

# **Electromagnetic Compatibility Test Report**

*Prepared in accordance with*

**FCC Part 15 Subpart B: 2020  
On  
December 10, 2020**

**Prepared for:**

**Grid Connect  
1630 W Diehl Rd  
Naperville, IL, 60563**

**Prepared by:**




**TUV Rheinland of North America, Inc.  
5015 Brandin Ct. Fremont CA 94538 USA**

**Revisions**

<b>Revision No.</b>	<b>Date</b>	<b>Reason for Change</b>	<b>Author</b>
0	10/24/19	Original Document	N/A
1	12/10/20	Updated to current date for IC fillings	OC

Note: Latest revision report will replace all previous reports.

## ATTESTATION OF TEST RESULTS

<b>Client:</b>	Grid Connect 1630 W Diehl Rd Naperville, IL, 60563		Email: cristianc@gridconnect.com	
<b>Model Name:</b>	Smart Power Cord	<b>Serial Number:</b>	N/A	
<b>Model Numbers:</b>	CS-SC-01	<b>Date(s) Tested:</b>	October 7th, 2019 to October 10th, 2019	
<b>Test Location:</b>	TUV Rheinland of North America Inc. 5015 Brandin Ct. Fremont CA 94538 USA			
<b>Test Specifications:</b>	Emissions:	FCC Part 15 Subpart B: 2020		
	Immunity:	N/A		
<b>Test Result:</b>	The above product was found to be Compliant to the above test standard(s)			
<b>Prepared by:</b>		<b>Reviewed by:</b>		
<u>December 10, 2020</u> <u>Osvaldo Casorla</u> <i>Date Name Signature</i>		<u>December 10, 2020</u> <u>Rachana Khanduri</u> <i>Date Name Signature</i>		
<b>Other aspects:</b>	None			
<b>FREMONT</b>				
	 <b>Testing Cert #3331.02</b>	<b>INDUSTRY CANADA 2932D</b>	 <b>1097 (A-0268)</b>	

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## **1 General Information**

### **1.1 Scope**

This report is intended to document the status of conformance with the listed standards based on the results of testing performed on October 7th, 2019 to October 10th, 2019 on the Smart Power Cord, Model No.: CS-SC-01, manufactured by Grid Connect. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

### **1.2 Purpose**

Testing was performed to evaluate the EMC performance of the EUT (Equipment Under Test) in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

**1.3 Summary of Test Results**

<b>Applicant</b>	Grid Connect 1630 W Diehl Rd Naperville, IL, 60563
<b>Contact</b>	Cristian Codreanu
<b>E-mail</b>	cristianc@gridconnect.com
<b>Description</b>	Smart cord with power control and monitoring, WiFi connectivity
<b>Model Name</b>	Smart Power Cord
<b>Model Number</b>	CS-SC-01
<b>Serial Number</b>	N/A
<b>Input Power</b>	AC 100-240V, 50/60Hz
<b>Test Date(s)</b>	October 7th, 2019 to October 10th, 2019

Standards	Description	Severity Level or Limit	Criteria	Test Result
FCC Part 15 Subpart B: 2020	Radiated Emissions	Class B 30 - 1000 MHz	Limit	Complies
FCC Part 15 Subpart B: 2020	Conducted Emissions	Class B 150 kHz - 30 MHz	Limit	Complies

## Laboratory Information

### 1.4 Accreditations & Endorsements

#### 1.4.1 US Federal Communications Commission



TUV Rheinland of North America EMC test facilities located at 1279 Quarry Lane, Ste. A, Pleasanton, CA, 94566, and 5015 Brandin Ct, Fremont, CA 94538, are recognized by the Commission for performing testing services for the general public on a fee basis. These laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Registration No. US1131). The laboratory Scopes of Accreditation include Title 47 CFR Parts 15, 18 and 90. The accreditations are updated every three years.

#### 1.4.2 A2LA



TUV Rheinland of North America EMC test facilities are accredited by the American Association for Laboratory Accreditation (A2LA). The laboratories have been assessed and accredited by A2LA in accordance with ISO Standard 17025:2017 (Testing Certificate #3331.02). The Scope of Laboratory Accreditation includes emission and immunity testing. The accreditations are

updated annually.

#### 1.4.3 Industry Canada



Industry  
Canada Industrie  
Canada

The Pleasanton 5-meter Semi-Anechoic Chamber, Registration No. 2932M-1, has been accepted by Industry Canada to perform testing to 3 and 5 meters based on the test procedures described in ANSI C63.4-2009. The Fremont 10-meter Semi-Anechoic Chamber, Registration No. 2932D-1, has been accepted by Industry Canada to perform testing to 3 and 10 meters based on the test procedures described in ANSI C63.4-2009.

#### 1.4.4 Japan – VCCI



The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) is a group that consists of Information Technology Equipment (ITE) manufacturers and EMC test laboratories. The purpose of the Council is to take voluntary control measures against electromagnetic interference from Information Technology Equipment, and thereby contribute to the development of a socially beneficial and responsible state of affairs in the realm of Information Technology Equipment in Japan. TUV Rheinland of North America EMC test facilities located at 1279 Quarry Lane, Ste. A, Pleasanton, CA, 94566, and 5015 Brandin Ct, Fremont, CA 94538, have been assessed and approved in accordance with the Regulations for Voluntary Control Measures.

VCCI Registration No. for Pleasanton: A-0326

VCCI Registration No. for Fremont: A-0327

## **1.5 Test Facilities and EMC Software**

Test facilities are located at 1279 Quarry Lane, Ste. A, Pleasanton, California 94566, U.S.A. and 5015 Brandin Ct. Fremont CA 94538 USA (Fremont is the Pleasanton Annex).

### **1.5.1 Emission Test Facility**

The Semi-Anechoic Chambers and AC Line Conducted measurement facilities used to collect radiated and conducted emissions data have been constructed in accordance with ANSI C63.7:1992. The Fremont 10 meter semi-anechoic chamber has been measured in accordance with and verified to comply with the theoretical volumetric normalized site attenuation of ANSI C63.4:2014 and SVSWR requirements of CISPR 16-1-4 Consol. Ed. 3.0 (2010-04), at test distances of 3 and 10 meters. This site has been described in reports dated November 1st, 2006, submitted to the FCC, and accepted by letter dated November 28, 2006. The site is listed with the FCC and accredited by A2LA (Testing Certificate #3331.02). The Pleasanton 5 meter semi-anechoic chamber has been verified to comply with the theoretical volumetric normalized site attenuation of ANSI C63.4:2009 and SVSWR requirements of CISPR 16-1-4 Consol. Ed. 3.0 (2010-04) at a test distance of 3 meters. This site has been described in reports dated November 1st, 2006, submitted to the FCC, and accepted by letter dated November 28, 2006. The site is listed with the FCC and accredited by A2LA (Testing Certificate #3331.02).

### **1.5.2 EMC Software - Fremont**

<b>Manufacturer</b>	<b>Name</b>	<b>Version</b>	<b>Test</b>
Rohde & Schwarz	EMC32	10.50.00	Radiated & Conducted Emissions
Voltech	IEC61000-3	1.26.13	Harmonic and Flicker Emissions
CEWare	CEWare32	4	Surge, EFT, and VDI
ETS-Lindgren	Tile	V 7.1.4.10	Radiated Immunity



## 1.6 Measurement Uncertainty

Two types of measurement uncertainty are expressed in this report, per *ISO Guide To The Expression Of Uncertainty In Measurement*, 1<sup>st</sup> Edition, 1995.

*The Combined Standard Uncertainty* is the standard uncertainty of the result of a measurement when that result is obtained from the values of a number of other quantities, equal to the positive square root of a sum of terms, the terms being the variances or co-variances of these other quantities weighted according to how the measurement result varies with changes in these quantities. The term standard uncertainty is the result of a measurement expressed as a standard deviation.

*The Expanded Uncertainty* defines an interval about the result of a measurement that may be expected to encompass a large fraction of the distribution of values that could reasonably be attributed to the measurement and the fraction may be viewed as the coverage probability or level of confidence of the interval.

### 1.6.1 Sample Calculation – radiated & conducted emissions

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

$$\text{Field Strength (dB}\mu\text{V/m)} = \text{RAW} - \text{AMP} + \text{CBL} + \text{ACF}$$

Where: RAW = Measured level before correction (dB $\mu$ V)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu\text{V/m} = 10^{\frac{\text{dB}\mu\text{V} / \text{m}}{20}}$$

#### Sample radiated emissions calculation @ 30 MHz

**Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dBuV/m)**

$$25 \text{ dBuV/m} + 17.5 \text{ dB} - 20 \text{ dB} + 1.0 \text{ dB} = 23.5 \text{ dBuV/m}$$

**1.6.2 Measurement Uncertainty Emissions**

Per CISPR 16-4-2	$U_{lab}$	$U_{cisp}$
<b>Radiated Disturbance @ 10 meters</b>		
30 – 1,000 MHz	2.25 dB	4.51 dB
<b>Radiated Disturbance @ 3 meters</b>		
30 – 1,000 MHz	2.26 dB	4.52 dB
1 – 6 GHz	2.12 dB	4.25 dB
6 – 18 GHz	2.47 dB	4.93 dB
<b>Conducted Disturbance @ Mains Terminals</b>		
150 kHz – 30 MHz	1.09 dB	2.18 dB
<b>Disturbance Power</b>		
30 MHz – 300 MHz	3.92 dB	4.3 dB

**1.7 Calibration Traceability**

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2017. Equipment calibration records are kept on file at the test facility.

## 1.8 Measurement Equipment Used

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal mm/dd/yyyy	Next Cal mm/dd/yyyy
Spectrum Analyzer	Rohde & Schwarz	FSU26.5	1166.1660.26	02/23/2020	02/23/2021
EMI Receiver	Rohde & Schwarz	ESW44	101663-dv	07/18/2019	07/18/2021
L.I.S.N.	Com-Power	LI-215	192000	01/16/2019	01/16/2021
Transient Limiter	Com-Power	LIT-930	531582	01/16/2019	01/16/2021
Preamplifier, 9 kHz – 1 GHz	Sonoma	310N	213221	01/16/2019	01/16/2021
Bilog Antenna	Sunol Sciences	JB3	A060502	12/19/2018	12/19/2020
Amplifier	Miteq	TTA1800-30-HG	1842452	01/15/2019	01/15/2021
Horn Antenna	Sunol Sciences	DRH-118	A040806	03/05/2019	03/05/2021
Amplifier	HP	8449B	3008A01013	01/15/2019	01/15/2021
Horn Antenna	EMCO	RA42-K-F-B-C	020131-004	03/04/2019	03/04/2021
Amplifier	Rohde & Schwarz	TS-PR26	3545.7014.03	03/04/2019	03/04/2021
Amplifier	Sonoma	310N	185516	N/A (See Note)	
1.6 GHz Low Pass Filter	K&L Microwave	8L120-X1600-0/09135-0249	UA691-35	N/A (See Note)	
3.5 GHz High Pass Filter	Hewlett Packard	84300-80038	820004	N/A (See Note)	
2.4GHZ Band Pass Filter	Microtronics	BRM50702	009	N/A (See Note)	

Note: CE=Conducted Emissions, CI=Conducted Immunity, DP=Disturbance Power, EFT=Electrical Fast Transients, ESD=Electrostatic Discharge, FLI=Flicker, HAR=Harmonics, MF=Magnetic Field Immunity, NCR=No Calibration Required, RE=Radiated Emissions, RI=Radiated Immunity, SI=Surge Immunity, VDSI=Voltage Dips and Short Interruptions

## **2 Product Information**

### **2.1 Product Description**

See Section 4.

### **2.2 Equipment Modifications**

No modifications were needed to bring product into compliance.

### **2.3 Test Plan**

The EUT product information, test configuration, mode of operation, test types, test procedures, test levels, pass/failure criteria, in this report were carried out per the product test plan located in Appendix A of this report.



Figure 1 - External Photo of EUT- Front View



Figure 2 - External Photo of EUT- Rear View



Figure 3 - External Photo of EUT- Top View



Figure 4 - External Photo of EUT- Bottom View



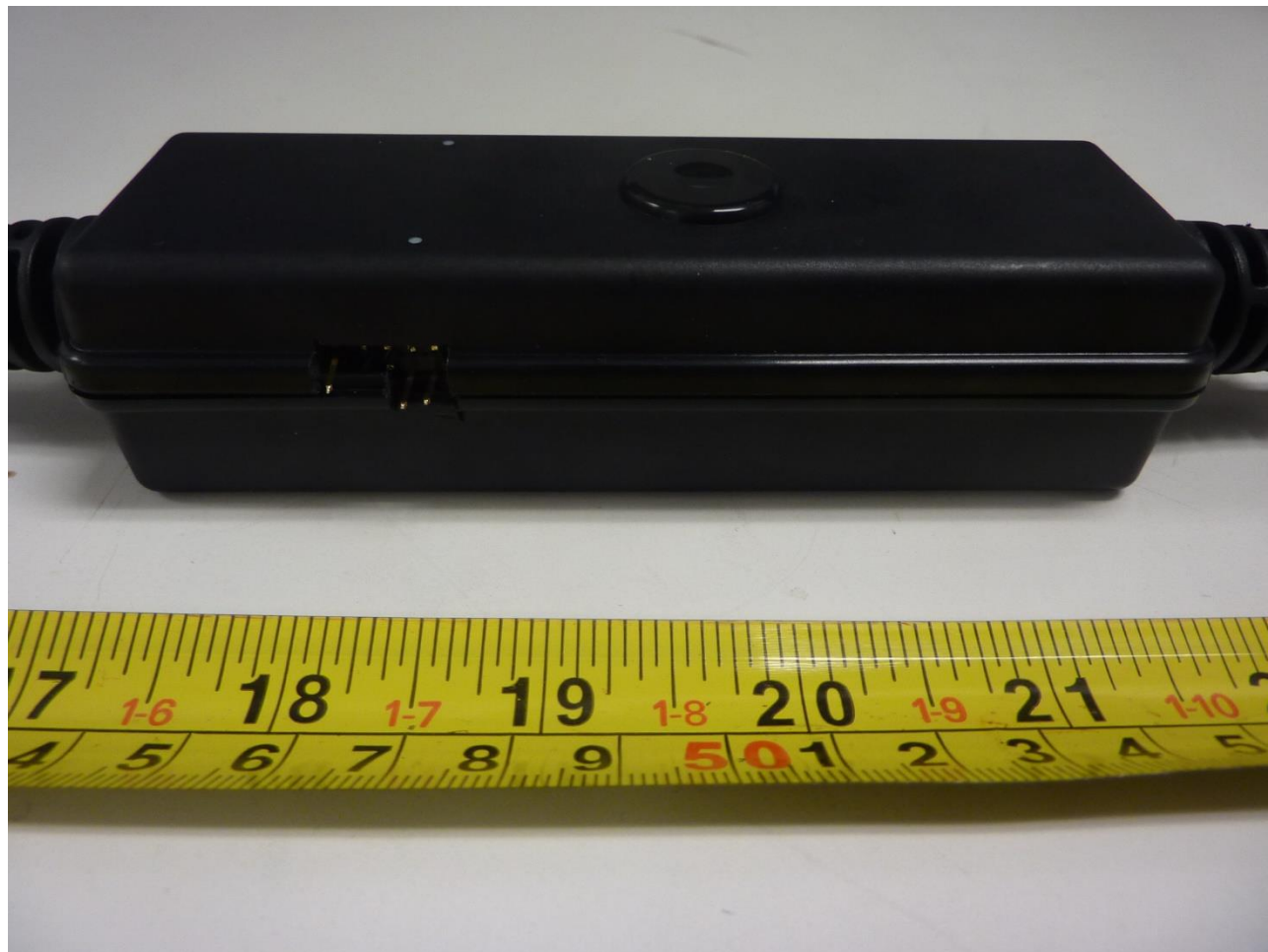


Figure 5 - External Photo of EUT- Left View

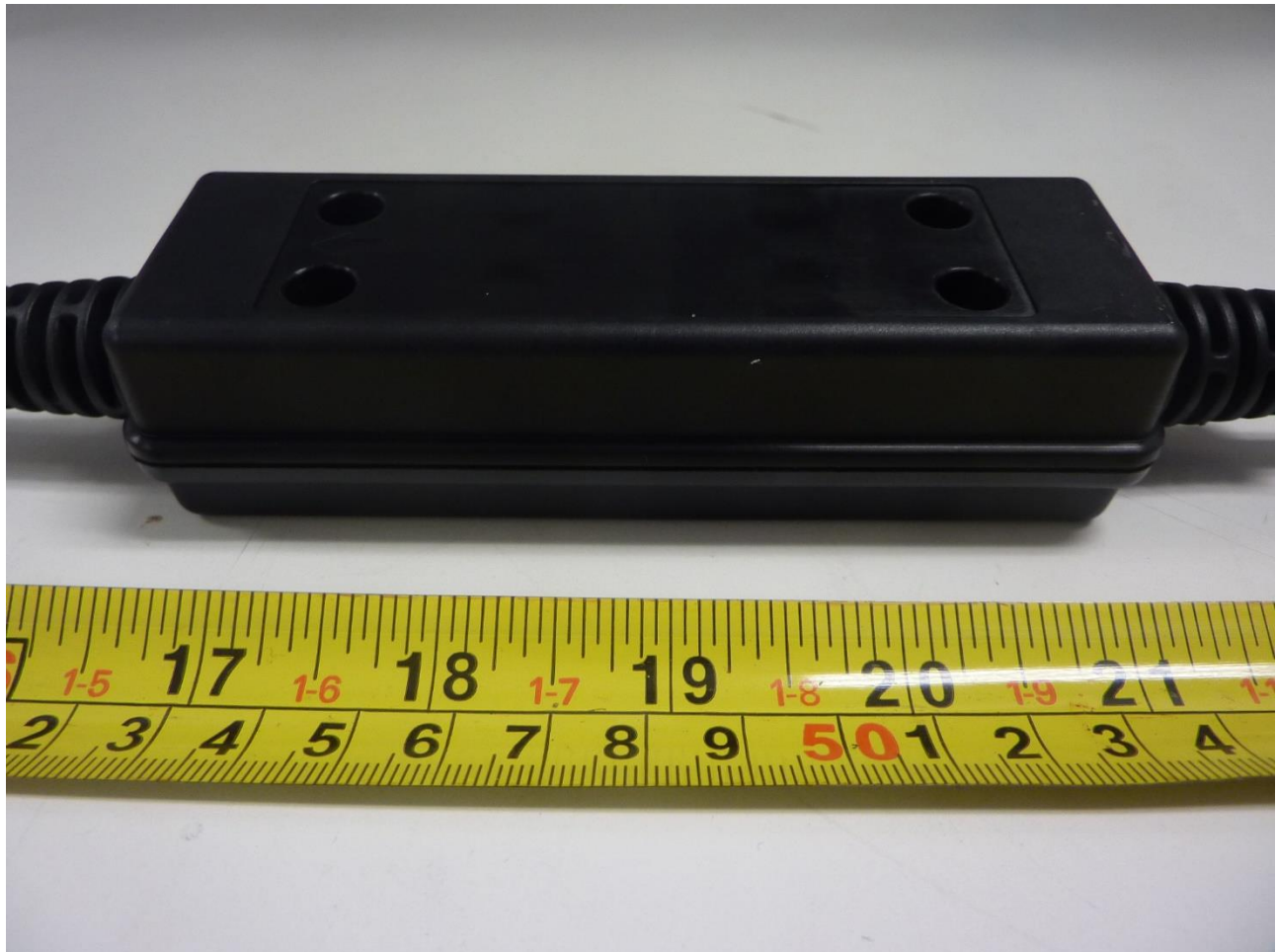


Figure 6 - External Photo of EUT- Right View



Figure 7 - Internal Photo of EUT- Cover off View

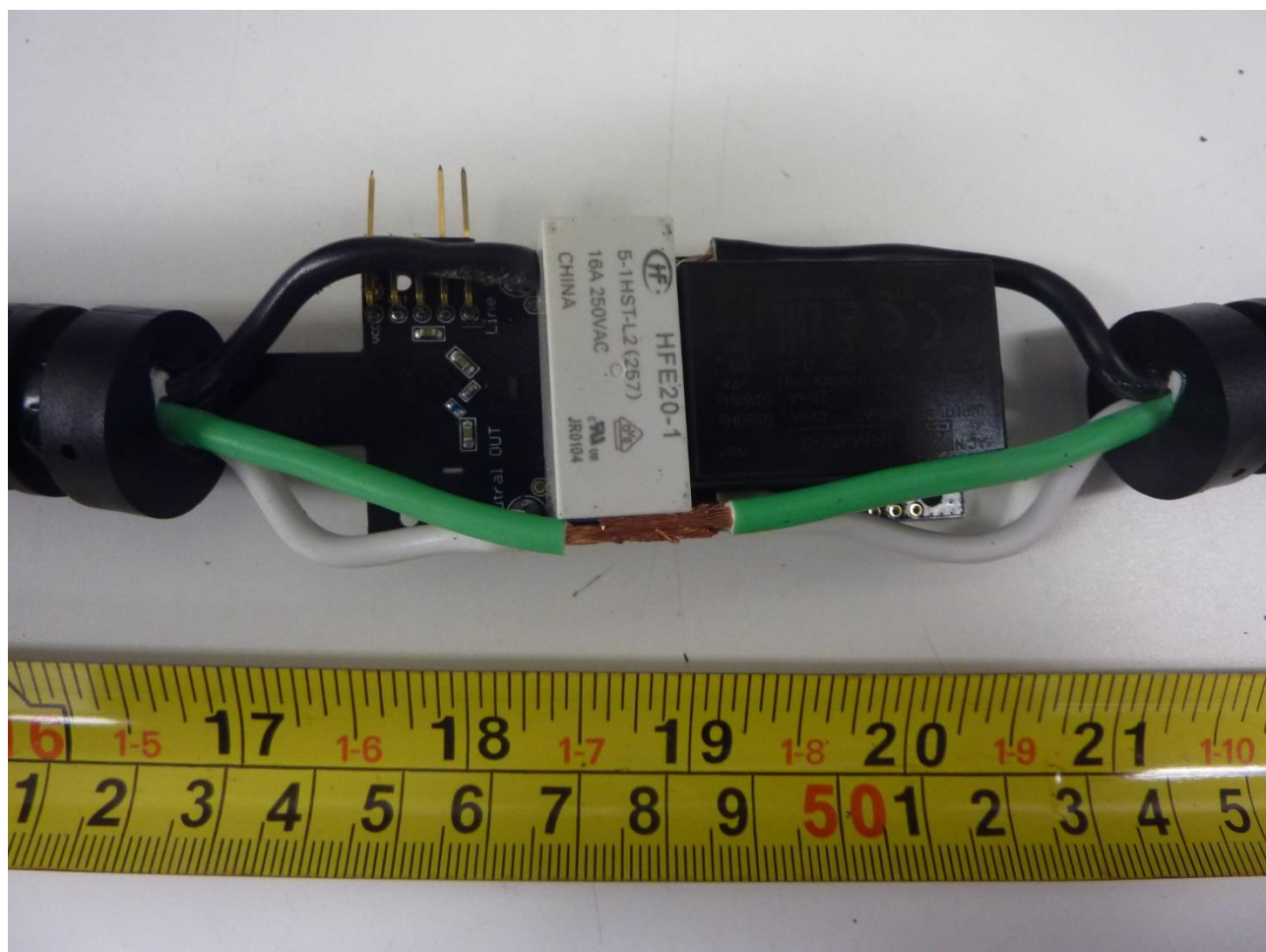


Figure 8 - Internal Photo of EUT- Top View



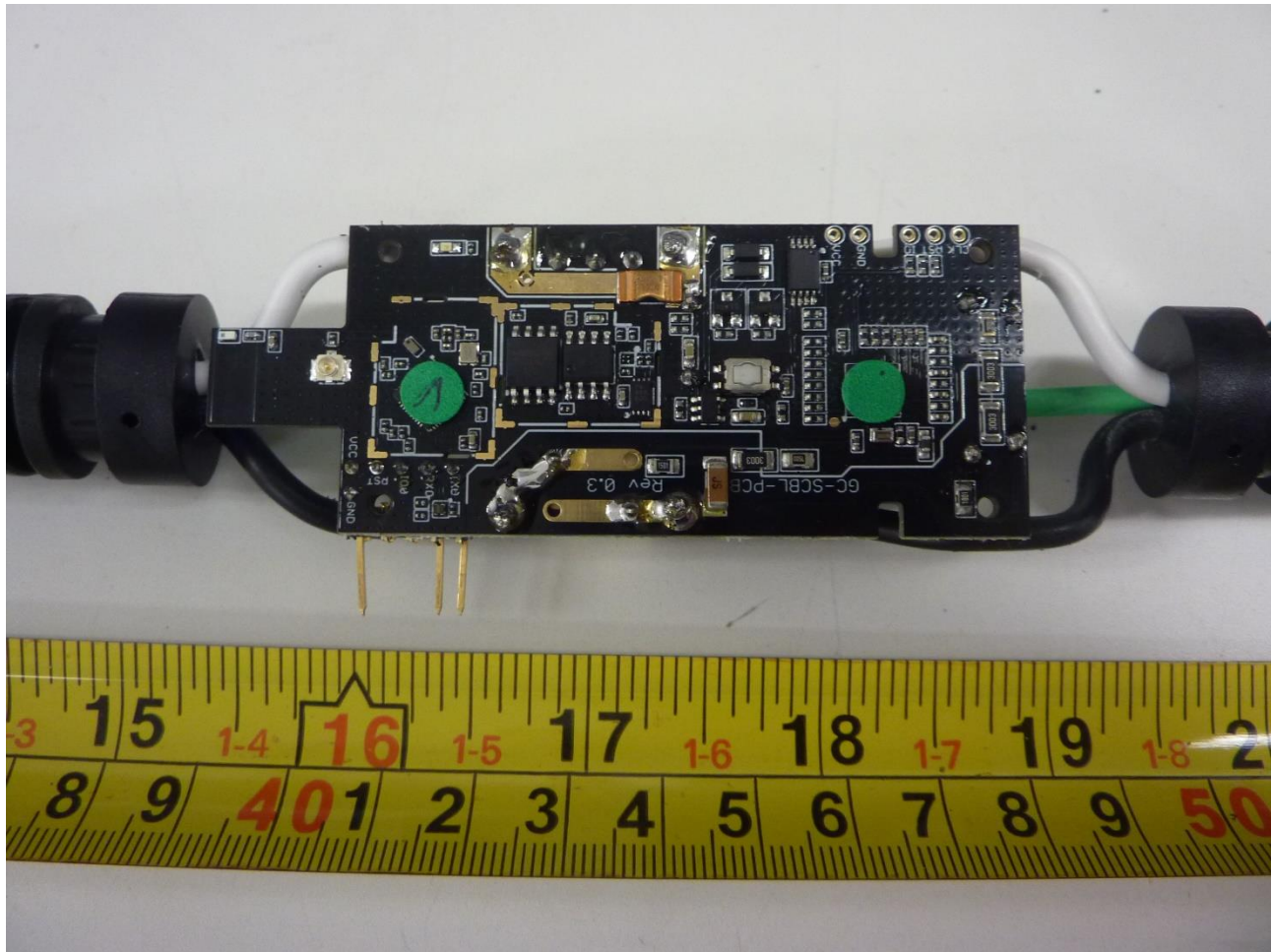


Figure 9 - Internal Photo of EUT- Bottom View

### 3 Emissions

#### 3.1 Radiated Emissions

This test measures the electromagnetic levels of spurious signals generated by the EUT that radiated from the EUT and may affect the performance of other nearby electronic equipment.

##### 3.1.1 Overview of Test

Results	Compliant (as tested per this report)				Test Date(s)		October 7th, 2019 to October 10th, 2019	
Standard	FCC Part 15 Subpart B: 2020							
Model Number	CS-SC-01				Serial #	N/A		
Configuration	Unintentional Radiated Emissions							
Test Setup	Tested in the 10-meter Semi-Anechoic chamber, placed on table: see test plan for details.							
EUT Powered By	120 VAC							
Environmental Conditions	October 7th, 2019	Temp	21.1° C	Humidity	38.8%	Pressure	1017 mbar	
Frequency Range	30 MHz to 18 GHz							
Perf. Criteria	Class B			Perf. Verification		Readings under limit		
Mod. to EUT	None			Test Performed By		Osvaldo Casorla		

##### 3.1.2 Test Procedure

Unintentional Radiated emissions tests were performed using the procedures of ANSI C63.4:2014 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from 30 MHz to 18 GHz was investigated for radiated emissions.

##### 3.1.3 Deviations

There were no deviations from the test methodology listed in the test plan for the radiated emission test.

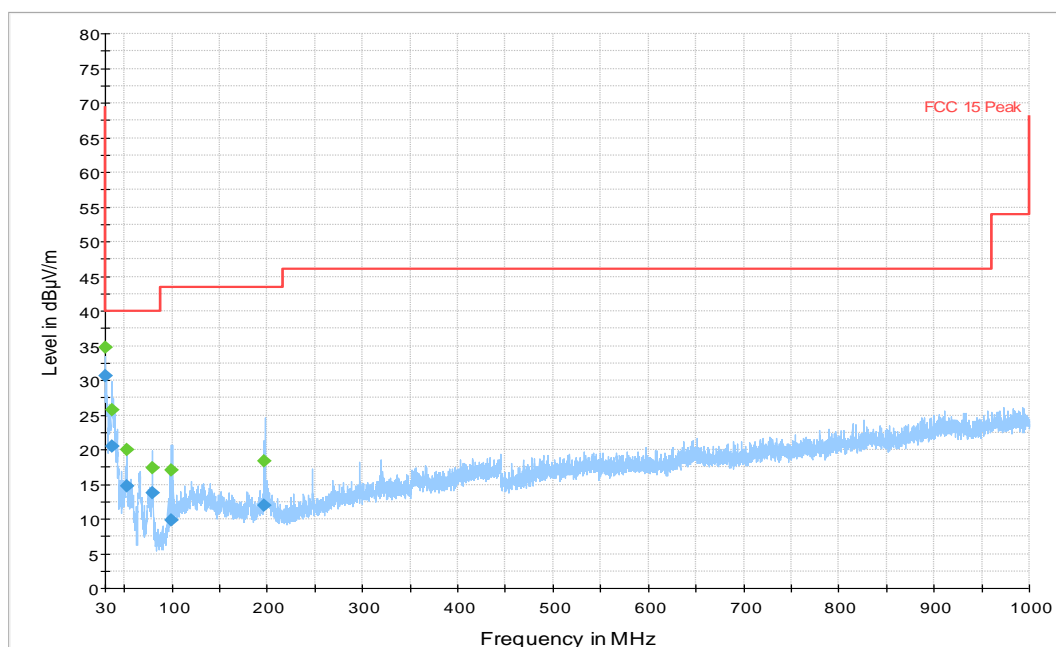
##### 3.1.4 Final Test

All final radiated emissions measurements were below the specification limits.

## 3.1.5 Plots

NOTES:

**Radiated Emissions Full Scan**  
**30 MHz – 1000 MHz**  
**Vertical / Horizontal**



## 3.1.6 Final Tabulated Data at 120 Vac, 60 Hz

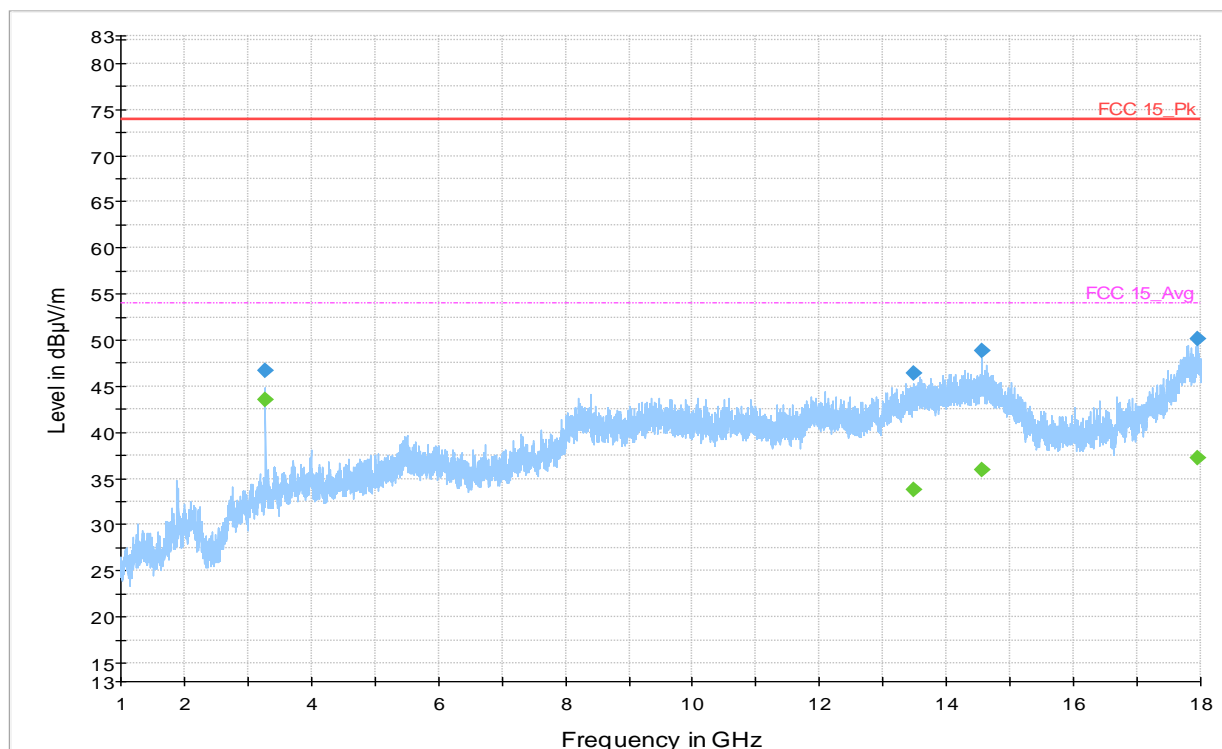
30 MHz – 1000 MHz

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
30.65	---	34.75	---	---	1000.00	120.00	306.00	V	160.00	-5.70	
30.65	30.68	---	40.00	9.32	1000.00	120.00	306.00	V	160.00	-5.70	
36.84	---	25.67	---	---	1000.00	120.00	300.00	V	57.00	-10.60	
36.84	20.49	---	40.00	19.51	1000.00	120.00	300.00	V	57.00	-10.60	
52.62	---	19.96	---	---	1000.00	120.00	200.00	V	129.00	-18.60	
52.62	14.70	---	40.00	25.30	1000.00	120.00	200.00	V	129.00	-18.60	
80.02	13.77	---	40.00	26.23	1000.00	120.00	300.00	V	-10.00	-18.80	
80.02	---	17.32	---	---	1000.00	120.00	300.00	V	-10.00	-18.80	
98.69	---	17.06	---	---	1000.00	120.00	100.00	V	-67.00	-16.40	
98.69	9.89	---	43.52	33.63	1000.00	120.00	100.00	V	-67.00	-16.40	
197.29	11.94	---	43.50	31.56	1000.00	120.00	100.00	V	119.00	-12.80	
197.29	---	18.32	---	---	1000.00	120.00	100.00	V	119.00	-12.80	

Report Date: December 10, 2020

## NOTES:

**Radiated Emissions Full Scan**  
**1000 MHz – 18000 MHz**  
 Vertical / Horizontal



### 3.1.1 Final Tabulated Data at 120 Vac, 60 Hz

1000 MHz – 18000 MHz

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
3282.73	—	43.48	54.00	10.52	1000.00	1000.00	101.00	V	122.00	-27.10	
3282.73	46.70	—	74.00	27.30	1000.00	1000.00	101.00	V	122.00	-27.10	
13476.40	—	33.75	54.00	20.25	1000.00	1000.00	254.00	H	-18.00	-12.50	
13476.40	46.49	—	74.00	27.51	1000.00	1000.00	254.00	H	-18.00	-12.50	
14554.26	—	36.01	54.00	17.99	1000.00	1000.00	300.00	V	-86.00	-11.80	
14554.26	48.87	—	74.00	25.13	1000.00	1000.00	300.00	V	-86.00	-11.80	
17943.05	50.19	—	74.00	23.81	1000.00	1000.00	100.00	V	-104.00	-6.90	
17943.05	—	37.18	54.00	16.82	1000.00	1000.00	100.00	V	-104.00	-6.90	

The test results contained in this report refer exclusively to the product(s) presented for testing. No liability may be assumed for models or products not referred to herein. This test report may not be published or duplicated in part without permission of the testing body. This test report by itself does not constitute authorization for the use of any TÜV Rheinland test mark. The report must not be used by the client to claim product certification, approval, or endorsement.



### 3.1.2 Photos

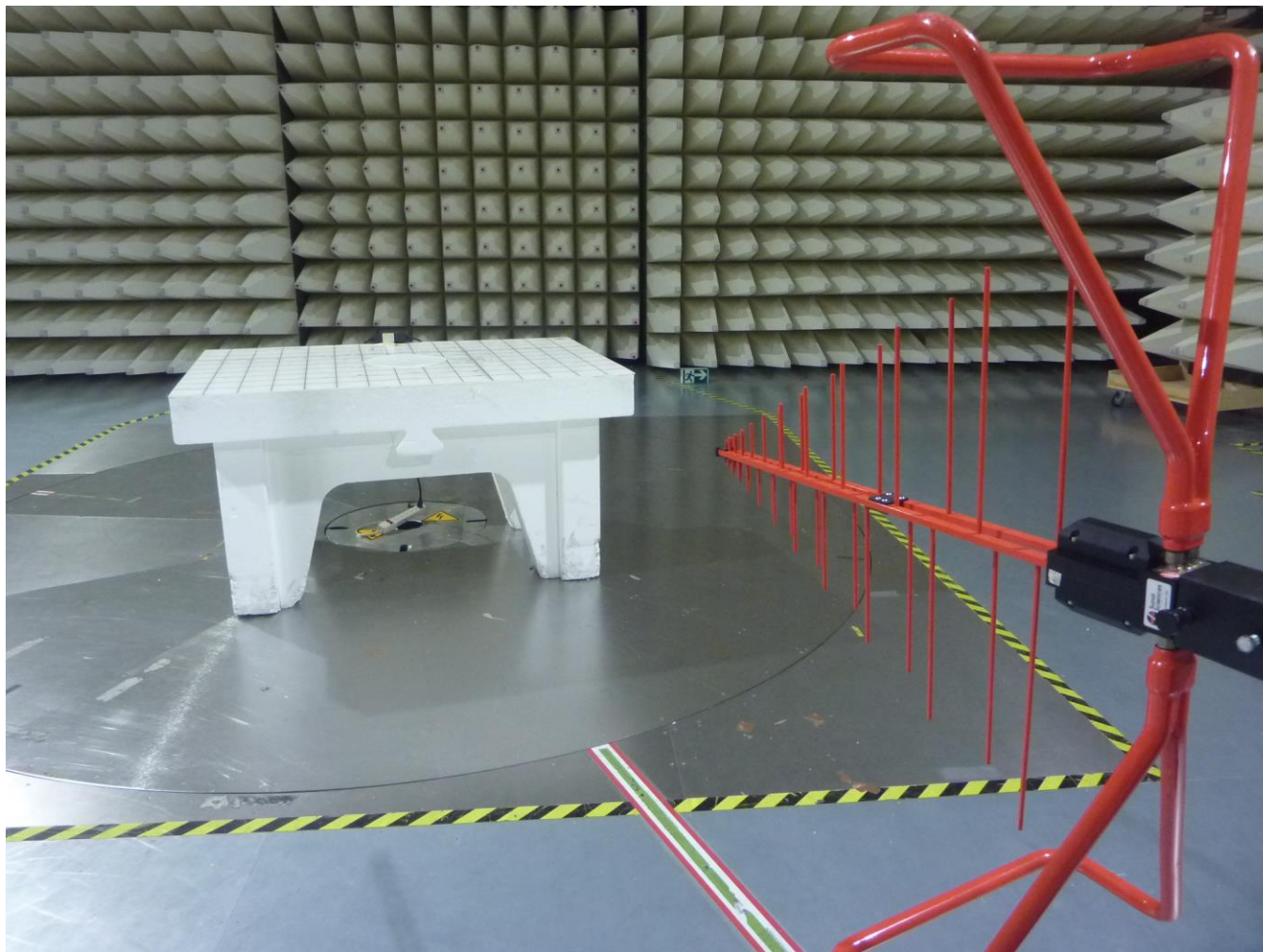


Figure 10 - Radiated Emissions Test Setup 30 - 1000 MHz

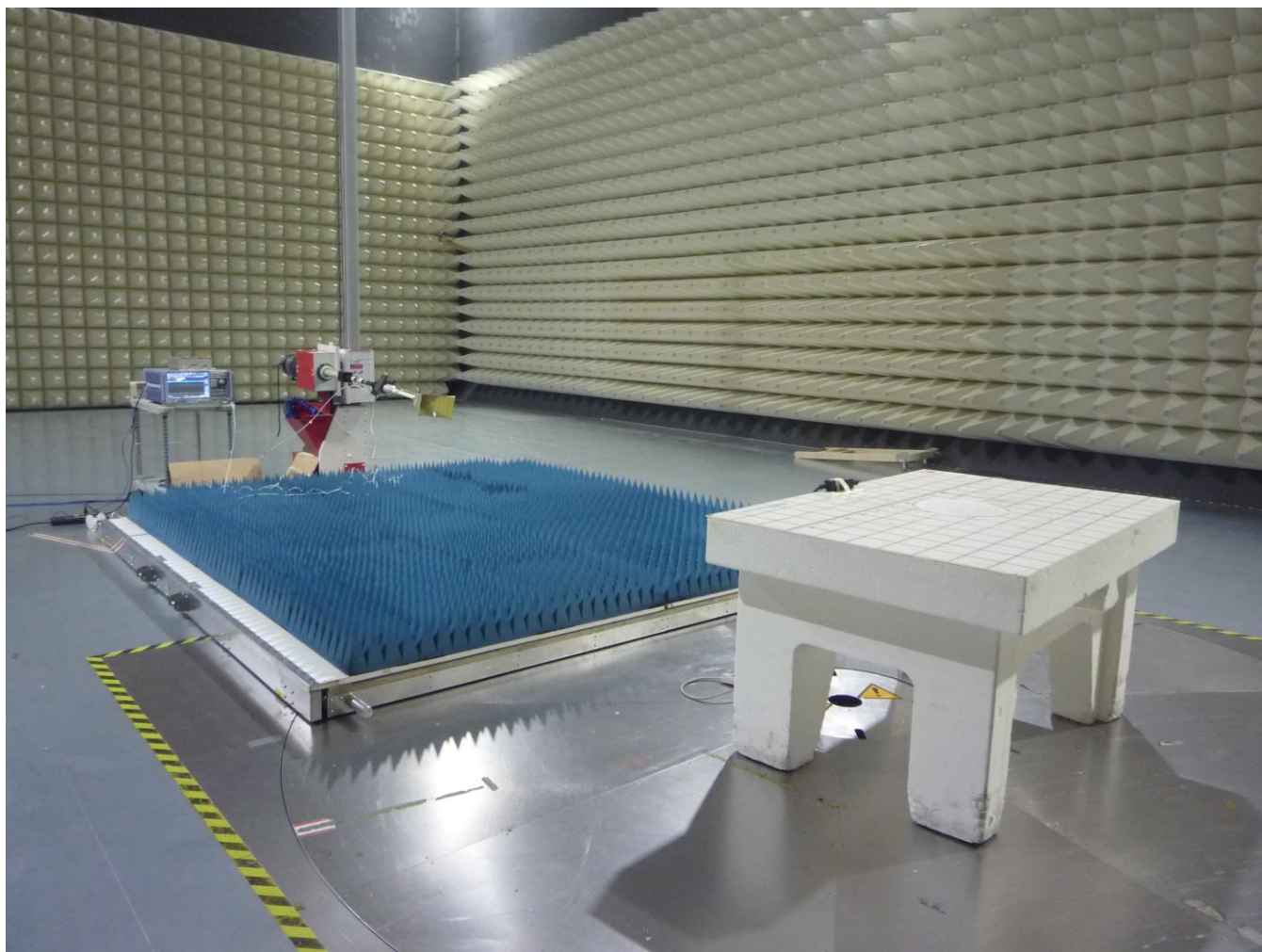


Figure 11 - Radiated Emissions Test Setup 1000 - 18000 MHz

### 3.2 Conducted Emissions

This test measures the electromagnetic levels of spurious signals generated by the EUT on the AC power line that may affect the performance of other nearby electronic equipment.

#### 3.2.1 Overview of Test

Results	Compliant (as tested per this report)				Test Date(s)	October 7th, 2019 to October 10th, 2019		
Standard	FCC Part 15 Subpart B: 2020							
Model Number	CS-SC-01				Serial #	N/A		
Configuration	See test plan for details.							
Test Setup	Tested in Lab 2, EUT placed on table: see test plan for details.							
EUT Powered By	120 Vac, 60 Hz							
Environmental Conditions	October 10th, 2019	Temp	20.3° C	Humidity	43%	Pressure	1017 mbar	
Frequency Range	0.15 – 30 MHz							
Perf. Criteria	None		Perf. Verification			Readings Under Limit for L1 & Neutral		
Mod. to EUT	None		Test Performed By			Osvaldo Casorla		

#### 3.2.2 Test Procedure

Conducted emissions tests were performed using the procedures of ANSI C63.4:2009 including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

The frequency range from

**150 kHz - 30 MHz** was investigated for conducted emissions.

Conducted Emissions measurements were performed in the shielded room using procedures specified in the test plan and standard.

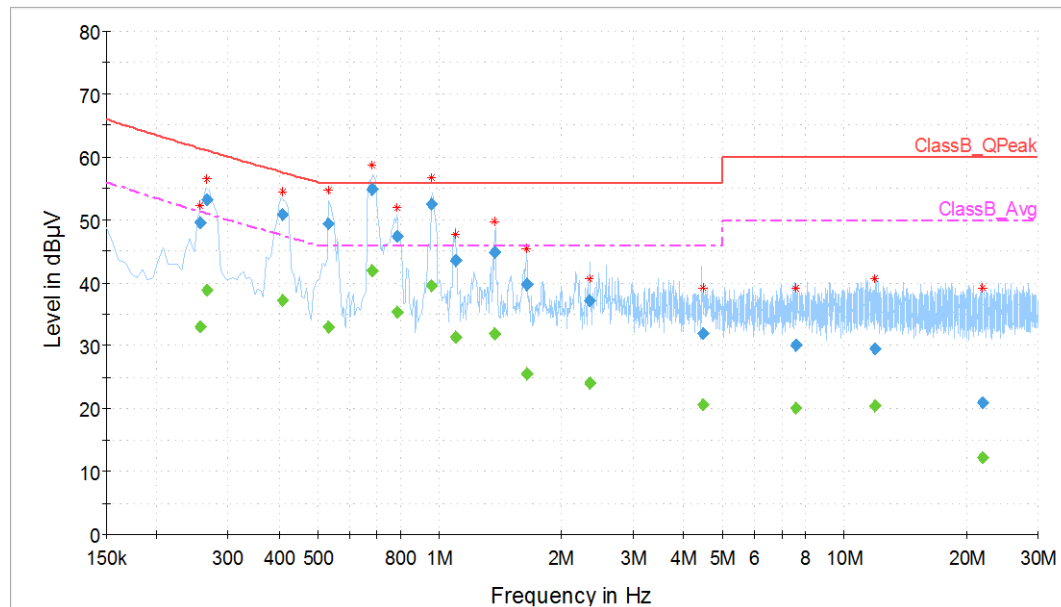
#### 3.2.3 Deviations

There were no deviations from the test methodology listed in the test plan for the conducted emission test.

#### 3.2.4 Final Test

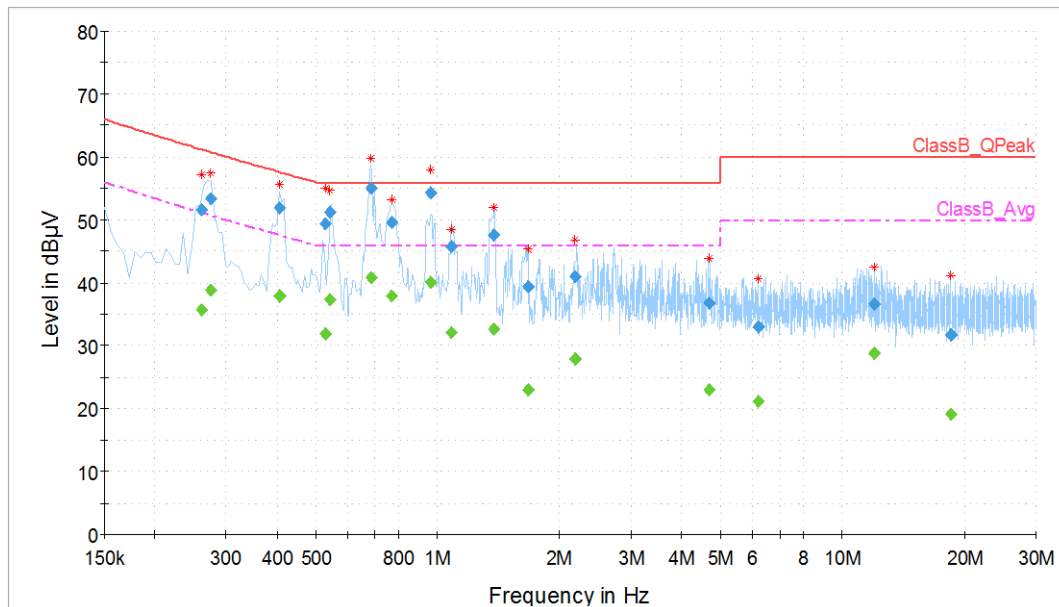
All final conducted emissions measurements were below the specification limits.

#### 4.7.2.1 Live Line



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)	Comment
0.26	---	32.96	51.32	18.36	1000.00	10.00	L1	GND	9.80	
0.26	49.56	---	61.36	11.80	1000.00	10.00	L1	GND	9.80	
0.27	---	38.79	50.98	12.18	1000.00	10.00	L1	GND	9.80	
0.27	53.22	---	61.02	7.79	1000.00	10.00	L1	GND	9.80	
0.41	---	37.24	47.55	10.31	1000.00	10.00	L1	GND	9.70	
0.41	50.88	---	57.57	6.69	1000.00	10.00	L1	GND	9.70	
0.53	---	32.91	46.00	13.09	1000.00	10.00	L1	GND	9.70	
0.53	49.41	---	56.00	6.59	1000.00	10.00	L1	GND	9.70	
0.68	---	41.94	46.00	4.06	1000.00	10.00	L1	GND	9.70	
0.68	54.85	---	56.00	1.15	1000.00	10.00	L1	GND	9.70	
0.78	---	35.37	46.00	10.63	1000.00	10.00	L1	GND	9.70	
0.78	47.41	---	56.00	8.59	1000.00	10.00	L1	GND	9.70	
0.96	---	39.55	46.00	6.45	1000.00	10.00	L1	GND	9.70	
0.96	52.51	---	56.00	3.49	1000.00	10.00	L1	GND	9.70	
1.09	---	31.32	46.00	14.68	1000.00	10.00	L1	GND	9.70	
1.09	43.51	---	56.00	12.49	1000.00	10.00	L1	GND	9.70	
1.37	---	31.95	46.00	14.05	1000.00	10.00	L1	GND	9.70	
1.37	44.89	---	56.00	11.11	1000.00	10.00	L1	GND	9.70	
1.64	---	25.45	46.00	20.55	1000.00	10.00	L1	GND	9.70	
1.64	39.64	---	56.00	16.36	1000.00	10.00	L1	GND	9.70	
2.34	---	24.04	46.00	21.96	1000.00	10.00	L1	GND	9.80	
2.34	37.21	---	56.00	18.79	1000.00	10.00	L1	GND	9.80	
4.46	---	20.53	46.00	25.47	1000.00	10.00	L1	GND	9.80	
4.46	31.97	---	56.00	24.03	1000.00	10.00	L1	GND	9.80	
7.59	---	20.01	50.00	29.99	1000.00	10.00	L1	GND	9.80	
7.59	30.14	---	60.00	29.86	1000.00	10.00	L1	GND	9.80	
11.92	---	20.40	50.00	29.60	1000.00	10.00	L1	GND	9.80	
11.92	29.49	---	60.00	30.51	1000.00	10.00	L1	GND	9.80	
21.92	---	12.14	50.00	37.86	1000.00	10.00	L1	GND	9.80	
21.92	21.04	---	60.00	38.96	1000.00	10.00	L1	GND	9.80	

#### 4.7.2.2 Neutral Line



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)	Comment
0.26	51.66	---	61.22	9.57	1000.00	10.00	L1	GND	9.80	
0.26	---	35.80	51.18	15.38	1000.00	10.00	L1	GND	9.80	
0.28	53.46	---	60.74	7.28	1000.00	10.00	L1	GND	9.80	
0.28	---	38.87	50.70	11.83	1000.00	10.00	L1	GND	9.80	
0.41	51.91	---	57.58	5.68	1000.00	10.00	L1	GND	9.70	
0.41	---	37.95	47.56	9.61	1000.00	10.00	L1	GND	9.70	
0.53	49.38	---	56.00	6.62	1000.00	10.00	L1	GND	9.70	
0.53	---	31.85	46.00	14.15	1000.00	10.00	L1	GND	9.70	
0.54	51.21	---	56.00	4.79	1000.00	10.00	L1	GND	9.70	
0.54	---	37.27	46.00	8.73	1000.00	10.00	L1	GND	9.70	
0.69	---	40.91	46.00	5.09	1000.00	10.00	L1	GND	9.70	
0.69	55.11	---	56.00	0.89	1000.00	10.00	L1	GND	9.70	
0.77	49.52	---	56.00	6.48	1000.00	10.00	L1	GND	9.70	
0.77	---	37.85	46.00	8.15	1000.00	10.00	L1	GND	9.70	
0.96	---	40.04	46.00	5.96	1000.00	10.00	L1	GND	9.70	
0.96	54.26	---	56.00	1.74	1000.00	10.00	L1	GND	9.70	
1.08	45.66	---	56.00	10.34	1000.00	10.00	L1	GND	9.70	
1.08	---	32.08	46.00	13.92	1000.00	10.00	L1	GND	9.70	
1.38	---	32.61	46.00	13.39	1000.00	10.00	L1	GND	9.70	
1.38	47.62	---	56.00	8.38	1000.00	10.00	L1	GND	9.70	
1.67	39.38	---	56.00	16.62	1000.00	10.00	L1	GND	9.70	
1.67	---	22.89	46.00	23.11	1000.00	10.00	L1	GND	9.70	
2.18	---	27.84	46.00	18.16	1000.00	10.00	L1	GND	9.80	
2.18	40.94	---	56.00	15.06	1000.00	10.00	L1	GND	9.80	
4.68	---	23.05	46.00	22.95	1000.00	10.00	L1	GND	9.80	
4.68	36.81	---	56.00	19.19	1000.00	10.00	L1	GND	9.80	
6.21	---	21.17	50.00	28.83	1000.00	10.00	L1	GND	9.80	
6.21	33.02	---	60.00	26.98	1000.00	10.00	L1	GND	9.80	
11.97	36.54	---	60.00	23.46	1000.00	10.00	L1	GND	9.80	
11.97	---	28.82	50.00	21.18	1000.00	10.00	L1	GND	9.80	
18.51	---	19.19	50.00	30.81	1000.00	10.00	L1	GND	9.80	
18.51	31.64	---	60.00	28.36	1000.00	10.00	L1	GND	9.80	

### 3.2.5 Photos





Figure 12 - Conducted Emissions Test Setup - Front





Figure 13 - Conducted Emissions Test Setup - Back

## Appendix A

### 4 Test Plan

This test report is intended to follow this test plan outlined here in unless otherwise stated in this here report. The following test plan will give details on product information, standards to be used, test set ups and refer to TUV test procedures. The test procedures will give the steps to be taken when performing the stated test. The product information below came via client, product manual, product itself and or the internet.

#### 4.1 General Information

Company Name	Grid Connect
Address	1630 W Diehl Rd
City, State, Zip	Naperville, IL, 60563
Country	USA

#### 4.2 EUT Designation

Model Name	Smart Power Cord
Model Number(s)	CS-SC-01

#### 4.3 EUT Description

Product Name	Smart Power Cord
Model Number	CS-SC-01
System Name	Smart Power Cord
Product Description	Smart cord with power control and monitoring, WiFi connectivity

#### 4.4 Equipment Under Test (EUT) Description

The EUT operates in one mode. The unit is set to operate on 2412 MHz WiFi 802.11b at maximum power.

#### 4.5 Product Environment(s)

<input checked="" type="checkbox"/>	<b>Domestic/Residential</b>	<input type="checkbox"/>	<b>Hospital</b>
<input type="checkbox"/>	<b>Light Industrial/Commercial</b>	<input type="checkbox"/>	<b>Small Clinic</b>
<input type="checkbox"/>	<b>Industrial</b>	<input type="checkbox"/>	<b>Doctor's office</b>
<input type="checkbox"/>	<b>Telecommunications Center</b>	<input type="checkbox"/>	<b>Other than Telecommunications Center</b>
<input type="checkbox"/>	<b>Other</b>		

\*Check all that apply

**4.6 Applicable Documents**

<b>Standards</b>	<b>Description</b>
FCC Part 15 Subpart B: 2020	Radiated Emissions
FCC Part 15 Subpart B: 2020	Conducted Emissions

**4.7 EUT Electrical Power Information**

Name	# of Phases	Type	Input Voltage		AC Voltage Frequency	Current Max.	Power
			Min	Max			
CS-SC-01	1 <input type="checkbox"/> 3 <input type="checkbox"/> None <input checked="" type="checkbox"/>	AC <input checked="" type="checkbox"/> DC <input type="checkbox"/> Host <input type="checkbox"/> Batteries <input type="checkbox"/>	100	240	50 / 60 Hz	0.025 A	2 W
<b>Notes</b>	The device is able to pass through relay up 20 Amp at 125 Vac for an external appliance						

**4.8 EUT Clock/Oscillator Frequencies**

Reference Designation	Speed (MHz)	Type
-	8	<input checked="" type="checkbox"/> Oscillator <input type="checkbox"/> Microprocessor
-	2 - 60	External Crystal Oscillator
-	0.032	External Crystal Oscillator RTC

**4.8.1 Radiated Emissions, Upper Frequency**

<input checked="" type="checkbox"/>	Less than 108 MHz	Scan to 1 GHz
<input type="checkbox"/>	Less than 500 MHz	Scan to 2 GHz
<input type="checkbox"/>	Less than 1000 MHz	Scan to 5 GHz
<input type="checkbox"/>	Greater than 1000 MHz	Scan to 5 <sup>th</sup> Harmonic or 40 GHz (whichever is lower)

**4.9 Electrical Support Equipment**

Reference Designation	Manufacturer	Model	Serial Number	BSMI #
N/A				

**4.10 Non - Electrical Support Equipment N/A**

Reference Designation	Manufacturer	Model	Serial Number or Description (e.g., Type of Gas or Liquid)
N/A			

**4.11 EUT Equipment/Cabling Information N/A**

EUT Port	Connected To	Cable Type			
		Length (Meters)	Shielded Yes / No	Bead Yes / No	
N/A	N/A	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**4.12 EUT Test Program****4.13 EUT Modes of Operation**

The CS-SC-01 was in a continuous TX mode operating at 802.11b 2412 MHz WiFi.

**4.14 Monitoring of EUT during Testing**

The EUT will be monitored by visual observation using a spectrum analyzer.

Prior to each tests the EUT is set to idle mode with no transmission.

**4.15 EUT Configuration**

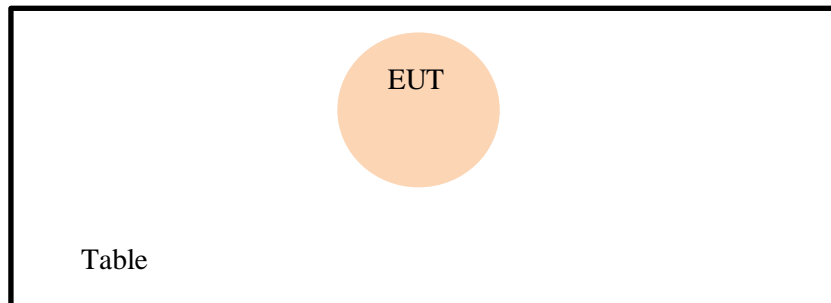
EUT is powered by AC mains Public Utility.

**4.16 Description**

Configuration		Description
Tabletop		EUT is a standalone equipment placed on tabletop
Notes		

**4.17 Subassemblies**

Reference Designation	Manufacturer	Model No.	Revision	Serial No.	Description
N/A					

**4.17.1 Block Diagram**



## 4.18 Emissions

### 4.18.1 Radiated Emissions

#### 4.18.1.1 Preliminary Radiated Emissions Test Setup

Standard	FCC Part 15 Subpart B: 2020			Procedure	ANSI C63.4
Limit	Class B	Emissions Verification		Emissions Under Limit	
Frequency Range	30 MHz – 18 GHz				
Scan #1	Pre-scan 30 – 18000 MHz	Antenna Distance	3m	Detector	Peak Scan
Configuration	See Section 4.16				
Notes	None				

**4.18.1.2 Final Radiated Emissions Test Setup**

Standard	FCC Part 15 Subpart B: 2020			Procedure	ANSI C63.4
Limit	Class B	Emissions Verification		Emissions Under Limit	
Frequency Range	30 MHz – 18 GHz				
Scan #1	Final Scan 30 – 18000 MHz	Antenna Distance	3m	Detector	Peak Scan
Configuration	See Section 4.16				
Notes	None				

## 4.18.2 Conducted Emissions

### 4.18.2.1 Final Conducted Emissions Test Setup

<b>Standard</b>	FCC Part 15 Subpart B: 2020	<b>Procedure</b>	ANSI C63.4
<b>Limit(s)</b>	Class B: Quasi Peak Average	<b>Emissions Verification</b>	Emissions Under Limit
<b>AC Mains Line</b>	1 AC Line	<b>LAN Cable(s)</b>	None
<b>Frequency Range</b>	150 kHz - 30 MHz	<b>Detectors</b>	Quasi Peak Average
<b>Scan #1</b>	120 Vac, 60 Hz	<b>EUT Powered By</b>	Power Supply
<b>Configuration</b>	See Section 4.16		
<b>Notes</b>	None		

**END OF REPORT**