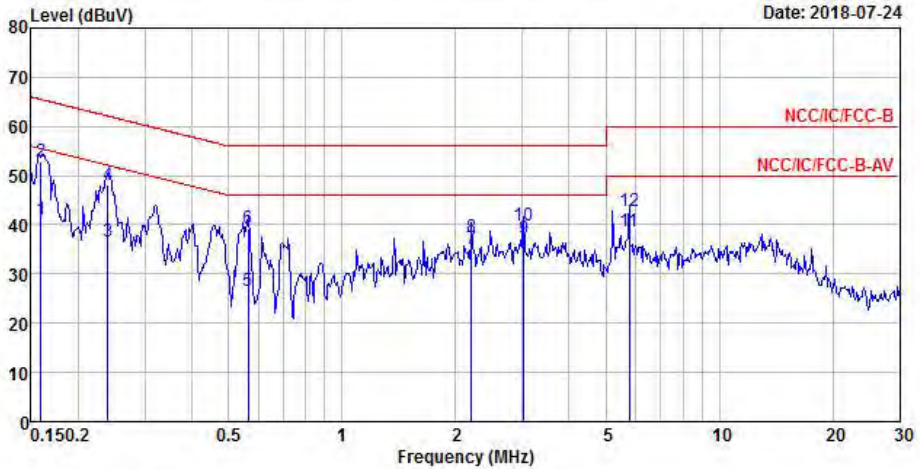
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

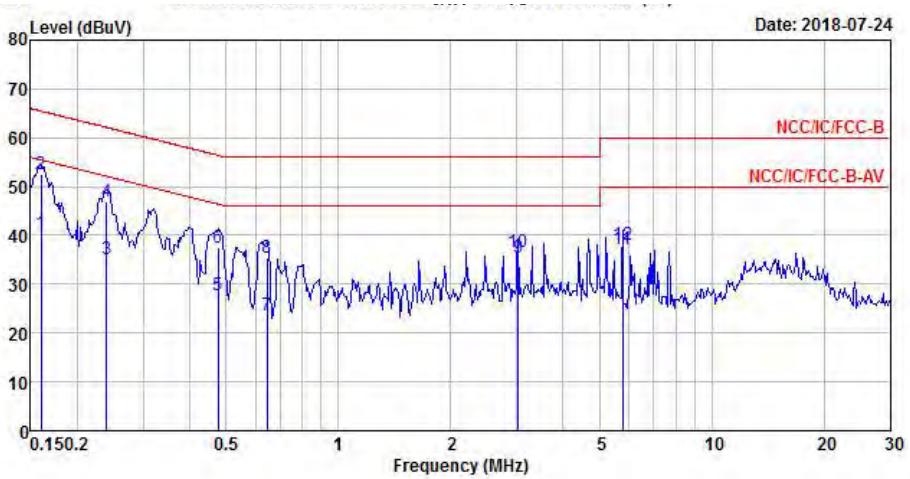
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	TX 122kHz, EUT (Z-Axis), charging with the Load (X-Axis)		



	Freq	Level	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	41.00	-14.49	55.49	31.34	9.63	0.03	Average
2	0.16	52.73	-12.76	65.49	43.07	9.63	0.03	QP
3	0.24	36.53	-15.60	52.13	26.88	9.62	0.03	Average
4	0.24	48.24	-13.89	62.13	38.59	9.62	0.03	QP
5	0.56	26.55	-19.45	46.00	16.88	9.61	0.06	Average
6	0.56	39.21	-16.79	56.00	29.54	9.61	0.06	QP
7	2.20	35.23	-10.77	46.00	25.59	9.63	0.01	Average
8	2.20	37.61	-18.39	56.00	27.97	9.63	0.01	QP
9 MAX	3.03	37.14	-8.86	46.00	27.45	9.64	0.05	Average
10	3.03	39.79	-16.21	56.00	30.10	9.64	0.05	QP
11	5.78	38.71	-11.29	50.00	28.92	9.66	0.13	Average
12	5.78	42.79	-17.21	60.00	33.00	9.66	0.13	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.

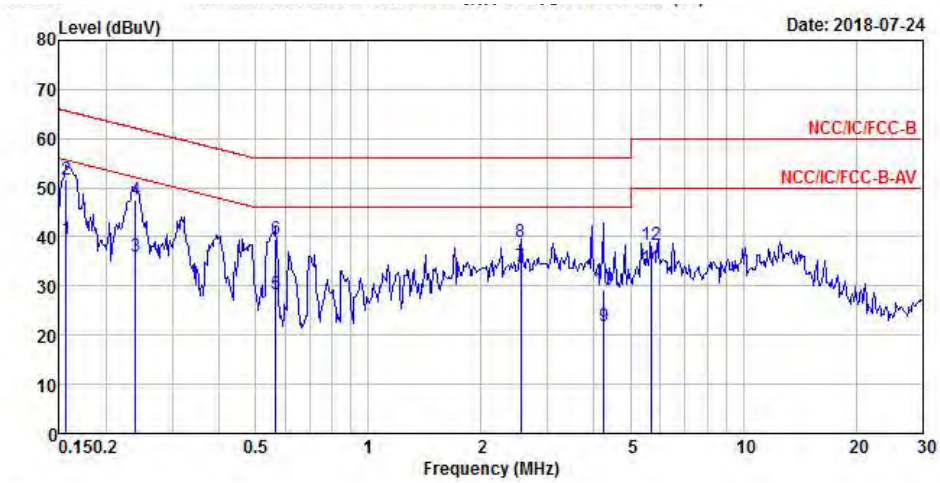
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	TX 122kHz, EUT (Z-Axis), charging with the Load (X-Axis)		



	Freq	Level	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	40.45	-15.03	55.48	30.80	9.62	0.03	Average
2	0.16	52.52	-12.96	65.48	42.87	9.62	0.03	QP
3	0.24	35.24	-16.88	52.12	25.59	9.62	0.03	Average
4	0.24	46.90	-15.22	62.12	37.25	9.62	0.03	QP
5	0.48	27.67	-18.74	46.41	17.98	9.61	0.08	Average
6	0.48	37.42	-18.99	56.41	27.73	9.61	0.08	QP
7	0.64	23.64	-22.36	46.00	13.98	9.61	0.05	Average
8	0.64	35.37	-20.63	56.00	25.71	9.61	0.05	QP
9 MAX	3.03	35.53	-10.47	46.00	25.85	9.63	0.05	Average
10	3.03	36.71	-19.29	56.00	27.03	9.63	0.05	QP
11	5.78	37.15	-12.85	50.00	27.38	9.64	0.13	Average
12	5.78	38.06	-21.94	60.00	28.29	9.64	0.13	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.

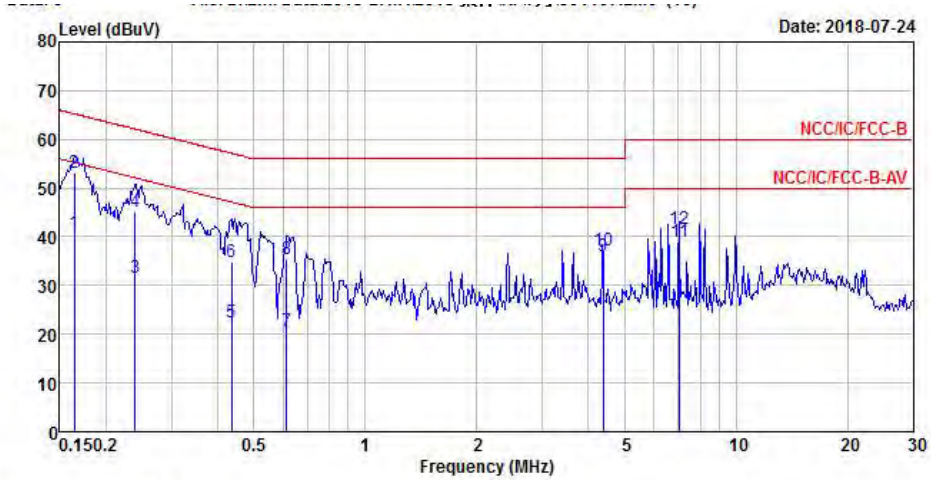
AC Power-line Conducted Emissions Result			
Operating Mode	2	**Power Phase**	Neutral
Operating Function	TX 139kHz, EUT (Z-Axis), charging with the Load (Y-Axis)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	39.67	-15.98	55.65	30.00	9.63	0.04	Average
2	0.16	51.78	-13.87	65.65	42.11	9.63	0.04	QP
3	0.24	35.95	-16.18	52.13	26.30	9.62	0.03	Average
4	0.24	47.65	-14.48	62.13	38.00	9.62	0.03	QP
5	0.57	28.33	-17.67	46.00	18.66	9.61	0.06	Average
6	0.57	39.49	-16.51	56.00	29.82	9.61	0.06	QP
7 MAX	2.55	33.92	-12.08	46.00	24.26	9.63	0.03	Average
8	2.55	38.96	-17.04	56.00	29.30	9.63	0.03	QP
9	4.25	21.87	-24.13	46.00	12.14	9.64	0.09	Average
10	4.25	29.25	-26.75	56.00	19.52	9.64	0.09	QP
11	5.68	33.74	-16.26	50.00	23.95	9.66	0.13	Average
12	5.68	38.27	-21.73	60.00	28.48	9.66	0.13	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.

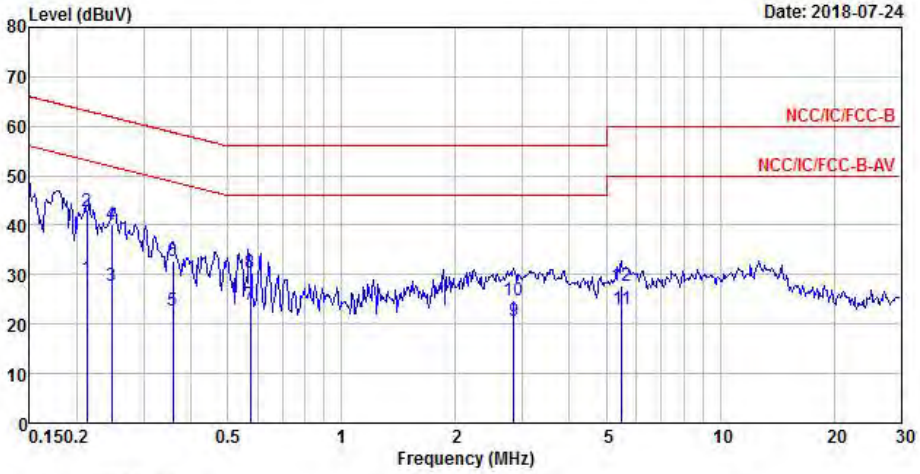
AC Power-line Conducted Emissions Result			
Operating Mode	2	**Power Phase**	Line
Operating Function	TX 139kHz, EUT (Z-Axis), charging with the Load (Y-Axis)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	40.86	-14.41	55.27	31.21	9.62	0.03	Average
2	0.16	53.17	-12.10	65.27	43.52	9.62	0.03	QP
3	0.24	31.46	-20.67	52.13	21.81	9.62	0.03	Average
4	0.24	45.31	-16.82	62.13	35.66	9.62	0.03	QP
5	0.44	22.52	-24.63	47.15	12.82	9.61	0.09	Average
6	0.44	34.90	-22.25	57.15	25.20	9.61	0.09	QP
7	0.61	20.62	-25.38	46.00	10.96	9.61	0.05	Average
8	0.61	35.49	-20.51	56.00	25.83	9.61	0.05	QP
9 MAX	4.38	35.92	-10.08	46.00	26.19	9.63	0.10	Average
10	4.38	37.09	-18.91	56.00	27.36	9.63	0.10	QP
11	7.05	38.82	-11.18	50.00	29.01	9.65	0.16	Average
12	7.05	41.62	-18.38	60.00	31.81	9.65	0.16	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.

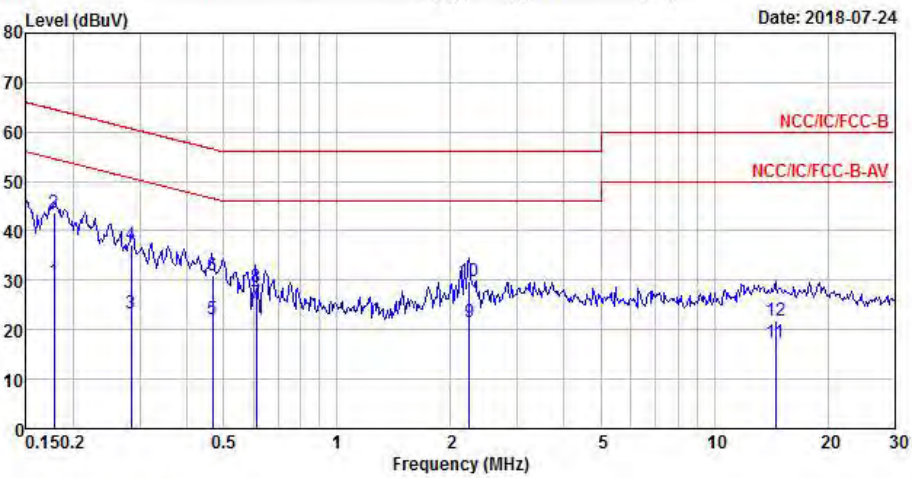
AC Power-line Conducted Emissions Result			
Operating Mode	3	**Power Phase**	Neutral
Operating Function	TX 133kHz, EUT (Z-Axis), charging with the Phone (X-Axis)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.21	29.31	-23.81	53.12	19.68	9.62	0.01	Average
2 MAX	0.21	42.85	-20.27	63.12	33.22	9.62	0.01	QP
3	0.25	27.65	-24.21	51.86	18.00	9.62	0.03	Average
4	0.25	40.28	-21.58	61.86	30.63	9.62	0.03	QP
5	0.36	22.72	-26.04	48.76	13.03	9.61	0.08	Average
6	0.36	32.73	-26.03	58.76	23.04	9.61	0.08	QP
7	0.57	24.03	-21.97	46.00	14.36	9.61	0.06	Average
8	0.57	30.38	-25.62	56.00	20.71	9.61	0.06	QP
9	2.84	20.69	-25.31	46.00	11.01	9.64	0.04	Average
10	2.84	24.85	-31.15	56.00	15.17	9.64	0.04	QP
11	5.50	23.15	-26.85	50.00	13.36	9.66	0.13	Average
12	5.50	27.69	-32.31	60.00	17.90	9.66	0.13	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.

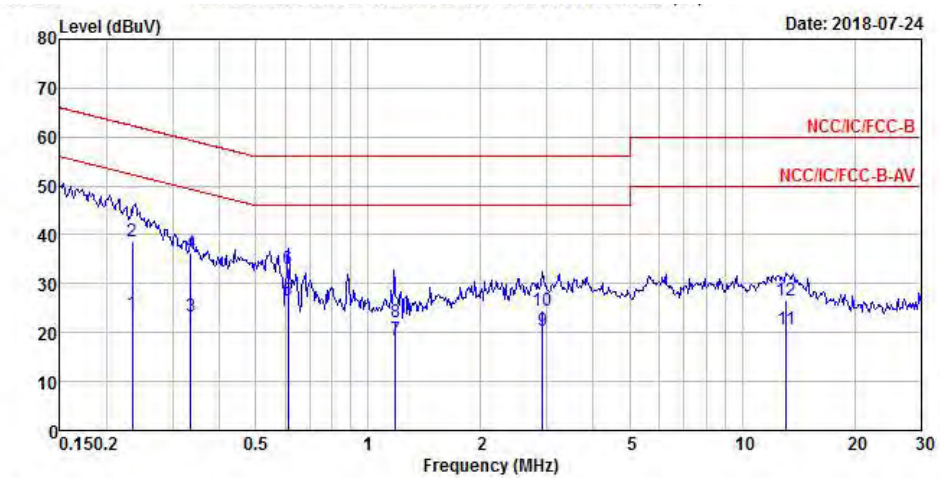
AC Power-line Conducted Emissions Result			
Operating Mode	3	**Power Phase**	Line
Operating Function	TX 133kHz, EUT (Z-Axis), charging with the Phone (X-Axis)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.18	29.91	-24.66	54.57	20.27	9.62	0.02	Average
2	0.18	43.83	-20.74	64.57	34.19	9.62	0.02	QP
3	0.28	23.44	-27.24	50.68	13.78	9.61	0.05	Average
4	0.28	37.10	-23.58	60.68	27.44	9.61	0.05	QP
5	0.47	22.27	-24.27	46.54	12.58	9.61	0.08	Average
6	0.47	31.00	-25.54	56.54	21.31	9.61	0.08	QP
7 MAX	0.61	25.31	-20.69	46.00	15.65	9.61	0.05	Average
8	0.61	28.75	-27.25	56.00	19.09	9.61	0.05	QP
9	2.24	21.55	-24.45	46.00	11.92	9.62	0.01	Average
10	2.24	29.95	-26.05	56.00	20.32	9.62	0.01	QP
11	14.52	17.46	-32.54	50.00	7.81	9.64	0.01	Average
12	14.52	21.84	-38.16	60.00	12.19	9.64	0.01	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.

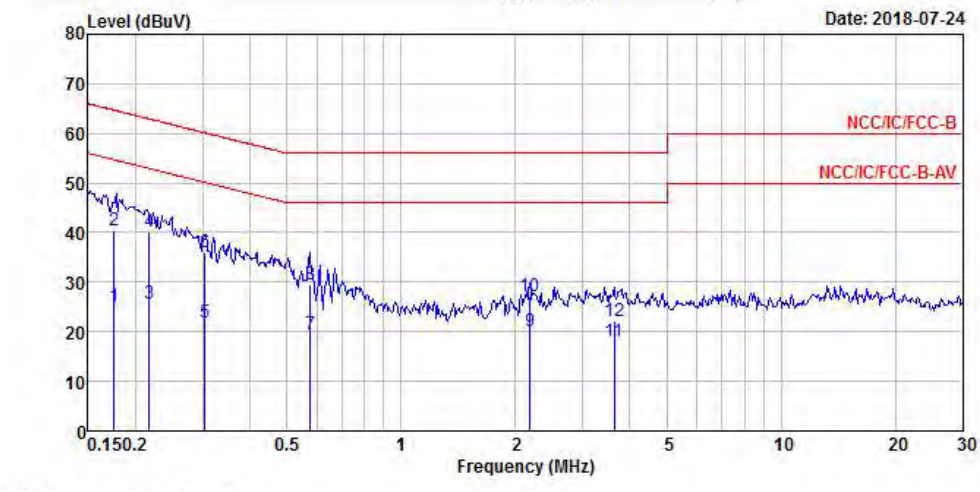
AC Power-line Conducted Emissions Result			
Operating Mode	4	**Power Phase**	Neutral
Operating Function	TX 133kHz, EUT (Z-Axis), charging with the Phone (Y-Axis)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.23	23.91	-28.39	52.30	14.27	9.62	0.02	Average
2	0.23	38.75	-23.55	62.30	29.11	9.62	0.02	QP
3	0.34	23.18	-26.13	49.31	13.50	9.61	0.07	Average
4	0.34	36.27	-23.04	59.31	26.59	9.61	0.07	QP
5 MAX	0.61	26.62	-19.38	46.00	16.96	9.61	0.05	Average
6	0.61	33.11	-22.89	56.00	23.45	9.61	0.05	QP
7	1.18	18.45	-27.55	46.00	8.83	9.62	0.00	Average
8	1.18	22.03	-33.97	56.00	12.41	9.62	0.00	QP
9	2.92	20.37	-25.63	46.00	10.68	9.64	0.05	Average
10	2.92	24.64	-31.36	56.00	14.95	9.64	0.05	QP
11	13.13	20.56	-29.44	50.00	10.80	9.70	0.06	Average
12	13.13	26.51	-33.49	60.00	16.75	9.70	0.06	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	4	**Power Phase**	Line
Operating Function	TX 133kHz, EUT (Z-Axis), charging with the Phone (Y-Axis)		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.18	25.22	-29.49	54.71	15.58	9.62	0.02	Average
2	0.18	40.56	-24.15	64.71	30.92	9.62	0.02	QP
3	0.22	25.59	-27.34	52.93	15.96	9.62	0.01	Average
4 MAX	0.22	40.29	-22.64	62.93	30.66	9.62	0.01	QP
5	0.30	21.87	-28.25	50.12	12.20	9.61	0.06	Average
6	0.30	36.06	-24.06	60.12	26.39	9.61	0.06	QP
7	0.58	19.46	-26.54	46.00	9.79	9.61	0.06	Average
8	0.58	29.51	-26.49	56.00	19.84	9.61	0.06	QP
9	2.18	20.03	-25.97	46.00	10.40	9.62	0.01	Average
10	2.18	27.08	-28.92	56.00	17.45	9.62	0.01	QP
11	3.64	17.91	-28.09	46.00	8.21	9.63	0.07	Average
12	3.64	22.17	-33.83	56.00	12.47	9.63	0.07	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

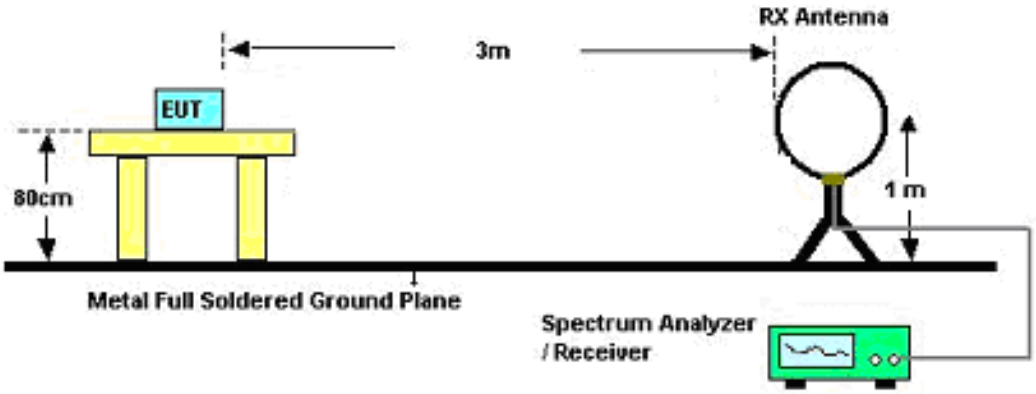
Refer a test equipment and calibration data table in this test report.

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 110-148.5 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.

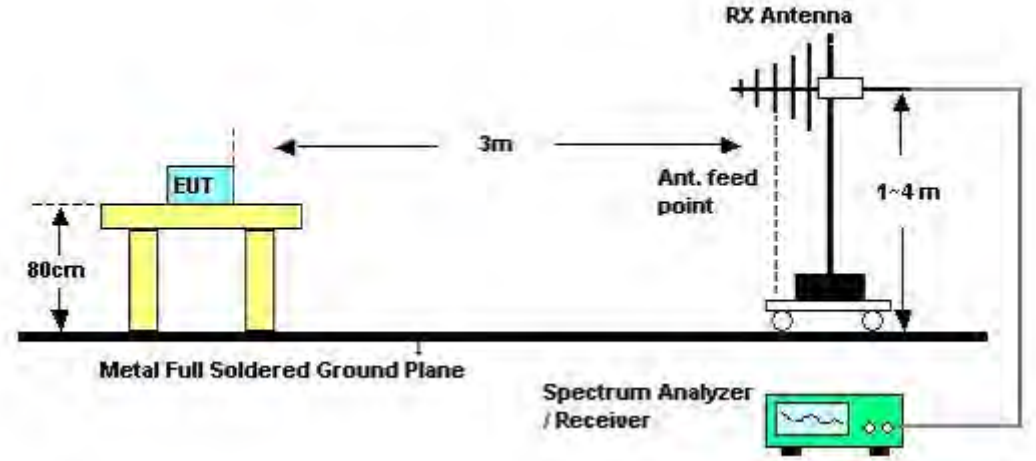
3.2.4 Test Setup

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.

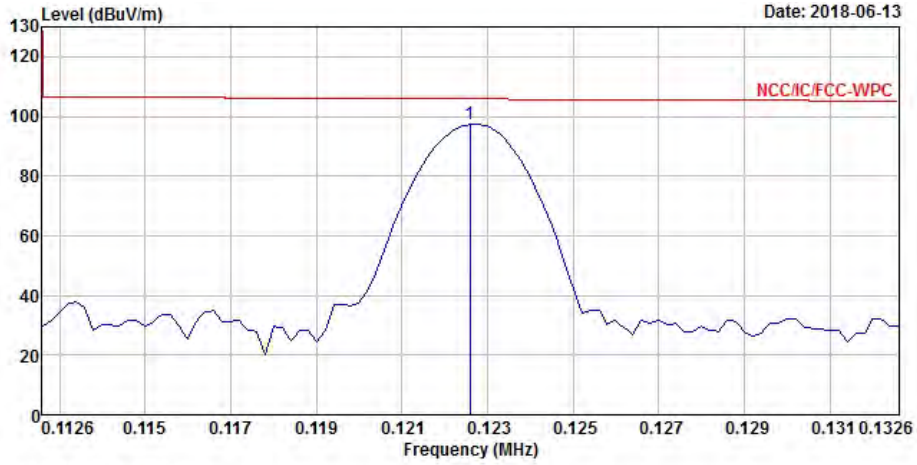
Transmitter Radiated Unwanted Emissions (Below 1GHz)



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)

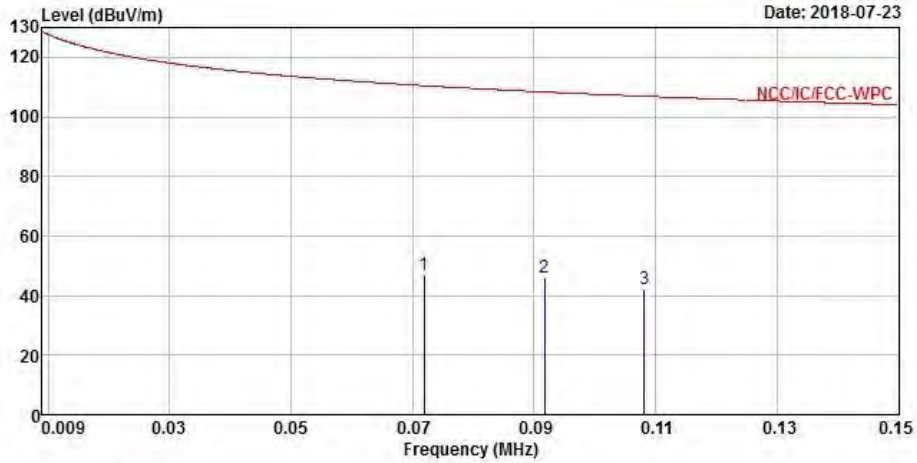
Transmitter Radiated Emissions (122 kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	1	**Operating Function**	Wireless Charger



	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	0.12260	97.19	-8.65	105.84	76.42	20.68	0.09	0.00	Peak	100	0

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: The test result in peak detector is less than average limit , so that we tested in peak detector only.

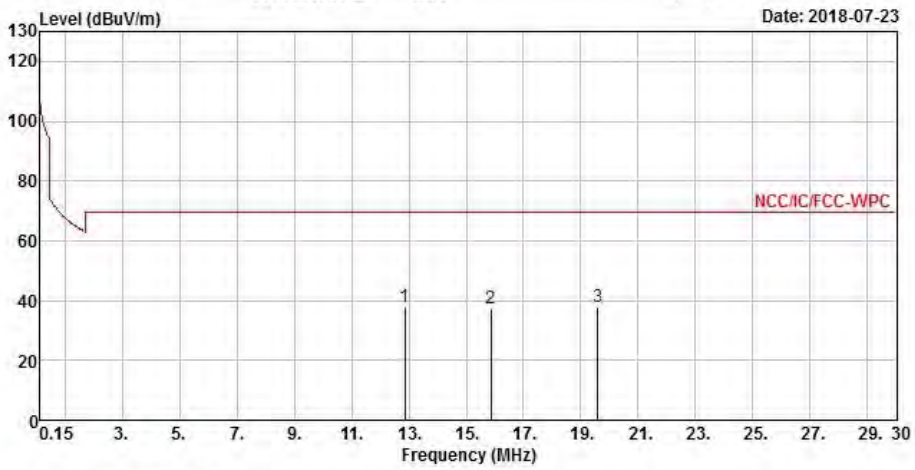
Transmitter Radiated Emissions (9 kHz – 150 kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	1	**Operating Function**	Wireless Charger



	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	0.0718860	46.91	-63.56	110.47	25.99	20.92	0.00	0.00	Peak	100	0
2	0.0917670	45.99	-62.36	108.35	25.22	20.77	0.00	0.00	Peak	100	0
3	0.1081230	42.42	-64.51	106.93	21.73	20.69	0.00	0.00	Peak	100	0

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.

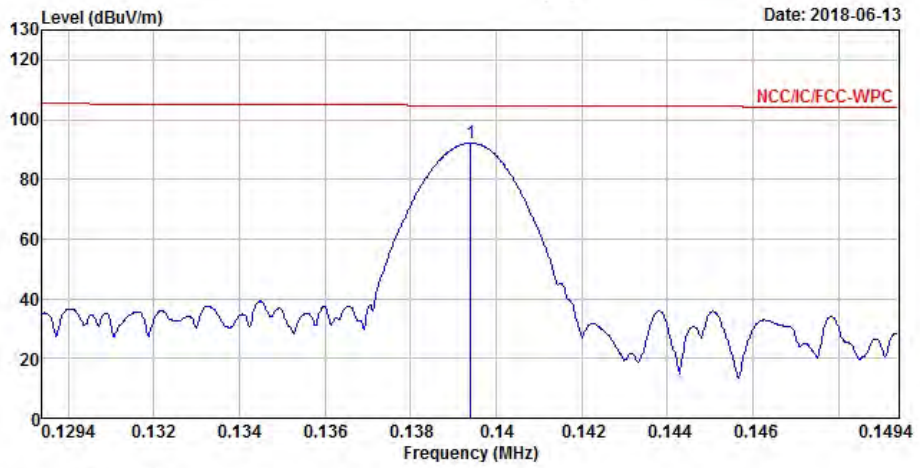
Transmitter Radiated Emissions (150 kHz – 30 MHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	1	**Operating Function**	Wireless Charger



	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	12.866100	37.69	-31.85	69.54	15.93	21.76	0.00	0.00	Peak	100	360
2	15.851100	37.44	-32.10	69.54	15.41	22.03	0.00	0.00	Peak	100	360
3	19.582350	37.89	-31.65	69.54	15.53	22.36	0.00	0.00	Peak	100	360

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.

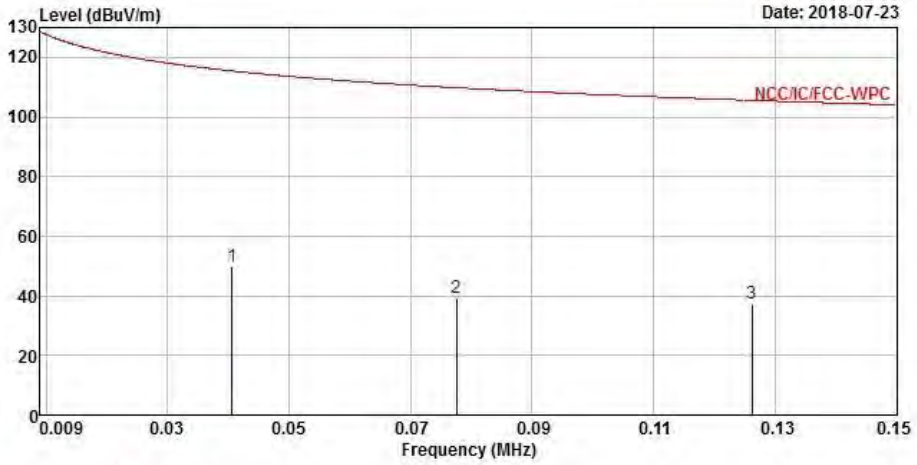
Transmitter Radiated Emissions (139kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	2	**Operating Function**	Wireless Charger



	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	0.13940	92.09	-12.63	104.72	71.34	20.66	0.09	0.00	Peak	100	360

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: The test result in peak detector is less than average limit , so that we tested in peak detector only.

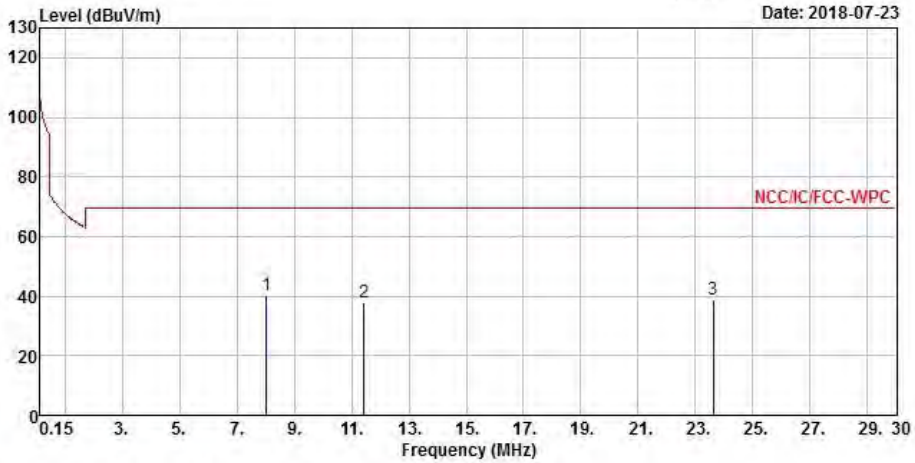
Transmitter Radiated Emissions (9 kHz – 150 kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	2	**Operating Function**	Wireless Charger



	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	0.0405840	49.87	-65.57	115.44	28.35	21.52	0.00	0.00	Peak	100	0
2	0.0775260	39.51	-70.31	109.82	18.63	20.88	0.00	0.00	Peak	100	0
3	0.1261710	37.43	-68.16	105.59	16.76	20.67	0.00	0.00	Peak	100	0

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.

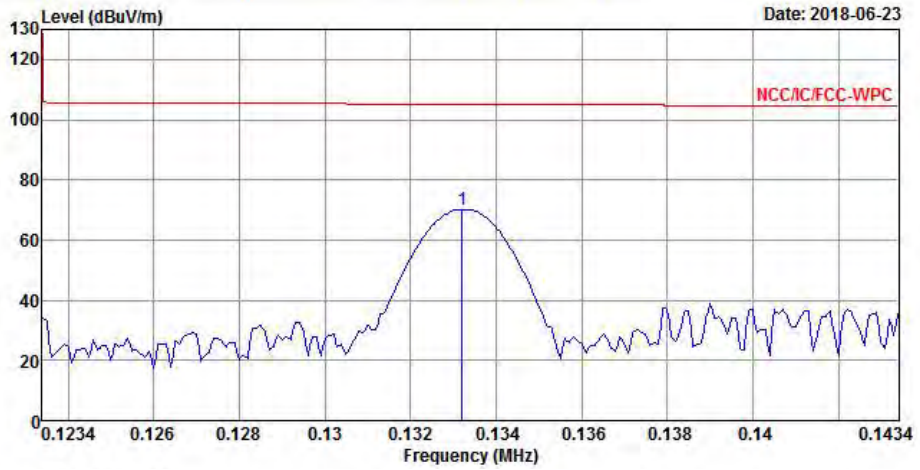
Transmitter Radiated Emissions (150 kHz – 30 MHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	2	**Operating Function**	Wireless Charger



	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	8.0304000	40.14	-29.40	69.54	18.96	21.18	0.00	0.00	Peak	100	360
2	11.433300	37.82	-31.72	69.54	16.19	21.63	0.00	0.00	Peak	100	360
3	23.612100	38.62	-30.92	69.54	16.11	22.51	0.00	0.00	Peak	100	360

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.

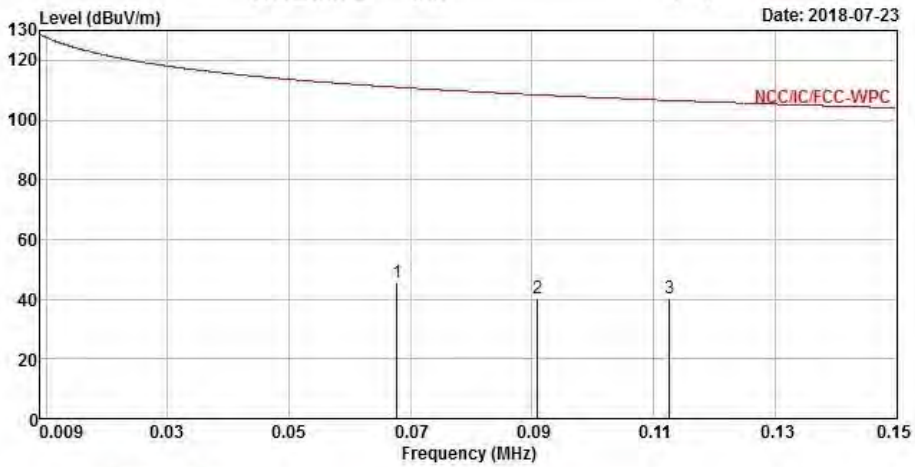
Transmitter Radiated Emissions (133kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	3	**Operating Function**	Wireless Charger



	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	0.13320	70.26	-34.86	105.12	49.50	20.67	0.09	0.00	Peak	100	0

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: The test result in peak detector is less than average limit , so that we tested in peak detector only.

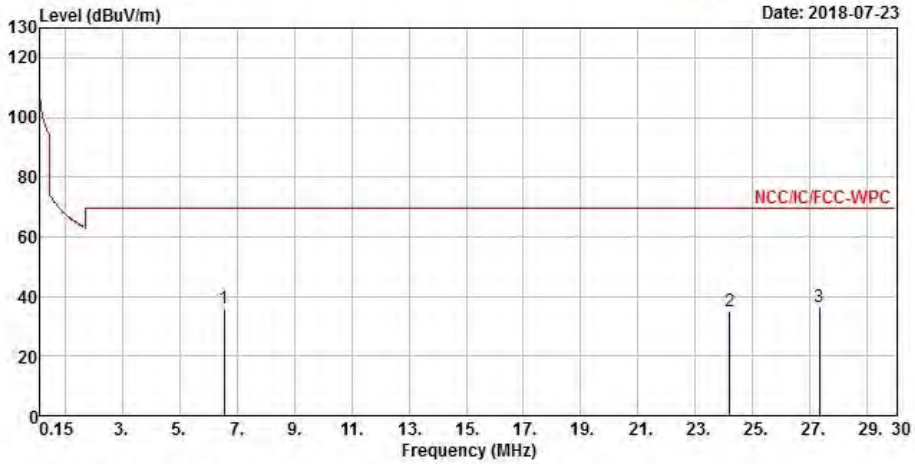
Transmitter Radiated Emissions (9 kHz – 150 kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	3	**Operating Function**	Wireless Charger



	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	0.0677970	45.72	-65.26	110.98	24.76	20.96	0.00	0.00	Peak	100	0
2	0.0909210	40.27	-68.16	108.43	19.50	20.77	0.00	0.00	Peak	100	0
3	0.1126350	40.17	-66.40	106.57	19.48	20.69	0.00	0.00	Peak	100	0

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.

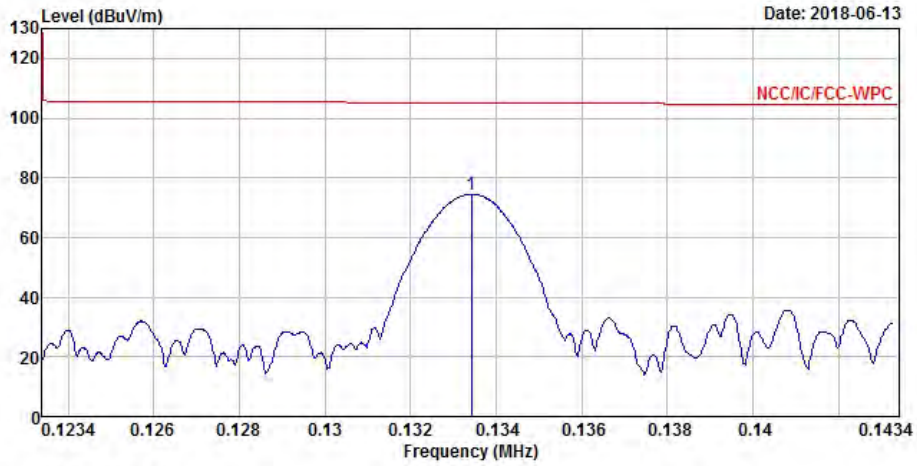
Transmitter Radiated Emissions (150 kHz – 30 MHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	3	**Operating Function**	Wireless Charger



	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	6.5677500	35.91	-33.63	69.54	14.96	20.95	0.00	0.00	Peak	100	360
2	24.179250	35.12	-34.42	69.54	12.59	22.53	0.00	0.00	Peak	100	360
3	27.313500	36.27	-33.27	69.54	13.65	22.62	0.00	0.00	Peak	100	360

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.

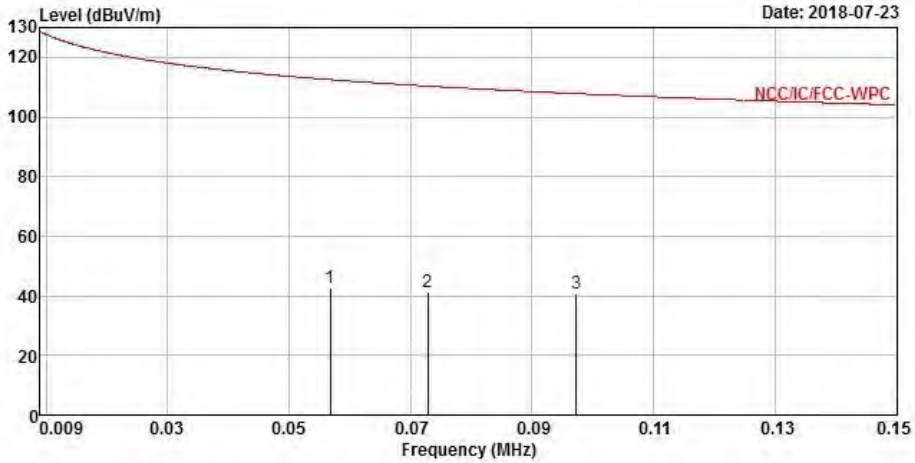
Transmitter Radiated Emissions (133kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	4	**Operating Function**	Wireless Charger



	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	0.13342	74.45	-30.65	105.10	53.69	20.67	0.09	0.00	Peak	100	0

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: The test result in peak detector is less than average limit , so that we tested in peak detector only.

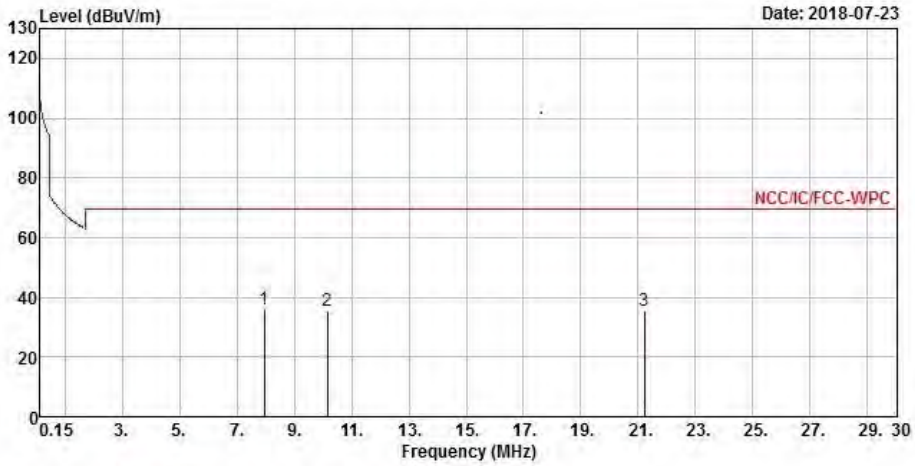
Transmitter Radiated Emissions (9 kHz – 150 kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	4	**Operating Function**	Wireless Charger



	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark		
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	0.0567990	42.77	-69.75	112.52	21.72	21.05	0.00	0.00	Peak	100	0
2	0.0728730	41.30	-69.06	110.36	20.38	20.92	0.00	0.00	Peak	100	0
3	0.0972660	40.88	-66.97	107.85	20.16	20.72	0.00	0.00	Peak	100	0

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.

Transmitter Radiated Emissions (150 kHz – 30 MHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	4	**Operating Function**	Wireless Charger

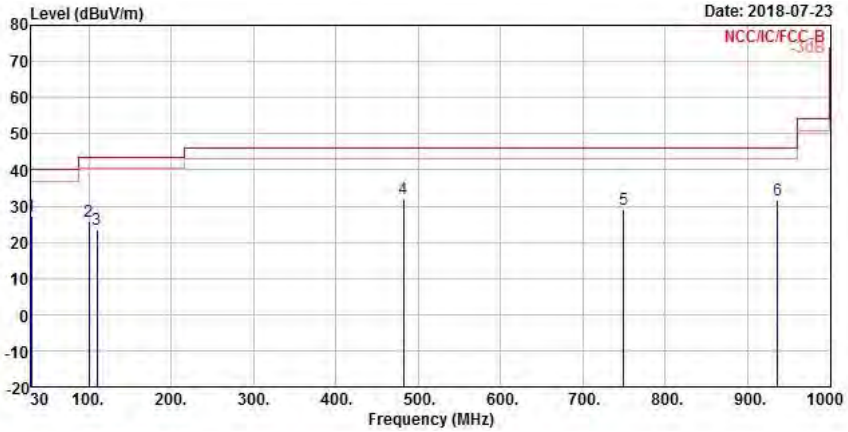


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	A/Pos	T/Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	7.9707000	35.92	-33.62	69.54	14.74	21.18	0.00	0.00	Peak	100	360
2	10.149750	35.37	-34.17	69.54	13.86	21.51	0.00	0.00	Peak	100	360
3	21.224100	35.43	-34.11	69.54	12.99	22.44	0.00	0.00	Peak	100	360

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.

3.2.6 Transmitter Radiated Emissions (Above 30MHz)

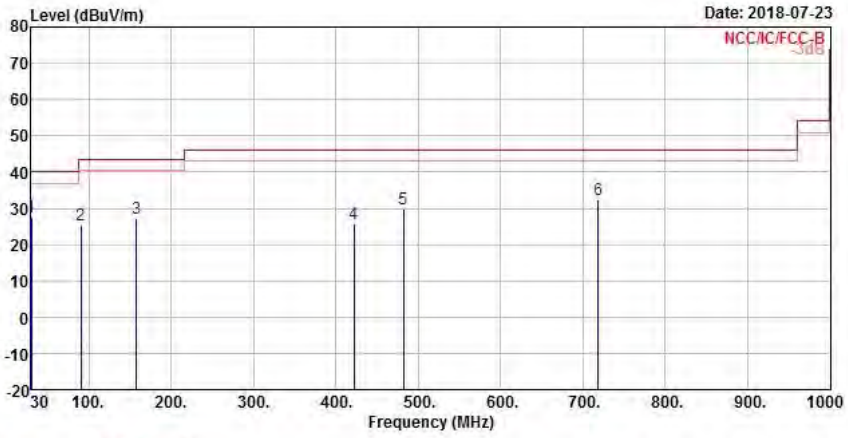
Transmitter Radiated Emissions (Above 30MHz)			
Modulation Mode	ASK	**Test Freq. (kHz)**	122 kHz
Operating Mode	1	**Polarization**	V



	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	30.000000	27.39	-12.61	40.00	31.84	23.11	0.29	27.85	Peak	100	0
2	99.840000	25.65	-17.85	43.50	36.02	15.97	1.47	27.81	Peak	100	0
3	109.54000	23.64	-19.86	43.50	32.80	17.03	1.58	27.77	Peak	100	0
4	482.02000	31.94	-14.06	46.00	34.26	22.79	3.28	28.39	Peak	100	0
5	749.74010	29.18	-16.82	46.00	28.24	25.05	4.12	28.23	Peak	100	0
6	935.98000	31.62	-14.38	46.00	28.31	26.10	4.72	27.51	Peak	100	0

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.

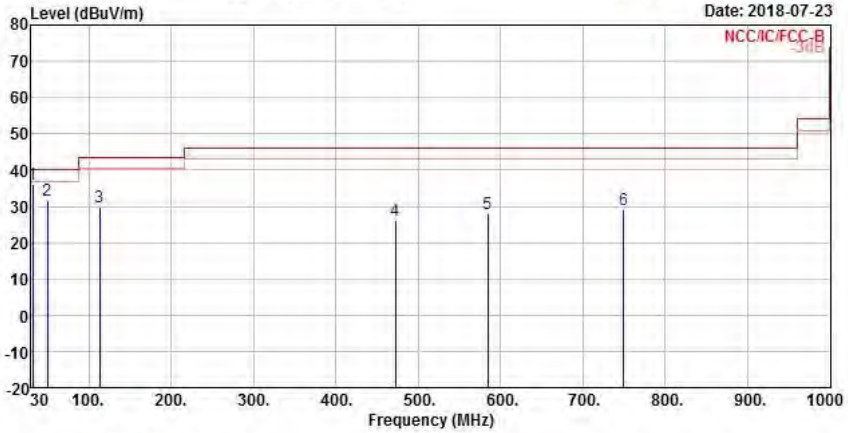
Transmitter Radiated Emissions (Above 30MHz)			
Modulation Mode	ASK	**Test Freq. (kHz)**	122 kHz
Operating Mode	1	**Polarization**	H



	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	30.000000	27.73	-12.27	40.00	32.18	23.11	0.29	27.85	Peak	200	360
2	90.140000	25.38	-18.12	43.50	37.73	14.02	1.39	27.76	Peak	200	360
3	158.04000	27.23	-16.27	43.50	37.62	15.28	1.93	27.60	Peak	200	360
4	421.88000	25.87	-20.13	46.00	28.75	21.99	3.21	28.08	Peak	200	360
5	482.02000	29.70	-16.30	46.00	32.02	22.79	3.28	28.39	Peak	200	360
6	718.70000	32.50	-13.50	46.00	32.28	24.46	4.08	28.32	Peak	200	360

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.

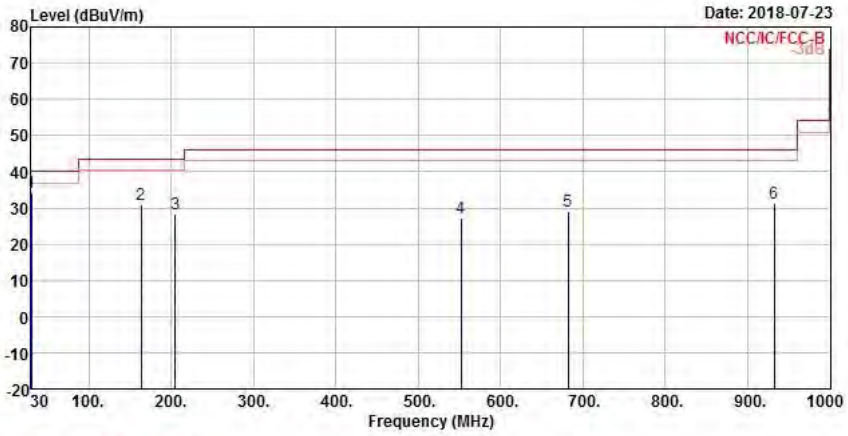
Transmitter Radiated Emissions (Above 30MHz)			
Modulation Mode	ASK	**Test Freq. (kHz)**	139 kHz
Operating Mode	2	**Polarization**	V



	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	31.940000	35.97	-4.03	40.00	41.33	22.11	0.36	27.83	Peak	100	0
2	49.400000	31.66	-8.34	40.00	45.11	13.29	0.83	27.57	Peak	100	0
3	113.42000	29.68	-13.82	43.50	38.57	17.26	1.61	27.76	Peak	100	0
4	472.32000	26.05	-19.95	46.00	28.47	22.65	3.27	28.34	Peak	100	0
5	584.84000	28.00	-18.00	46.00	29.12	23.78	3.65	28.55	Peak	100	0
6	749.74010	28.98	-17.02	46.00	28.04	25.05	4.12	28.23	Peak	100	0

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.

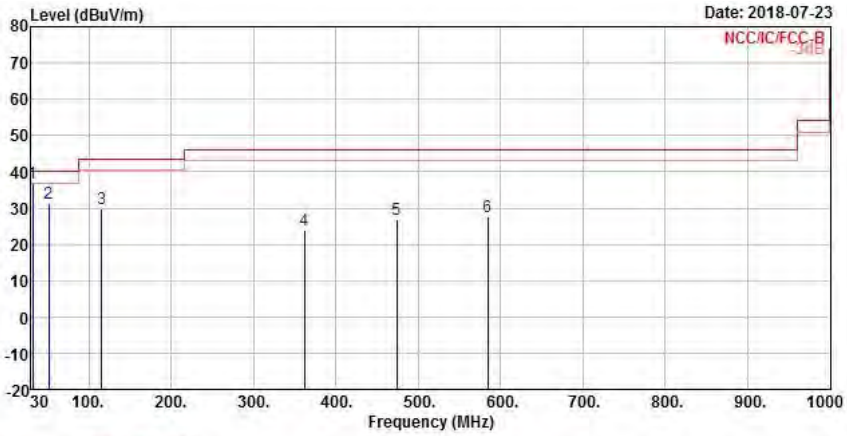
Transmitter Radiated Emissions (Above 30MHz)			
Modulation Mode	ASK	**Test Freq. (kHz)**	139 kHz
Operating Mode	2	**Polarization**	H



	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark		
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	30.000000	34.39	-5.61	40.00	38.84	23.11	0.29	27.85	Peak	100	360
2	163.86000	30.87	-12.63	43.50	41.34	15.11	1.99	27.57	Peak	100	360
3	204.60000	28.50	-15.00	43.50	39.16	14.39	2.38	27.43	Peak	100	360
4	551.86000	27.10	-18.90	46.00	27.96	24.08	3.59	28.53	Peak	100	360
5	681.84000	28.90	-17.10	46.00	29.20	24.15	3.96	28.41	Peak	100	360
6	932.10000	31.31	-14.69	46.00	28.07	26.09	4.68	27.53	Peak	100	360

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.

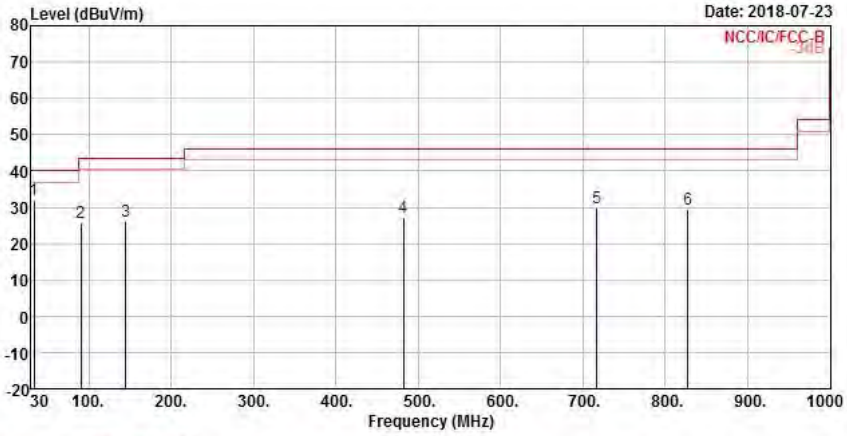
Transmitter Radiated Emissions (Above 30MHz)			
Modulation Mode	ASK	**Test Freq. (kHz)**	133 kHz
Operating Mode	3	**Polarization**	V



	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	31.940000	36.72	-3.28	40.00	42.08	22.11	0.36	27.83	Peak	100	0
2	51.340000	31.38	-8.62	40.00	45.36	12.74	0.85	27.57	Peak	100	0
3	115.36000	29.77	-13.73	43.50	38.54	17.35	1.63	27.75	Peak	100	0
4	361.74000	23.81	-22.19	46.00	28.40	19.96	3.12	27.67	Peak	100	0
5	474.26000	26.70	-19.30	46.00	29.09	22.69	3.27	28.35	Peak	100	0
6	584.84000	27.67	-18.33	46.00	28.79	23.78	3.65	28.55	Peak	100	0

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.

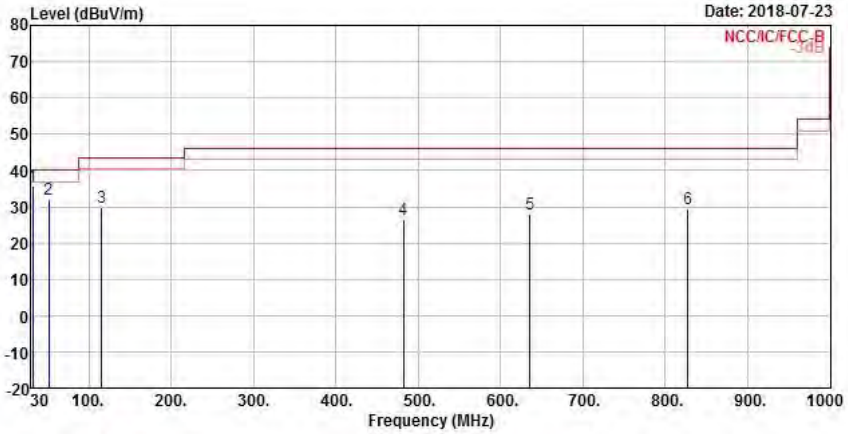
Transmitter Radiated Emissions (Above 30MHz)			
Modulation Mode	ASK	**Test Freq. (kHz)**	133 kHz
Operating Mode	3	**Polarization**	H



	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	33.880000	32.12	-7.88	40.00	38.38	21.11	0.43	27.80	Peak	100	360
2	90.140000	25.77	-17.73	43.50	38.12	14.02	1.39	27.76	Peak	100	360
3	144.46000	26.04	-17.46	43.50	36.01	15.88	1.80	27.65	Peak	100	360
4	482.02000	27.26	-18.74	46.00	29.58	22.79	3.28	28.39	Peak	100	360
5	716.76000	29.95	-16.05	46.00	29.80	24.41	4.07	28.33	Peak	100	360
6	827.34000	29.53	-16.47	46.00	27.86	25.42	4.21	27.96	Peak	100	360

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.

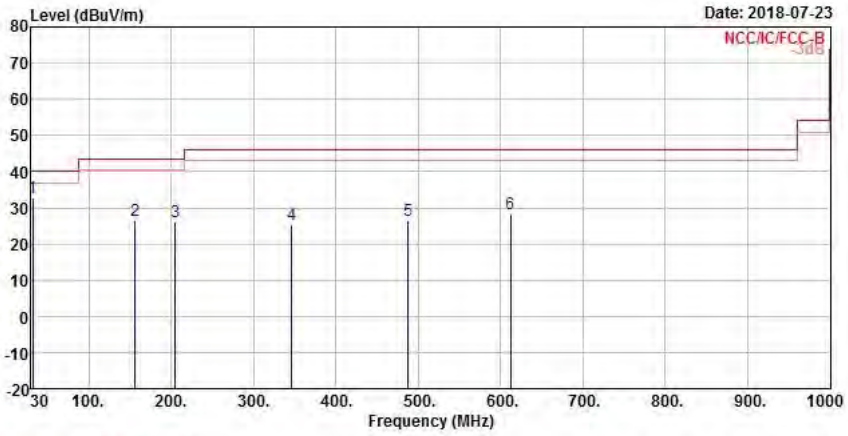
Transmitter Radiated Emissions (Above 30MHz)			
Modulation Mode	ASK	**Test Freq. (kHz)**	133 kHz
Operating Mode	4	**Polarization**	V



	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	31.940000	35.56	-4.44	40.00	40.92	22.11	0.36	27.83	Peak	100	0
2	51.340000	31.90	-8.10	40.00	45.88	12.74	0.85	27.57	Peak	100	0
3	115.36000	29.96	-13.54	43.50	38.73	17.35	1.63	27.75	Peak	100	0
4	482.02000	26.56	-19.44	46.00	28.88	22.79	3.28	28.39	Peak	100	0
5	635.28000	28.13	-17.87	46.00	28.49	24.38	3.76	28.50	Peak	100	0
6	827.34000	29.52	-16.48	46.00	27.85	25.42	4.21	27.96	Peak	100	0

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)**	133 kHz
Operating Mode	4	**Polarization**	H



	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark		
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	31.940000	32.60	-7.40	40.00	37.96	22.11	0.36	27.83	Peak	200	360
2	156.10000	26.32	-17.18	43.50	36.64	15.37	1.91	27.60	Peak	200	360
3	204.60000	26.14	-17.36	43.50	36.80	14.39	2.38	27.43	Peak	200	360
4	346.22000	25.38	-20.62	46.00	30.38	19.46	3.09	27.55	Peak	200	360
5	487.84000	26.41	-19.59	46.00	28.74	22.81	3.29	28.43	Peak	200	360
6	612.00000	28.22	-17.78	46.00	28.94	24.12	3.70	28.54	Peak	200	360

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

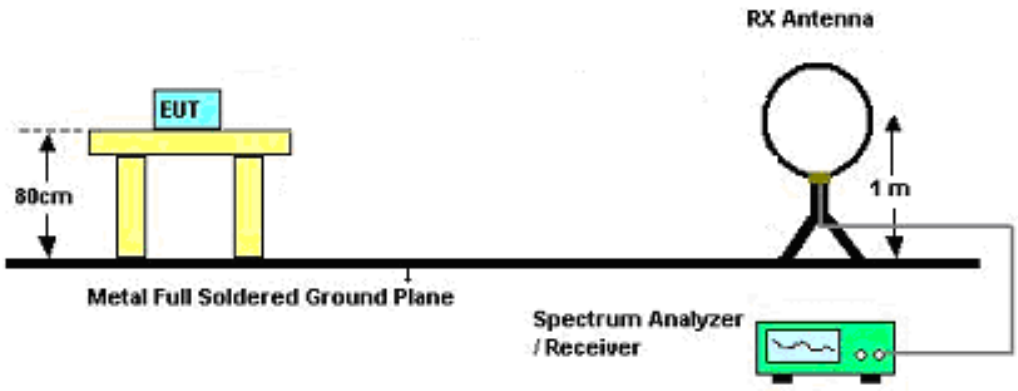
Refer a test equipment and calibration data table in this test report.

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

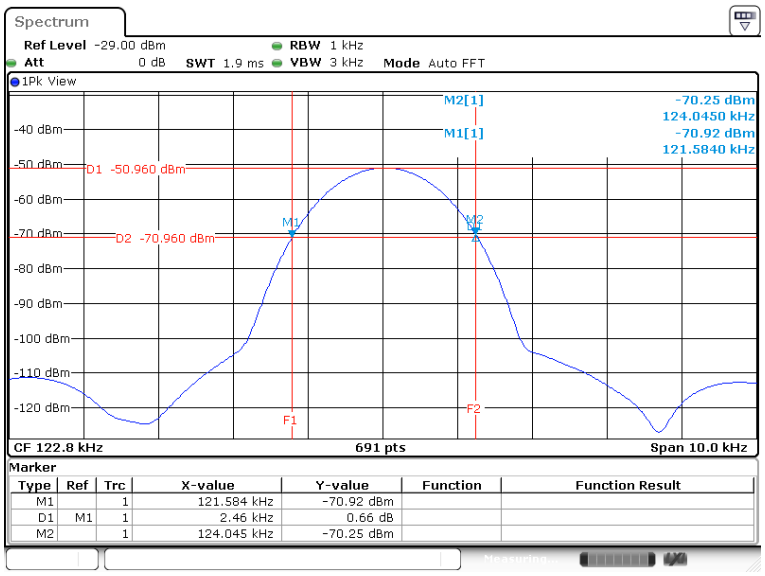


3.3.5 Test Result of Emission Bandwidth

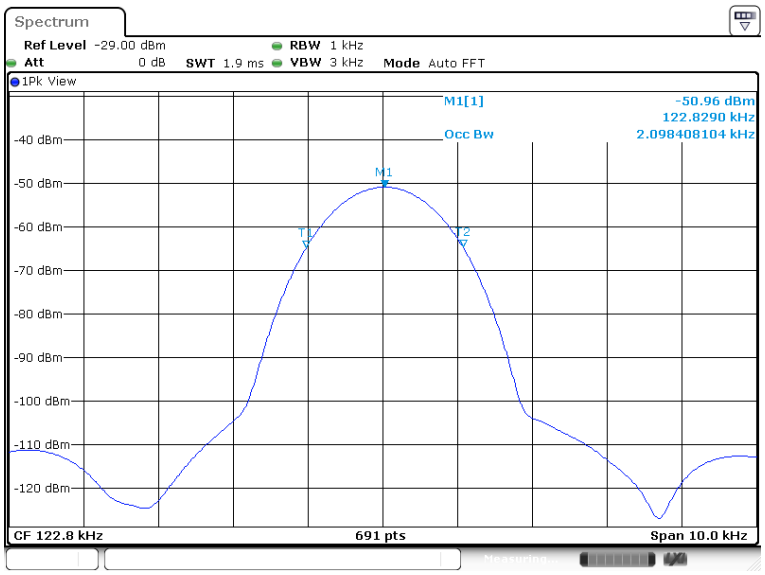
<Mode 1>

Occupied Channel Bandwidth Result			
Modulation Mode	**Frequency (kHz)**	**20dB Bandwidth (kHz)**	**99% Bandwidth (kHz)**
ASK	122	2.4610	2.0985
Limit		**N/A**	**N/A**
Result		**Complied**	

Emission Bandwidth Plot 20dB Bandwidth (122 kHz)



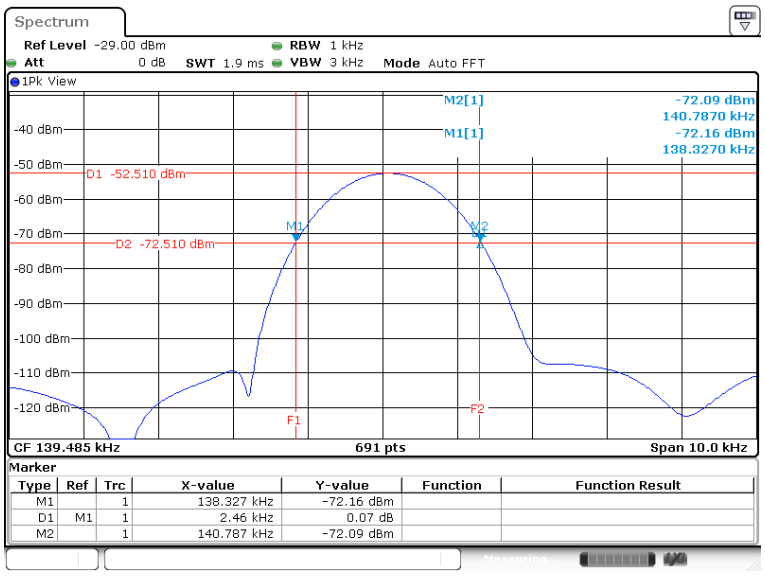
Emission Bandwidth Plot 99% Bandwidth (122 kHz)



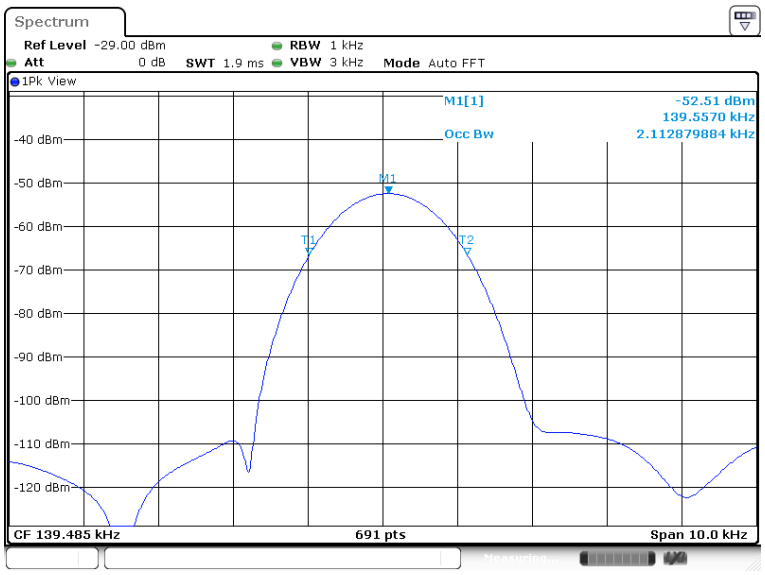
<Mode 2>

Occupied Channel Bandwidth Result			
Modulation Mode	**Frequency (kHz)**	**20dB Bandwidth (kHz)**	**99% Bandwidth (kHz)**
ASK	139	2.4600	2.1129
Limit		**N/A**	**N/A**
Result		**Complied**	

Emission Bandwidth Plot 20dB Bandwidth (139 kHz)



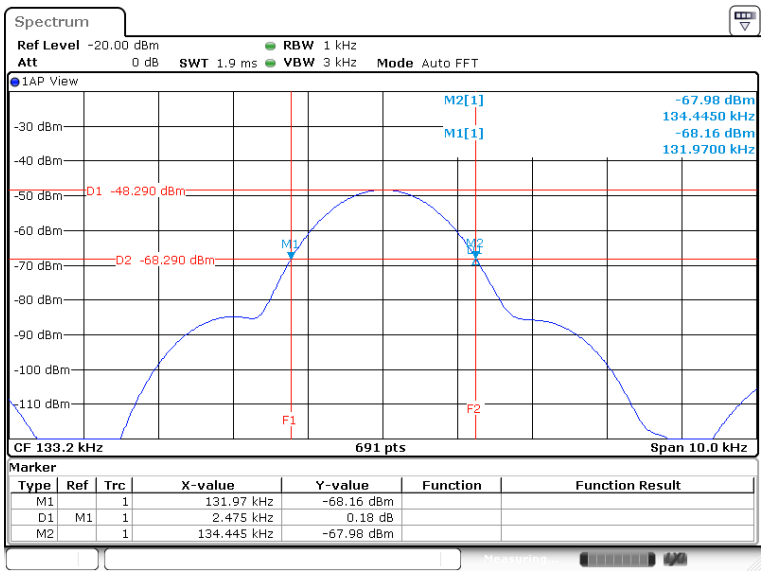
Emission Bandwidth Plot 99% Bandwidth (139 kHz)



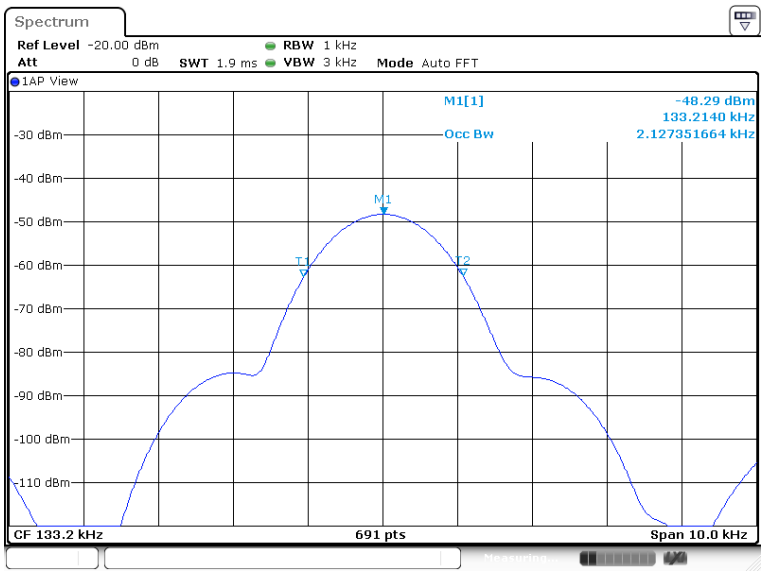
<Mode 3>

Occupied Channel Bandwidth Result			
Modulation Mode	**Frequency (kHz)**	**20dB Bandwidth (kHz)**	**99% Bandwidth (kHz)**
ASK	133	2.4750	2.1274
Limit		**N/A**	**N/A**
Result		**Complied**	

Emission Bandwidth Plot 20dB Bandwidth (133 kHz)



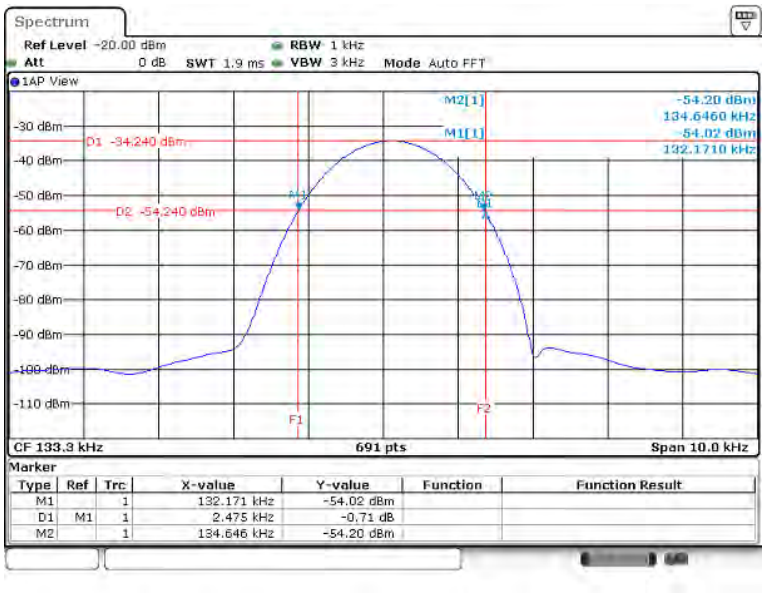
Emission Bandwidth Plot 99% Bandwidth (133 kHz)



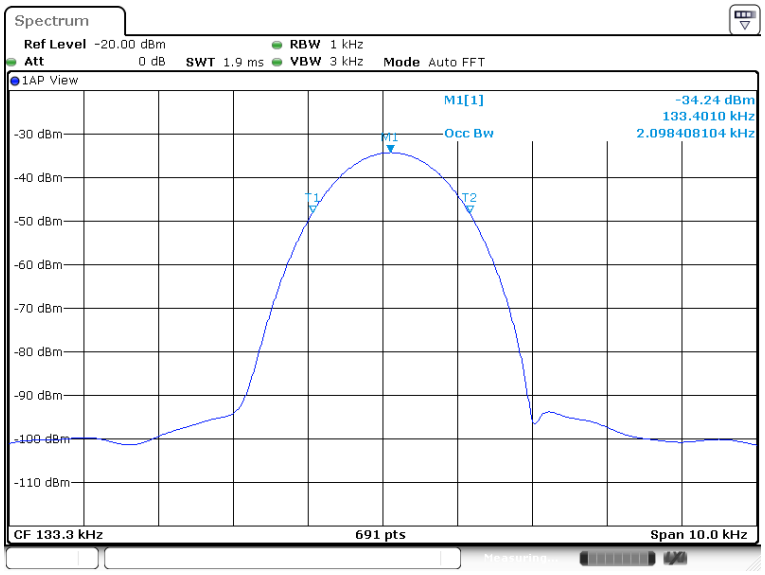
<Mode 4>

Occupied Channel Bandwidth Result			
Modulation Mode	**Frequency (kHz)**	**20dB Bandwidth (kHz)**	**99% Bandwidth (kHz)**
ASK	133	2.4750	2.0985
Limit		**N/A**	**N/A**
Result		**Complied**	

Emission Bandwidth Plot 20dB Bandwidth (133 kHz)



Emission Bandwidth Plot 99% Bandwidth (133 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	ESR	102051	9KHz ~ 3.6GHz	03/May/2018	02/May/2019
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	17/Nov/2017	16/Nov/2018
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	06/Oct/2017	05/Oct/2018
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2017	11/Oct/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	101013	10Hz~40GHz	05/Feb/2018	04/Feb/2019
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	16/Mar/2018	15/Mar/2019

< Radiated Emission >

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	20/Oct/2017	19/Oct/2018
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	1GHz ~ 18GHz 3m	27/Oct/2017	26/Oct/2018
Amplifier	Agilent	8447D	2944A11149	100kHz ~ 1.3GHz	03/Jul/2018	02/Jul/2019
Spectrum Analyzer	Rohde & Schwarz	FSP40	100593	9KHz - 40GHz	12/Dec/2017	11/Dec/2018
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100354	9kHz ~ 2.75GHz	08/Dec/2017	07/Dec/2018
RF Cable-R03m	Jye Bao	RG142	CB017	9kHz ~ 1GHz	19/Jan/2018	18/Jan/2019
Bilog Antenna	SCHAFFNER	CBL 6112B	2723	30MHz ~ 1GHz	09/Sep/2017	08/Sep/2018
Loop Antenna	TESEQ	HLA 6120	31244	9k-30MHz	29/Mar/2018	28/Mar/2019