TEST REPORT

Report Number: 104034906MPK-001
Project Number: G104034906
Issue Date: August 9, 2019

Testing performed on the
Wireless Charger
Model: SOURCE
FCC ID: 2ASP901EH1

to

FCC Part 15 Subpart C (15.209)
Industry Canada RSS-210 Issue 9
FCC Part 15, Subpart B
Industry Canada ICES-003

For

Pi Inc.

Test Performed by:	Test Authorized by:
Intertek	Pi Inc.
1365 Adams Court	1111 Bayhill Dr., Suite 235
Menlo Park, CA 94025 USA	San Bruno, CA 94066 USA

Prepared by: _____ **Date:** August 9, 2019
Aaron Chang

Reviewed by: _____ **Date:** August 9, 2019
Krishna Vemuri

Report No. 104034906MPK-001	
Equipment Under Test:	Wireless Charger
Trade Name:	Pi Inc.
Model Number:	SOURCE
Serial Number:	01011907040019
Applicant:	Pi Inc.
Contact:	Viswajit Natarajan
Address:	Pi Inc. 1111 Bayhill Dr., Suite 235 San Bruno, CA 94066
Country:	USA
Tel. Number:	(614) 330-7193
Email:	vish@spansive.com
Applicable Regulation:	FCC Part 15 Subpart C (15.209) Industry Canada RSS-210 Issue 9 FCC Part 15, Subpart B Industry Canada ICES-003 Issue 6
Test Site Location:	ITS – Site 1 1365 Adams Drive Menlo Park, CA 94025
Date(s) of Test:	July 31 – August 5, 2019

We attest to the accuracy of this report:

Aaron Chang
EMC Project Engineer

Krishna K Vemuri
Engineering Team Lead

TABLE OF CONTENTS

1.0 Summary of Tests

TEST	REFERENCE FCC 15C	REFERENCE RSS-210	RESULTS
Radiated Emissions	15.209	RSS 210 (4.3)	Complies
Line Conducted Emissions	15.207	RSS-GEN	Complies
Occupied Bandwidth	15.215(c)	RSS-GEN	Complies
Radiated Emissions from Digital Parts	15.109	ICES-003	Complies
Conducted Emissions from Digital Parts	15.107	ICES-003	Complies
Antenna requirement	15.203	RSS-GEN	Complies[1]

[1] EUT utilizes an internal Antenna.

2.0 General Description

2.1 Product Description

Pi Inc. supplied the following description of the EUT:

The EUT is a Qi compatible wireless charger for cellphone. Up to 4 devices can be charged through wireless charging + 2 High Power USB charging ports. Total 8 coils (4 pairs of Tx/Rx). Operating Frequency range = 113kHz – 230kHz.

For more information, refer to the following product specification, declared by the manufacturer.

Overview of the EUT	
Applicant name & address:	Pi Inc. 1111 Bayhill Dr., Suite 235 San Bruno, CA 94066 USA
Contact info / Email:	Viswajit Natarajan
Model:	SOURCE
FCC Identifier:	2ASP901EH1
Operating Frequency:	113kHz – 230kHz
Number of Channels:	1
Type of Modulation:	ASK
Antenna Type:	PCB

EUT receive date: July 31, 2019
EUT receive condition: The EUT was received in good condition with no apparent damage. As declared by the Applicant it is identical to the production units.
Test start date: July 31, 2019
Test completion date: August 8, 2019

2.2 Related Submittal(s) Grants

None

2.3 Test Methodology

Both AC mains line-conducted and radiated emissions measurements were performed according to the procedures in ANSI C63.4: 2014 & ANSI C63.10: 2013. Radiated tests were performed at an antenna to EUT distance of 10 meters, unless stated otherwise in this test report. All other measurements were made in accordance with the procedures in part 2 of CFR 47, ANSI C63.10: 2013 & RSS-GEN Issue 5.

2.4 Test Facility

The radiated emission test site and conducted measurement facility used to collect the data is 10m semi-anechoic chamber located in Menlo Park, California. This test facility and site measurement data have been fully placed on file with the FCC and Industry Canada (Site # 2042L-1).

3.0 System Test Configuration

3.1 Support Equipment and description

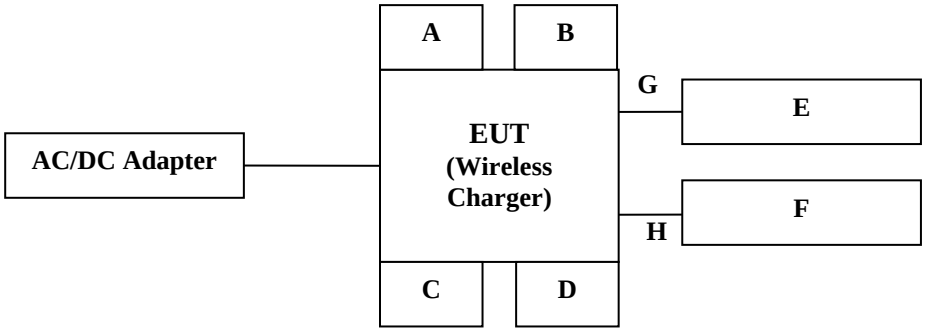
Support Equipment				
Ref. No.	**Description**	**Manufacturer**	**Model**	**Serial Number**
A	WPT Phone	Apple	iPhone XS	DNQX9C2BKPFR
B	WPT Phone	Apple	iPhone X	FK1VMS1FJCLF
C	WPT Phone	Apple	iPhone XR	G0NXL08ZXKT
D	WPT Phone	Apple	iPhone XS Max	F2LXFGP7KPHF
E	USB Phone	Samsung	Galaxy S7	R58HC0951DL
F	USB Phone	Samsung	Galaxy S6	R28G52V694T

Support Equipment				
Ref. No.	**Description**	**Cable Length (m)**	**From**	**To**
G	USB Cable	1.0, S	EUT	USB Phone
H	USB Cable	1.0, S	EUT	USB Phone

3.2 Block Diagram of Test Setup

Equipment Under Test			
Description	**Manufacturer**	**Model Number**	**Serial Number**
Wireless Charger	Pi Inc.	SOURCE	01011907040019
AC/DC Adapter	Delta	ADP-65DW Y	6IEW8CS0039

The diagram shown below details the interconnection of the EUT and support equipment. For specific layout, refer to the test configuration photograph in the relevant section of this report.



S = Shielded **U** = Unshielded	**F** = With Ferrite **m** = Length in Meters

3.3 Justification

For radiated emission measurements the EUT is placed on a non-conductive table.

Class II permissive change testing for FCC was performed based on following modifications:
Wireless charging circuit modified by changing tuning capacitors. Certified frequency range is 0.113 MHz – 0.23 MHz and new frequency range is 0.113 MHz – less than 0.23 MHz.

3.4 Software Exercise Program

The EUT exercise program used during radiated and conducted testing was provided by Pi Inc.

3.5 Mode of Operation during test

During transmitter testing, the transmitter was setup to continuously transmit.

3.6 Modifications required for Compliance

No modifications were installed by Intertek Testing Services during compliance testing in order to bring the product into compliance.

3.7 Additions, deviations and exclusions from standards

No additions, deviations or exclusion have been made from standard.

4.0 Measurement Results

4.1 Occupied Bandwidth

4.1.1 Requirements

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

4.1.2 Procedure

Tests are performed in accordance with ANSI C63.10-2013.

The EUT was setup to transmit in normal operating condition.

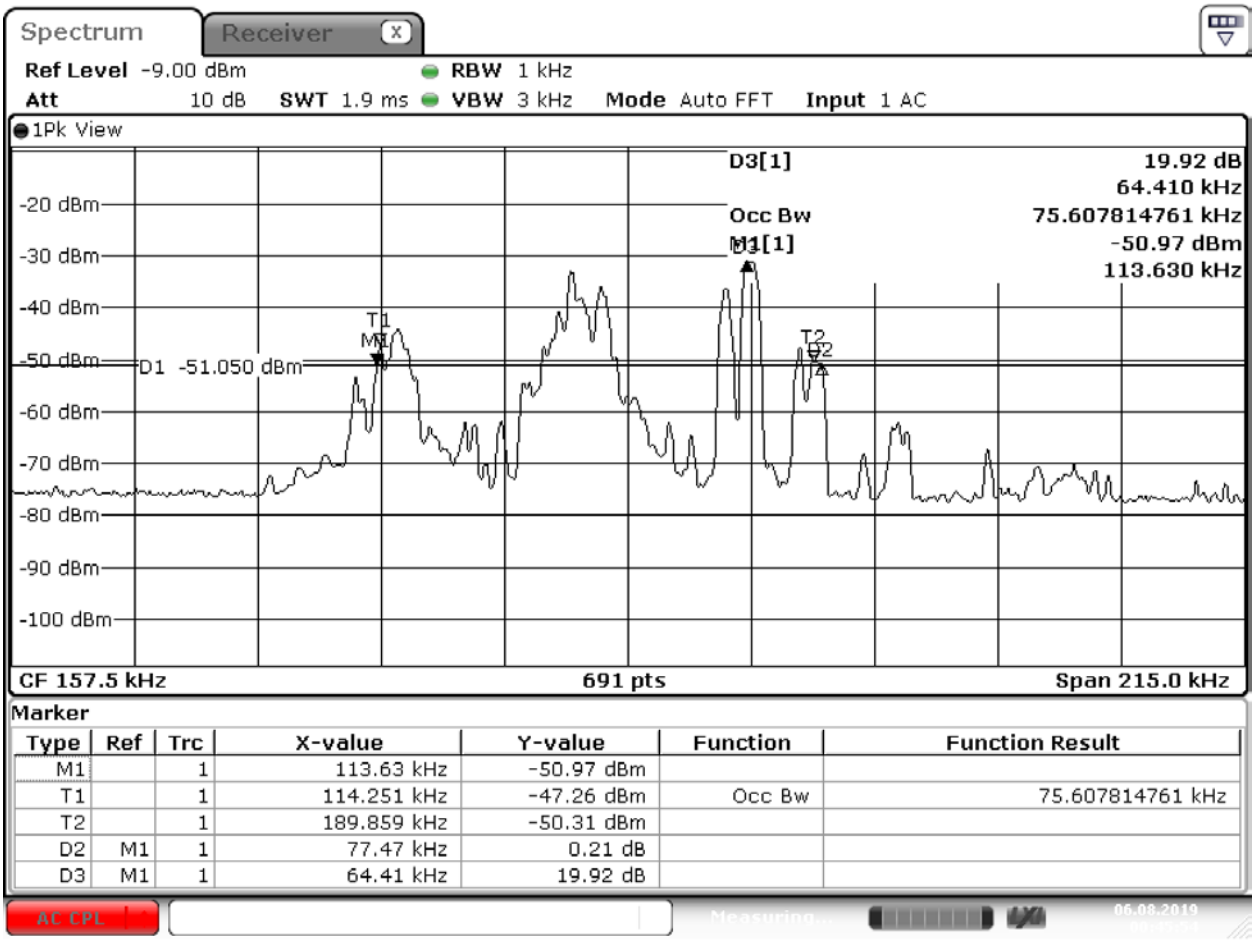
Measurements were made with the loop antenna in close proximity of the EUT. Following the procedures of ANSI 63.10: 2013, the 20dB bandwidth measurements were taken. The following plots show Occupied Bandwidth.

4.1.3 Test Results

EUT + 4 WPT Phones + 2 USB Phones

Frequency (kHz)	-20 dB Channel Bandwidth (kHz)	99% Channel Bandwidth (kHz)
178.04	77.47	75.607

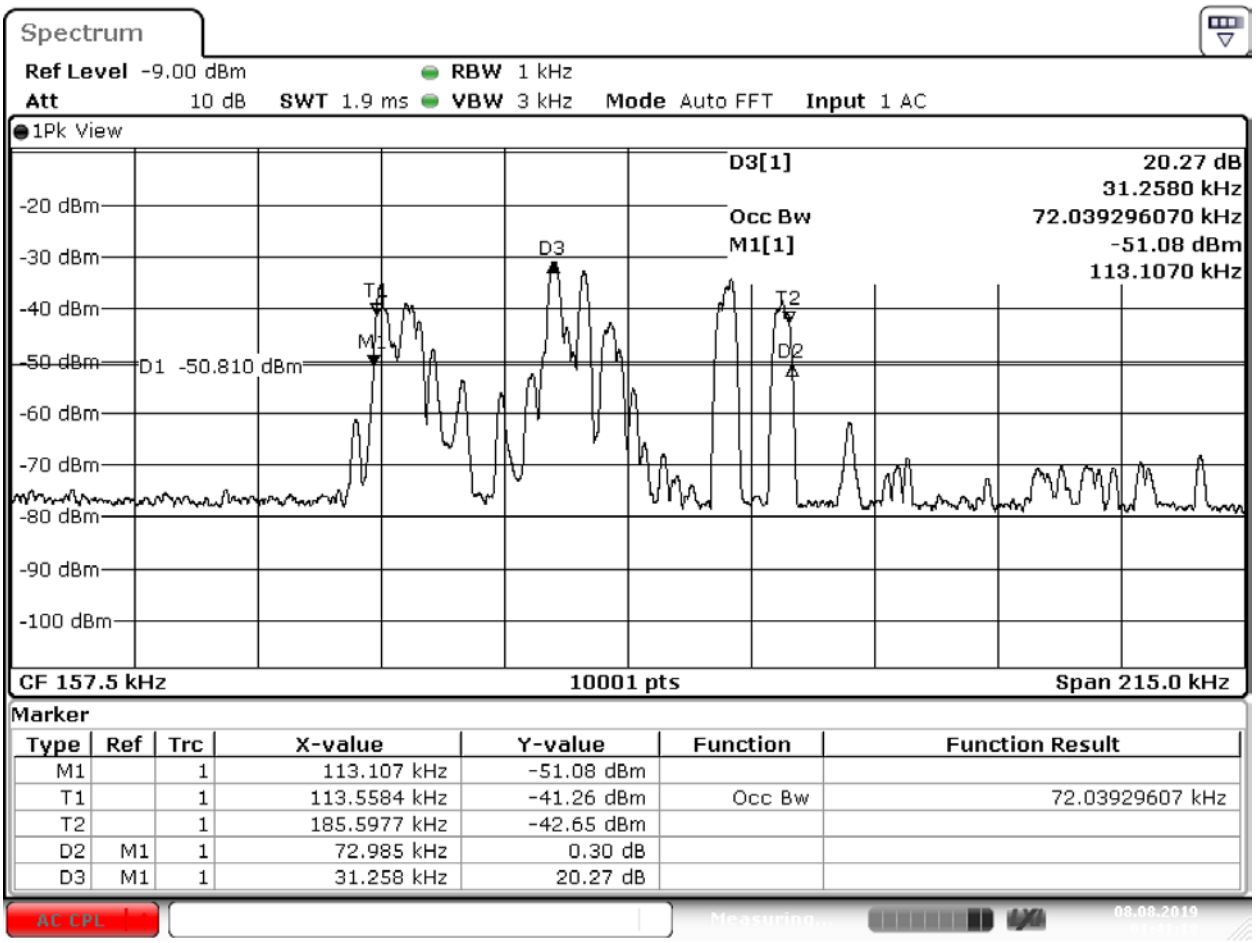
-20dB & 99% Channel Bandwidth Plot



EUT + 3 WPT Phones + 2 USB Phones

Frequency (kHz)	-20 dB Channel Bandwidth (kHz)	99% Channel Bandwidth (kHz)
144.365	72.985	72.039

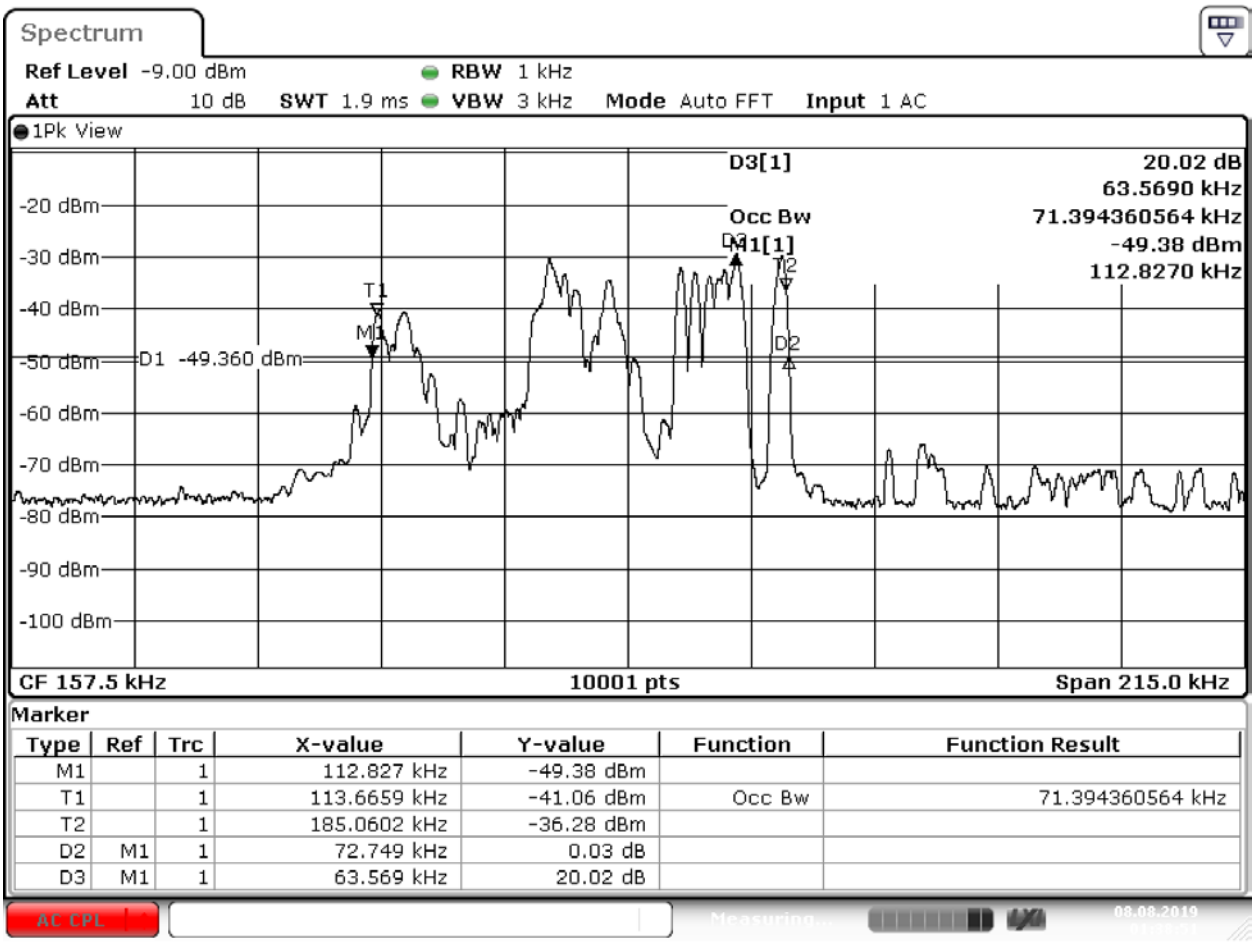
-20dB & 99% Channel Bandwidth Plot



EUT + 2 WPT Phones + 2 USB Phones

Frequency (kHz)	-20 dB Channel Bandwidth (kHz)	99% Channel Bandwidth (kHz)
176.396	72.749	71.394

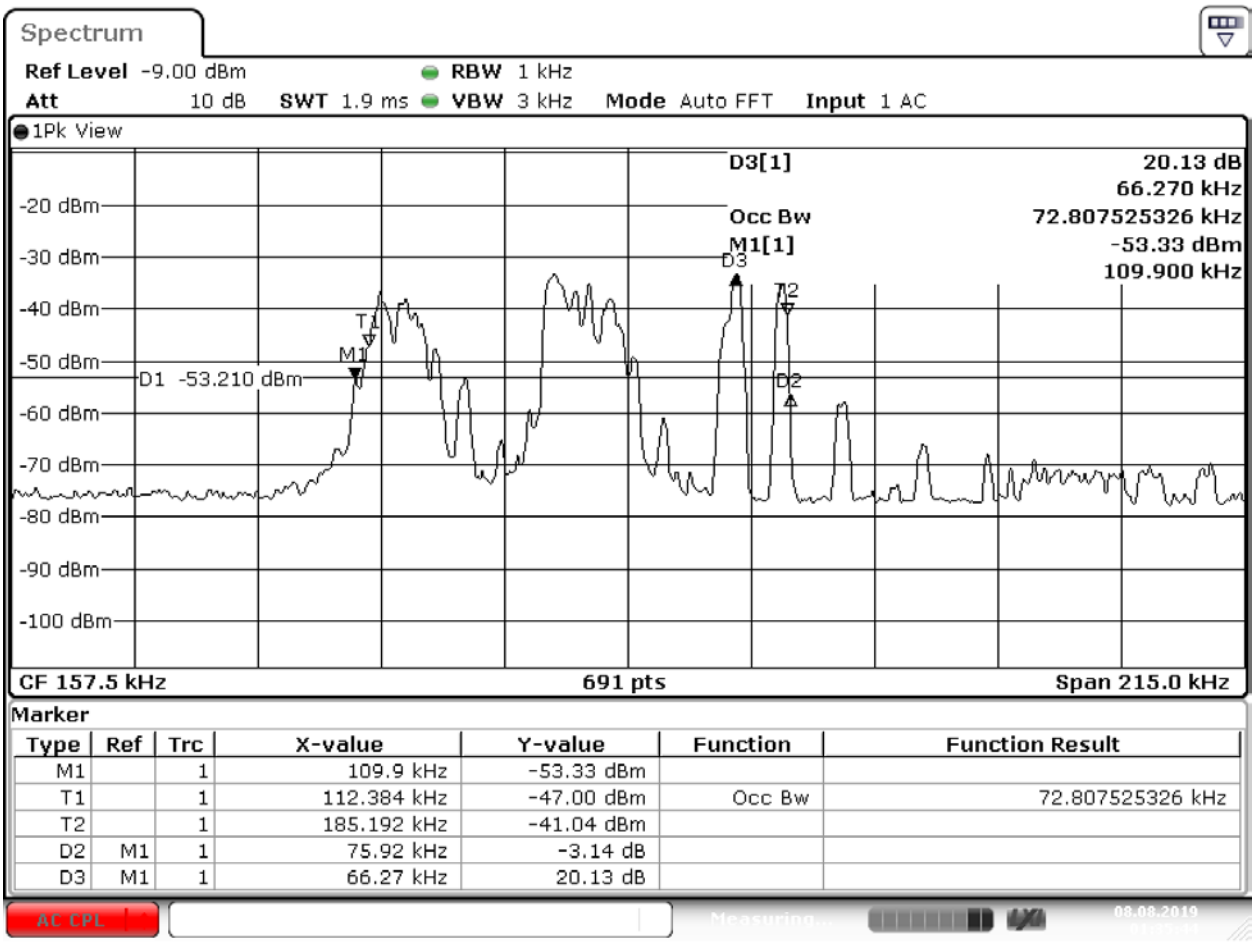
-20dB & 99% Channel Bandwidth Plot



EUT + 1 WPT Phones + 2 USB Phones

Frequency (kHz)	-20 dB Channel Bandwidth (kHz)	99% Channel Bandwidth (kHz)
176.17	75.92	72.807

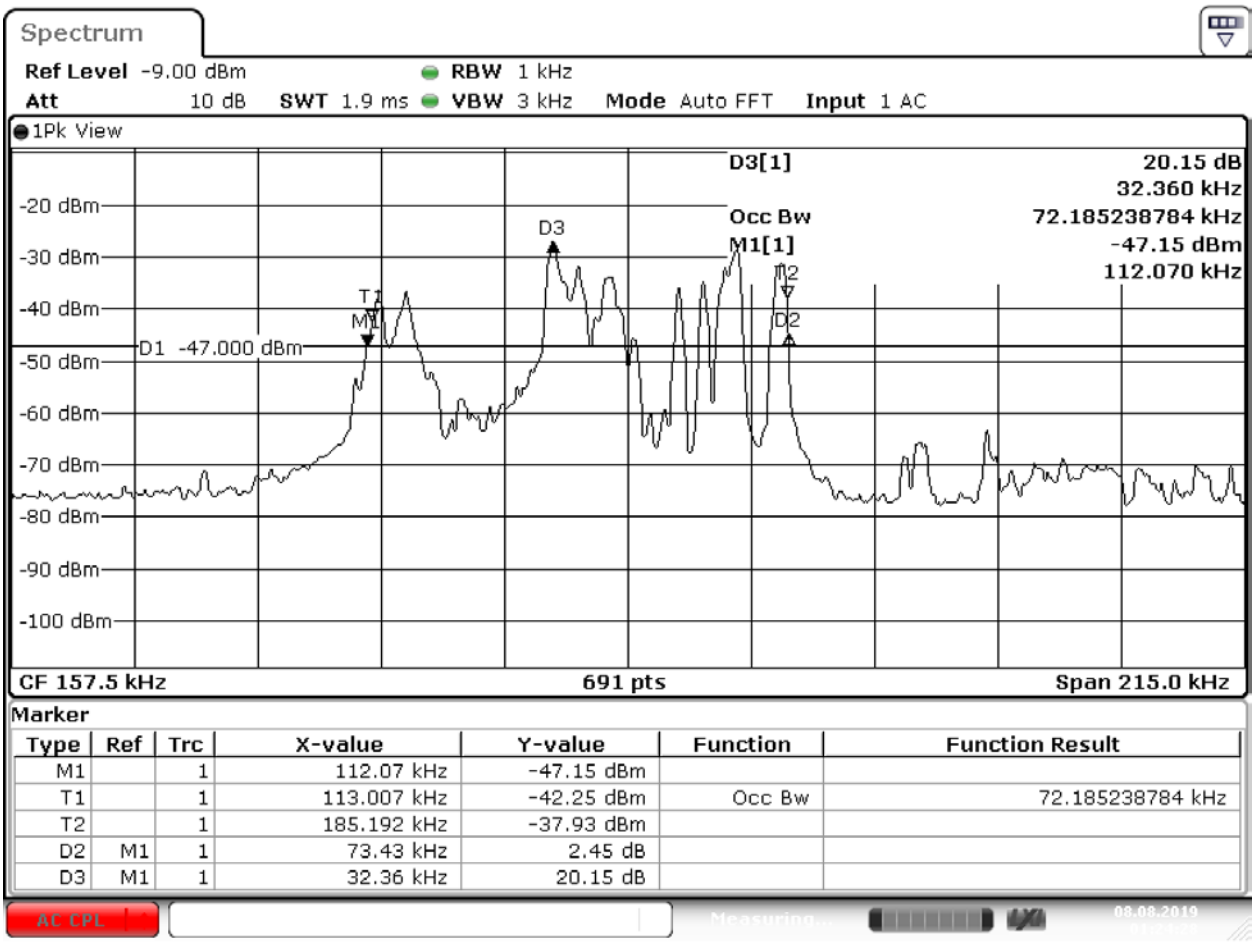
-20dB & 99% Channel Bandwidth Plot



EUT + 2 USB Phones

Frequency (kHz)	-20 dB Channel Bandwidth (kHz)	99% Channel Bandwidth (kHz)
144.43	73.43	72.185

-20dB & 99% Channel Bandwidth Plot



Results	Complies
Test date:	August 6 & 8, 2019

4.2 Transmitter Radiated Emissions
FCC Rules: 15.209, 15.205; RSS-210;

4.2.1 Requirements

§15.209 Radiated emission limits; general requirements.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

4.2.2 Procedure

Radiated Measurements Below 30 MHz

During the test the EUT is rotated and the measuring antenna angles are varied during the search for maximum signal level.

Radiated emissions are taken at ten meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Measurements for below 30 MHz were made at 10 meters.

Radiated Measurements Above 30 MHz

During the test the EUT is rotated and the measuring antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at ten meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Measurements for above 30 MHz were made at 10 meters.

Radiated emission measurements were performed from 9kHz to 1 GHz.
Analyzer resolution is:

200Hz or greater for 9kHz to 150kHz
9 kHz or greater for 150kHz to 30 MHz
120 kHz or greater for 30MHz to 1000 MHz
For those frequencies quasi-peak detector applies

Data includes of the worst-case configuration (the configuration which resulted in the highest emission levels).

4.2.3 Field Strength Calculation

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF – AG; if measurement is performed at a distance other than specified in the rule, a Distance Correction Factor (DCF) shall be added.

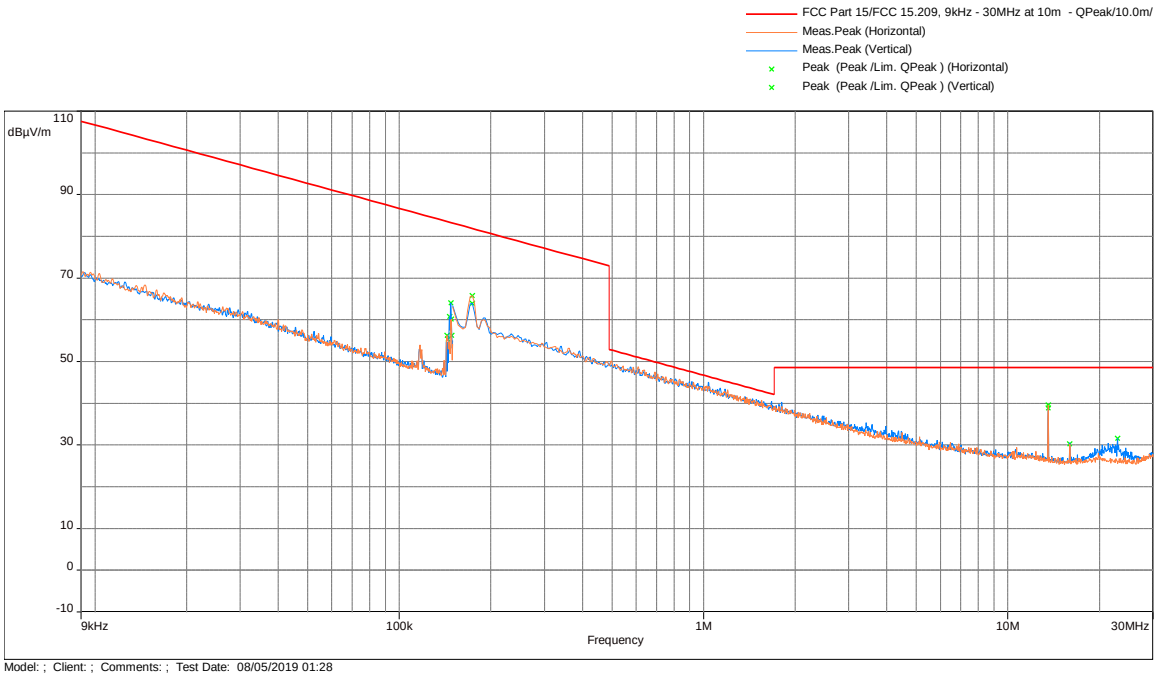
Where FS = Field Strength in dB(μV/m)
RA = Receiver Amplitude (including preamplifier) in dB(μV); AF = Antenna Factor in dB(1/m)
CF = Cable Attenuation Factor in dB; AG = Amplifier Gain in dB

Assume a receiver reading of 52.0 dB(μV) is obtained. The antennas factor of 7.4 dB(1/m) and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving field strength of 32 dB(μV/m). This value in dB(μV/m) was converted to its corresponding level in μV/m.
RA = 52.0 dB(μV)
AF = 7.4 dB(1/m)
CF = 1.6 dB
AG = 29.0 dB
FS = 52.0+7.4+1.6-29.0 = 32 dB(μV/m).
Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m.

4.2.4 Test Result

EUT + 4 WPT Phones + 2 USB Phones

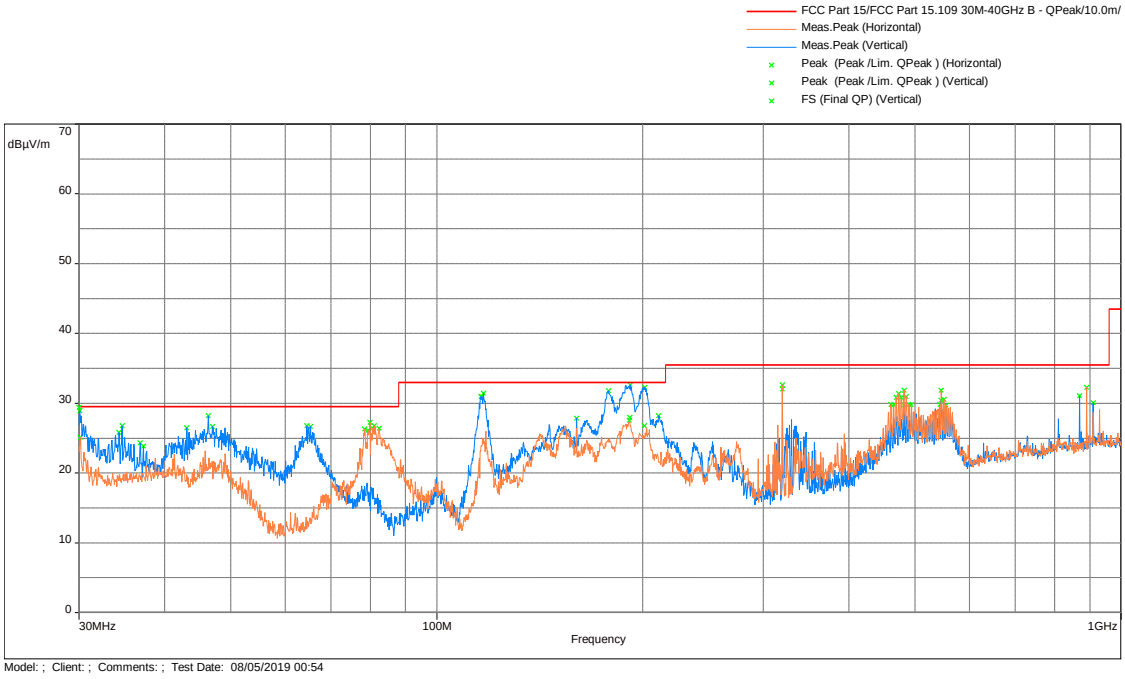
Radiated Spurious Emissions from 9 kHz to 30MHz



Frequency	Peak FS @10m	Limit@10m	Margin	RA@10m	Correction
(MHz)	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB
0.174	65.74	81.89	-16.16	51.86	13.88
0.148	64.01	83.32	-19.31	50.14	13.87
0.146	60.75	83.4	-22.65	46.88	13.87
13.559	39.6	48.6	-9.0	24.58	15.02

EUT + 4 WPT Phones + 2 USB Phones

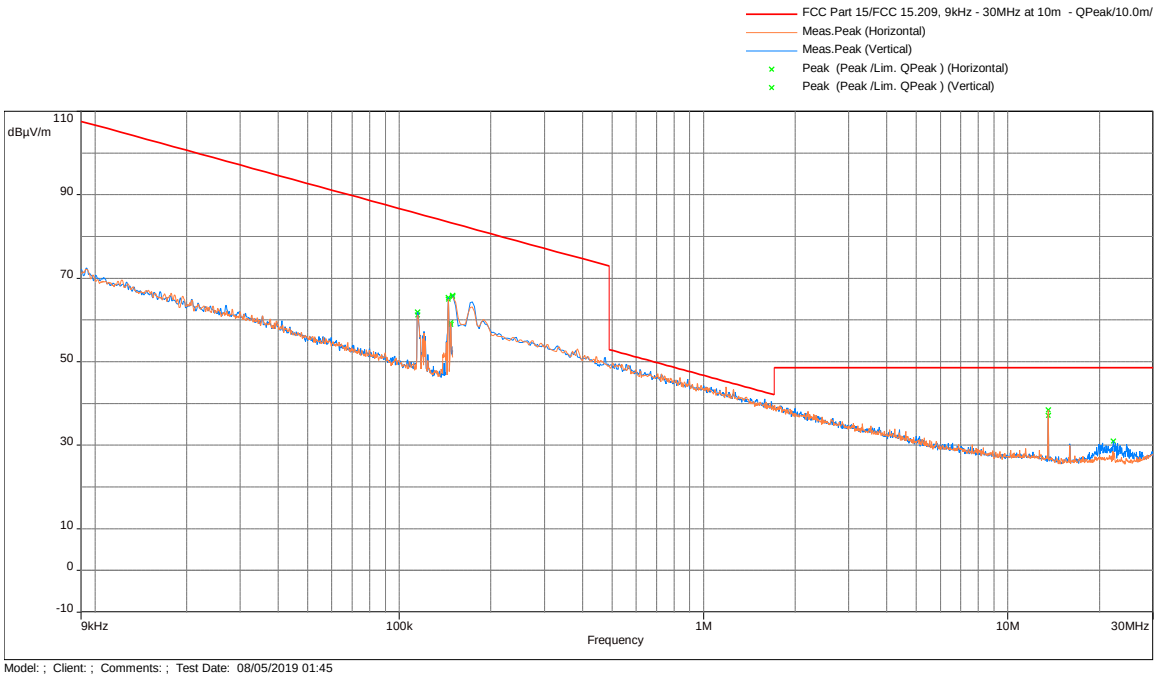
Radiated Spurious Emissions from 30 MHz to 1000 MHz



Freq (MHz)	FS @ 10m dB(uV/m)	Limit dB(uV/m)	Margin (dB)	Azimuth (Deg)	Height (m)	Polarity	RA (dBuV)	Correction (dB)
30.000	27.4	29.5	-2.1	135.25	3.96	Vertical	34.11	-6.71
191.363	27.95	33	-5.05	17.5	1.55	Vertical	42.39	-14.44
200.966	26.77	33	-6.23	262.75	1	Vertical	41.04	-14.27

EUT + 3 WPT Phones + 2 USB Phones

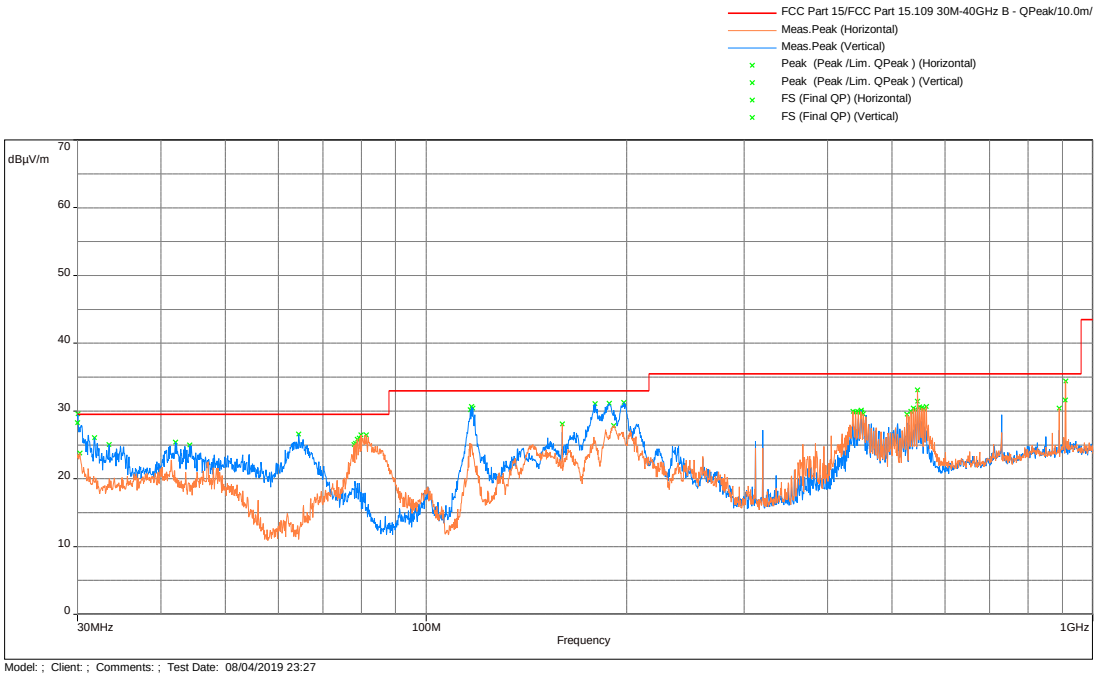
Radiated Spurious Emissions from 9 kHz to 30MHz



Frequency	Peak FS @10m	Limit@10m	Margin	RA@10m	Correction
(MHz)	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB
0.150	65.86	83.18	-17.32	51.99	13.87
0.145	65.32	83.48	-18.16	51.45	13.87
0.115	61.91	85.49	-23.57	48.06	13.85
0.148	59.29	83.32	-24.02	45.42	13.87
13.562	38.47	48.6	-10.13	23.45	15.02

EUT + 3 WPT Phones + 2 USB Phones

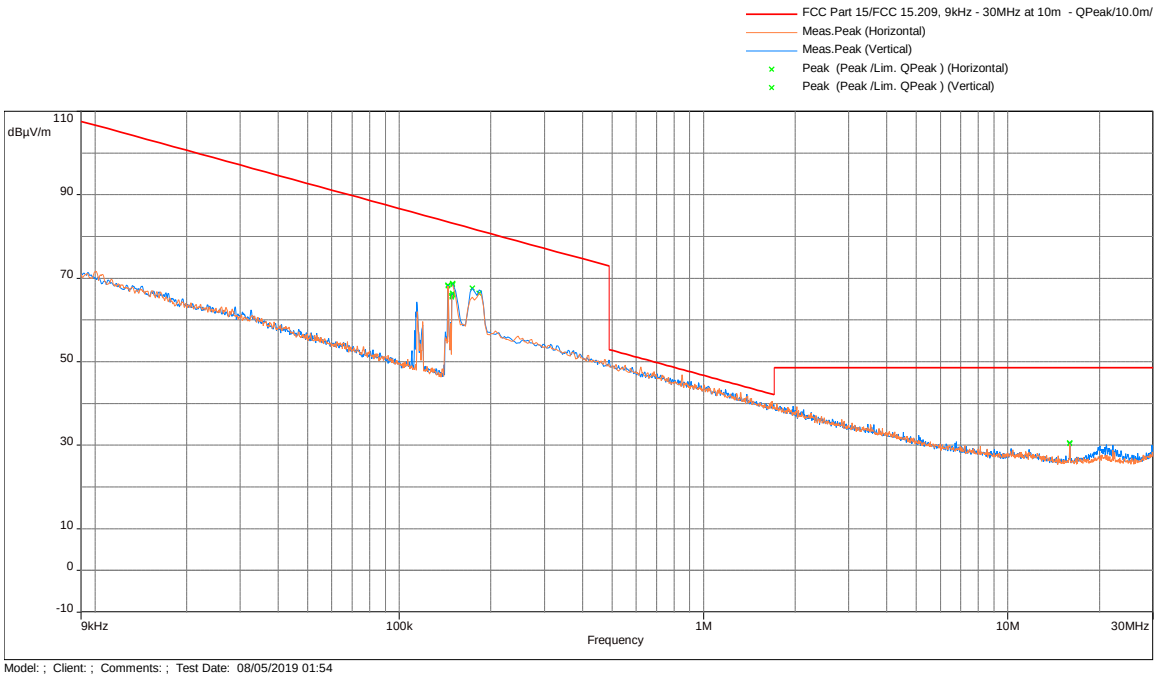
Radiated Spurious Emissions from 30 MHz to 1000 MHz



Freq (MHz)	FS @ 10m dB(uV/m)	Limit dB(uV/m)	Margin (dB)	Azimuth (Deg)	Height (m)	Polarity	RA (dBuV)	Correction (dB)
30.000	28.26	29.5	-1.24	145.5	3.07	Vertical	34.97	-6.69
909.963	31.58	35.5	-3.92	209.25	1.04	Horizontal	31.99	-0.41

EUT + 2 WPT Phones + 2 USB Phones

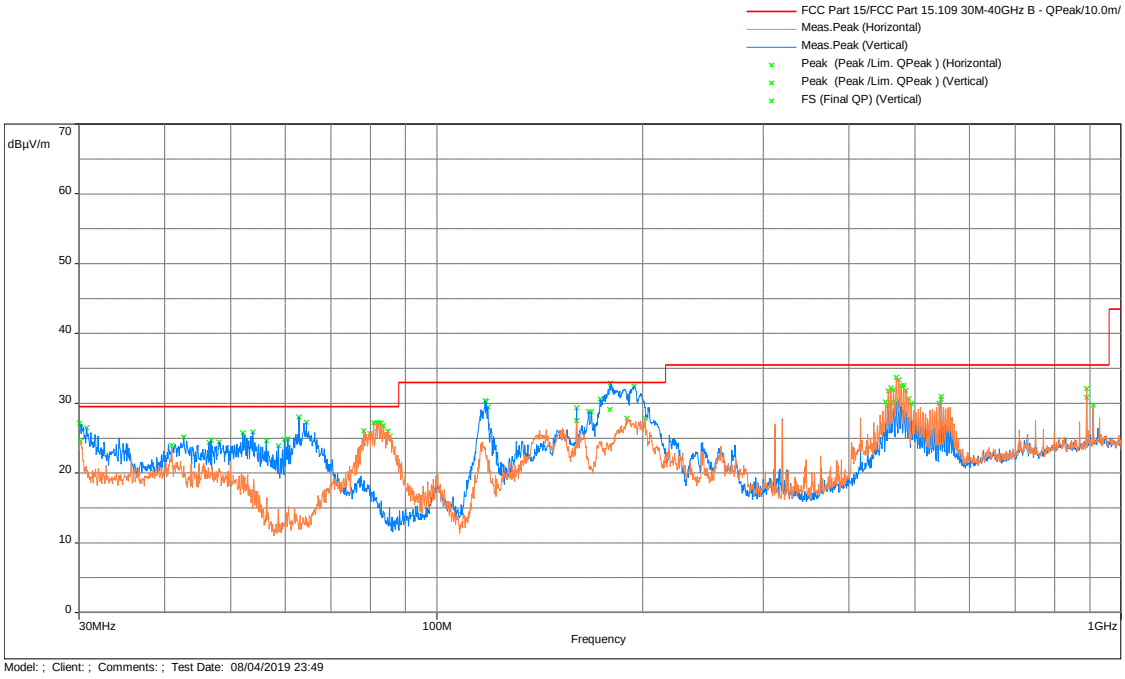
Radiated Spurious Emissions from 9 kHz to 30MHz



Frequency	Peak FS @10m	Limit@10m	Margin	RA@10m	Correction
(MHz)	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB
0.174	67.6	81.89	-14.29	53.72	13.88
0.150	68.72	83.18	-14.46	54.85	13.87
0.183	66.35	81.46	-15.11	52.46	13.89
0.145	68.37	83.49	-15.12	54.49	13.88

EUT + 2 WPT Phones + 2 USB Phones

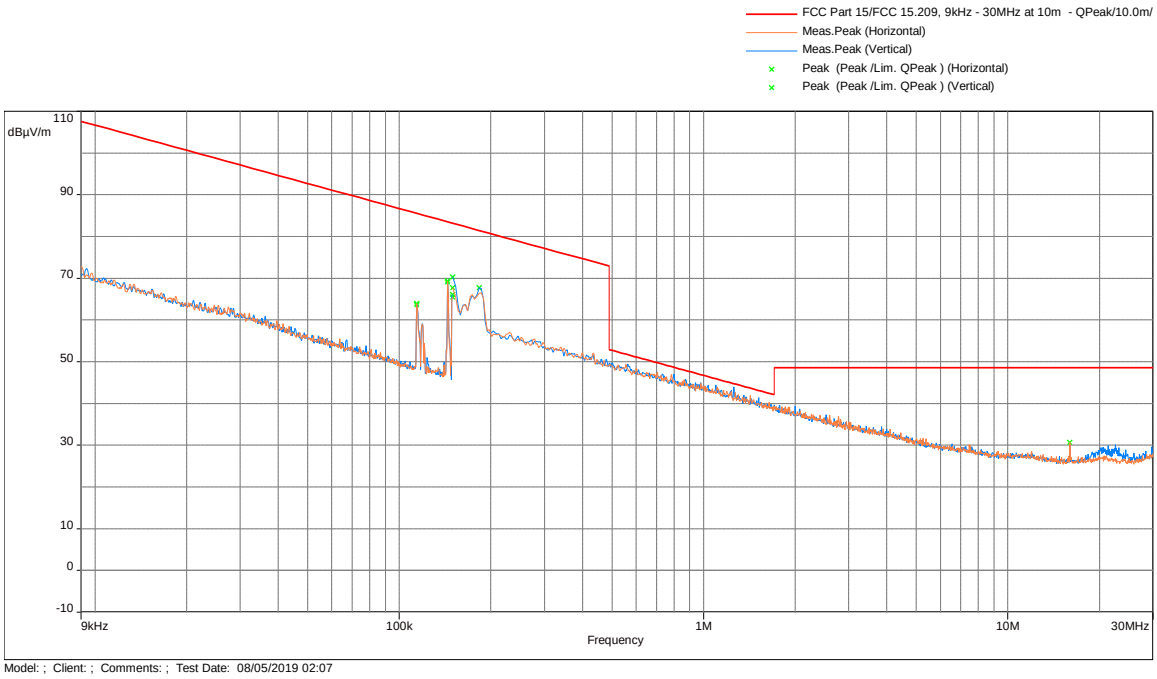
Radiated Spurious Emissions from 30 MHz to 1000 MHz



Freq (MHz)	FS @ 10m dB(uV/m)	Limit dB(uV/m)	Margin (dB)	Azimuth (Deg)	Height (m)	Polarity	RA (dBuV)	Correction (dB)
178.914	29.09	33	-3.91	346.25	1.4	Vertical	44.12	-15.04

EUT + 1 WPT Phone + 2 USB Phones

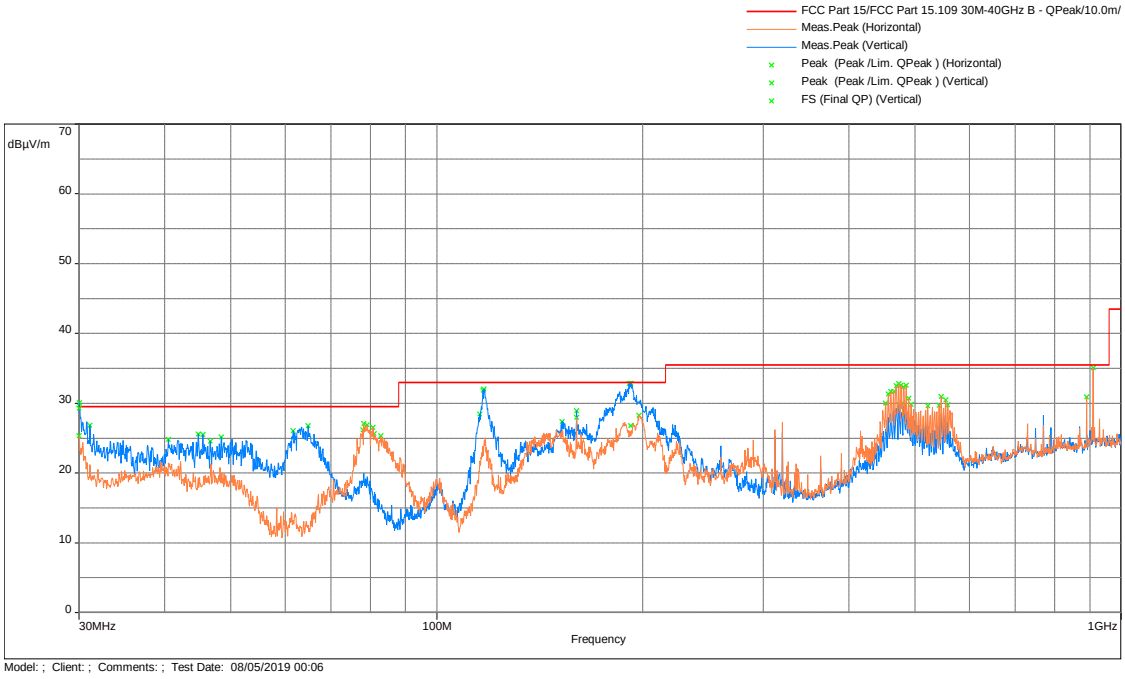
Radiated Spurious Emissions from 9 kHz to 30MHz



Frequency	Peak FS @10m	Limit@10m	Margin	RA@10m	Correction
(MHz)	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB
0.150	70.26	83.18	-12.91	56.39	13.87
0.183	67.72	81.46	-13.74	53.83	13.89
0.144	69.34	83.52	-14.19	55.46	13.88
0.150	67.68	83.18	-15.5	53.81	13.87
0.114	63.96	85.55	-21.59	50.11	13.85

EUT + 1 WPT Phone + 2 USB Phones

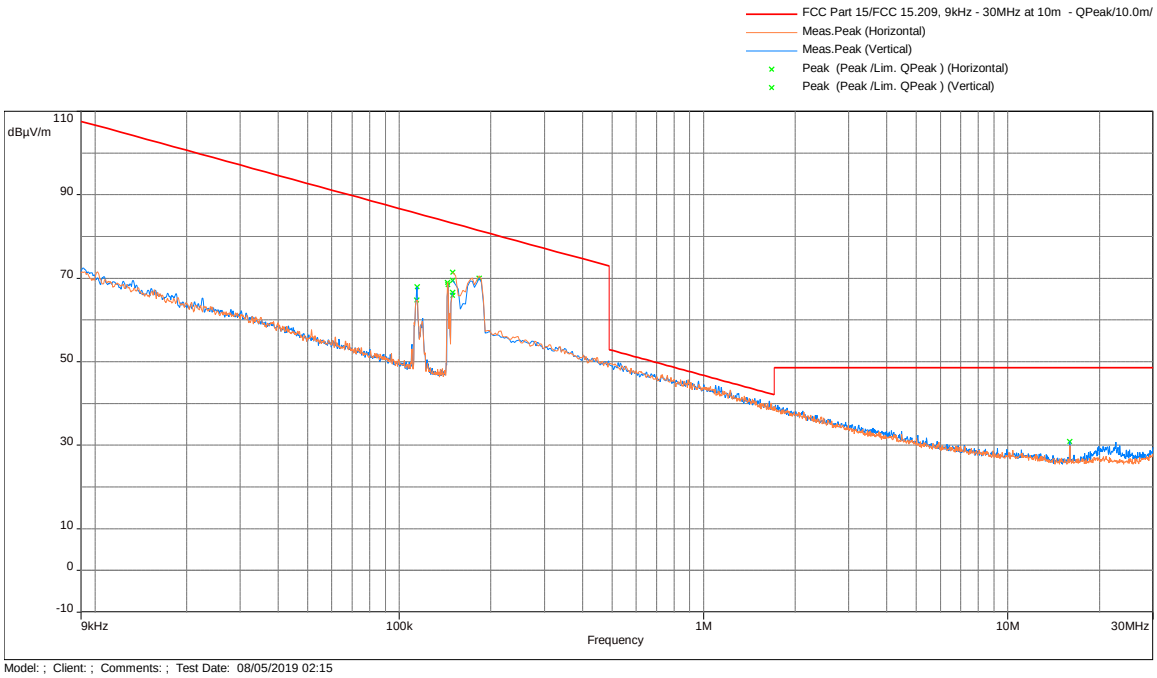
Radiated Spurious Emissions from 30 MHz to 1000 MHz



Freq (MHz)	FS @ 10m dB(uV/m)	Limit dB(uV/m)	Margin (dB)	Azimuth (Deg)	Height (m)	Polarity	RA (dBuV)	Correction (dB)
30.000	25.89	29.5	-3.61	125.75	1.12	Vertical	32.6	-6.71
191.980	26.74	33	-6.26	159.5	1.47	Vertical	41.18	-14.44

EUT + 2 USB Phones

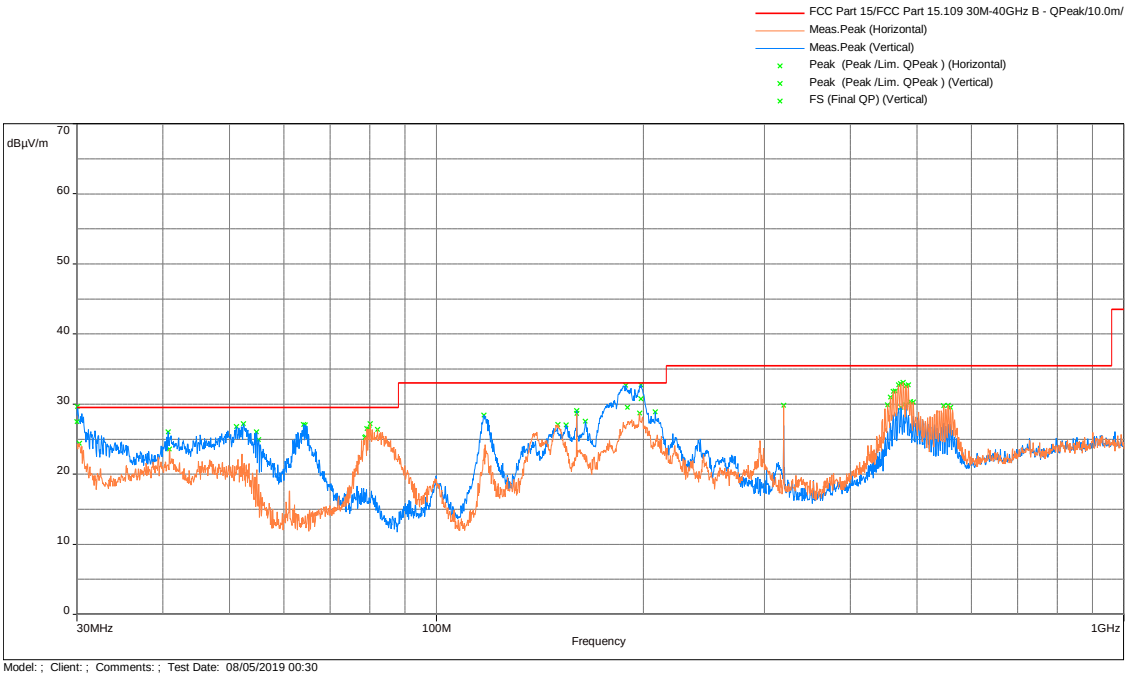
Radiated Spurious Emissions from 9 kHz to 30MHz



Frequency	Peak FS @10m	Limit@10m	Margin	RA@10m	Correction
(MHz)	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB
0.183	69.96	81.46	-11.5	56.07	13.89
0.150	71.45	83.18	-11.73	57.58	13.87
0.144	68.94	83.52	-14.58	55.06	13.88
0.145	68.45	83.49	-15.04	54.57	13.88
0.114	67.92	85.53	-17.61	54.07	13.85

EUT + 2 USB Phones

Radiated Spurious Emissions from 30 MHz to 1000 MHz

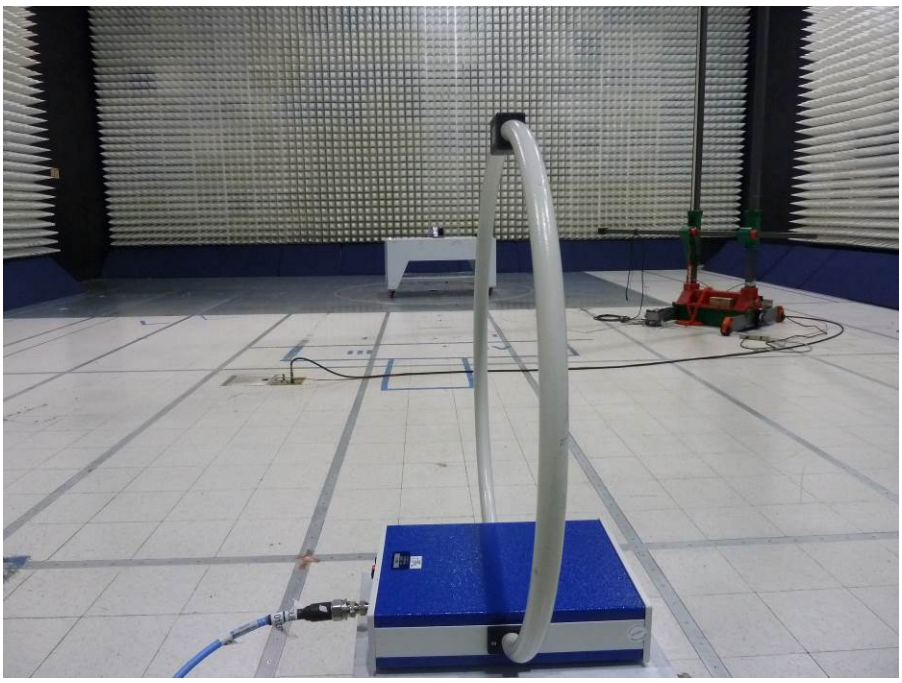


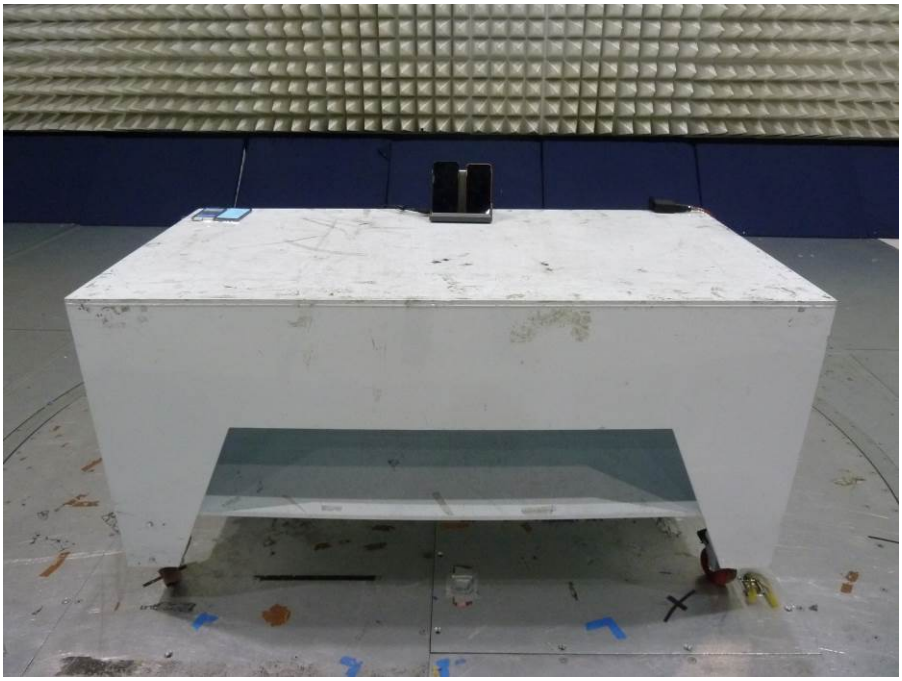
Freq (MHz)	FS @ 10m dB(uV/m)	Limit dB(uV/m)	Margin (dB)	Azimuth (Deg)	Height (m)	Polarity	RA (dBuV)	Correction (dB)
30.000	27.5	29.5	-2	135.75	3.68	Vertical	34.21	-6.71
189.614	29.5	33	-3.5	336	1.76	Vertical	44.05	-14.55
198.261	30.75	33	-2.25	244.75	1.34	Vertical	45.05	-14.3

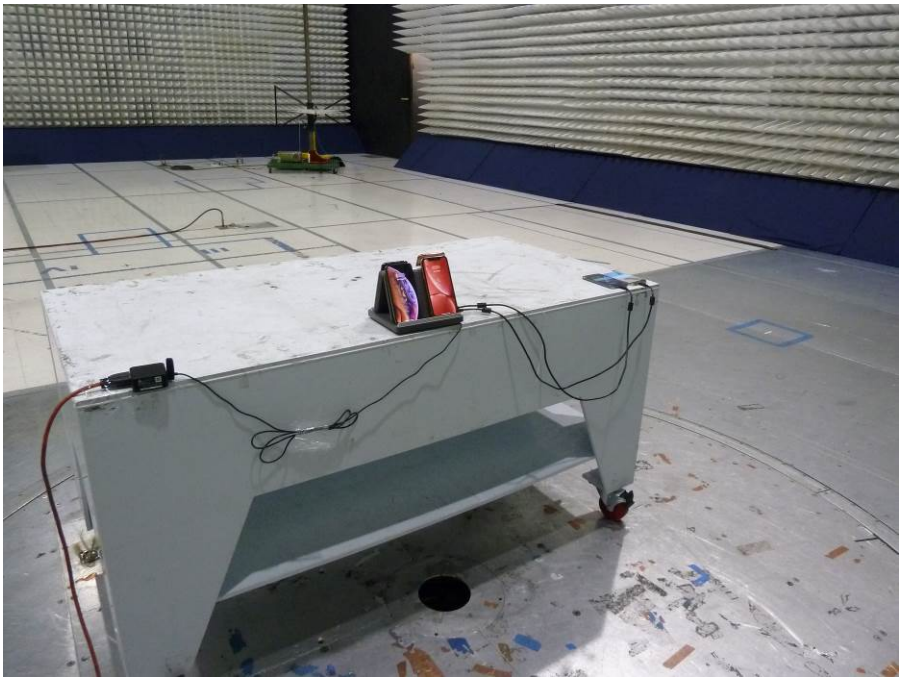
Results	Complies
Test date:	August 5, 2019

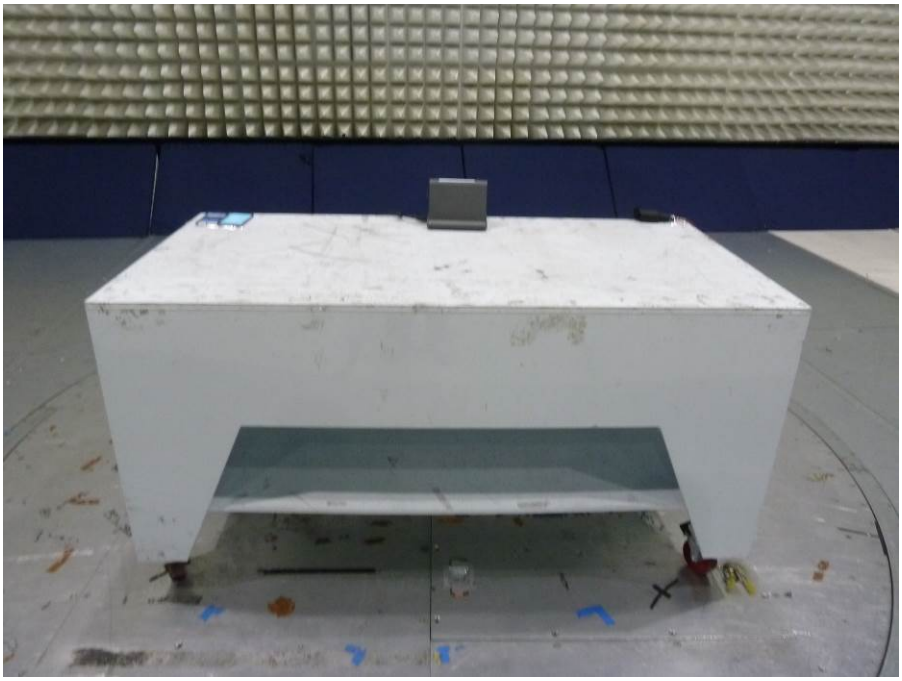
4.1.5 Test Configuration Photographs

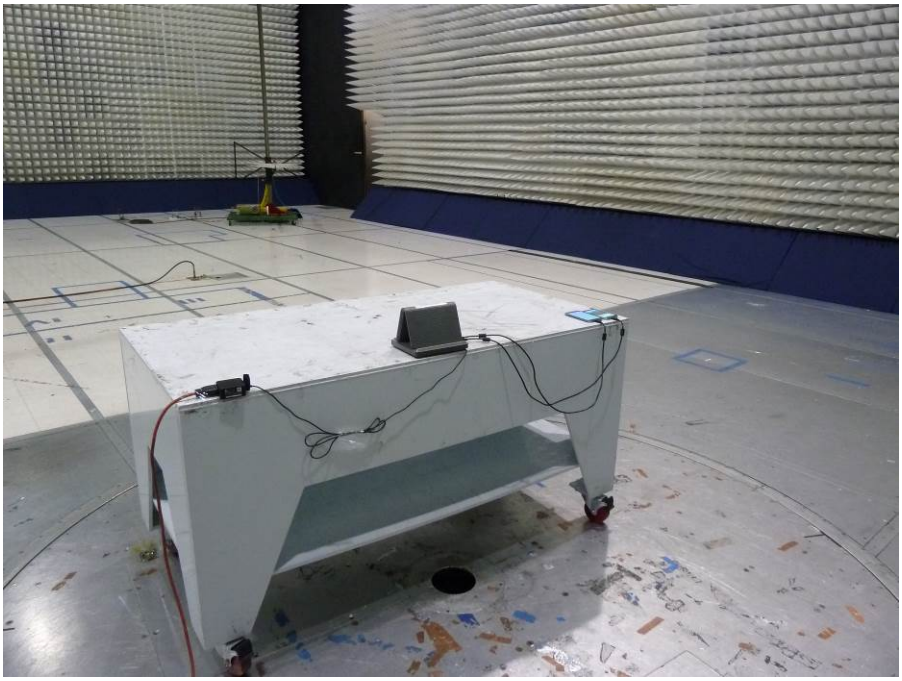
The following photographs show the testing configurations used.











4.3 Radiated Emissions on Digital Parts
FCC Ref: 15.109, ICES 003, RSS Gen

4.3.1 Test Limit

Limits for Electromagnetic Radiated Emissions FCC Section 15.109(b), ICES 003*, RSS GEN

Frequency (MHz)	**Class A at 10m dB(µV/m)**	**Class B at 3m dB(µV/m)**
30-88	39	40.0
88-216	43.5	43.5
216-960	46.4	46.0
Above 960	49.5	54.0

* According to FCC Part 15.109(g) an alternative to the radiated emission limits shown above, digital devices may be shown to comply with the limit of CISPR Pub. 22

4.3.2 Procedures

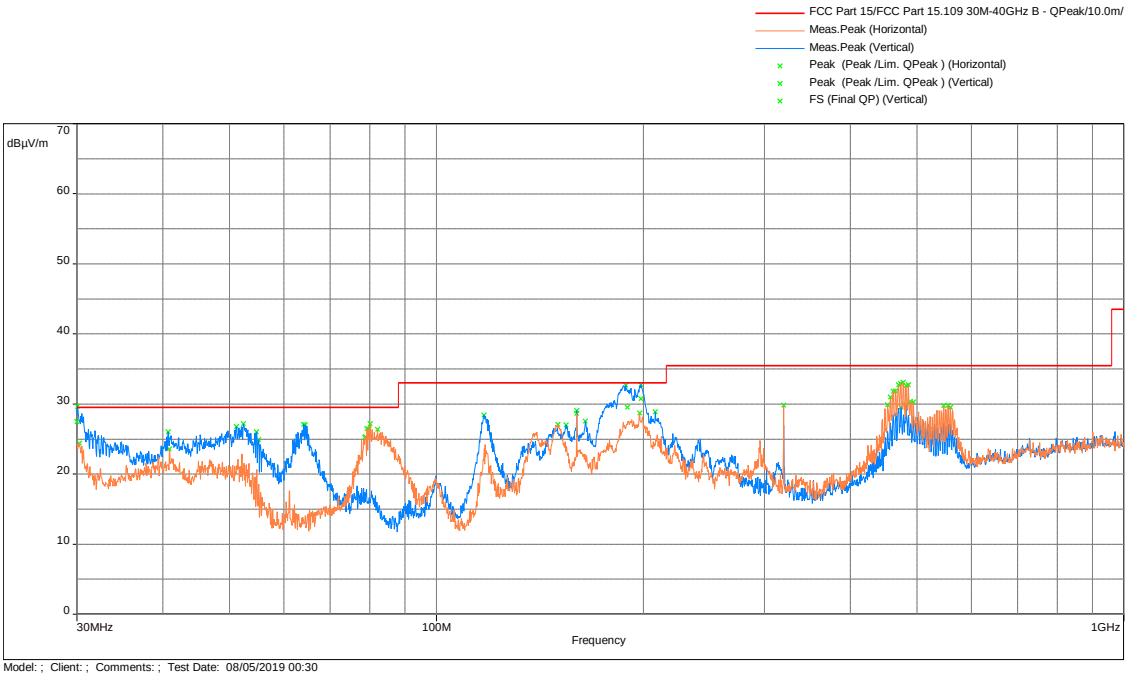
Radiated measurements were taken. 120 kHz resolution bandwidth was used from 30 MHz - 1 GHz. 1 MHz resolution bandwidth was used for measurements done above 1 GHz. All plots are corrected for cable loss, antenna factor, and preamp.

Radiated emission measurements were performed from 30 MHz to 1000 MHz. The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Measurements recorded in this section were made with the Transmitter in Tx mode.

4.3.3 Test Results

Radiated Spurious Emissions from 30 MHz to 1000 MHz

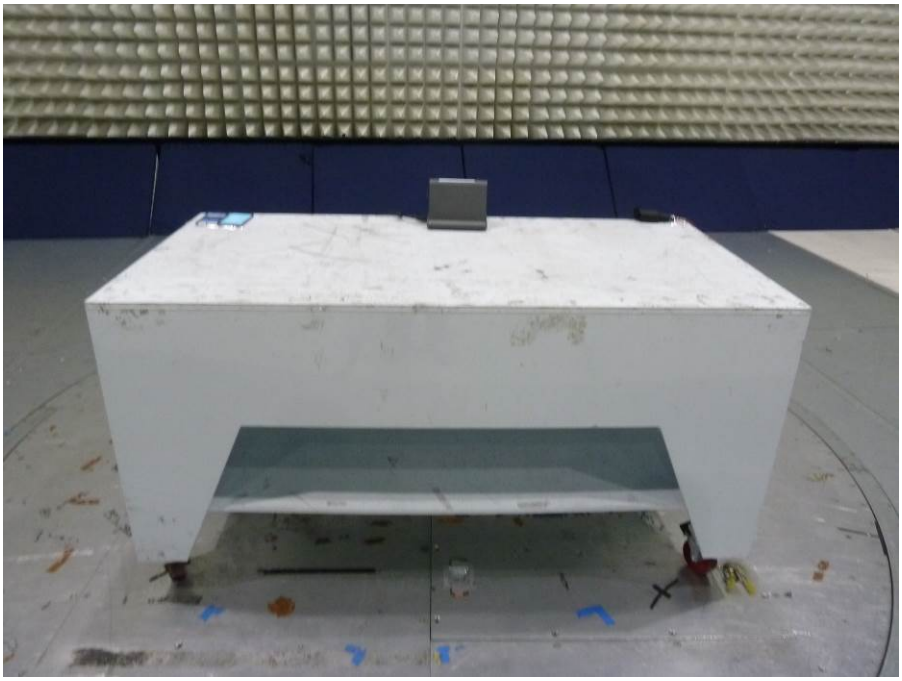


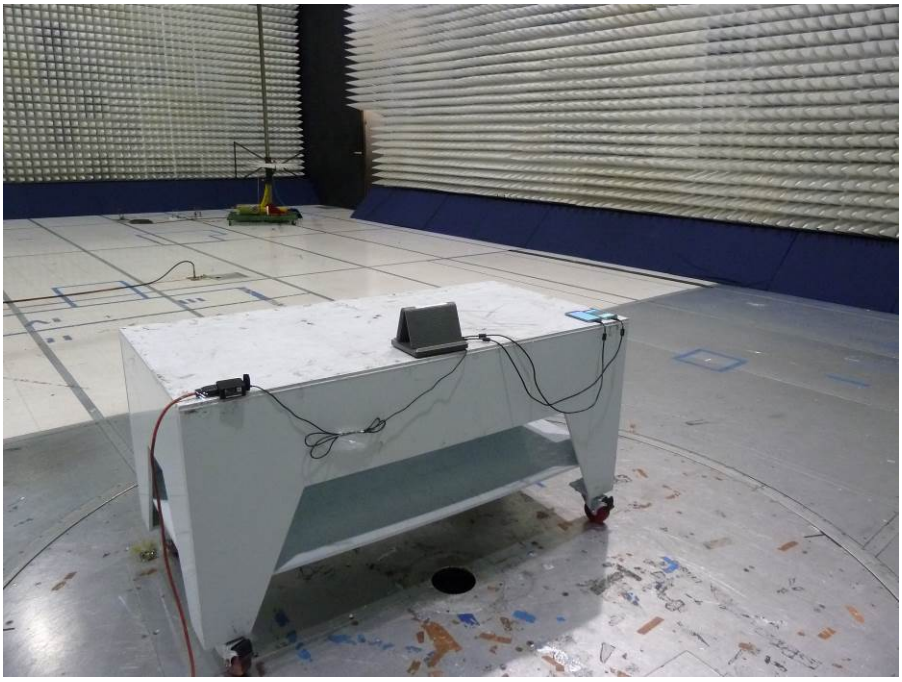
Freq (MHz)	FS dB(uV/m)	Limit dB(uV/m)	Margin (dB)	Azimuth (Deg)	Height (m)	Polarity	RA (dBuV)	Correction (dB)
30.000	27.5	29.5	-2.0	135.75	3.68	Vertical	34.21	-6.71
52.375	27.21	29.5	-2.29	80.75	2	Vertical	37.99	-10.78
64.112	27.07	29.5	-2.43	119.25	2	Vertical	43.56	-16.49
80.149	27.18	29.5	-2.32	197.25	3.98	Horizontal	45.54	-18.36
189.614	29.5	33	-3.5	336	1.76	Vertical	44.05	-14.55
198.261	30.75	33	-2.25	244.75	1.34	Vertical	45.05	-14.3

Results	**Complies** by 2.0 dB* for FCC Part 15 Subpart B and ICES-003

*Note: Measured result is below the specification limit by a margin less than the measurement uncertainty; it is not therefore possible to determine compliance at confidence level of 95%. However, the measured result indicates a higher probability that the product tested complies with the specification limit.

4.3.4 Test Configuration Photographs





Electromagnetic Radiated Disturbance Setup Photograph

4.4 AC Line Conducted Emission
FCC Rule 15.107/15.207

4.4.1 Requirement

Frequency Band MHz	Class B Limit dB(µV)		Class A Limit dB(µV)	
	Quasi-Peak	Average	Quasi-Peak	Average
0.15-0.50	66 to 56 *	56 to 46 *	79	66
0.50-5.00	56	46	73	60
5.00-30.00	60	50	73	60

*Note: *Decreases linearly with the logarithm of the frequency. At the transition frequency the lower limit applies.*

4.4.2 Procedure

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m but may be extended for larger EUT.

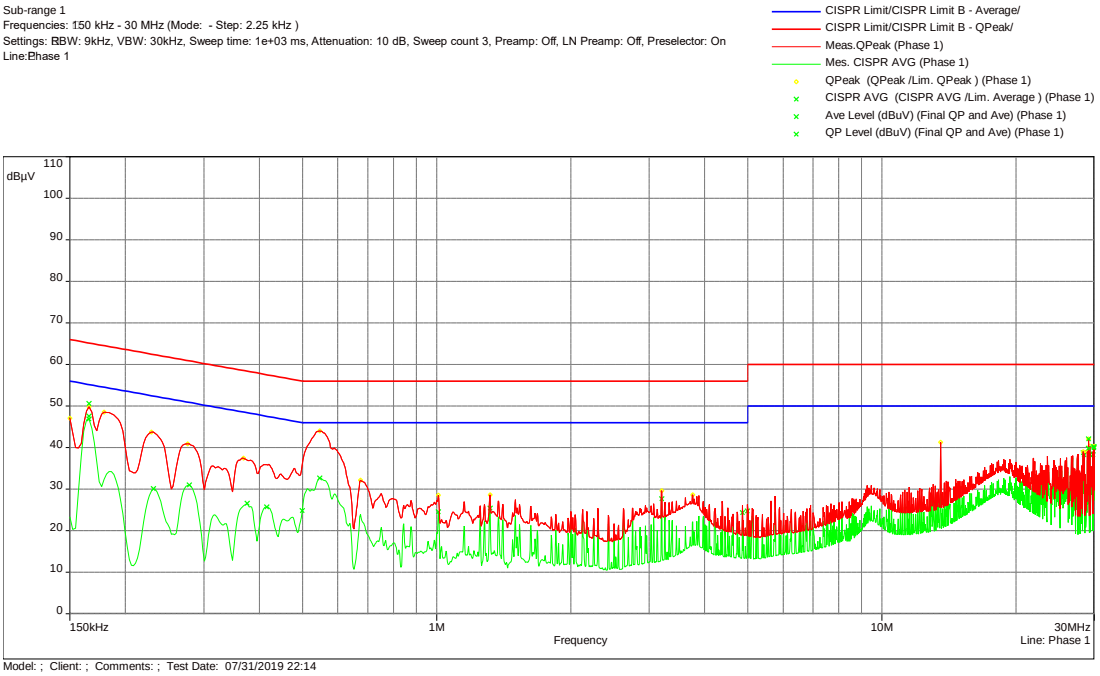
Floor standing EUT are placed on a horizontal metal ground plane and isolated from the ground plane by resting on an insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

EUT was placed in transmission mode then tested for conducted emissions per 15.207 and 15.107.

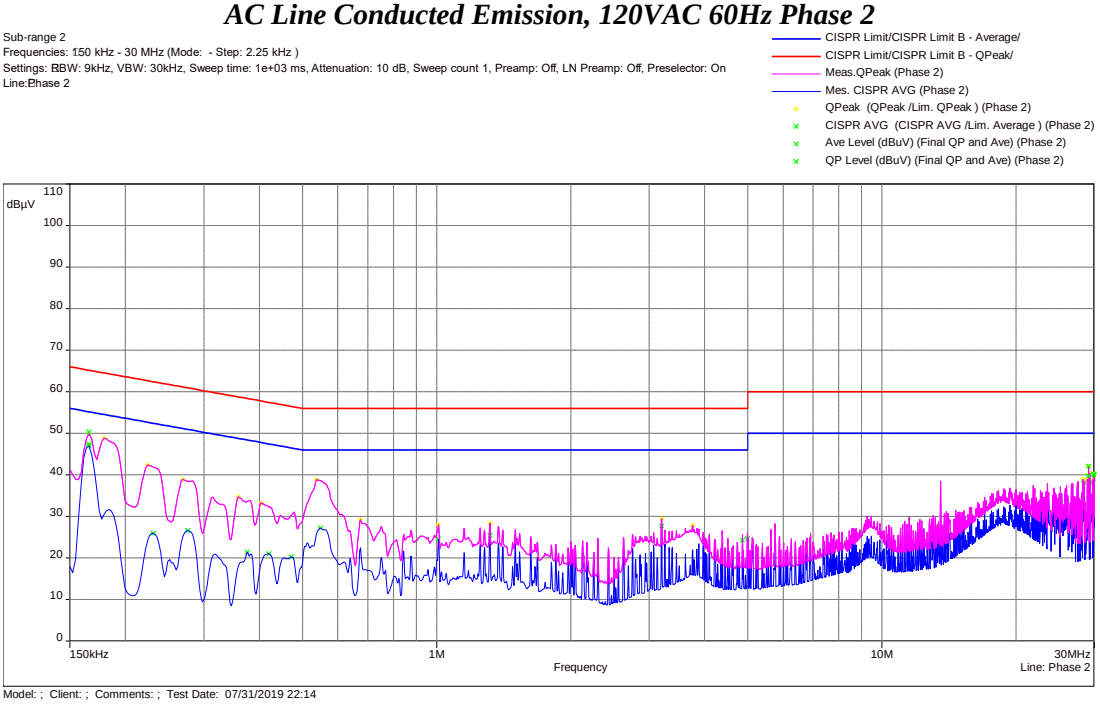
4.4.3 Test Result

EUT + 4 WPT Phones + 2 USB Phones

15.107 & 15.207 AC Line Conducted Emission, 120VAC 60Hz Phase 1



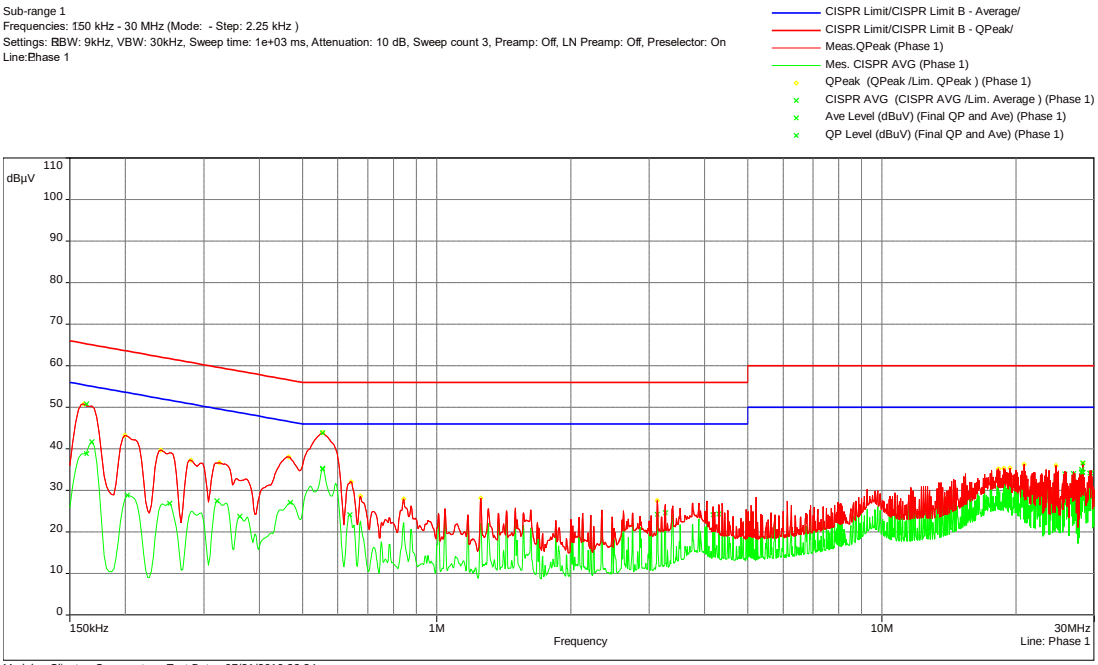
AC Line Conducted Emission, 120VAC 60Hz Phase 2



Frequency	Ave Level	QP Level	Ave Limit	QP Limit	Ave Margin	QP Margin	Line	Correction
MHz	dBµV	dBµV	dBµV	dBµV	dB	dB		dB
0.166	47.39	50.3	55.17	65.17	-7.78	-14.87	Phase 2	11.93
0.166	47.55	50.64	55.17	65.17	-7.62	-14.53	Phase 1	11.93
29.135	39.77	42.04	50	60	-10.23	-17.96	Phase 1	12.64
29.136	39.7	42.1	50	60	-10.3	-17.9	Phase 2	12.64
29.959	39.94	40.18	50	60	-10.06	-19.82	Phase 2	12.65
29.958	39.93	40.18	50	60	-10.07	-19.82	Phase 1	12.65

EUT + 3 WPT Phones + 2 USB Phones

15.107 & 15.207 AC Line Conducted Emission, 120VAC 60Hz Phase 1



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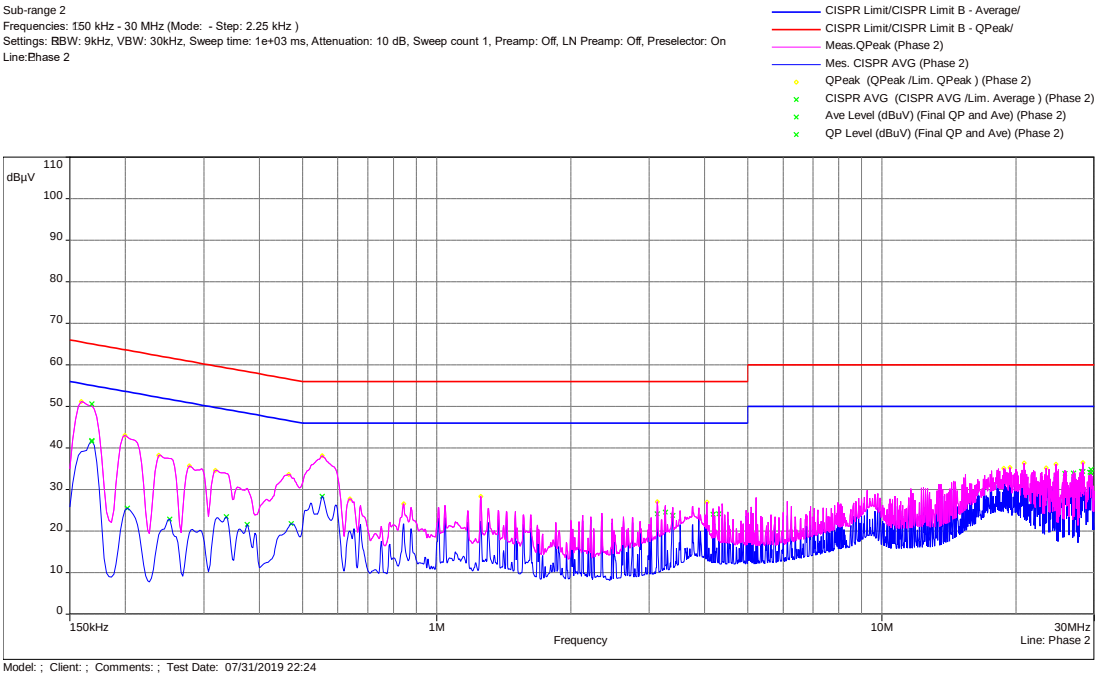
AC Line Conducted Emission, 120VAC 60Hz Phase 2

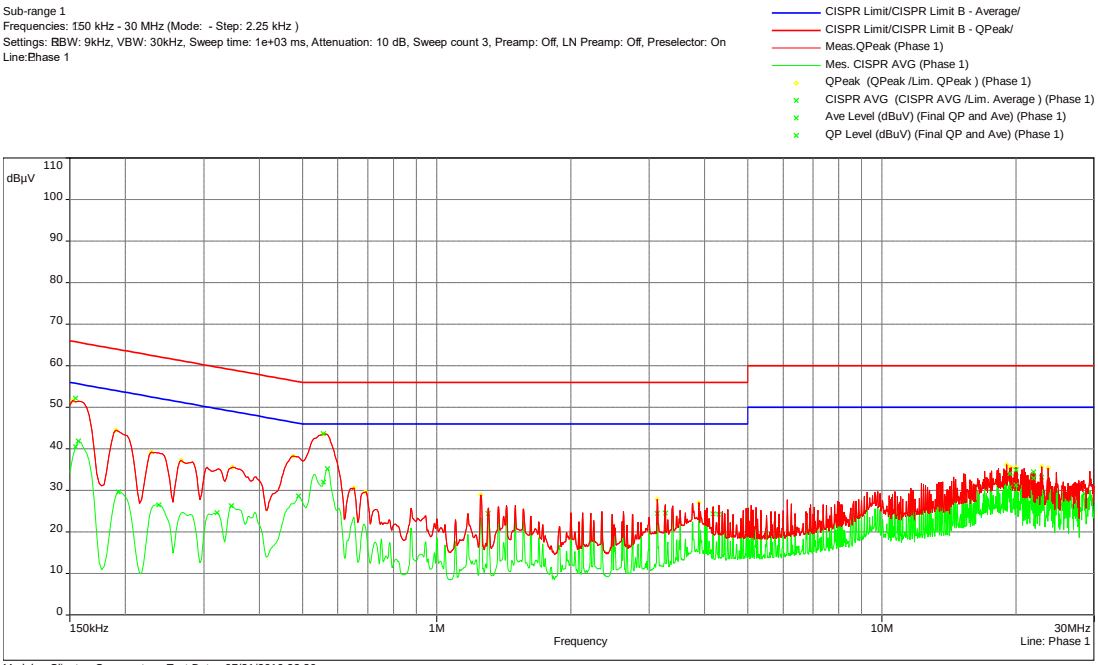


Model: ; Client: ; Comments: ; Test Date: 07/31/2019 22:24

Frequency	Ave Level	QP Level	Ave Limit	QP Limit	Ave Margin	QP Margin	Line	Correction
MHz	dBµV	dBµV	dBµV	dBµV	dB	dB		dB
0.163	38.82	50.75	55.28	65.28	-16.47	-14.53	Phase 1	11.93
0.167	41.62	50.59	55.06	65.06	-13.43	-14.46	Phase 2	11.93
0.554	35.07	43.88	46	56	-10.93	-12.12	Phase 1	11.96
28.126	34.39	34.97	50	60	-15.61	-25.03	Phase 1	12.62
28.295	34.35	36.6	50	60	-15.65	-23.4	Phase 1	12.63
29.473	34.02	34.77	50	60	-15.98	-25.23	Phase 2	12.65

EUT + 2 WPT Phones + 2 USB Phones

15.107 & 15.207 AC Line Conducted Emission, 120VAC 60Hz Phase 1



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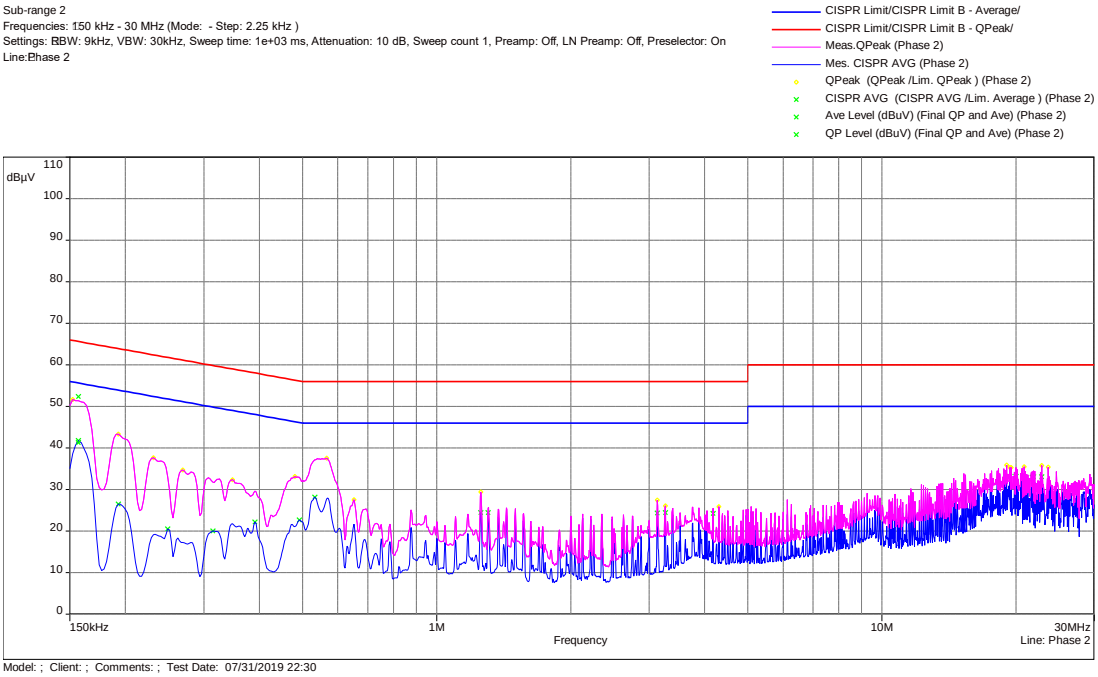
AC Line Conducted Emission, 120VAC 60Hz Phase 2

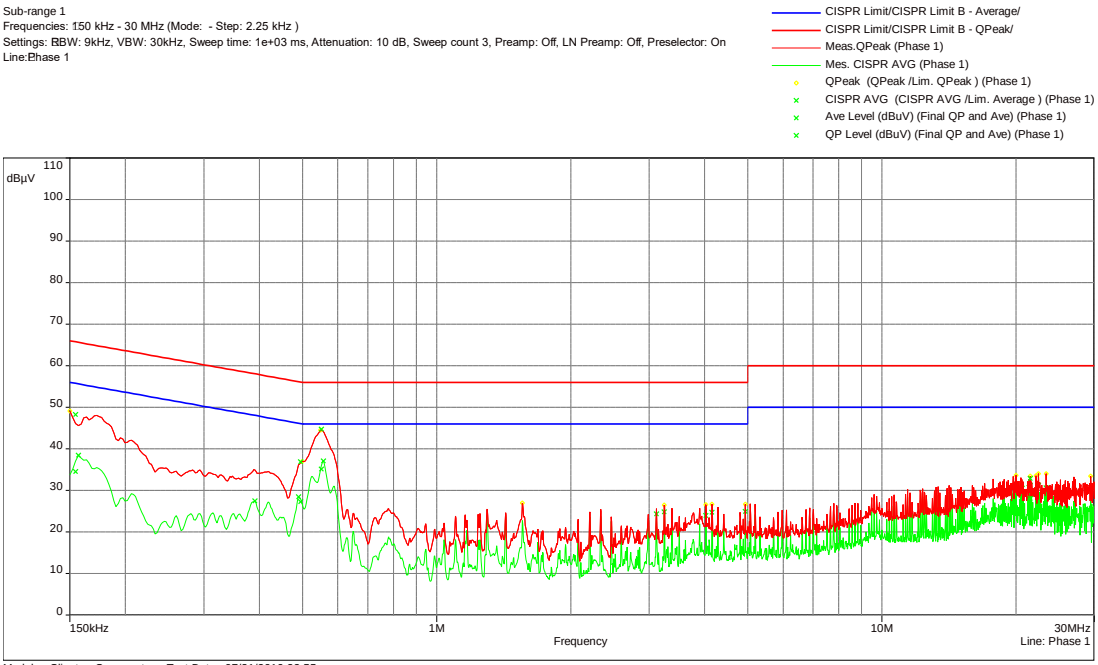


Model: ; Client: ; Comments: ; Test Date: 07/31/2019 22:30

Frequency	Ave Level	QP Level	Ave Limit	QP Limit	Ave Margin	QP Margin	Line	Correction
MHz	dBµV	dBµV	dBµV	dBµV	dB	dB		dB
0.155	40.54	52.19	55.75	65.75	-15.21	-13.57	Phase 1	11.92
0.156	41.27	52.32	55.63	65.63	-14.36	-13.32	Phase 2	11.92
0.558	31.99	43.63	46	56	-14.01	-12.37	Phase 1	11.96
19.408	30.7	34.05	50	60	-19.3	-25.95	Phase 1	12.49
20.034	31.26	34.87	50	60	-18.74	-25.13	Phase 1	12.51
21.924	32.94	34.39	50	60	-17.06	-25.61	Phase 1	12.52

EUT + 1 WPT Phone + 2 USB Phones

15.107 & 15.207 AC Line Conducted Emission, 120VAC 60Hz Phase 1



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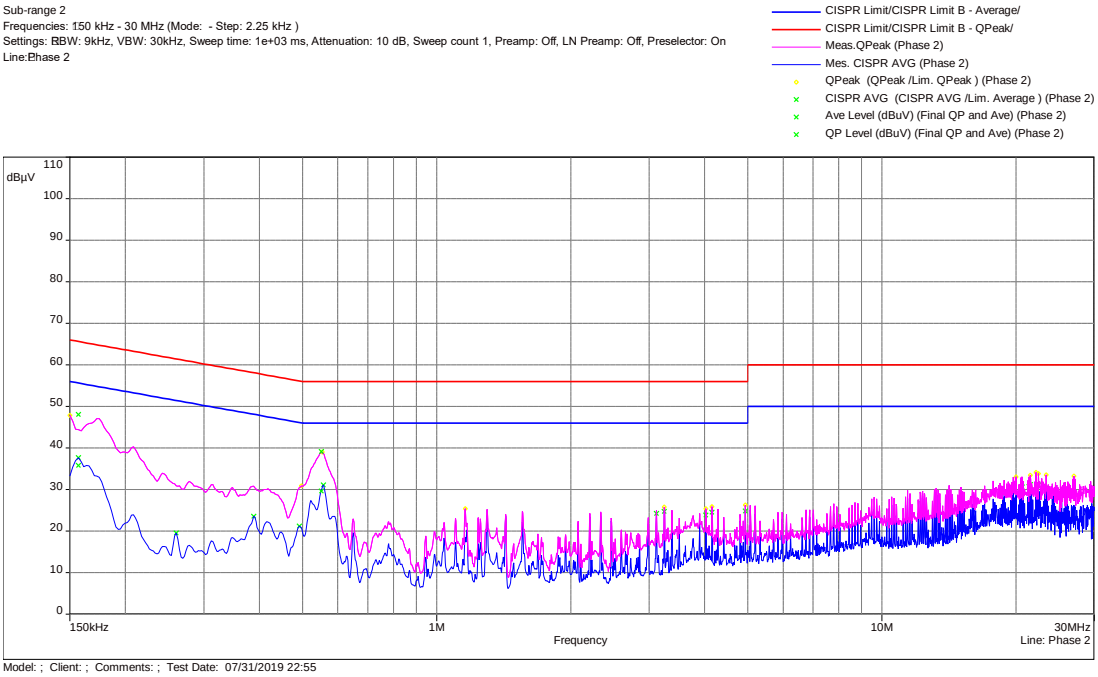
AC Line Conducted Emission, 120VAC 60Hz Phase 2

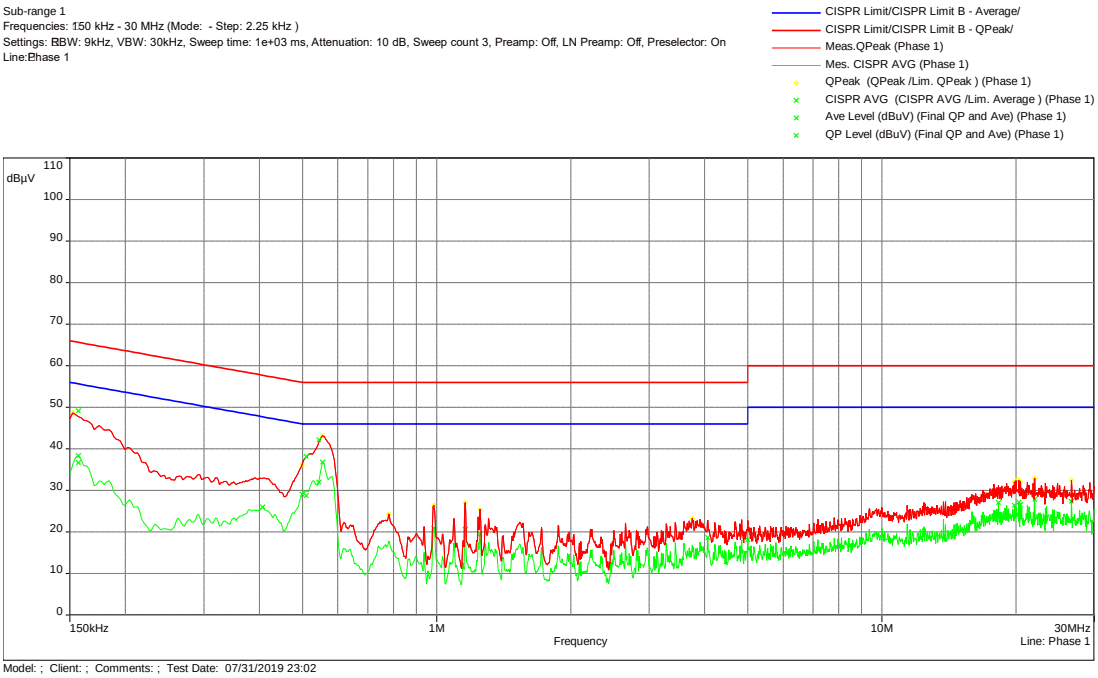


Model: ; Client: ; Comments: ; Test Date: 07/31/2019 22:55

Frequency	Ave Level	QP Level	Ave Limit	QP Limit	Ave Margin	QP Margin	Line	Correction
MHz	dBµV	dBµV	dBµV	dBµV	dB	dB		dB
0.154	34.48	48.26	55.75	65.75	-21.27	-17.5	Phase 1	11.92
0.157	35.8	48.03	55.63	65.63	-19.83	-17.61	Phase 2	11.92
0.494	27.27	36.9	46.1	56.1	-18.83	-19.2	Phase 1	11.97
0.551	29.59	39.16	46	56	-16.41	-16.84	Phase 2	11.96
0.550	35.06	44.67	46	56	-10.94	-11.33	Phase 1	11.96
21.562	28.08	32.9	50	60	-21.92	-27.1	Phase 1	12.51

EUT + 2 USB Phones

15.107 & 15.207 AC Line Conducted Emission, 120VAC 60Hz Phase 1



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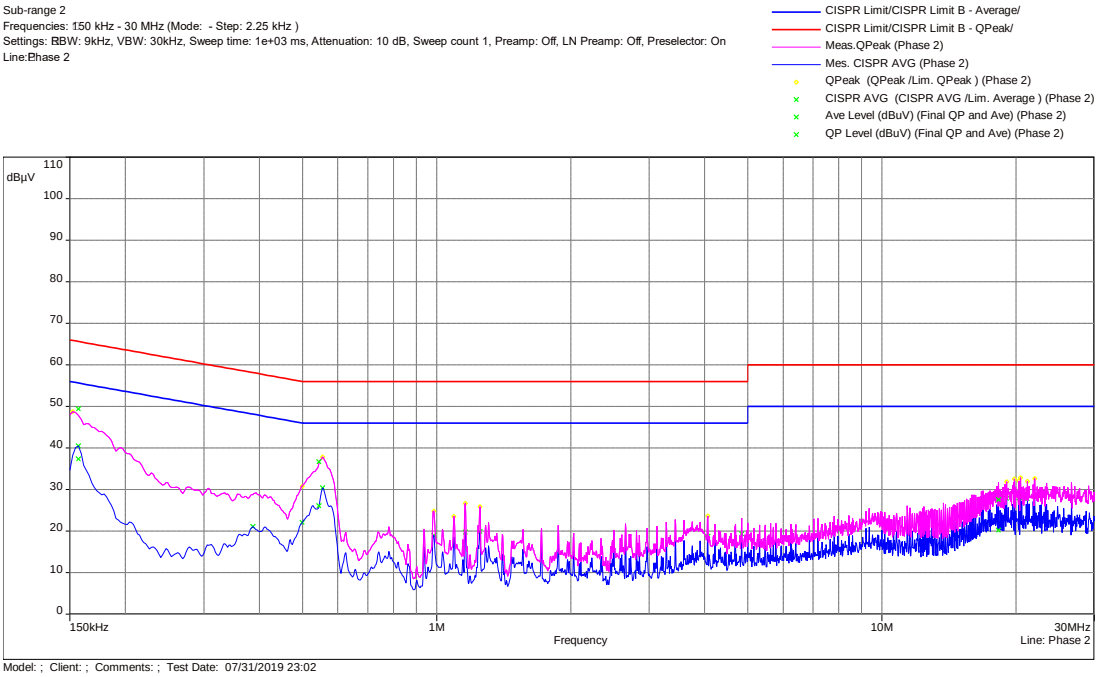
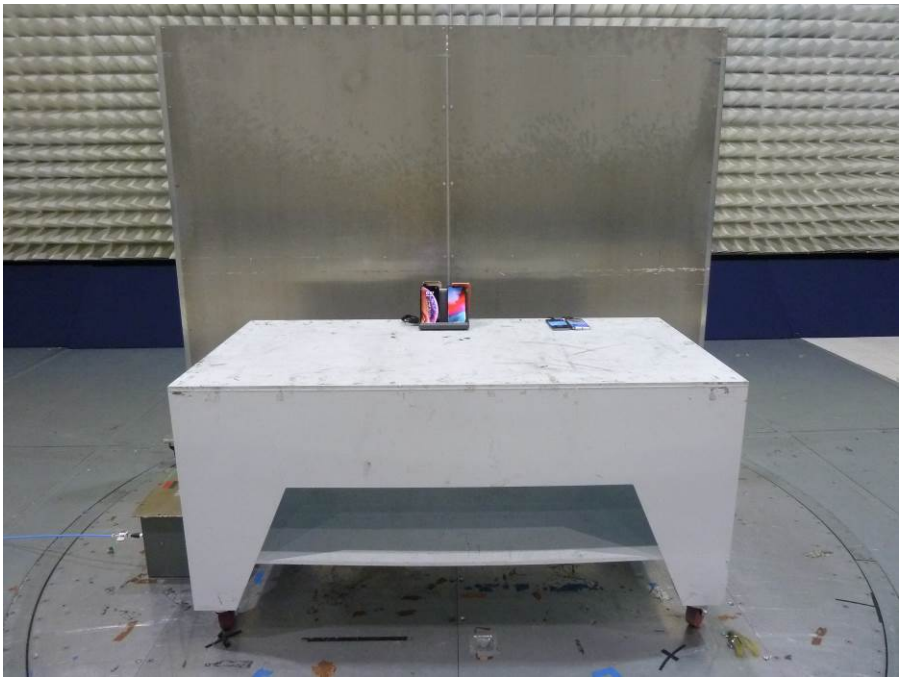
AC Line Conducted Emission, 120VAC 60Hz Phase 2



Model: ; Client: ; Comments: ; Test Date: 07/31/2019 23:02

Frequency	Ave Level	QP Level	Ave Limit	QP Limit	Ave Margin	QP Margin	Line	Correction
MHz	dBµV	dBµV	dBµV	dBµV	dB	dB		dB
0.158	37.31	49.41	55.63	65.63	-18.32	-16.23	Phase 2	11.92
0.156	36.66	49.1	55.63	65.63	-18.97	-16.53	Phase 1	11.92
0.509	28.69	38.13	46	56	-17.31	-17.87	Phase 1	11.97
0.545	26.04	36.7	46	56	-19.96	-19.3	Phase 2	11.96
0.545	32.01	42.17	46	56	-13.99	-13.83	Phase 1	11.96
18.275	20.18	27.53	50	60	-29.82	-32.47	Phase 2	12.48

4.4.4 Test Configuration Photographs



5.0 List of test equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Serial No.	Calibration Interval	Cal Due
EMI Receiver	Rohde and Schwarz	ESR	ITS 01607	12	10/24/19
BI-Log Antenna	Antenna Research	LPB-2513	ITS 00355	12	04/24/20
Pre-Amplifier	Sonoma Instrument	310	ITS 00942	12	03/15/20
Active Loop Antenna	Com-Power	AL-130R	ITS 01589	12	10/09/19
RF Cable	TRU Corporation	TRU CORE 300	ITS 01330	12	05/09/20
RF Cable	TRU Corporation	TRU CORE 300	ITS 00465	12	08/16/19
RF Cable	TRU Corporation	TRU CORE 300	ITS 01470	12	08/16/19
LISN	FISCHER CUSTOM COMMUNICATIONS	FCC-LISN-50-50-M-H	ITS 00551	12	10/04/19

Software used for emission compliance testing utilized the following:

Name	Manufacturer	Version	Template/Profile
BAT-EMC	Nexio	3.16.0.64	Pi 07-31-2019.bat

6.0 Document History

Revision/ Job Number	Writer Initials	Reviewer Initials	Date	Change
1.0 / G104034906	AC	KV	August 9, 2019	Original document

END OF REPORT