



EMISSIONS TEST REPORT

(FULL COMPLIANCE)

Report Number: 103295446BOX-001
Project Number: G103295446

Report Issue Date: 11/29/2017

Model(s) Tested: Table top wireless charger
Model(s) Partially Tested: None
Model(s) Not Tested but declared equivalent by the client: None

Standards: FCC Part 15 Subpart C (15.209): 11/2017
FCC Part 15 Subpart B: 11/2017
RSS 216 Issue 2: 01/2016
ICES 003 Issue 6: 01/2016 updated 04/2017
RSS 102 Issue 5: 03/2015
RSS Gen Issue 4: 09/2014

Tested by:
Intertek Testing Services NA, Inc.
70 Codman Hill Road
Boxborough, MA 01719
USA

Client:
Pass & Seymour Legrand
50 Boyd Ave Syracuse,
NY 13209-2314
USA

Report prepared by Naga Suryadevara

Naga Suryadevara/EMC Project Engineer

Report reviewed by Kouma Sinn

Kouma Sinn/EMC Staff Engineer

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1 Introduction and Conclusion

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 **complies** 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
3	Client Information	--
4	Description of Equipment Under Test and Variant Models	--
5	System Setup and Method	--
6	Radiated Emissions and Human RF Exposure (FCC Part 15 Subpart C (15.209): 11/2017 RSS 216 Issue 2: 01/2016 FCC Part 15 Subpart B: 11/2017 ICES 003 Issue 6: 01/2016 updated 04/2017 RSS 102 Issue 5: 03/2015)	Pass
7	Occupied Bandwidth (RSS Gen Issue 4: 09/2014)	Pass
8	AC Mains Conducted Emissions (FCC Part 15 Subpart C (15.209): 11/2017 RSS 216 Issue 2: 01/2016 FCC Part 15 Subpart B: 11/2017 ICES 003 Issue 6: 01/2016 updated 04/2017)	Pass
9	Revision History	--

3 Client Information

This EUT was tested at the request of:

Client: Pass & Seymour Legrand
50 Boyd Ave Syracuse,
NY 13209-2314
USA

Contact: Jeff Richards
Telephone: 315-468-8005
Fax: None
Email: jeff.richards@legrand.us

4 Description of Equipment Under Test and Variant Models

Manufacturer: Pass & Seymour Legrand
50 Boyd Ave Syracuse,
NY 13209-2314
USA

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Tabletop wireless charger	Pass & Seymour Legrand	077580	030 17W22
AC-DC Power supply	XInSPower	A122-0502400IU	Not provided – BOX1711101522-003*

*Issued by Intertek Boxborough for sample tracking purposes only.

Receive Date:	11/10/2017
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
Tabletop wireless charger

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
100-240 VAC	0.4 A	50/60 Hz	1

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Wireless charger set for charging a load, the battery is completely discharged during testing to keep the wireless transmitter transmitting at maximum power using the fast discharge app.

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	Fast discharge V1.4.2 to keep the cellphone battery discharged.

Radio/Receiver Characteristics	
Frequency Band(s)	110-205 kHz
Modulation Type(s)	CW
Maximum Output Power	N/A, Electric field strength of the fundamental is Magnetic field strength of the fundamental
Test Channels	N/A
Occupied Bandwidth	44.48 Hz
Frequency Hopper: Number of Hopping Channels	N/A
Frequency Hopper: Channel Dwell Time	N/A
Frequency Hopper: Max interval between two instances of use of the same channel	N/A
MIMO Information (# of Transmit and Receive antenna ports)	N/A
Equipment Type	Standalone host device
ETSI LBT/Adaptivity	N/A
ETSI Adaptivity Type	N/A
ETSI Temperature Category (I, II, III)	N/A
ETSI Receiver Category (1, 2, 3)	N/A
Antenna Type and Gain	N/A

Variant Models:

The following variant models were not tested as part of this evaluation, but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

None

5 System Setup and Method

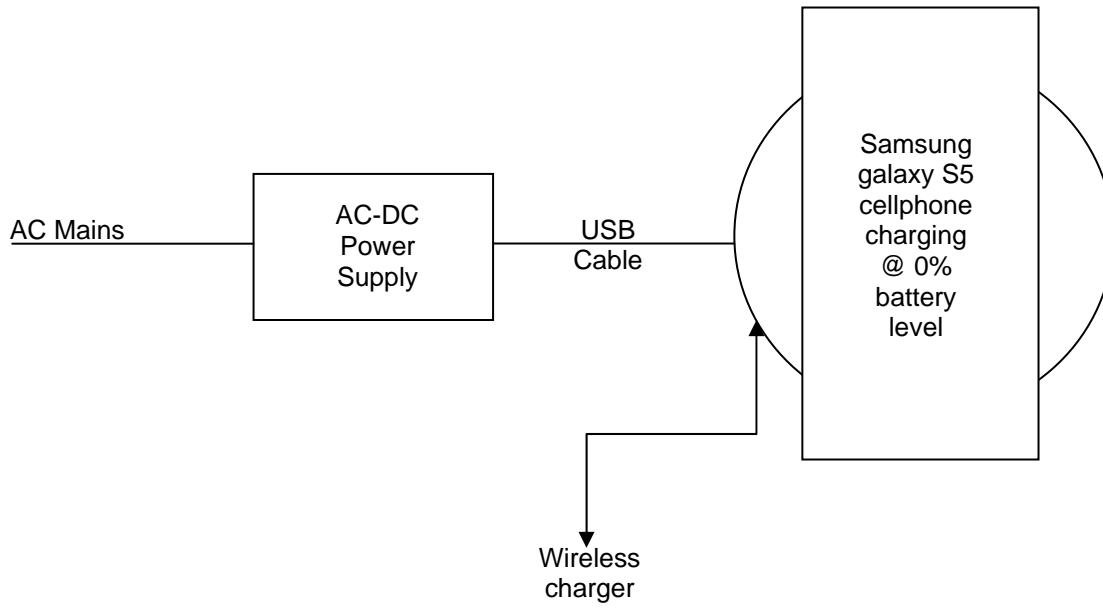
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
1	USB Cable	2.5	Yes	None	AC Mains

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Samsung Galaxy S7	Samsung	Galaxy S7	R58HA07593X

5.1 Method:

Configuration as required by FCC Part 15 Subpart C (15.209): 11/2017, FCC Part 15 Subpart B: 11/2017
RSS 216 Issue 2: 01/2016, ICES 003 Issue 6: 01/2016 updated 04/2017, RSS 102 Issue 5: 03/2015, ANSI C 63.10: 2013 and ANSI C 63.4: 2014.

5.2 EUT Block Diagram:



6 Radiated Emissions and Human RF Exposure

6.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C (15.209), FCC Part 15 Subpart B, RSS 216, ICES 003, RSS 102, ANSI C 63.10 and ANSI C 63.4.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucisprr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

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, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

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 dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- 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 dB μ V 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 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

$$NF = \text{Net Reading in dB}\mu\text{V}$$

Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$

$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

Alternately, when BAT-EMC Emission Software is used, the "Level" includes all losses and gains and is compared directly in the "Margin" column to the "Limit". The "Correction" includes Antenna Factor, Preamp, and Cable Loss. These are already accounted for in the "Level" column.

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
BAR1'	Digital 4 Line Barometer	Mannix	OABA116	BAR1	05/04/2017	05/04/2018
ETS003'	9kHz-30MHz Active Loop Antenna	ETS Lindgren	6502	00143396	05/23/2017	05/23/2018
CBLBNC2012-3'	50 Ohm Coaxial Cable	Pomona	RG58C/U	CBLBNC2012-3	03/09/2017	03/09/2018
145-416'	Cables 145-420 145-423 145-425 145-408	Huber + Suhner	3m Track B cables	multiple	07/25/2017	07/25/2018
145-410'	Cables 145-420 145-421 145-422 145-406	Huber + Suhner	10m Track A Cables	multiple	07/25/2017	07/25/2018
145145'	Broadband Hybrid Antenna 30 MHz - 3 GHz	Sunol Sciences Corp.	JB3	A122313	05/02/2017	05/02/2018
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/15/2017	03/15/2018
PRE10'	30-1000MHz pre-amp	ITS	PRE10	PRE10	12/16/2016	12/16/2017
SCH7'	Electromagnetic Radiation Meter Set	Schaffner	EMC-20	AP-0044	05/09/2017	05/09/2018

Software Utilized:

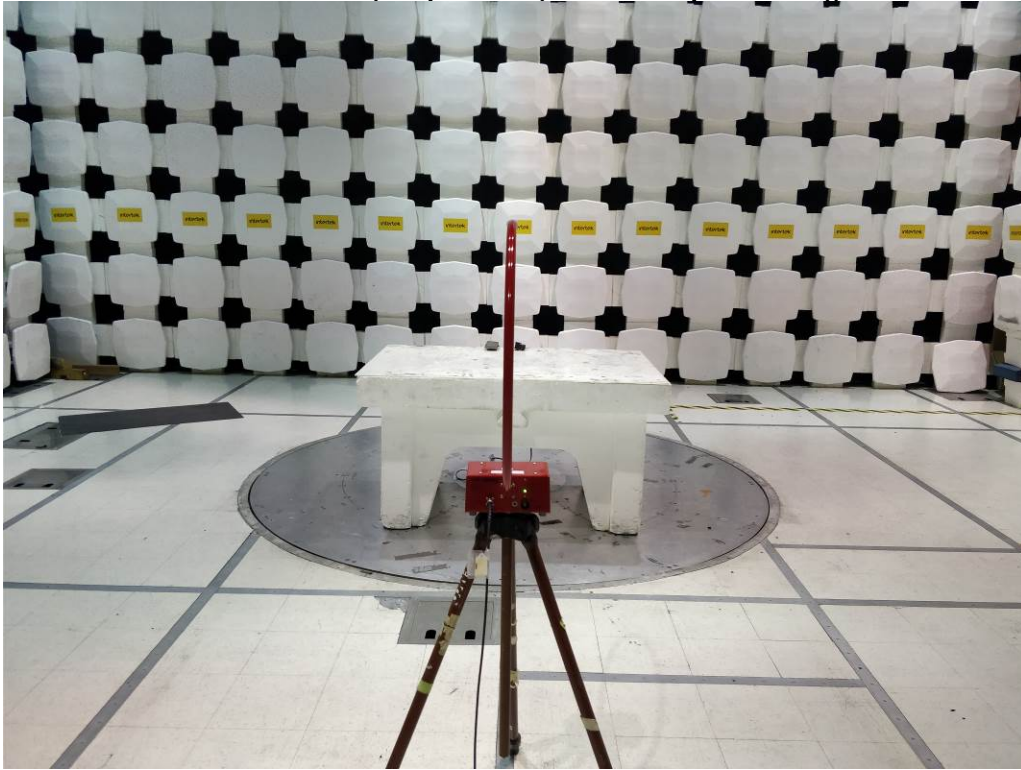
Name	Manufacturer	Version
BAT-EMC	Nexio	3.16.0.69

6.3 Results:

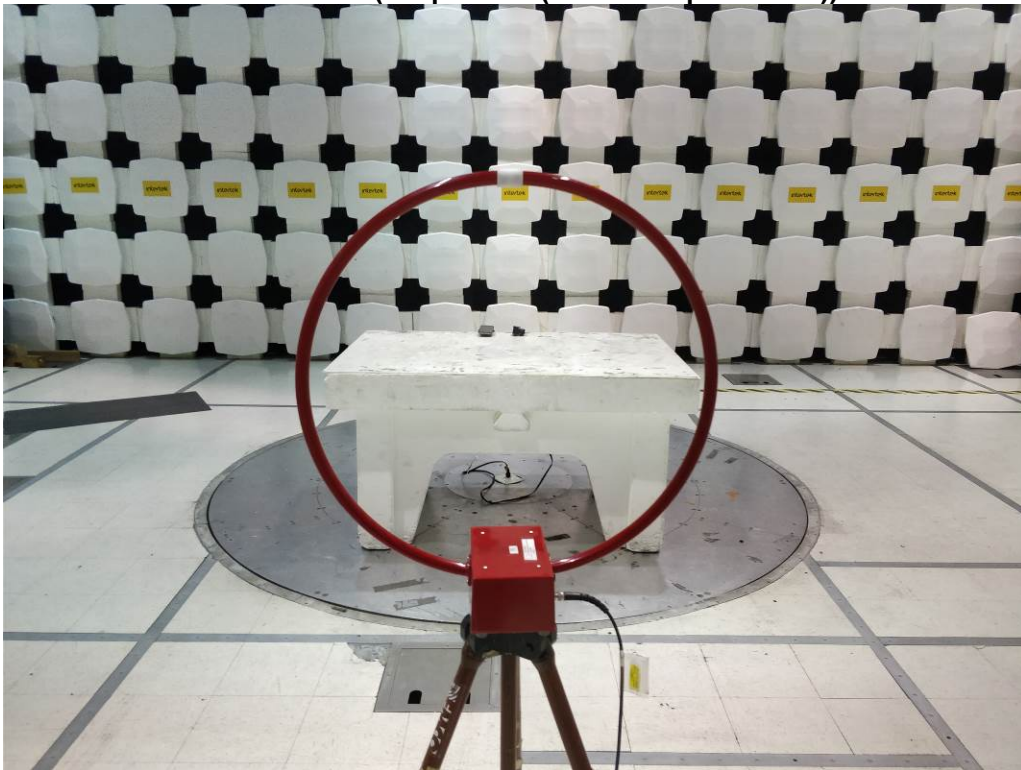
The sample tested was found to Comply.

6.4 Setup Photographs:

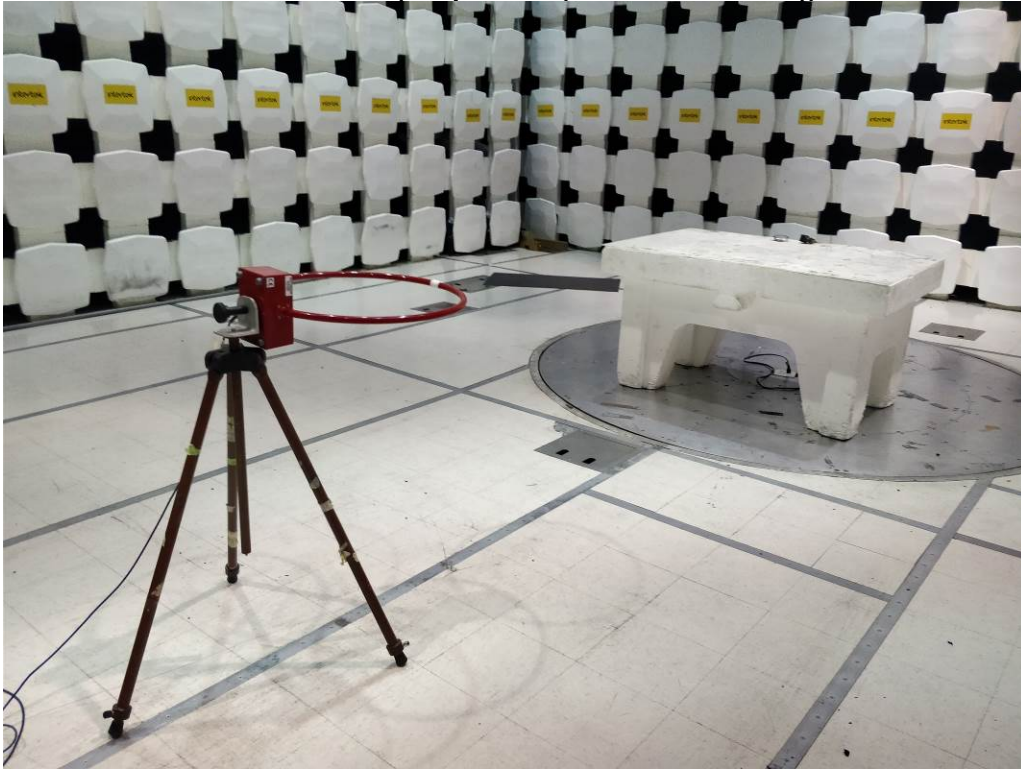
9kHz – 30MHz (Loop X-axis (Vertical/Perpendicular))



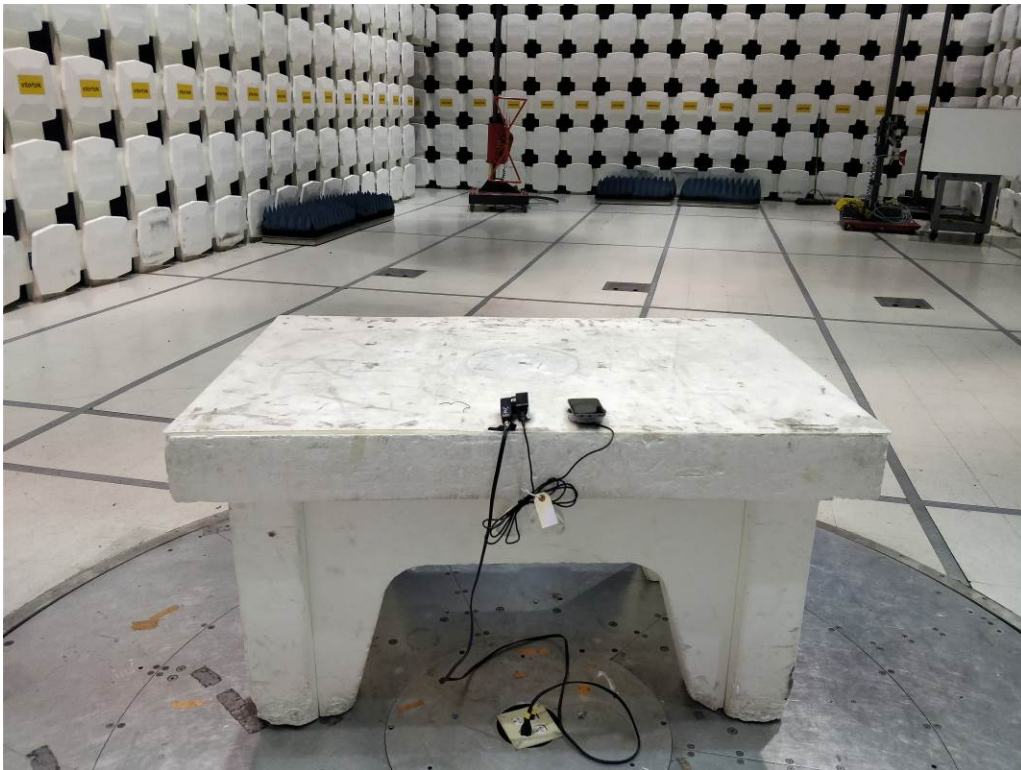
9kHz – 30MHz (Loop Y-axis (Vertical/Perpendicular))



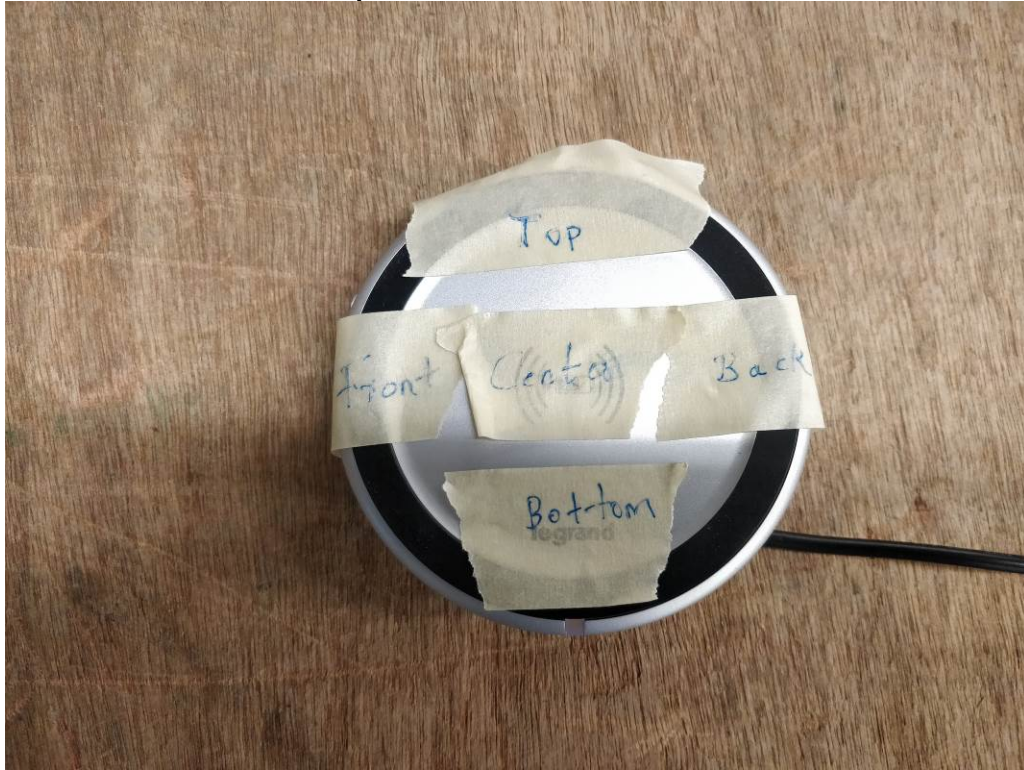
9kHz – 30MHz (Loop Z-axis (Horizontal/Parallel))



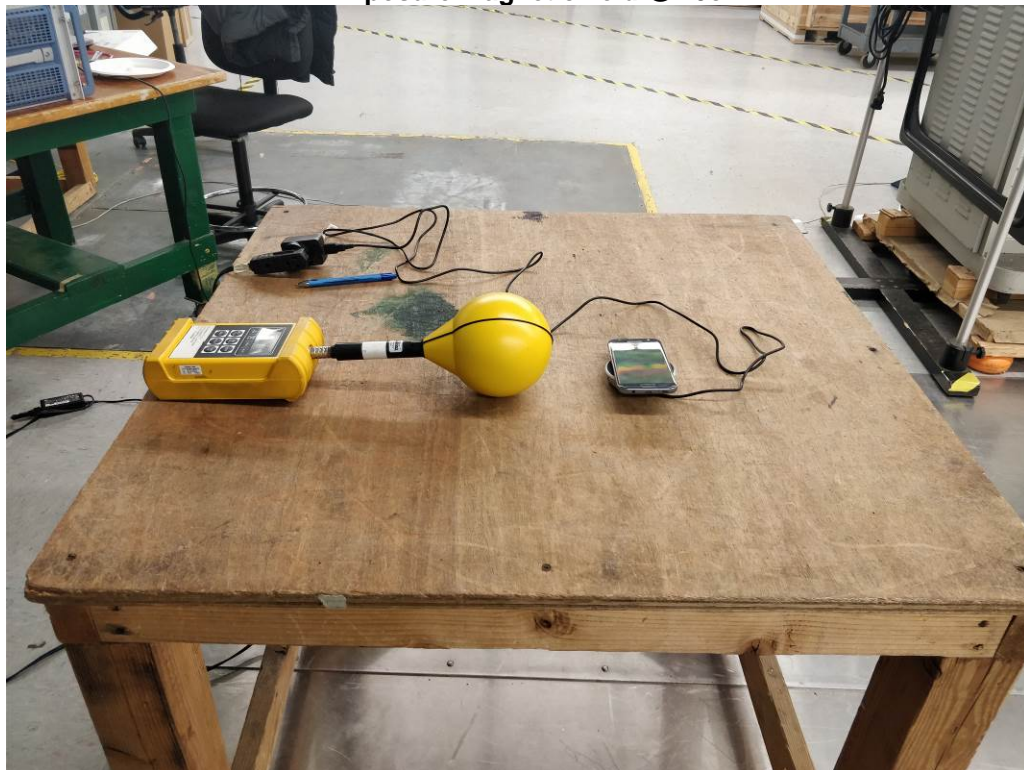
30-1000 MHz



RF Exposure Measurement Locations



RF Exposure magnetic field @ 10cm



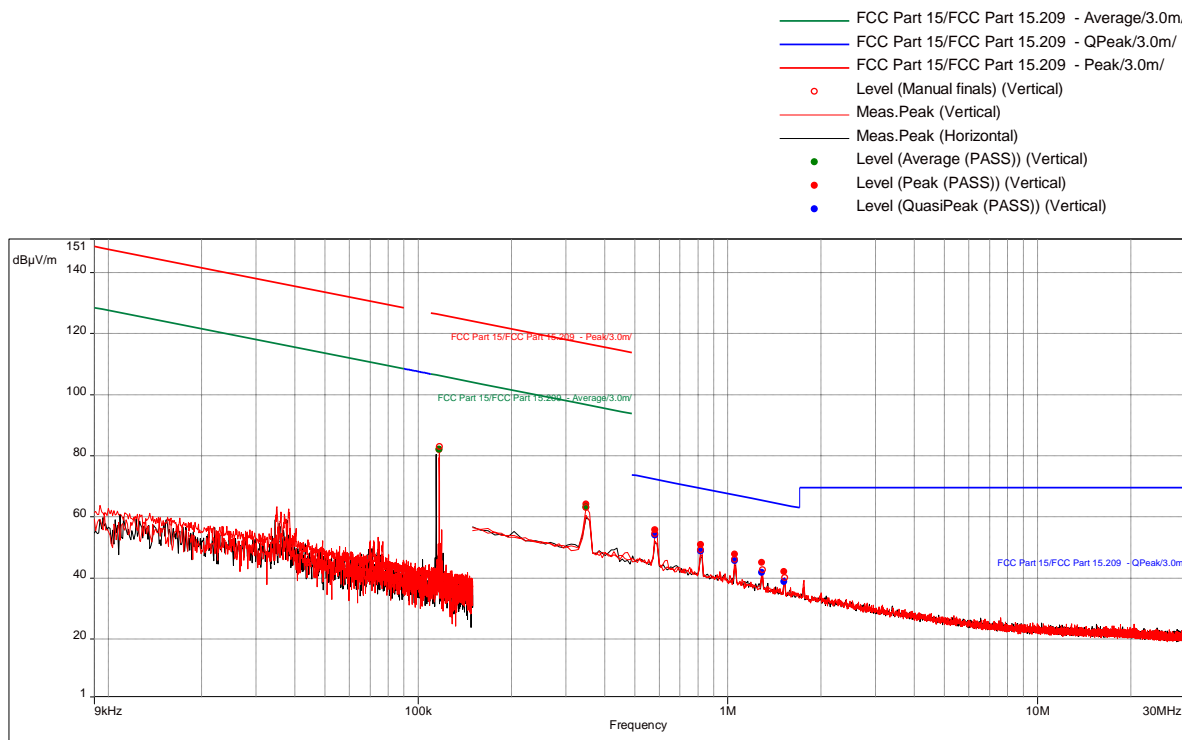
6.5 Plots/Data:

9kHz – 30MHz Electric field per FCC 15.209

Test Information:

Date and Time	11/12/2017 8:35:22 PM
Client and Project Number	Pass and Seymour Legrand G103295446
Engineer	Naga Suryadevara
Temperature	22C
Humidity	25%
Atmospheric Pressure	1003mbars
Comments	Scan 5 RE 9kHz-30MHz Loop antenna, Electric Field, 3M Location

Graph:



Results:

QuasiPeak (PASS) (5)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
0.5843684211	54.11	72.31	-18.19	182.00	1.00	Vertical	9000.00	11.26
0.8183684211	48.80	69.37	-20.57	4.00	1.00	Vertical	9000.00	11.29
1.052368421	45.59	67.18	-21.59	355.00	1.00	Vertical	9000.00	11.49
1.288263158	41.77	65.43	-23.66	359.00	1.00	Vertical	9000.00	11.51
1.522263158	38.85	63.98	-25.13	345.00	1.00	Vertical	9000.00	11.54

Peak (PASS) (7)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
0.1169947368	82.99	126.24	-43.26	350.00	1.00	Vertical	200.00	11.29
0.3503684211	64.15	116.77	-52.62	346.00	1.00	Vertical	9000.00	11.04

Average (PASS) (2)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
0.1169947368	82.10	106.24	-24.14	350.00	1.00	Vertical	200.00	11.29
0.3503684211	63.18	96.77	-33.59	346.00	1.00	Vertical	9000.00	11.04

9kHz – 30MHz Magnetic field per RSS 216

QuasiPeak (Pass) (7)

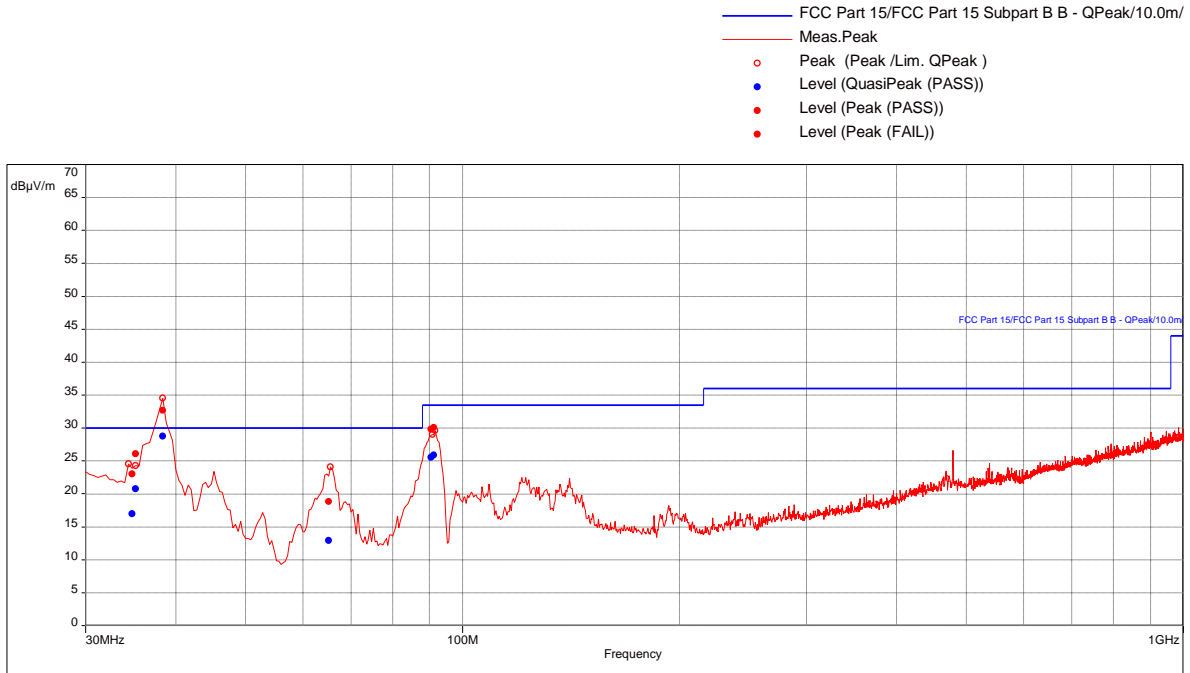
Frequency (MHz)	Level (dB μ A/m)	Limit (dB μ A/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
0.1169947	30.03	48.852339	-18.8223392	350	1	Vertical	200	-40.4
0.3503684	11.77	29.628551	-17.8585514	346	1	Vertical	9000	-40.5
0.5843684	2.38	24.107491	-21.7274908	182	1	Vertical	9000	-40.3
0.8183684	-2.11	20.344207	-22.4542068	4	1	Vertical	9000	-40.4
1.0523684	-5.85	17.599107	-23.4491075	355	1	Vertical	9000	-40.1
1.2882632	-7.4	15.386753	-22.7867533	359	1	Vertical	9000	-40.1
1.5222632	-10.17	13.560598	-23.7305982	345	1	Vertical	9000	-40.1

30-1000 MHz per RSS 216 per FCC 15.209, FCC Part 15 Subpart B and ICES 003

Test Information:

Date and Time	11/11/2017 5:06:55 PM
Client and Project Number	Pass and Seymour Legrand G103295446
Engineer	Naga Suryadevara
Temperature	22C
Humidity	18%
Atmospheric Pressure	1001mbars
Comments	Scan 1 RE 30-1000MHz SA mode

Graph:



Results:

QuasiPeak (PASS) (6)

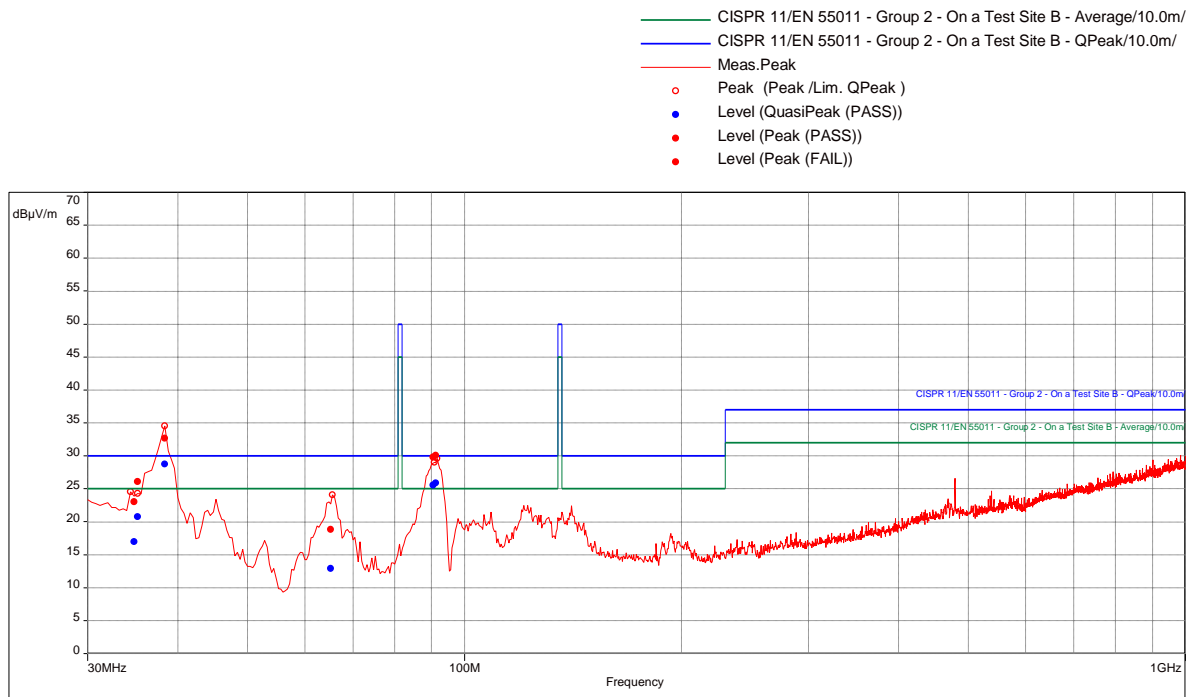
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
34.71578947	16.98	30.00	-13.02	65.00	3.71	Vertical	120000.00	-15.85
35.04210526	20.79	30.00	-9.21	237.00	1.00	Vertical	120000.00	-16.11
38.55789474	28.77	30.00	-1.23	260.00	1.00	Vertical	120000.00	-18.71
65	12.92	30.00	-17.08	359.00	1.67	Vertical	120000.00	-25.39
90.48421053	25.58	33.50	-7.92	358.00	1.54	Vertical	120000.00	-25.16
91.18947368	25.86	33.50	-7.64	345.00	1.60	Vertical	120000.00	-24.99

30-1000 MHz per RSS 216 (CISPR 11 Group 2 limits)

Test Information:

Date and Time	11/11/2017 5:06:55 PM
Client and Project Number	Pass and Seymour Legrand G103295446
Engineer	Naga Suryadevara
Temperature	22C
Humidity	18%
Atmospheric Pressure	1001mbars
Comments	Scan 1 RE 30-1000MHz SA mode

Graph:



Results:

QuasiPeak (PASS) (6)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW	Correction (dB)
34.71578947	16.98	30.00	-13.02	65.00	3.71	Vertical	120000.00	-15.85
35.04210526	20.79	30.00	-9.21	237.00	1.00	Vertical	120000.00	-16.11
38.55789474	28.77	30.00	-1.23	260.00	1.00	Vertical	120000.00	-18.71
65	12.92	30.00	-17.08	359.00	1.67	Vertical	120000.00	-25.39
90.48421053	25.58	30.00	-4.42	358.00	1.54	Vertical	120000.00	-25.16
91.18947368	25.86	30.00	-4.14	345.00	1.60	Vertical	120000.00	-24.99

The average limits apply to magnetron driven equipment only. If magnetron driven equipment exceeds the quasi-peak limit at certain frequencies, then the measurement shall be repeated at these frequencies with the average detector and the average limits specified in this table apply.

6.6 Human RF Exposure

FCC Human RF Exposure Limits

CFR47 FCC §1.1307(c) and (d), §1.1310

According to §1.1310, the criteria listed in the following table shall be used to evaluate the environment impact of a human exposure to RF radiation.

FCC LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	842/f	2.19/f	*(180/f ²)	30

* = Plane-wave equivalent power density

Measurement is done in a distance of 10 cm. The power transfer is achieved by inductive coupling. Therefore, in the table below only the magnetic field is measured. The electric field component would have to be measured at a distance of more than $\lambda/2$ and will therefore be far below the limits shown in above table.

RSS 102 Human RF Exposure Limits

According to RSS-102, the criteria listed in the following table shall be used to evaluate the environment impact of a human exposure to RF radiation.

HEALTH CANADA LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Reference Level Basis	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.003-10	170	180	NS	instantaneous
0.1-10	--	1.6 / f	SAR	6
1.129-10	193 / f ^{0.5}	--	SAR	6
(B) Limits for General Population/Uncontrolled Exposure				
0.003-10	83	90	NS	instantaneous
0.1-10	--	0.73 / f	SAR	
1.1 -10	87 / f ^{0.5}	--	SAR	6

f is frequency in MHz.

* = Plane-wave equivalent power density

NS = Nerve Stimulation

Measurement is done in a distance of 10 cm. The power transfer is achieved by inductive coupling. Therefore, in the table below only the magnetic field is measured. The electric field component would have to be measured at a distance of more than $\lambda/2$ and will therefore be far below the limits shown in above table.

Intertek

Report Number: 103295446BOX-001

Issued: 11/29/2017

Location	Measured Value in uT @ 10cm	Calculated value A/m @ 10cm	Limit for Canada A/m (worst case)	Limit for FCC A/m
Top	0.109	0.086	0.153	1.63
Bottom	0.153	0.122	0.153	1.63
Front	0.133	0.106	0.153	1.63
Back	0.178	0.141	0.153	1.63
Center	0.120	0.095	0.153	1.63

Worst case limit for Canada is used ($0.73/f = 0.73/0.205$)

Frequency (MHz)	Measured Value in dBuV/m @ 3m distance	Distance factor from 3m to 0.1m (dB)	Calculated value in dBuV/m @ 10cm distance	Calculated value in V/m @ 10cm distance	Limit for Canada V/m (worst case)	Limit for FCC V/m
0.1169947368	81.99	59.08	141.07	11.31	83	614

Test Personnel: Naga Suryadevara N5
 Supervising/Reviewing Engineer: N/A
 (Where Applicable)
 Product Standard: FCC Part 15 Subpart C (15.209)
 FCC Part 15 Subpart B
 RSS 216
 ICES 003
 RSS 102
 Input Voltage: 120VAC 60Hz
 Pretest Verification w/ Ambient Signals or BB Source: BB Source

Test Date: 11/11/2017
 11/12/2017

Limit Applied: As specified in section 6.5

Ambient Temperature: 22, 22 °C

Relative Humidity: 25, 18 %

Atmospheric Pressure: 1003, 1001 mbars

Deviations, Additions, or Exclusions: None

7 Occupied Bandwidth

7.1 Method

Tests are performed in accordance with RSS Gen.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

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, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

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 dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- 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 dB μ V 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 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

$$NF = \text{Net Reading in dB}\mu\text{V}$$

Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$

$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
BAR1'	Digital 4 Line Barometer	Mannix	0ABA116	BAR1	05/04/2017	05/04/2018
ETS003'	9kHz-30MHz Active Loop Antenna	ETS Lindgren	6502	00143396	05/23/2017	05/23/2018
CBLBNC2012-3'	50 Ohm Coaxial Cable	Pomona	RG58C/U	CBLBNC2012-3	03/09/2017	03/09/2018
145-416'	Cables 145-420 145-423 145-425 145-408	Huber + Suhner	3m Track B cables	multiple	07/25/2017	07/25/2018

Software Utilized:

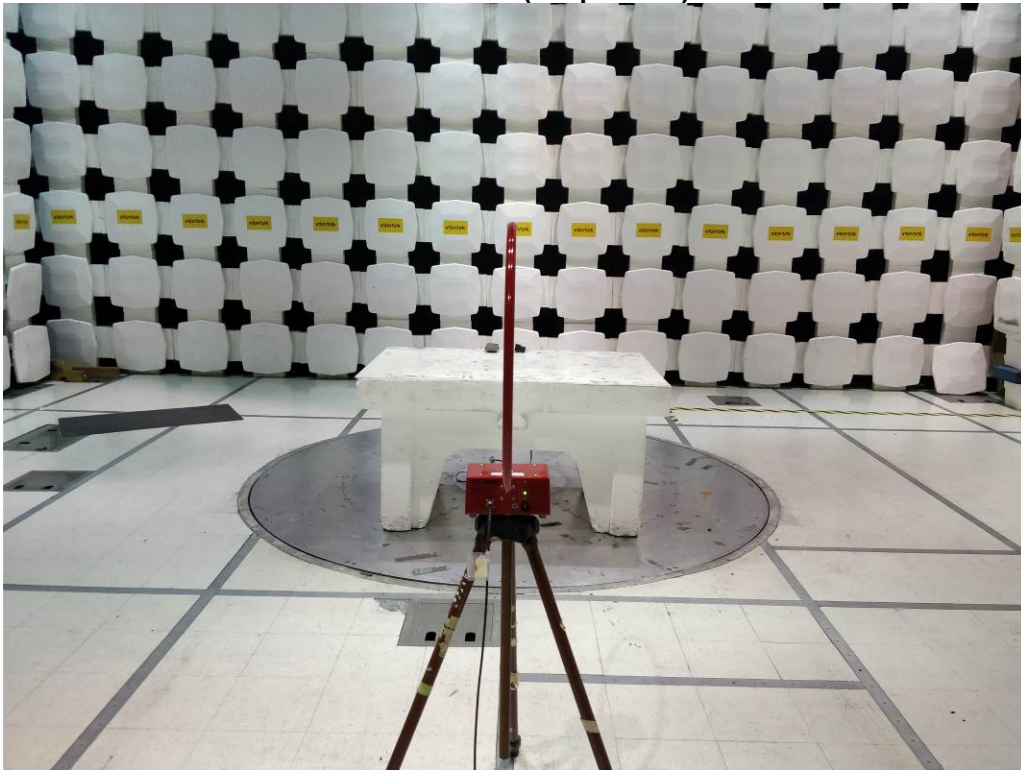
Name	Manufacturer	Version
BAT-EMC	Nexio	3.16.0.69

7.3 Results:

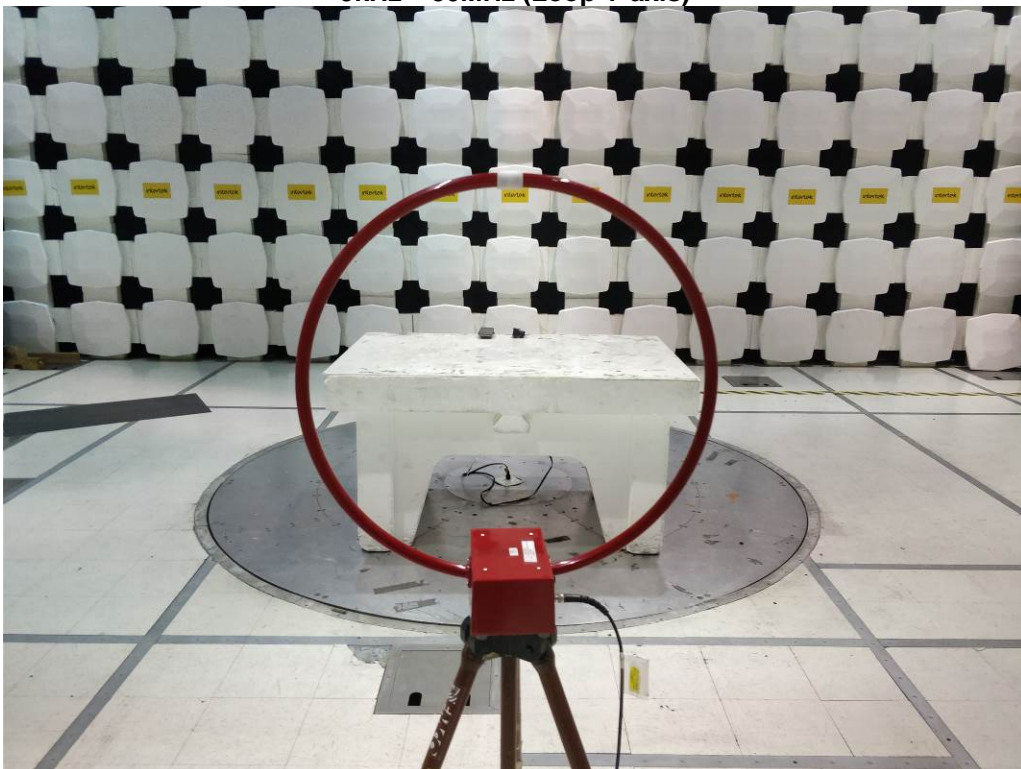
The sample tested was found to Comply.

7.4 Setup Photographs:

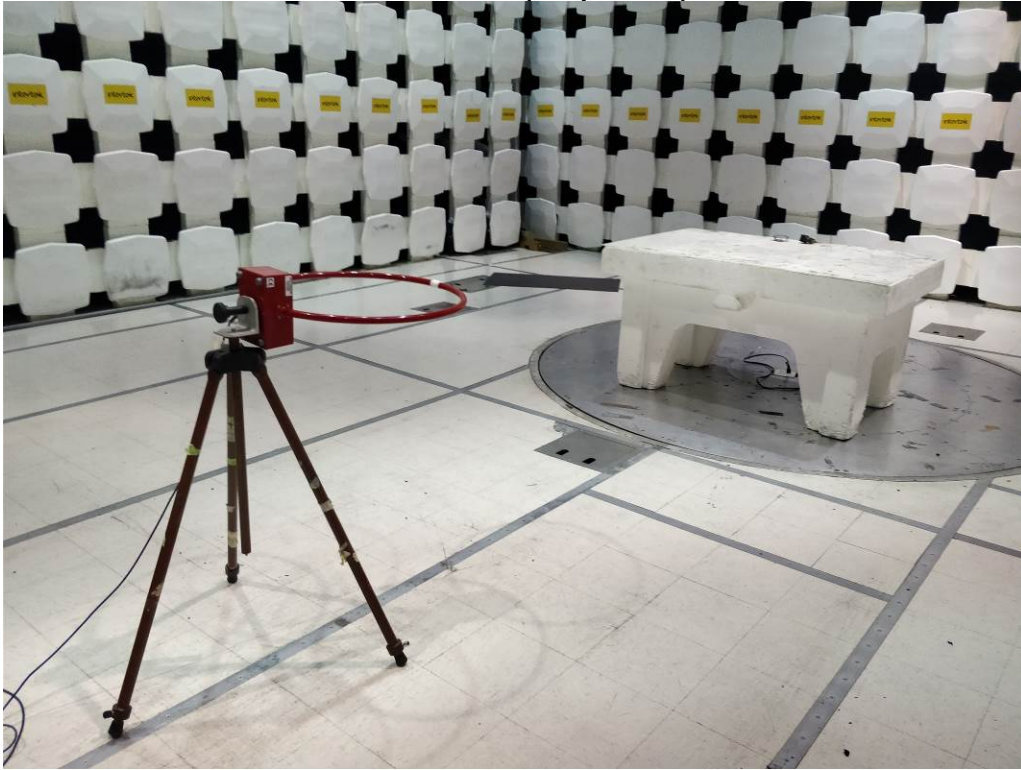
9kHz – 30MHz (Loop X-axis)



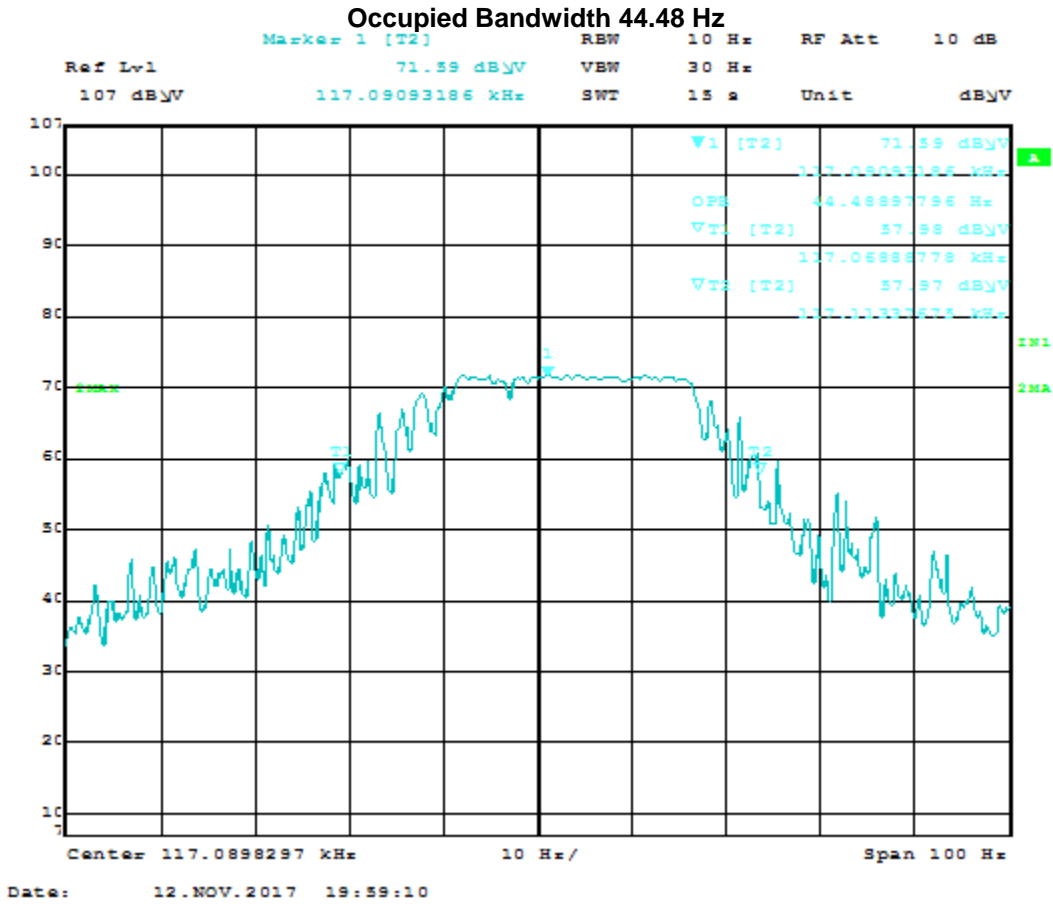
9kHz – 30MHz (Loop Y-axis)



9kHz – 30MHz (Loop Z-axis)



7.5 Plots/Data:



Test Personnel: Naga Suryadevara N.S
 Supervising/Reviewing Engineer: _____
 (Where Applicable) N/A

Test Date: 11/12/2017

Product Standard: RSS Gen
 Input Voltage: 120VAC 60Hz

Limit Applied: As specified in section 7.5

Pretest Verification w/
 Ambient Signals or
 BB Source: BB Source

Ambient Temperature: 22 °C

Relative Humidity: 18 %

Atmospheric Pressure: 1001 mbars

8 AC Mains Conducted Emissions

8.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C (15.209), FCC Part 15 Subpart B, RSS 216, RSS Gen and ICES 003

TEST SITE: EMC Lab

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
AC Line Conducted Emissions	150 kHz - 30 MHz	2.8dB	3.4dB
Telco Port Emissions	150 kHz - 30 MHz	3.2dB	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, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculations

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

$$NF = RF + LF + CF + AF$$

Where NF = Net Reading in dB μ V

RF = Reading from receiver in dB μ V

LF = LISN or ISN Correction Factor in dB

CF = Cable Correction Factor in dB

AF = Attenuator Loss Factor in dB

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

$$NF = \text{Net Reading in dB}\mu\text{V}$$

Example:

$$NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 \text{ dB}\mu\text{V}$$

$$UF = 10^{(49.1 \text{ dB}\mu\text{V} / 20)} = 285.1 \mu\text{V/m}$$

Alternately, when C5 Software is used, the "Level" includes all losses and gains and is compared directly in the "Margin" column to the "Limit". "TF" is the Transducer Factor; in this case LISN or ISN loss.

8.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	05/10/2017	05/10/2018
ROS002'	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	08/03/2017	08/03/2018
CBLBNC7'	30 ft 50 ohm coax, BNC - BNC	ITT Pomona	RG 58 C/U	CBLBNC7	01/10/2017	01/10/2018
DS25'	Attenuator, 20dB	Mini Circuits	20dB, 50 ohm	DS25	10/17/2017	10/17/2018
LISN32'	LISN - CISPR16 Compliant 9kHz-30MHz	Com-Power	LI-215A	191955	05/03/2017	05/03/2018

Software Utilized:

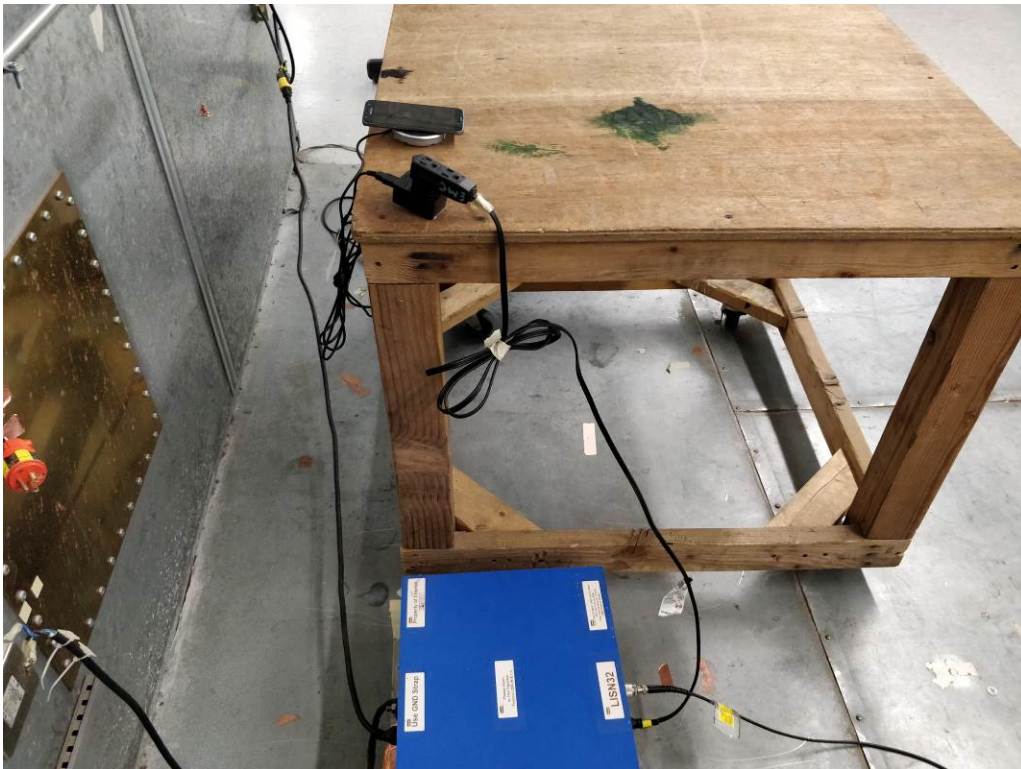
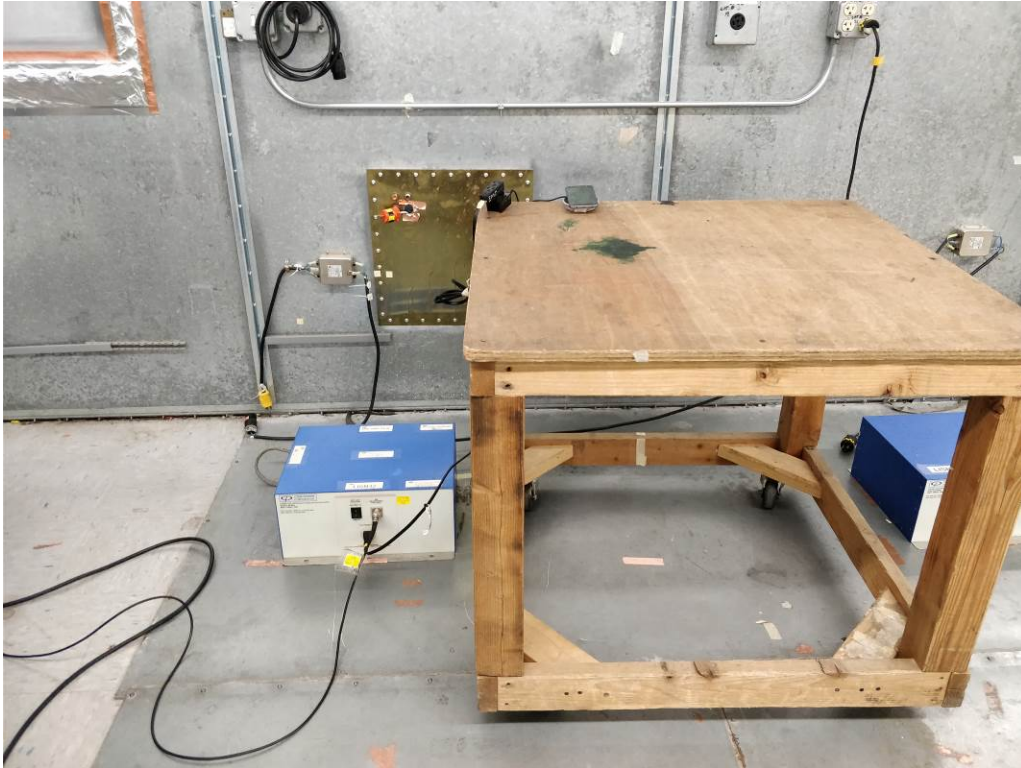
Name	Manufacturer	Version
Compliance 5	Teseq	5.26.46.46

8.3 Results:

The sample tested was found to Comply.

8.4 Setup Photographs:

9kHz – 30 MHz Conducted Emissions



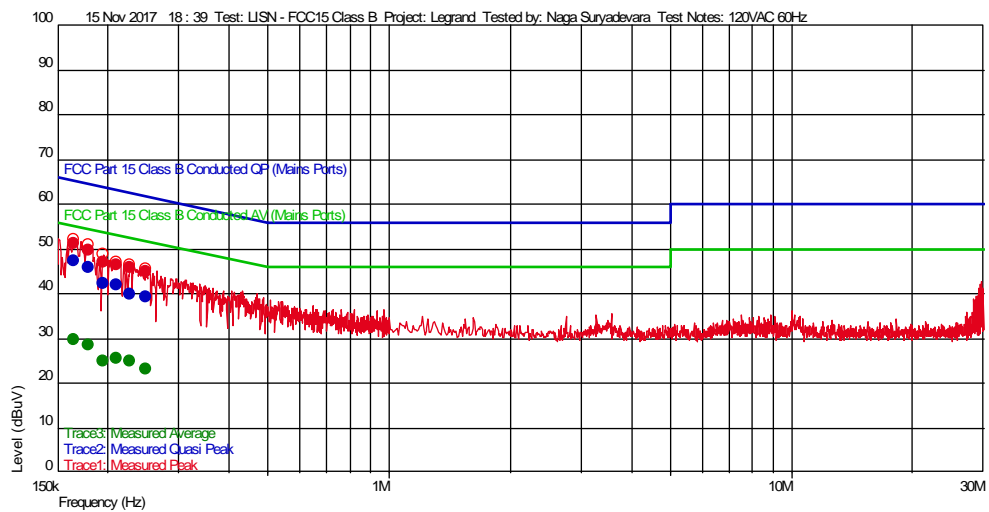
8.5 Plots/Data:

150kHz – 30MHz @ 120VAC 60Hz

Test Information

Test Details	User Entry	Additional Information
Test:	LISN - FCC15 Class B	
Project:	Legrand	
Test Notes:	120VAC 60Hz	
Temperature:	23C	
Humidity:	21% 1011mbars	
Tested by:	Naga Suryadevara	
Test Started:	15 Nov 2017 18 : 39	

Prescan Emission Graph



- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable
- Swept Peak Data
- Swept Quasi Peak Data
- Swept Average Data

Emissions Test Data

Trace2: Measured Quasi Peak

Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
228.2 k	39.87	1.002	20.105	62.515	-22.65	9 k		N
249.45 k	39.18	0.898	20.107	61.775	-22.60	9 k		N
195.9 k	42.31	1.188	20.101	63.783	-21.47	9 k		N
210.35 k	41.88	1.089	20.103	63.191	-21.31	9 k		N
179.75 k	45.73	1.375	20.100	64.497	-18.77	9 k		N
165.3 k	47.32	1.543	20.098	65.193	-17.87	9 k		N

Trace3: Measured Average

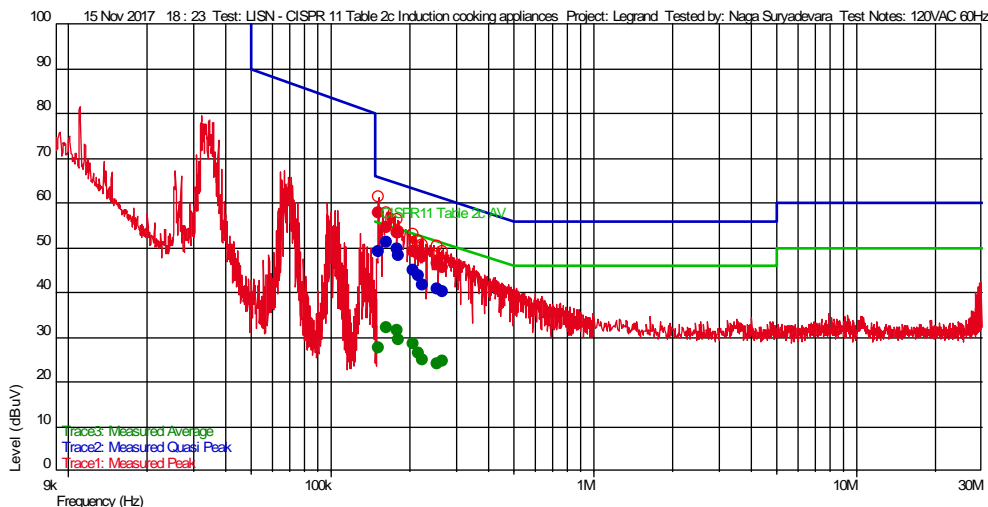
Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
195.9 k	24.82	1.188	20.101	53.783	-28.96	9 k		N
249.45 k	23.13	0.898	20.107	51.775	-28.64	9 k		N
210.35 k	25.55	1.089	20.103	53.191	-27.64	9 k		N
228.2 k	25.05	1.002	20.105	52.515	-27.47	9 k		N
179.75 k	28.66	1.375	20.100	54.497	-25.84	9 k		N
165.3 k	29.77	1.543	20.098	55.193	-25.42	9 k		N

9kHz – 30MHz @ 120VAC 60Hz

Test Information

Test Details	User Entry	Additional Information
Test:	LISN - CISPR 11 Table 2c Induction cooking appliances	
Project:	Legrand	
Test Notes:	120VAC 60Hz	
Temperature:	23C	
Humidity:	21% 1011mbars	
Tested by:	Naga Suryadevara	
Test Started:	15 Nov 2017 18 : 23	

Prescan Emission Graph



- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable
- Swept Peak Data
- Swept Quasi Peak Data
- Swept Average Data

Emissions Test Data

Trace2: Measured Quasi Peak

Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
269.0 k	40.05	0.802	20.110	61.106	-21.05	9 k		N
226.5 k	41.55	1.010	20.105	62.523	-20.97	9 k		N
255.4 k	40.60	0.869	20.108	61.533	-20.93	9 k		N
218.0 k	43.65	1.052	20.104	62.838	-19.19	9 k		N
208.65 k	44.99	1.098	20.103	63.199	-18.21	9 k		N
152.55 k	49.18	1.690	20.097	65.778	-16.60	9 k		N
183.15 k	48.23	1.335	20.100	64.273	-16.04	9 k		L1
179.75 k	49.73	1.375	20.100	64.427	-14.69	9 k		N
163.6 k	51.19	1.562	20.098	65.202	-14.02	9 k		N

Trace3: Measured Average

Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
152.55 k	27.68	1.690	20.097	55.778	-28.10	9 k		N
255.4 k	23.90	0.869	20.108	51.533	-27.63	9 k		N
226.5 k	25.05	1.010	20.105	52.523	-27.48	9 k		N
269.0 k	24.62	0.802	20.110	51.106	-26.49	9 k		N
218.0 k	26.37	1.052	20.104	52.838	-26.47	9 k		N
183.15 k	29.39	1.335	20.100	54.273	-24.88	9 k		L1
208.65 k	28.49	1.098	20.103	53.199	-24.71	9 k		N
163.6 k	32.17	1.562	20.098	55.202	-23.03	9 k		N
179.75 k	31.49	1.375	20.100	54.427	-22.93	9 k		N

Test Personnel: Naga Suryadevara N.S
Supervising/Reviewing Engineer: _____
(Where Applicable) N/A
FCC Part 15 Subpart C
FCC Part 15 Subpart B
RSS 216
RSS Gen
Product Standard: ICES 003
Input Voltage: 120VAC 60Hz
Pretest Verification w/
Ambient Signals or
BB Source: Yes

Test Date: 11/15/2017
Limit Applied: As specified in section 8.5
Ambient Temperature: 23 °C
Relative Humidity: 21 %
Atmospheric Pressure: 1011 mbars

Deviations, Additions, or Exclusions: None

9 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	11/29/2017	103295446BOX-001	N5	KPS <i>KPS</i>	Original Issue