FCC Test Report

Equipment	:	**Qubi WPB2**
Brand Name	:	**OTTA**
Model No.	:	**PBWC-02057GBXXB**
FCC ID	:	**2AEX5-PBWC-02057**
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	:	**LIEN CHANG ELECGTRONIC ENTERPRISE CO., LTD.** 11F, No.501, Sec. 6, Nanjing E., Rd., Neihu Dist., Taipei City 11469, TWN
Manufacturer	:	**POWERGENE Technology Co., LTD. Taiwan Branch** Rm. 1, 8F., No.1, Wuquan 1st Rd., Xinzhuang Dist., New Taipei City 242, Taiwan (R.O.C.)

The product sample received on Mar. 27, 2015 and completely tested on May 04, 2015. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 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:

Vic Hsiao / Supervisor

Testing Laboratory
1190

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Summary of Test Result

Conformance Test Specifications					
Report Clause	**Ref. Std. Clause**	**Description**	**Measured**	**Limit**	**Result**
1.1.3	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	[dBuV]:0.1615500MHz 51.16 (Margin 14.22dB) - QP 30.91 (Margin 24.47dB) - AV	FCC 15.207	Complied
3.2	15.209	Transmitter Radiated Emissions	[dBuV/m at 3m]:37.76MHz 32.85 (Margin 7.15dB) - PK	FCC 15.209	Complied
3.3	15.215(c)	Emission Bandwidth	20dB Bandwidth 2.64 [kHz]	N/A	Complied

Revision History

Report No.	Version	Description	Issued Date
FR532616	Rev. 03	Initial issue of report	Jun. 04, 2015

1 General Description

1.1 Information

1.1.1 Product Details

The equipment is Qubi WPB2. There are four types of the EUT. The differences are appearance, battery capacity, PCB location and TX coil location. In this report, we chose the Sample 2 to test.

Sample No.	Appearance Color	Battery Capacity
Sample 1	Black	5000mAh
Sample 2	White	
Sample 3	Black	7000mAh
Sample 4	White	

For more detailed features description, please refer to the manufacturer's specifications or user's manual.

1.1.2 General Information

Wireless Power Transfer General Information			
Frequency Range	**Modulation**	**Charging Freq. (kHz)**	**Field Strength (dBuV/m)**
110-205 kHz	ASK	110-205	84.34
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	40 cm^2	Client directly contact
Note 1: Field strength performed peak level at 3m.			

1.1.3 Antenna Information

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

1.1.4 Type of EUT

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

1.1.5 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				
USB Cable	Brand Name	OTTA	Model Name	PBWC02_USB_MICROUSB_0.3M_B
	Signal Line	0.3 meter, non-shielded cable, w/o ferrite core		

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

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5520	DoC
2	Load (Client Provide)	NA	NA	DoC

1.3 Testing Applied Standards

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

- 47 CFR FCC Part 15
- ANSI C63.10-2009

1.4 Testing Location Information

Testing Location					
☒	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.			
		TEL : 886-3-327-3456	FAX : 886-3-327-0973		
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	
AC Conduction		CO04-HY	Zeus	24℃ / 42%	
RF Conducted		TH06-HY	Howard	25℃ / 64%	
Radiated Emission		03CH02-HY	Allen	24.2℃ / 53%	
Test Site Registration Number					
FCC		636805			

1.5 Measurement Uncertainty

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

Measurement Uncertainty		
Test Item		**Uncertainty**
AC power-line conducted emissions		±2.3 dB
Emission bandwidth		±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 ℃
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)
ASK	84.34
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	125 kHz (F1)
Wireless charger frequencies are variable frequency range (110-205 kHz) and depend on charging loading. The charging frequency is 125 kHz.	

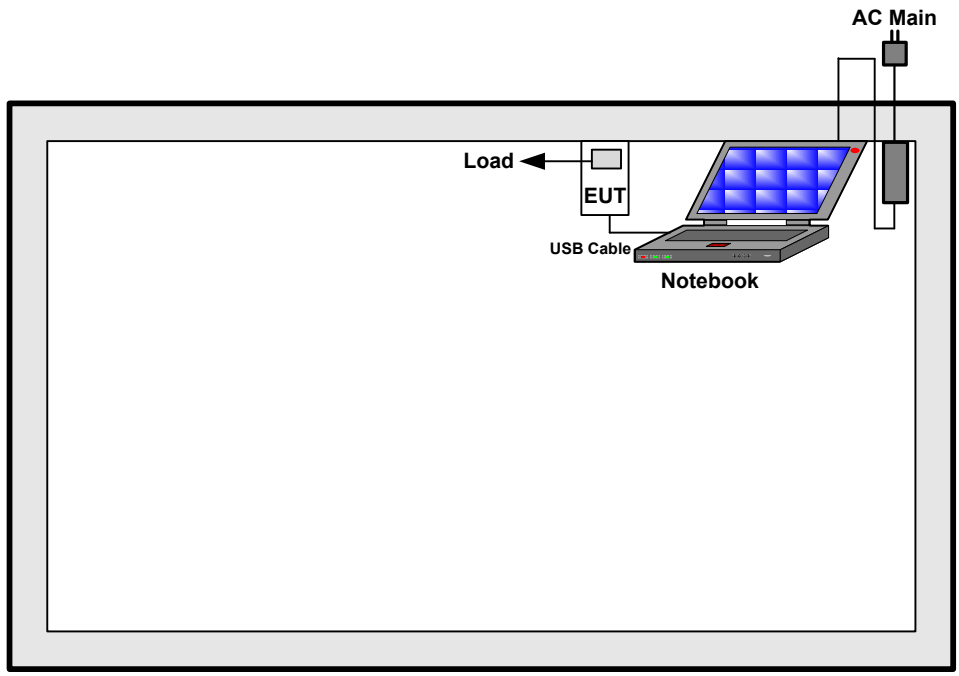
2.3 The Worst Case Measurement Configuration

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: 120Vac / 60Hz
Operating Mode	Operating Mode Description
1	5000mAh + Load
2	7000mAh + Load
For operating mode 1 is the worst case and it was record in this test report.	

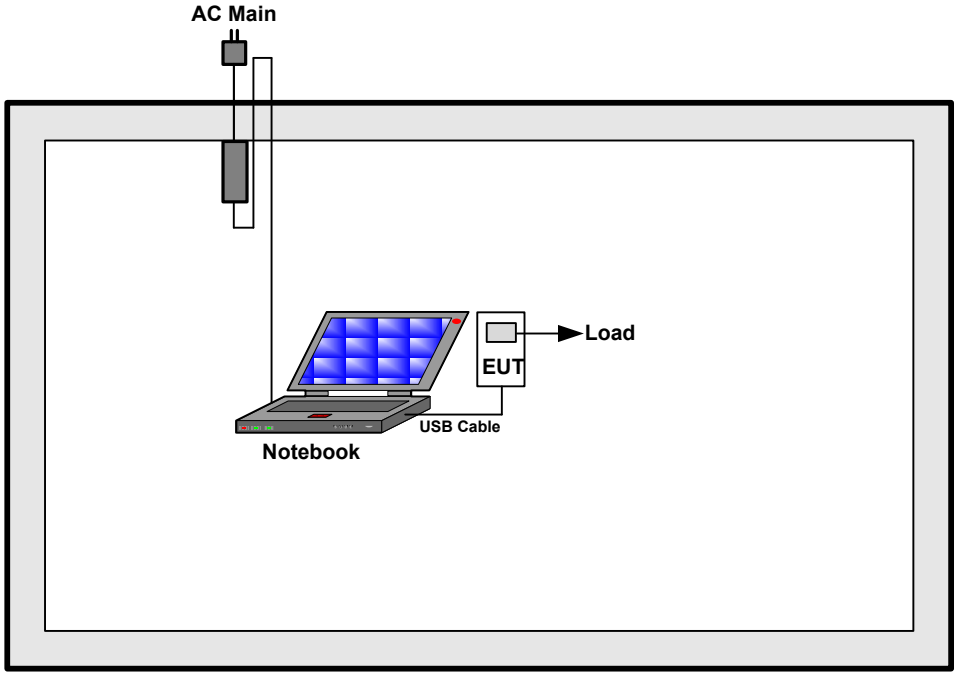
The Worst Case Mode for Following Conformance Tests	
Tests Item	Transmitter Radiated Emissions, Emission Bandwidth
Test Condition	Radiated measurement
User Position	☐ EUT will be placed in fixed position.
	☐ EUT will be placed in mobile position and operating multiple positions. EUT shall be performed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

2.4 Test Setup Diagram

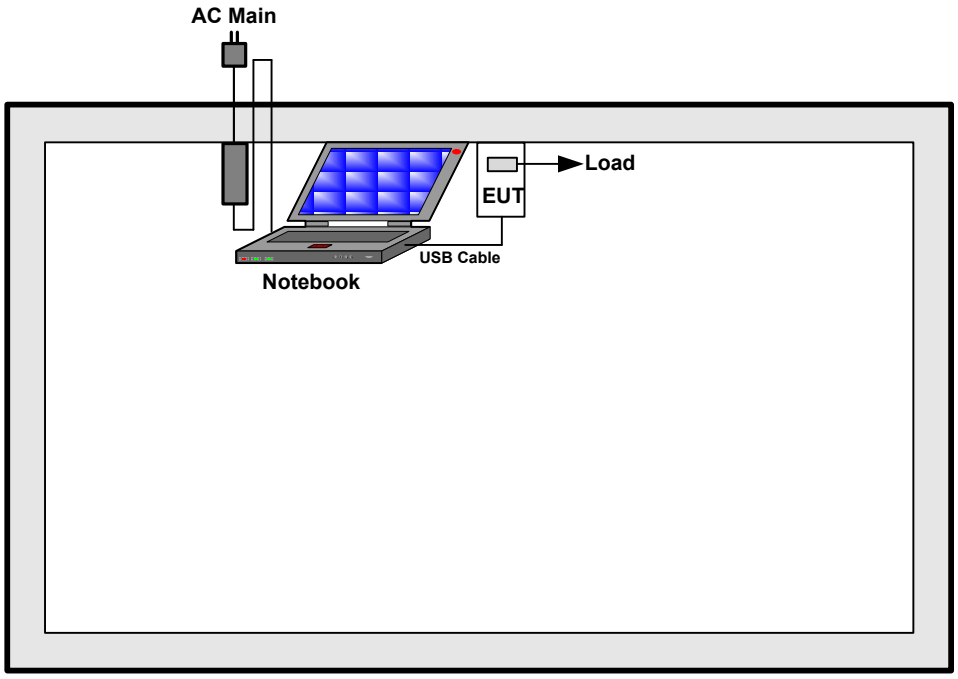
Test Setup Diagram – AC Line Conducted Emission Test (Mode 1)



Test Setup Diagram - Radiated Test 9kHz~30MHz (Mode 1)



Test Setup Diagram - Radiated Test 30MHz~1GHz (Mode 1)



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

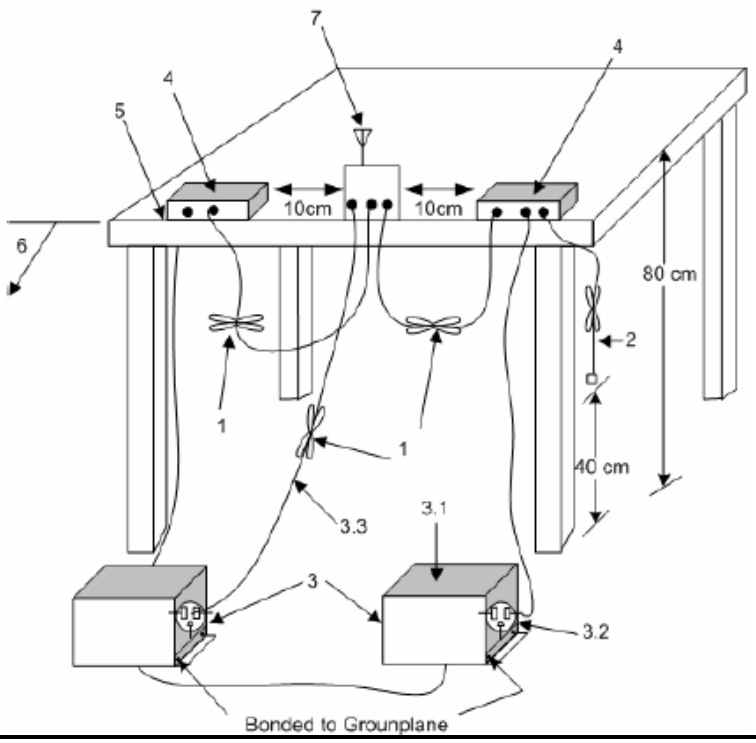
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method	
☒	Refer as ANSI C63.10-2009, 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.

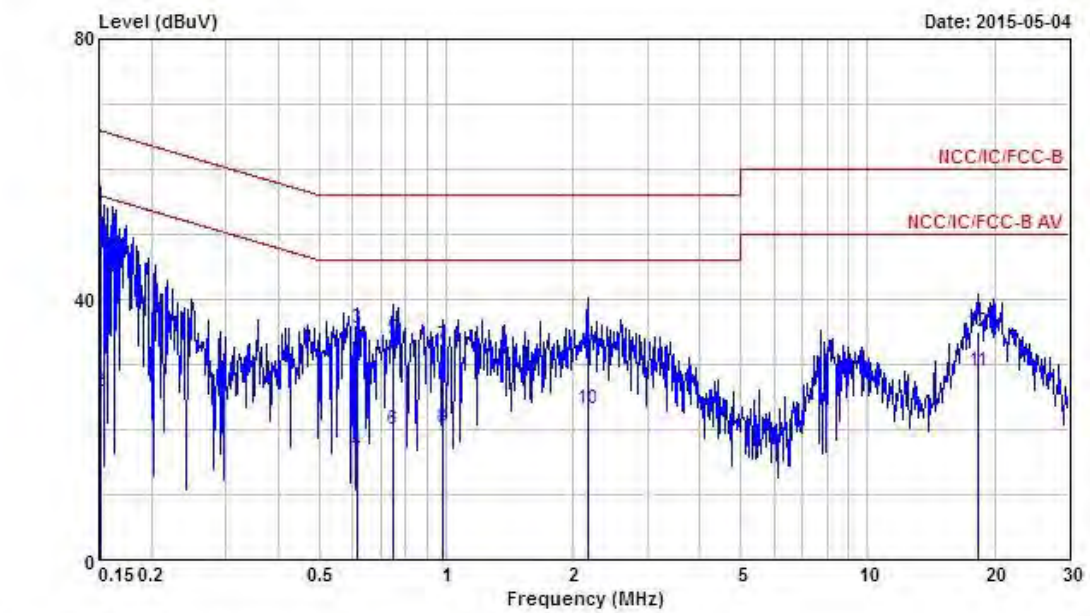
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

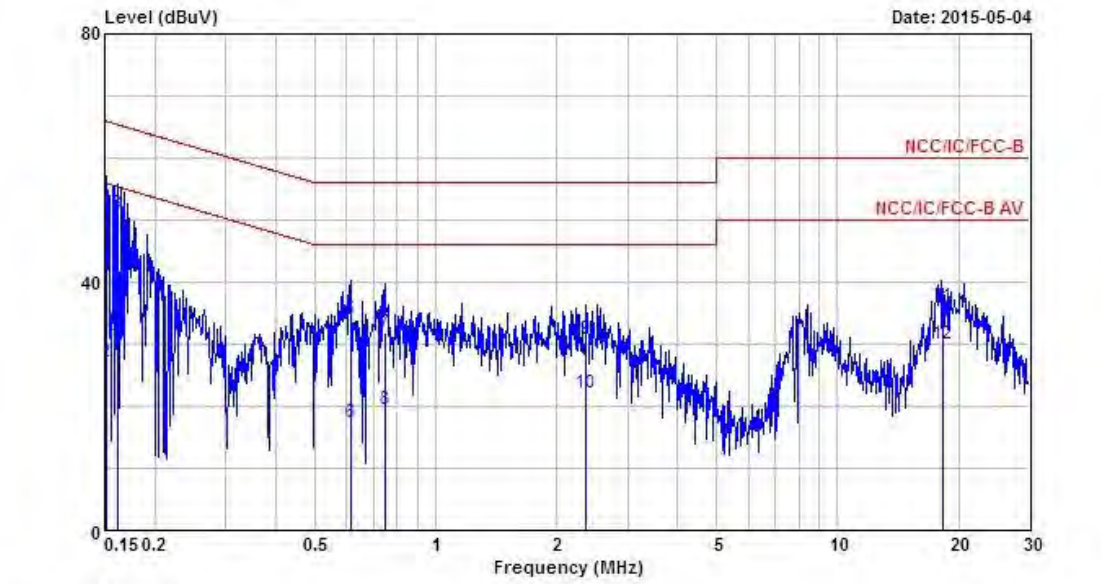
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	5000mAh + Load		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.1515980	49.57	-16.34	65.91	49.16	0.07	0.34	QP
2	0.1515980	25.83	-30.08	55.91	25.42	0.07	0.34	Average
3	0.6139960	35.47	-20.53	56.00	34.70	0.08	0.69	QP
4	0.6139960	16.59	-29.41	46.00	15.82	0.08	0.69	Average
5	0.7469700	34.00	-22.00	56.00	33.18	0.08	0.74	QP
6	0.7469700	19.90	-26.10	46.00	19.08	0.08	0.74	Average
7	0.9839140	32.97	-23.03	56.00	32.08	0.09	0.80	QP
8	0.9839140	20.37	-25.63	46.00	19.48	0.09	0.80	Average
9	2.170	31.96	-24.04	56.00	31.07	0.10	0.79	QP
10	2.170	23.14	-22.86	46.00	22.25	0.10	0.79	Average
11	18.330	29.07	-20.93	50.00	27.96	0.38	0.73	Average
12	18.330	35.01	-24.99	60.00	33.90	0.38	0.73	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	5000mAh + Load		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.1507970	51.26	-14.70	65.96	50.87	0.05	0.34	QP
2	0.1507970	27.12	-28.84	55.96	26.73	0.05	0.34	Average
3	@0.1615500	51.16	-14.22	65.38	50.73	0.05	0.38	QP
4	0.1615500	30.91	-24.47	55.38	30.48	0.05	0.38	Average
5	0.6139960	33.83	-22.17	56.00	33.07	0.07	0.69	QP
6	0.6139960	17.25	-28.75	46.00	16.49	0.07	0.69	Average
7	0.7469700	31.73	-24.27	56.00	30.91	0.08	0.74	QP
8	0.7469700	19.35	-26.65	46.00	18.53	0.08	0.74	Average
9	2.370	30.87	-25.13	56.00	29.98	0.11	0.78	QP
10	2.370	22.05	-23.95	46.00	21.16	0.11	0.78	Average
11	18.330	35.99	-24.01	60.00	34.92	0.34	0.73	QP
12	18.330	29.87	-20.13	50.00	28.80	0.34	0.73	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

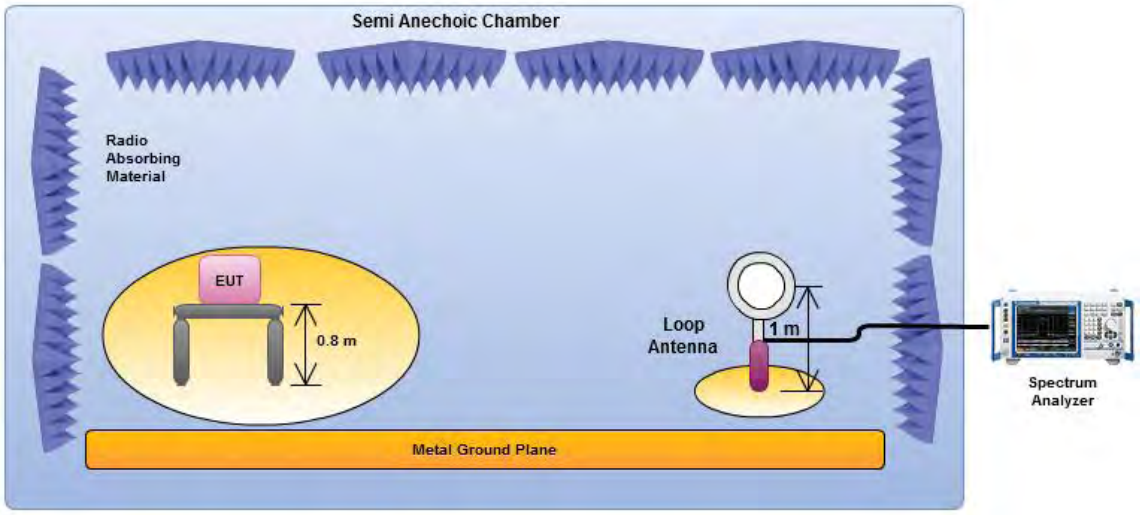
Refer a test equipment and calibration data table in this test report.

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

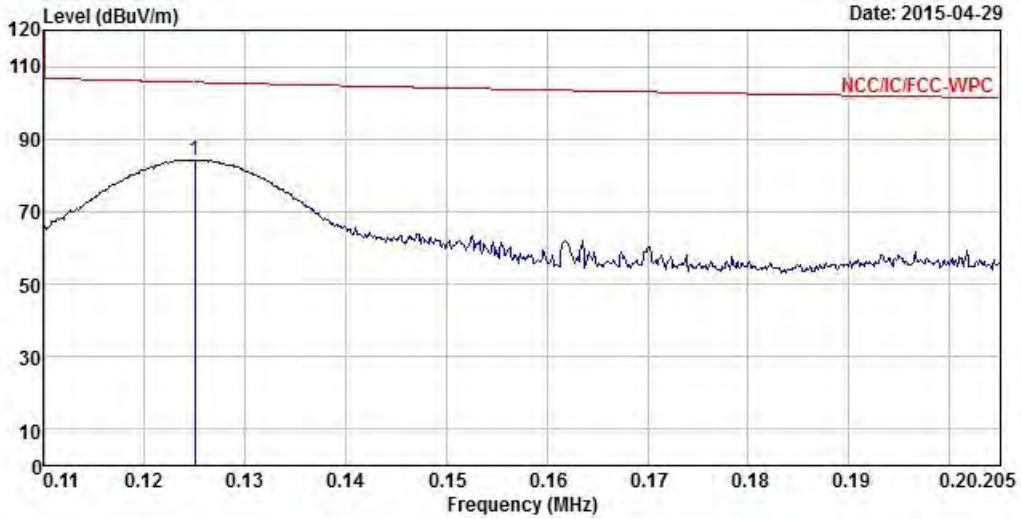
Transmitter Radiated Emissions



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

3.2.5 Transmitter Radiated Emissions (Below 30MHz)

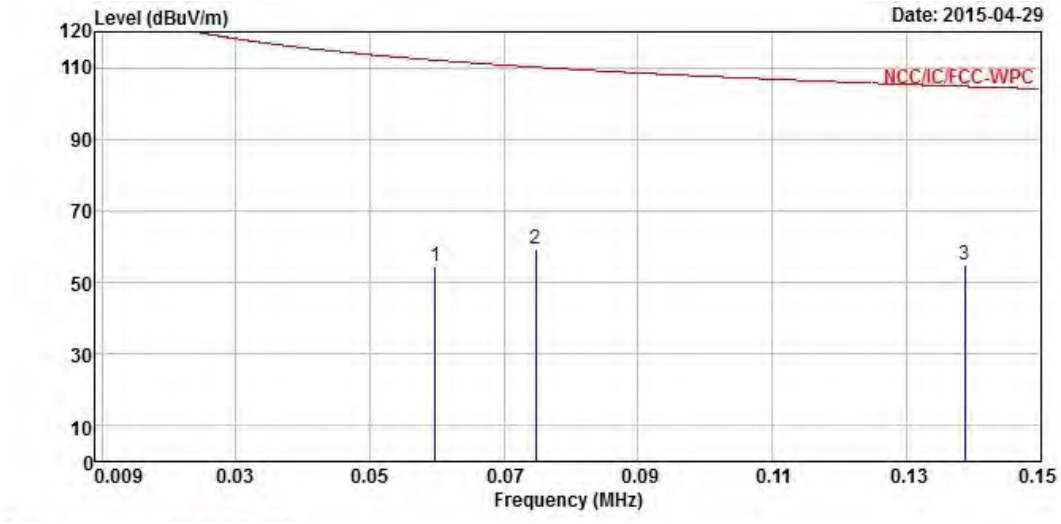
Transmitter Radiated Emissions (125 kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	1	**Operating**	EUT via USB Charging



	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	0.125	84.34	-21.33	105.67	63.22	21.06	0.06	0.00	Peak

Note 1: “>20dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.
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.

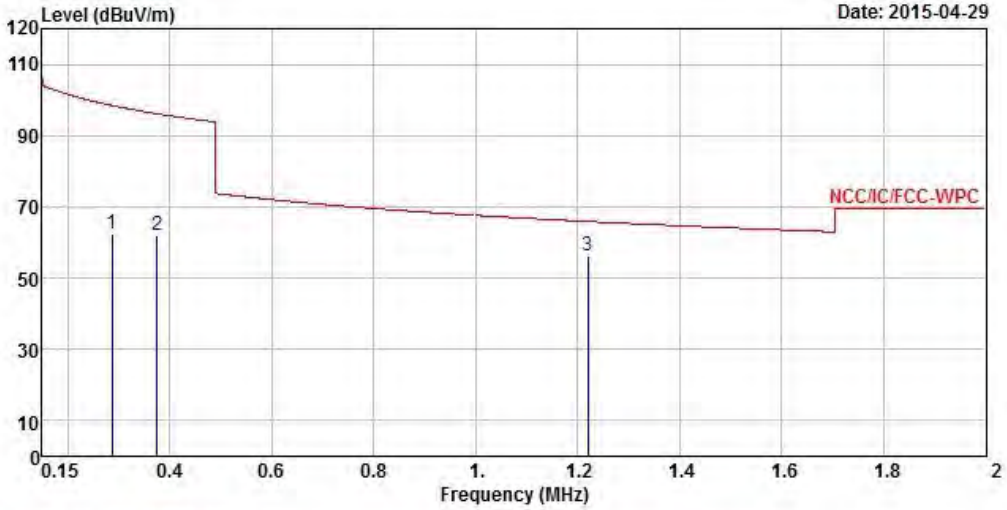
Transmitter Radiated Emissions (9 kHz – 150 kHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	1	**Operating Function**	EUT via USB Charging



	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	0.06	54.56	-57.52	112.08	33.50	21.00	0.06	0.00	Peak
2	0.07	59.32	-50.82	110.14	38.26	21.00	0.06	0.00	Peak
3	0.14	54.99	-49.78	104.77	33.87	21.06	0.06	0.00	Peak

Note 1: “>20dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.
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.

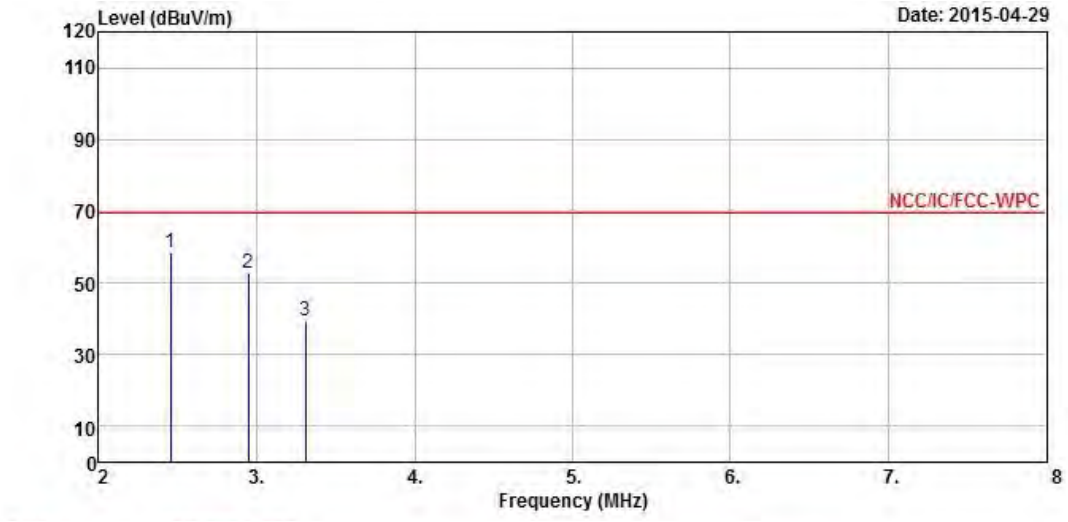
Transmitter Radiated Emissions (150 kHz – 2 MHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	1	**Operating Function**	EUT via USB Charging



	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	0.29	62.41	-36.05	98.46	41.51	20.84	0.06	0.00	Peak
2	0.38	62.18	-33.94	96.12	41.35	20.77	0.06	0.00	Peak
3	1.22	56.02	-9.87	65.89	35.19	20.73	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 (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.

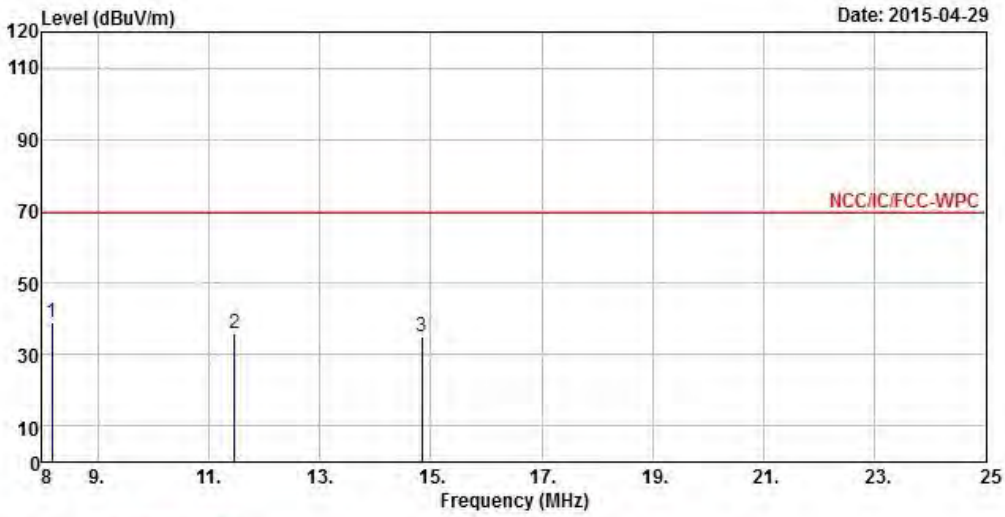
Transmitter Radiated Emissions (2 MHz – 8 MHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	1	**Operating Function**	EUT via USB Charging



	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	2.46	58.63	-10.91	69.54	38.19	20.29	0.15	0.00	Peak
2	2.95	52.80	-16.74	69.54	32.49	20.12	0.19	0.00	Peak
3	3.31	39.60	-29.94	69.54	19.19	20.22	0.19	0.00	Peak

Note 1: “>20dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.
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.

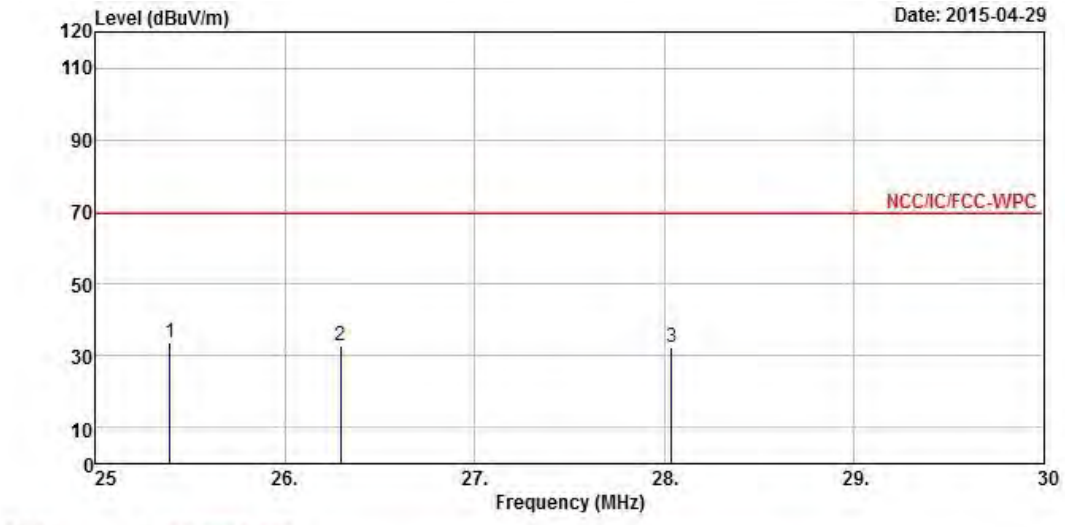
Transmitter Radiated Emissions (8 MHz – 25 MHz)			
Modulation Mode	ASK	**Polarization**	H
Operating Mode	1	**Operating Function**	EUT via USB Charging



	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	8.17	38.99	-30.55	69.54	17.50	21.15	0.34	0.00	Peak
2	11.47	35.86	-33.68	69.54	14.11	21.33	0.42	0.00	Peak
3	14.83	34.88	-34.66	69.54	12.96	21.40	0.52	0.00	Peak

Note 1: “>20dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement worst emissions of receive antenna polarization: H (Horizontal).
Note 4: No level of unwanted emissions exceeds the level of the fundamental emission.
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	ASK	**Polarization**	H
Operating Mode	1	**Operating Function**	EUT via USB Charging

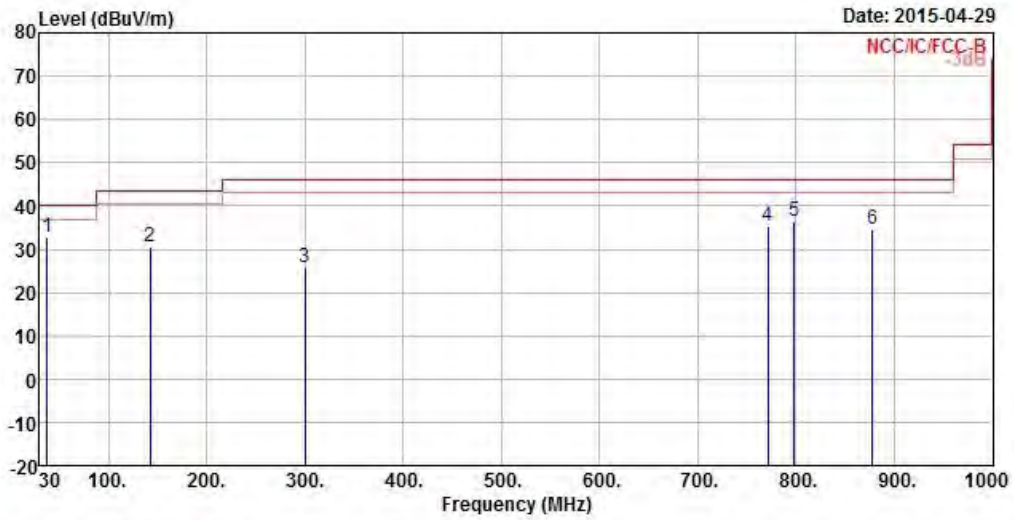


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	25.39	33.75	-35.79	69.54	11.46	21.61	0.68	0.00	Peak
2	26.29	32.65	-36.89	69.54	10.33	21.63	0.69	0.00	Peak
3	28.04	32.54	-37.00	69.54	10.16	21.66	0.72	0.00	Peak

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 (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)

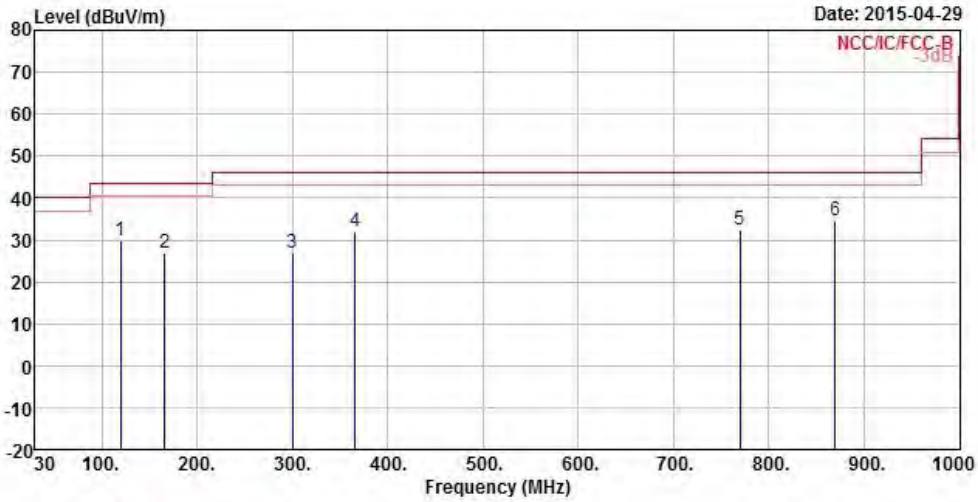
Transmitter Radiated Emissions (Above 30MHz)			
Modulation Mode	ASK	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Polarization**	V



	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	37.76	32.85	-7.15	40.00	45.86	13.97	0.83	27.81	Peak
2	142.52	30.63	-12.87	43.50	45.72	10.76	1.72	27.57	Peak
3	299.66	25.76	-20.24	46.00	37.53	12.85	2.51	27.13	Peak
4	771.08	35.39	-10.61	46.00	39.82	19.43	4.23	28.09	Peak
5	798.24	36.36	-9.64	46.00	40.56	19.49	4.32	28.01	Peak
6	877.78	34.56	-11.44	46.00	37.67	20.07	4.53	27.71	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. (FX)**	F1
Operating Function	Transmit	**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	119.24	29.70	-13.80	43.50	44.01	11.83	1.52	27.66	Peak
2	165.80	26.80	-16.70	43.50	42.63	9.80	1.86	27.49	Peak
3	299.66	26.92	-19.08	46.00	38.69	12.85	2.51	27.13	Peak
4	365.62	32.19	-13.81	46.00	42.46	14.50	2.83	27.60	Peak
5	770.11	32.30	-13.70	46.00	36.74	19.43	4.23	28.10	Peak
6	870.02	34.71	-11.29	46.00	37.87	20.05	4.53	27.74	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

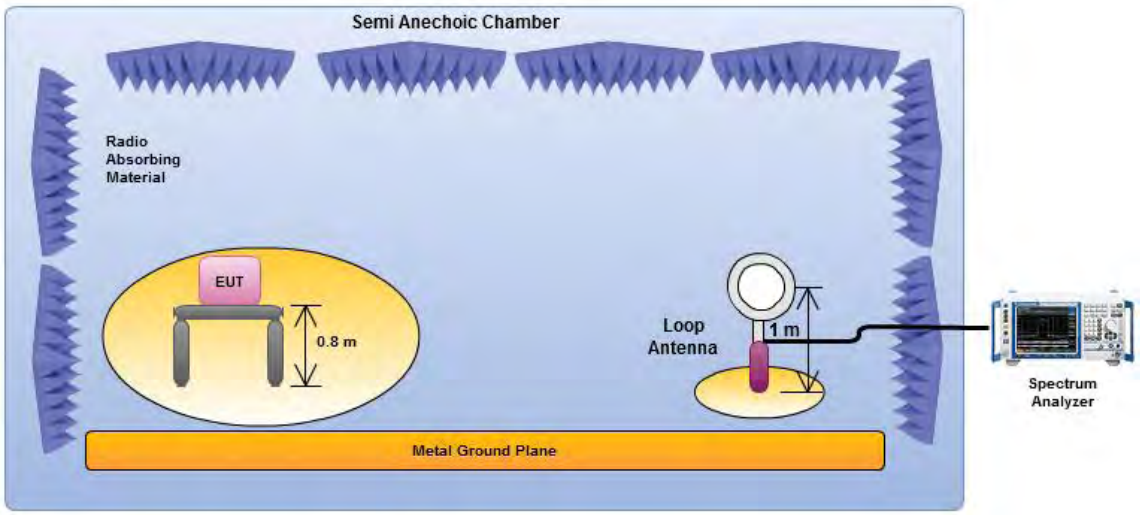
Refer a test equipment and calibration data table in this test report.

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

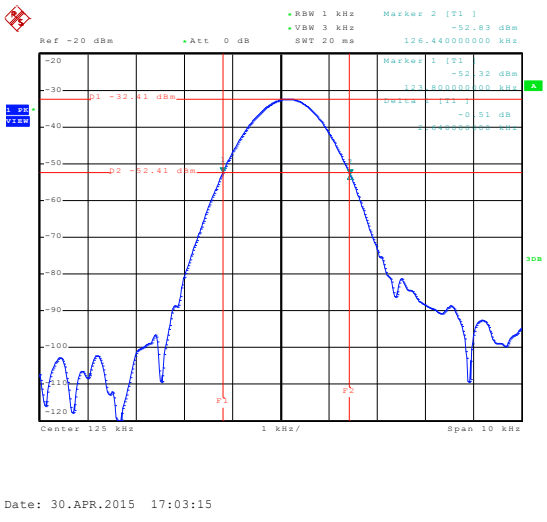
Emission Bandwidth



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)
ASK	100-205	2.64	123.8	126.44	2.24
Limit		**N/A**	**110**	**205**	**N/A**
Result		**Complied**			

Emission Bandwidth Plot



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz ~ 2.75GHz	Apr. 15. 2015	AC Conduction
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz ~ 30MHz	Jan. 22, 2015	AC Conduction
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	Oct. 31, 2014	AC Conduction
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	AC Conduction

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSV 40	101514	9KHz~40GHz	Jun. 13, 2014	RF Conducted

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100593	9kHz ~ 40GHz	Oct. 02, 2014	Radiation
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz ~ 1GHz 3m	May 11, 2014	Radiation
Amplifier	Agilent	8447D	2944A11149	100kHz ~ 1.3GHz	Jul. 22, 2014	Radiation
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Nov. 08, 2014	Radiation
Bilog Antenna	SCHAFFNER	CBL61128	2723	30MHz ~ 2GHz	Sep 20, 2014	Radiation
Turn Table	Chaintek Instruments	3000	MF7802058	0~ 360 degree	N/A	Radiation
Antenna Mast	MF	MF7802	MF780208205	1 ~ 4 m	N/A	Radiation

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Feb. 02, 2015	Radiation

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