EMC TEST REPORT

Report Number: 102800561LAX-002
Project Number: G102800561

Report Issue Date: January 17, 2017

Model(s) Tested: 5505, 5512, 1114RCR, 5404R, 5314R
Model(s) Not Tested: 1114RCL, 5404L, 5314L

Standards: **FCC CFR47 Part 15 Subpart C, 2015**
Intentional Radiator
§15.247, Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ISED RSS-247 Issue 1, May 2015
Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Tested by:
Intertek
25791 Commercentre Drive
Lake Forest, CA 92630
USA

Client:
Orthofix, Inc.
3451 Plano Pkwy
Lewisville, TX 75056
USA

Report prepared by

Grace Lin
EMC Staff Engineer

Report reviewed by

Michael Spataro
Engineering Specialist

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1 Introduction and Conclusion

The tests included in this test report are to support Class II Permissive Change filings for Orthofix, Inc. FCC ID: 2AHVN-OFIC-5000-001 and IC: 21309-5000OFIX001. The equipment can be either in treatment mode (battery mode) or in charging mode, but not both. In the original filings, the Bluetooth radio was active in the treatment mode (battery mode) only, not in the charging mode. With the updated firmware, Bluetooth radio is active in the charging mode. There was no modification made on the radio. The device/equipment is not a wireless power transfer device. Output power, AC power line conducted emissions, and transmitter radiated spurious emission tests were performed to support the change.

The tests indicated in Section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested comply with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
-	6 dB Bandwidth (FCC §15.247(a)(2), IC RSS-247§5.2(1))	N/A*
-	Occupied Bandwidth (IC RSS-Gen Issue 4 §6.6)	N/A*
6	Maximum Peak Conducted Output Power at Antenna Terminals (FCC §15.247(b)(3), IC RSS-247§5.4(4))	Compliant
-	Maximum Power Spectral Density (FCC §15.247(e), IC RSS-247§5.2(2))	N/A*
-	Out of Band Conducted Emissions (FCC §15.247(d), IC RSS-247§5.5)	N/A*
7	AC Mains Conducted Emissions (FCC §15.207; IC RSS-Gen Issue 4 §8.8)	Compliant
8	Transmitter Radiated Spurious Emissions ((FCC §15.247(d), §15.209, §15.205; RSS-247§5.5)	Compliant

*: This test was not applicable as the change does not affect this parameter

3 Client Information

This EUT was tested at the request of:

Client: Orthofix, Inc.
3451 Plano Pkwy
Lewisville, TX 75056
USA

Contact: Daniela Behzad
Telephone: (214) 937-2000
Fax:
Email: denielabehzad@orthofix.com

4 Description of Equipment Under Test and Variant Models

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
PEMF Simulator	Orthofix, Inc.	5505	Unit #1
PEMF Simulator	Orthofix, Inc.	5212	Unit #1
PEMF Simulator	Orthofix, Inc.	1114RCR, 5404R, 5314R	Unit #2
AC Adapter (EUT)	Orthofix, Inc.	20110412	Not Labeled

Receive Date:	1/05/2017	Test Started:	1/10/2017
Received Condition:	Good	Test Completed:	2/17/2017
Type:	Production		

Description of Equipment Under Test (provided by the manufacturer)

The devices under test are Orthofix PEMF simulators containing Bluetooth Low Energy radio and operating at 2.4 GHz. Models 5505 and 5212 were listed in the original filings.

Model 1114RCR is identical to 5404R. Model 5314R is the same as 1114RCR/5404R except its treatment duration is 1.5 hours versus 3 hours for the 1114RCR/5404R. For 1114RCR/5404R/5314R, “R” refers to the version to be worn on the right shoulder. For 1114RCL/5404L/5314L (models not tested), “L” refers to the version to be worn on the left shoulder.

All of the models use the same control module (the black plastic enclosure with the LCD) that contains the same PCA and antenna. The only difference between the different models is the garment/ treatment coil size and shape and where the model is placed on a human body. Battery consumption, peak treatment coil current, number of treatment pulses, and treatment duration can also be different between the different models.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
100Vac – 240 Vac	1.3 A	50-60 Hz	1

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Test Mode – Continuously Transmitting (for output measurement)
2	Normal Operation (for AC Mains conducted emission measurement)

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	Under test mode, the EUT was programmed to transmit continuously during testing.
2	Under normal operation, the EUT was programmed to operate as an end user would normally use.

Radio/Receiver Characteristics	
Frequency Band(s)	2402-2480 MHz
Modulation Type(s)	GFSK / 1 Mbit/s
Maximum Output Power	-8.56 dBm (0.139 mW)
Test Channels	2402 MHz, 2442 MHz, 2480 MHz
Equipment Type	Standalone
Antenna Type and Gain	PCB Antenna, -3.86 dBi

5 System Setup and Method

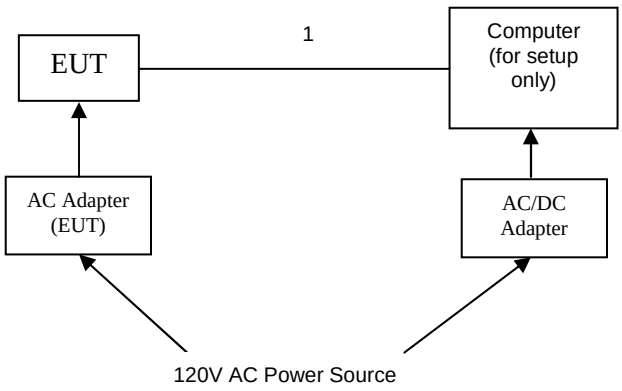
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
1	USB	2.8	Yes	Yes	Yes

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Computer	DELL	PP18L	19579442553
AC Adapter	DELL	DA90PS0-00	CN-0XD757-48661-6CG-N67W

5.1 Method:

Configuration as required by ANSI C63.10-2013.

5.2 EUT Block Diagram:



6 Maximum Peak Conducted Output Power at Antenna Terminals

6.1 Requirement(s)

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt or 30 dBm.
For antennas with gains greater than 6 dBi, transmitter output level must be decreased appropriately, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.2 Method

The procedure described in FCC Publication 558074 D01 DTS Meas Guidance v03r05 April 8, 2016 was used. Specifically, section 9.1.1 RBW ≥ DTS bandwidth was utilized as the spectrum analyzer's resolution bandwidth was greater than the DTS bandwidth.

1. Set the RBW ≥ DTS Bandwidth
2. Set the VBW ≥ 3 x RBW
3. Set the span ≥ 3 x RBW
4. Sweep time = auto couple
5. Detector = Peak
6. Trace mode = max Hold
7. Allow trace to fully stabilize
8. Use peak marker function to determine the peak amplitude level.

TEST SITE:

The test is performed in the 3 meter semi-anechoic chamber located at 25791 Commercentre Drive, Lake Forest, California 92630 USA. This test facility meets the requirements of CISPR 16-1-4 and has been accredited by A2LA. IC test site registration number is 2042T.

6.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
637	3m Semi-anechoic Chamber	Panashield	3 meter	25 331-D-Z	August 2015	August 2018
1140	EMI Test Receiver	R&S	ESCI7	100825	2/22/2016	2/22/2017
1001	Barometer/ Humidity	Omega	iBTHX-W	0440775	4/22/2016	4/22/2017

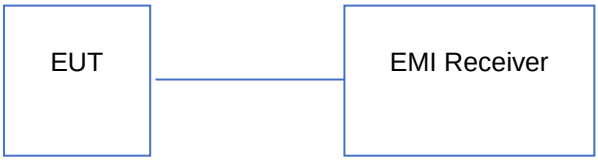
Software Utilized:

Name	Manufacturer	Version	Profile
N/A	N/A	N/A	N/A

6.4 Results:

The sample tested was found to comply.

6.5 Setup Diagram:



6.6 Plots/Data:

Model	Frequency (MHz)	Power Setting	Peak Conducted Power (dBm)		Peak Conducted Power (mW)	
			Battery Mode	Charging Mode	Battery Mode	Charging Mode
5505	2402	2	-8.99	-8.99	0.126	0.126
	2440	2	-8.56	-8.56	0.139	0.139
	2480	2	-9.29	-9.29	0.118	0.118
5512	2402	2	-10.49	-10.49	0.089	0.089
	2440	2	-9.35	-9.35	0.116	0.116
	2480	2	-9.07	-9.07	0.124	0.124
1114RCR 5404R 5314R	2402	2	-10.92	-10.92	0.081	0.081
	2440	2	-9.81	-9.81	0.104	0.104
	2480	2	-9.41	-9.41	0.115	0.115

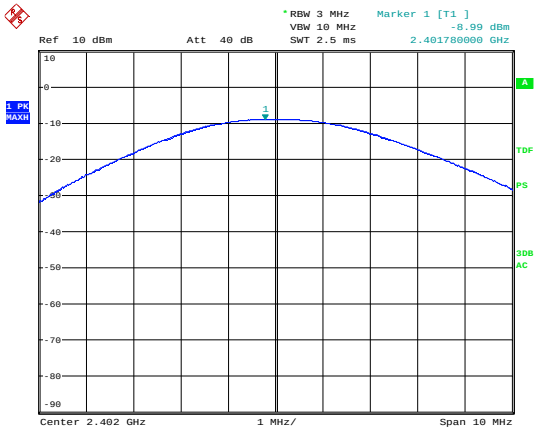
Note: The insertion loss was compensated for in the receiver.

Deviations, Additions, or Exclusions: None

Test Personnel:	Grace Lin	Test Date:	1/16/2017
Product Standard:	FCC 15.247, IC RSS-247	Limit Applied:	FCC 15.247, IC RSS-247
Input Voltage:	120 Vac, 60 Hz		
Pretest Verification w/ Ambient Signals or		Ambient Temperature:	21.1 ºC
		Relative Humidity:	43.7 %
BB Source:	N/A		
		Atmospheric Pressure:	992.2 mbars

Power, Model: 5505

Battery Mode, 2402 MHz



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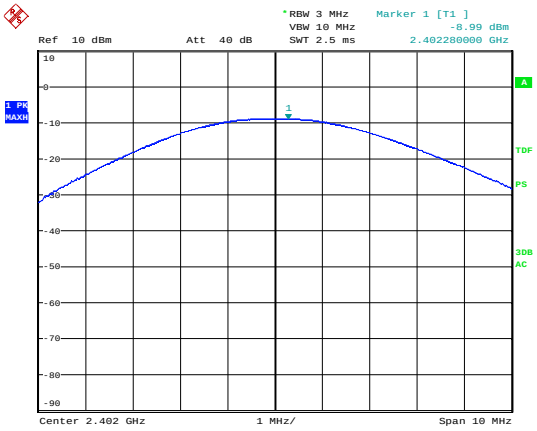
Charging Mode, 2402 MHz



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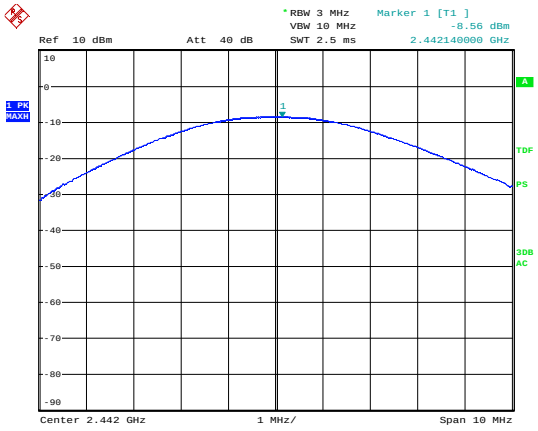
Battery Mode, 2442 MHz



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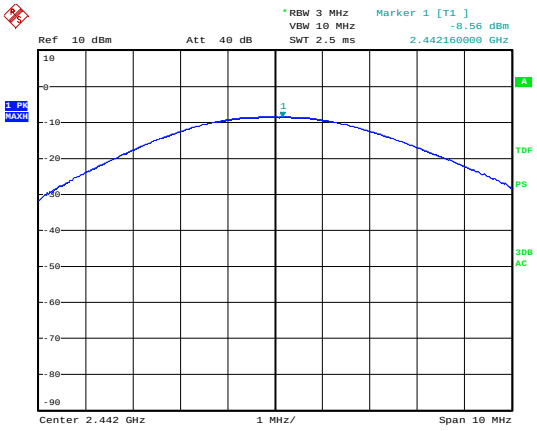
Charging Mode, 2442 MHz



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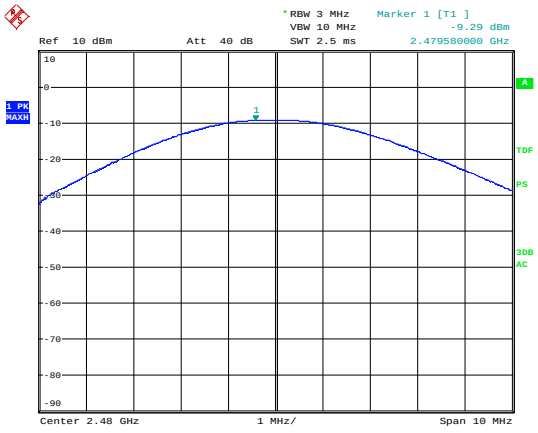
Battery Mode, 2480 MHz



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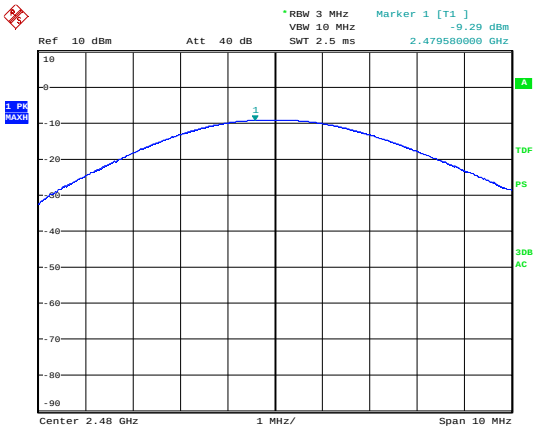
Charging Mode, 2480 MHz



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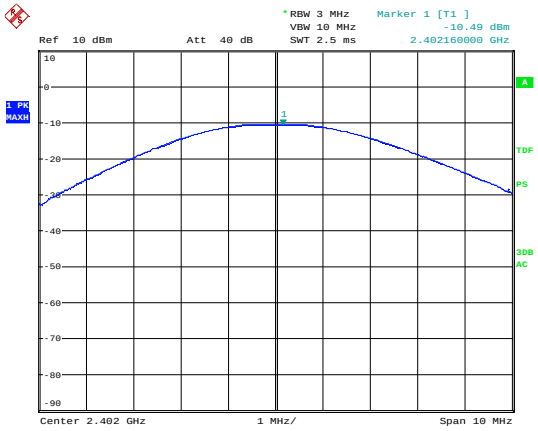
Power, Model: 5212

Battery Mode, 2402 MHz



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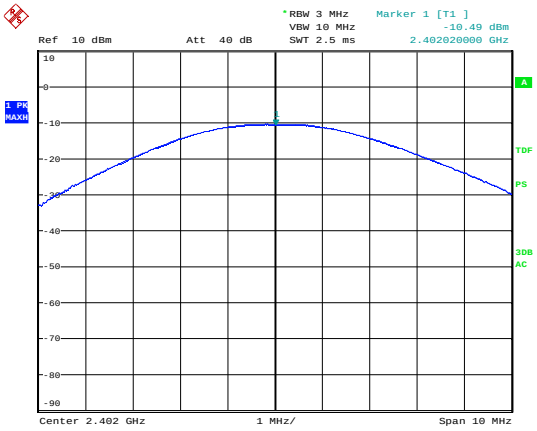
Charging Mode, 2402 MHz



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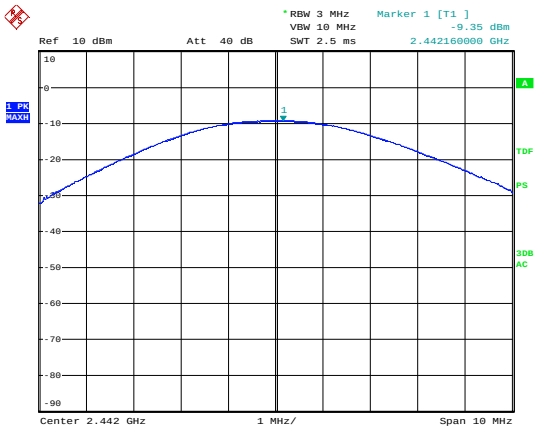
Battery Mode, 2442 MHz



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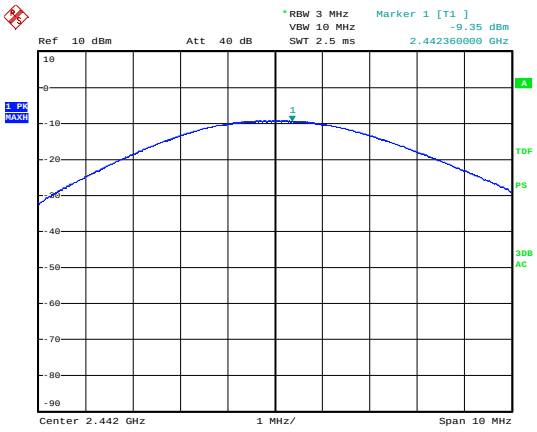
Charging Mode, 2442 MHz



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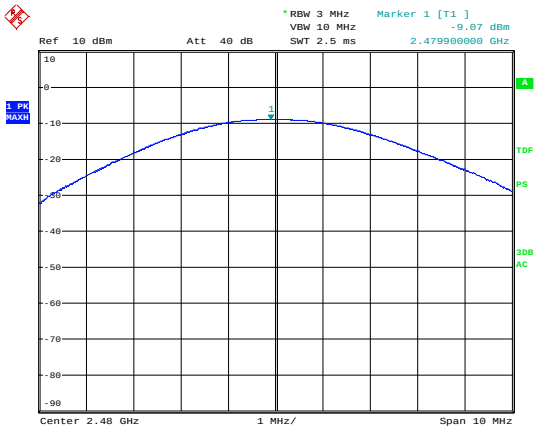
Battery Mode, 2480 MHz



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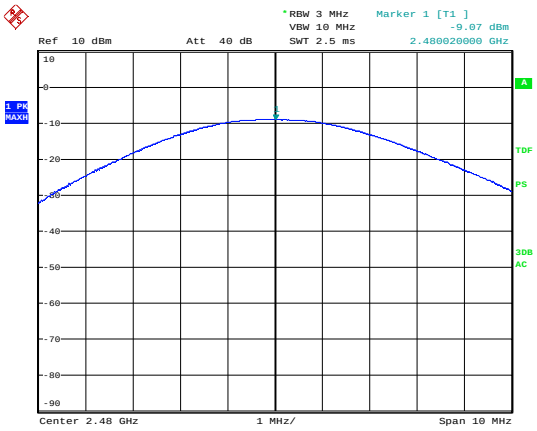
Charging Mode, 2480 MHz



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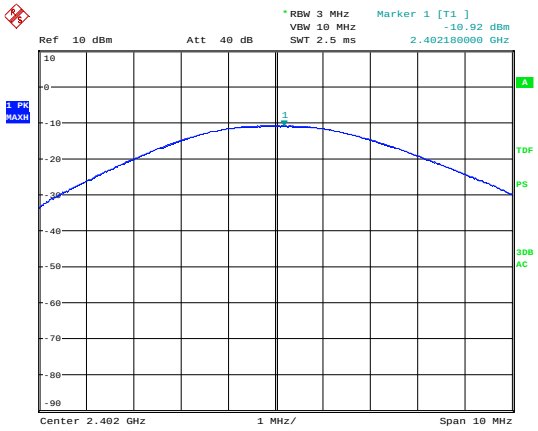
Power, Model: 1114RCR/5404R/5314R

Battery Mode, 2402 MHz



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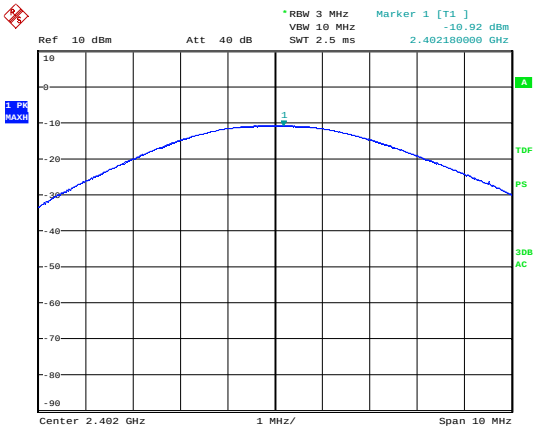
Charging Mode, 2402 MHz



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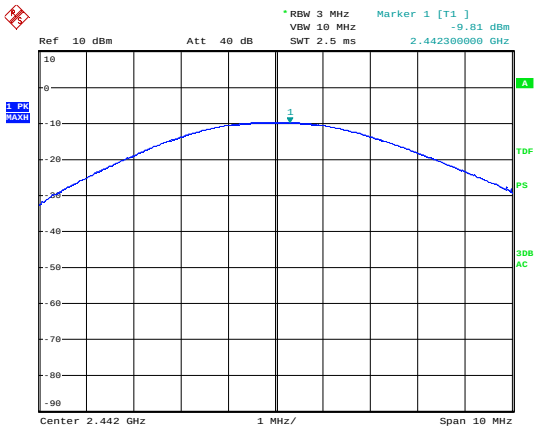
Battery Mode, 2442 MHz



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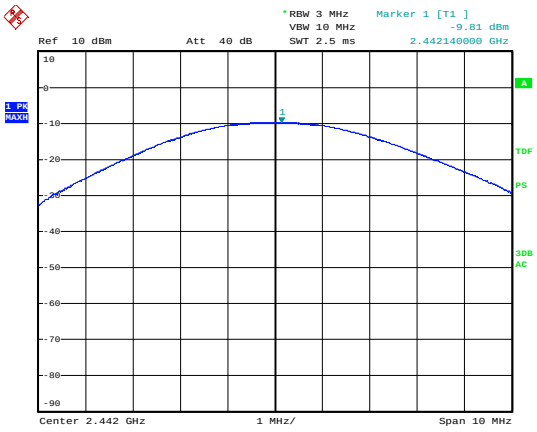
Charging Mode, 2442 MHz



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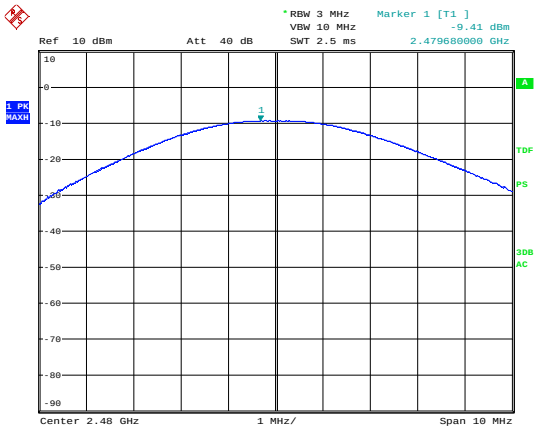
Battery Mode, 2480 MHz



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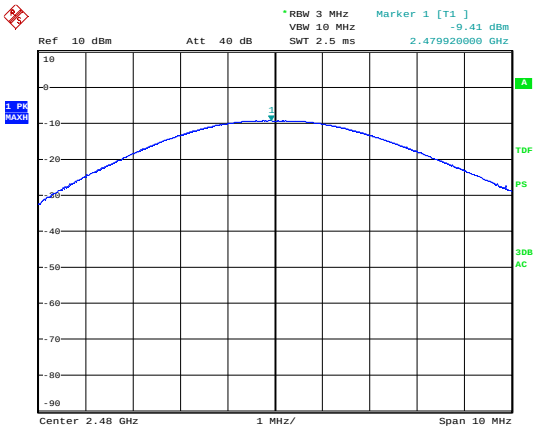
Charging Mode, 2480 MHz



Date: 16.JAN.2017 11:12:31

7 AC Mains Conducted Emissions

7.1 Performance Criterion

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.

7.2 Method

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.

Equipment setup for conducted disturbance tests followed the guidelines of ANSI C63.4.

Testing was performed on the 5505, 5212, and 1114RCR/5404R/5314R.

TEST SITE:

The test is performed in the 3 meter semi-anechoic chamber located at 25791 Commercentre Drive, Lake Forest, California 92630 USA. This test facility meets the requirements of CISPR 16-1-4 and has been accredited by A2LA. IC test site registration number is 2042T.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
AC Line Conducted Emissions	150 kHz - 30 MHz	2.1 dB	3.4dB
Telco Port Emissions	150 kHz - 30 MHz	2.6 dB	5.0dB

As shown in the table above our conducted emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required.

Sample Calculations

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBµV
RF = Reading from receiver in dBµV
LF = LISN or ISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBµV to µV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in µV
NF = Net Reading in dBµV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBµV
$UF = 10^{(49.1\ dB\mu V / 20)}$ = 285.1 µV/m

7.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
637	3m Semi-anechoic Chamber	Panashield	3 meter	25 331-D-Z	12/21/2015	12/21/2018
1140	EMI Test Receiver	R&S	ESCI7	100825	2/22/2016	2/22/2017
666	LISN	Teseq	NNB 51	36058	8/26/2016	8/26/2016
1470	Cable	MegaPhase	TM18-N1N1-600	-	6/15/2016	6/15/2017
1001	Barometer/ Humidity	Omega	iBTHX-W	0440775	4/22/2016	4/22/2017

Software Utilized:

Name	Manufacturer	Version	Profile
Tile	Quantum Change	4.1	Master CE FCC

7.4 Results:

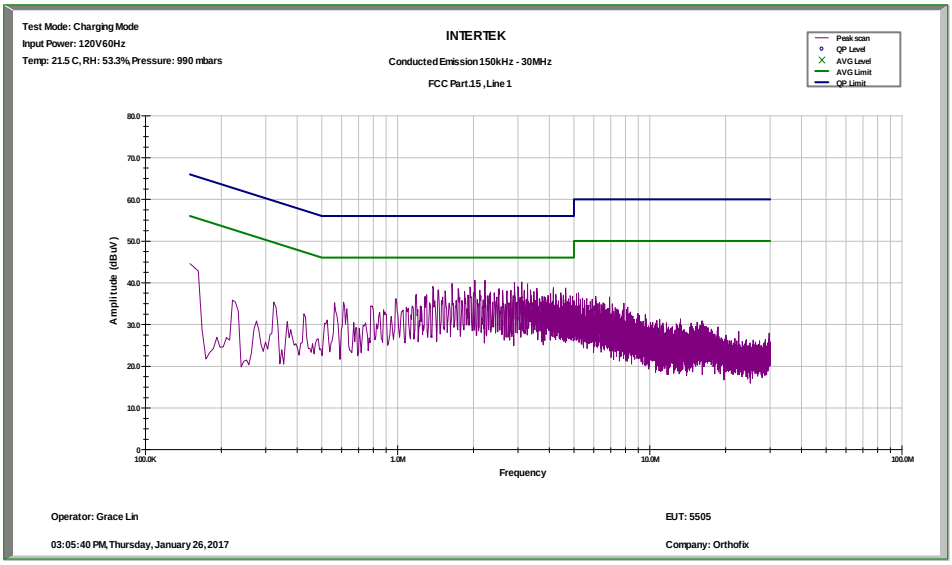
The sample tested was found to Comply.

7.5 Setup Diagram:

7.6 Plots/Data:

Model: 5505

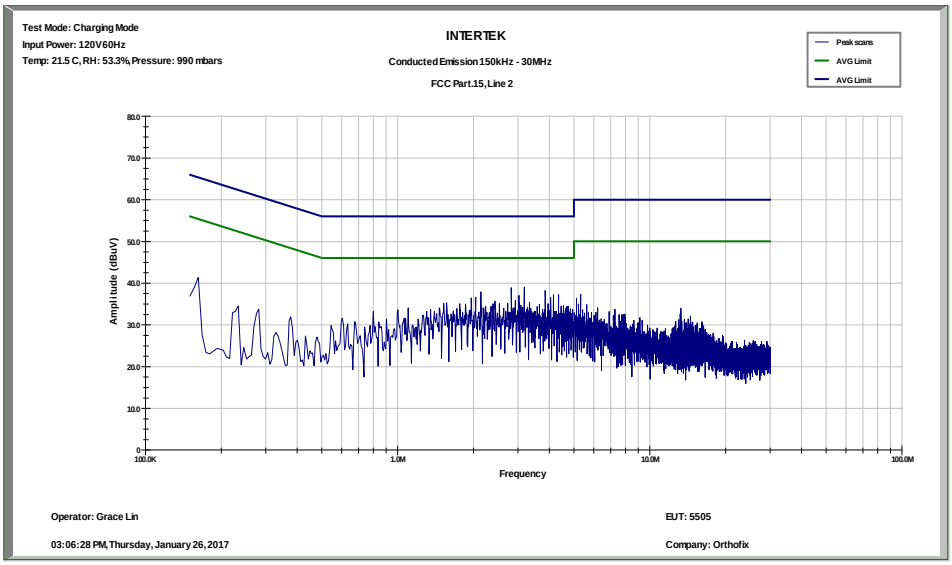
Line 1:



Frequency	AVG Level	QP Level	AVG Limit	QP Limit	AVG Margin	QP Margin
MHz	dBuV	dBuV	dBuV	dBuV	dB	dB
0.152	20.1	29.9	56.0	66.0	-35.9	-36.0
0.565	24.6	29.7	46.0	56.0	-21.4	-26.3
0.613	22.9	28.4	46.0	56.0	-23.1	-27.6
0.979	21.3	27.2	46.0	56.0	-24.7	-28.8
1.627	22.0	27.9	46.0	56.0	-24.0	-28.1
2.008	23.7	29.1	46.0	56.0	-22.3	-26.9
2.204	24.1	29.7	46.0	56.0	-21.9	-26.3
3.097	23.2	29.2	46.0	56.0	-22.8	-26.8
4.662	20.7	26.8	46.0	56.0	-25.3	-29.2

Model: 5505

Line 2:

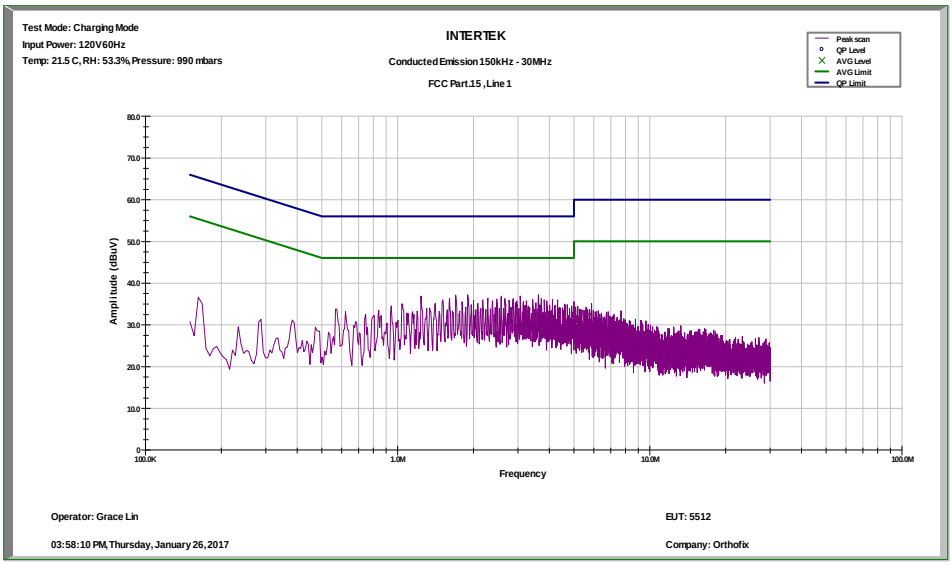


Frequency	AVG Level	QP Level	AVG Limit	QP Limit	AVG Margin	QP Margin
MHz	dBuV	dBuV	dBuV	dBuV	dB	dB
0.154	19.3	30.2	55.9	65.9	-36.6	-35.7
0.162	22.6	34.2	55.7	65.7	-33.1	-31.4
0.284	14.5	24.3	52.2	62.2	-37.7	-37.9
1.101	22.0	28.0	46.0	56.0	-24.0	-28.0
2.129	23.5	29.8	46.0	56.0	-22.5	-26.2
3.178	23.4	29.7	46.0	56.0	-22.6	-26.3
3.879	22.9	29.1	46.0	56.0	-23.1	-26.9
4.330	22.3	28.5	46.0	56.0	-23.7	-27.5
5.295	21.3	27.0	50.0	60.0	-28.7	-33.0

Test Personnel:	Grace Lin	Test Date:	1/26/2017
		Limit Applied:	FCC §15.207;
Product Standard:	FCC 15C, RSS-247		ISED RSS-Gen Issue 4 §8.8
Input Voltage:	120 Vac, 60 Hz	Ambient Temperature:	21.5 ºC
Pretest Verification w/ Ambient Signals or		Relative Humidity:	53.3 %
BB Source:	Yes	Atmospheric Pressure:	990 mbars

Model: 5212

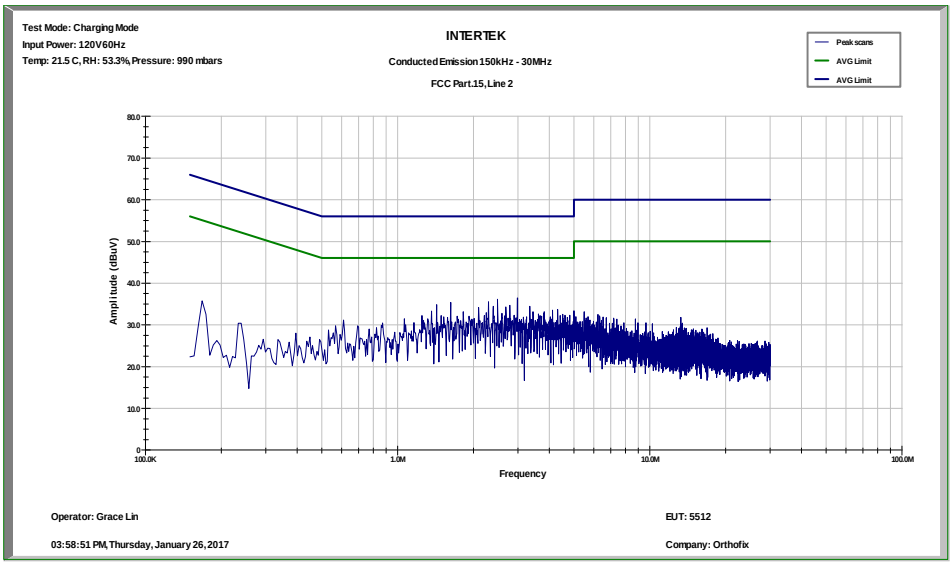
Line 1:



Frequency	AVG Level	QP Level	AVG Limit	QP Limit	AVG Margin	QP Margin
MHz	dBuV	dBuV	dBuV	dBuV	dB	dB
0.164	19.1	29.3	55.6	65.6	-36.6	-36.3
0.568	23.4	27.3	46.0	56.0	-22.6	-28.7
0.621	22.4	26.2	46.0	56.0	-23.7	-29.8
1.514	22.4	27.1	46.0	56.0	-23.6	-28.9
1.688	21.3	26.4	46.0	56.0	-24.7	-29.6
2.257	21.8	26.6	46.0	56.0	-24.2	-29.4
3.068	20.7	26.4	46.0	56.0	-25.3	-29.6
3.594	21.2	26.3	46.0	56.0	-24.8	-29.7
4.976	19.3	24.8	46.0	56.0	-26.7	-31.2

Model: 5212

Line 2:

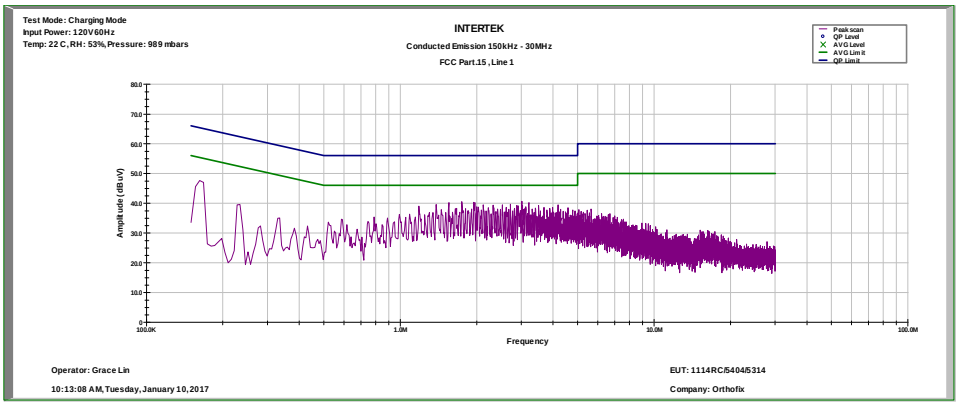


Frequency	AVG Level	QP Level	AVG Limit	QP Limit	AVG Margin	QP Margin
MHz	dBuV	dBuV	dBuV	dBuV	dB	dB
0.170	17.5	30.5	55.4	65.4	-38.0	-35.0
0.612	22.4	26.9	46.0	56.0	-23.6	-29.1
1.059	20.9	25.4	46.0	56.0	-25.1	-30.6
1.361	20.6	25.7	46.0	56.0	-25.4	-30.3
1.614	20.7	25.4	46.0	56.0	-25.3	-30.6
2.273	22.3	27.3	46.0	56.0	-23.7	-28.7
2.486	22.4	27.2	46.0	56.0	-23.6	-28.8
2.959	21.9	26.6	46.0	56.0	-24.1	-29.4
3.334	22.0	25.9	46.0	56.0	-24.0	-30.1
4.312	21.0	25.6	46.0	56.0	-25.0	-30.4

Test Personnel:	Grace Lin	Test Date:	1/26/2017
		Limit Applied:	FCC §15.207;
Product Standard:	FCC 15C, RSS-247		ISED RSS-Gen Issue 4 §8.8
Input Voltage:	120 Vac, 60 Hz	Ambient Temperature:	21.5 ºC
Pretest Verification w/ Ambient Signals or		Relative Humidity:	53.3 %
BB Source:	Yes	Atmospheric Pressure:	990 mbars

Model: 1114RCR/5404R/5314R

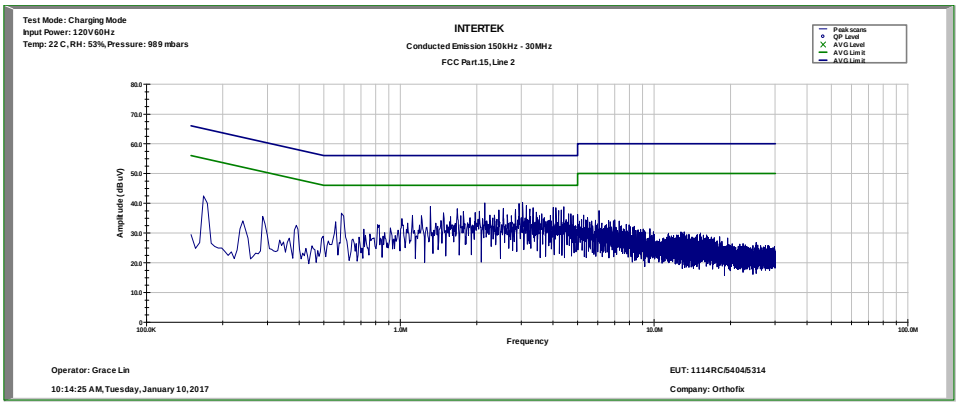
Line 1:



Frequency	AVG Level	QP Level	AVG Limit	QP Limit	AVG Margin	QP Margin
MHz	dBuV	dBuV	dBuV	dBuV	dB	dB
4.873	22.8	29.6	46.0	56.0	-23.2	-26.4
2.974	24.7	31.3	46.0	56.0	-21.3	-24.7
2.000	23.9	30.8	46.0	56.0	-22.1	-25.2
0.584	21.2	28.8	46.0	56.0	-24.8	-27.2
0.333	16.4	23.9	50.8	60.8	-34.3	-36.9
0.234	15.1	25.6	53.6	63.6	-38.5	-38.0
0.167	17.4	27.3	55.5	65.5	-38.1	-38.2

Model: 1114RCR/5404R/5314R

Line 2:



Frequency	AVG Level	QP Level	AVG Limit	QP Limit	AVG Margin	QP Margin
MHz	dBuV	dBuV	dBuV	dBuV	dB	dB
0.591	27.9	30.5	46.0	56.0	-18.1	-25.5
1.447	24.0	27.9	46.0	56.0	-22.0	-28.1
2.612	23.8	29.3	46.0	56.0	-22.2	-26.7
3.024	23.2	28.2	46.0	56.0	-22.8	-27.8
3.982	22.2	27.5	46.0	56.0	-23.8	-28.5
4.084	21.5	25.8	46.0	56.0	-24.5	-30.2
4.959	20.6	25.6	46.0	56.0	-25.4	-30.4

Test Personnel:	Grace Lin	Test Date:	1/10/2017
		Limit Applied:	FCC §15.207;
Product Standard:	FCC 15C, RSS-247		ISED RSS-Gen Issue 4 §8.8
Input Voltage:	120 Vac, 60 Hz	Ambient Temperature:	22 ºC
Pretest Verification w/ Ambient Signals or		Relative Humidity:	53 %
BB Source:	Yes	Atmospheric Pressure:	989 mbars

Deviations, Additions, or Exclusions: None

8 Transmitter Radiated Spurious Emissions

8.1 Requirement(s)

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

In any 100 kHz bandwidth outside the EUT pass-band, the RF power shall be below the maximum in-band 100 kHz emissions by at least 20 dB (if peak power of in-band emission is measured) or 30 dB (if average power of in-band emission is measured).

8.2 Method

EUT was configured to transmit continuously. Radiated emission measurements were performed from 30 MHz to 25 GHz according to the procedure described in ANSI C64.10. Spectrum analyzer resolution bandwidth is 120 kHz for frequencies 30 MHz to 1000 MHz. Above 1 GHz, both Peak and Average measurements were performed. The peak level of radiated emissions was measured with a resolution bandwidth (RBW) of 1 MHz and a video bandwidth (VBW) of 3 MHz. The average level of radiated emissions was measured with a resolution bandwidth (RBW) of 1 MHz and a video bandwidth (VBW) of 10 Hz.

The EUT is placed on a plastic turntable that is 80 cm in height for frequencies 30 MHz to 1000 MHz, 1.5 meters for frequency above 1000 MHz. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst-case emissions. The signal is maximized through rotation. The 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 3 meters for frequencies below 18 and 1 meter for frequencies above 18 GHz.

Data included is representative of the worst-case configuration (the configuration which resulted in the highest emission levels). Plots below are corrected for distance, cables, preamp, filters and antenna factors then compared to the limits.

TEST SITE:

The test is performed in the 3 meter semi-anechoic chamber located at 25791 Commercentre Drive, Lake Forest, California 92630 USA. This test facility meets the requirements of CISPR 16-1-4 and has been accredited by A2LA. IC test site registration number is 2042T.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 3m	30-1000 MHz	4.3	6.3 dB
Radiated Emissions, 3m	1-18 GHz	5.5	5.2 dB
Radiated Emissions, 1m	18-26.5 GHz	4.5	-

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required.

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

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

8.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
637	3m Semi-anechoic Chamber	Panashield	3 meter	25 331-D-Z	August 2015	August 2018
1140	EMI Test Receiver	R&S	ESCI7	100825	2/22/2016	2/22/2017
690	Spectrum Analyzer, 9 KHz - 40 GHz	R&S	FSP40	100027	1/24/2017	1/24/2018
1147	Bilog Antenna	TESEQ Gmbh	CBL 6112D	32852	11/03/2016	11/03/2017
1576	Preamplifier	R&S	TS-PR1	9037.6616.02	7/01/2016	7/01/2017
692	Horn Antenna	ETS-Lindgren	3115	00031626	7/08/2016	7/08/2017
1135	Preamplifier	Miteq	AMF-6D-00501800-24-10P	1685147	4/15/2016	4/15/2017
1517	Cable	R&S	TSPR-B7	101528	7/01/2016	7/01/2017
1518	Cable	R&S	TSPR-B7	101529	7/01/2016	7/01/2017
1001	Barometer/ Humidity	Omega	iBTHX-W	0440775	4/22/2016	4/22/2017

Software Utilized:

Name	Manufacturer	Version	Profile
Tile	Quantum Change	4.1	• FCC 30 to 1000 • FCC Part 15 FSP 1-18GHz

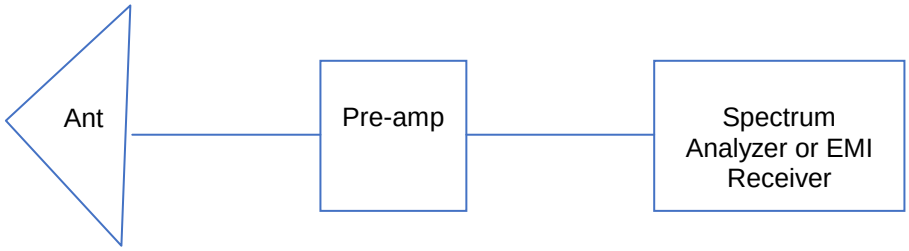
8.4 Results:

The sample tested was found to Comply.

Since this test was to support a Class II Permissive Change, there was no modification made directly on the radio, and the margin from the original test data was more than 10 dB, test was performed by spot checking the worst case emission. Test result of the spot check showed the emissions in charging mode do not degrade the radio parameters. The difference between the original test data and the test data in this section was much below the measurement uncertainty.

Test data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

8.5 Setup Diagram:



8.6 Plots/Data:

Antenna Polarization	Frequency (MHz)	Channel Freq. (MHz)	EUT Orientation	Mode	Measured Data (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Turntable Degree	Detector
H	4804	2402	YZ	Battery	42.24	54	-11.76	109.0	6.0	AVE
H	4804	2402	YZ	Battery	50.46	74	-23.54	109.0	6.0	PK
H	4804	2402	YZ	Charging	41.26	54	-12.74	133.0	302.0	AVE
H	4804	2402	YZ	Charging	49.59	74	-24.41	133.0	302.0	PK
H	4804	2402	XY	Battery	43.84	54	-10.16	102.0	128.0	AVE
H	4804	2402	XY	Battery	51.28	74	-22.72	102.0	128.0	PK
H	4804	2402	XY	Charging	43.75	54	-10.25	100.0	128.0	AVE
H	4804	2402	XY	Charging	51.21	74	-22.79	100.0	128.0	PK

EUT Orientation: XY

EUT Orientation: YZ

Test Personnel:	Grace Lin	Test Date:	2/13/2017, 2/17/2017
Product Standard:	FCC 15.247, IC RSS-247	Limit Applied:	FCC 15.247, FCC 15.209, IC RSS-247, IC RSS-Gen
Input Voltage:	120 Vac; Battery	Ambient Temperature:	19.6 ºC
Pretest Verification w/		Relative Humidity:	52 %
BB Source:	Yes	Atmospheric Pressure:	985.2 mbars

Deviations, Additions, or Exclusions: None

9 Revision History

Revision	Date	Report Number	Prepared By	Reviewed By	Notes
0	1/28/2017	102800561LAX-002	GL	MS	Initial Release
1	2/22/2017	102800561LAX-002	GL	MS	Added Section 8