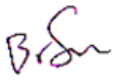
EMC Test Report

Report No.: EMC_SL15120101-HID-031_FCC_IC
Supersede Report No.: None

Applicant	HID Global Corporation
Product Name	Color Card Printer
Model No.	X002100, DTC5500LMX
Test Standard	47 CFR FCC 15 subpart B ICES-003:2012
Test Method	ANSI C63.4:2014
Date of test	01/12/2016 - 03/07/2016
Issue Date	3/29/2016
Test Result	☒ Pass ☐ Fail
Equipment complied with the specification	**[x]**
Equipment did not comply with the specification	**[ ]**
This Test Report is Issued Under the Authority of:	
	
Michael R. Gates	**Bryan Smith**
Test Engineer	**Engineer Reviewer**
This test report may be reproduced in full only **Test result presented in this test report is applicable to the tested sample only**	

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, CA 95035

ACCREDITED
TESTING CERT # 2742-01

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
EMC_SL15120101-HID-031_FCC_IC	Original	Original	3/15/2016

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: HID Global Corporation
Product: Color Card Printer
Model: X002100, DTC5500LMX

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	HID Global Corporation
Applicant Address	6533 FLYING CLOUD DR, SUITE 1000, EDEN PRAIRIE, MN 55344 USA
Manufacturer Name	HID Global Corporation
Manufacturer Address	6533 FLYING CLOUD DR, SUITE 1000, EDEN PRAIRIE, MN 55344 USA

4 Test site information

Lab performing tests	SIEMIC Laboratories
Lab Address	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	881796
IC Test Site No.	4842D-2
VCCI Test Site No.	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 Test Software Version

Test Item	Vendor	Software	Version
Radiated Emission	EMISoft	EMISoft Vasona	V5.0
Conducted Emission	EMISoft	EMISoft Vasona	V5.0

7 EUT Information

7.1 EUT Description

Product Name	Color Card Printer
Model No.	X002100, DTC5500LMX
Trade Name	HID
Serial No.	N/a
Input Power	100 - 240Vac 47/63Hz 3.0A
Power Adapter Manu/Model	ABC225-1024L / BEI
Power Adapter SN	N/a
Hardware version	N/a
Software version	FW version 0.1.2.8, & FW version 1.0.1.6
Date of EUT received	12/10/2015
Equipment Class/ Category	Class A / ITE
Clock Frequencies	>108MHz
Port/Connectors	RJ-45x1, USB Type Bx1
Remark	EUT was tested with all modifications
AC Power Cord Type	IEC Type B
DC Power Cable Type	N/a

7.2 EUT test modes/configuration Description

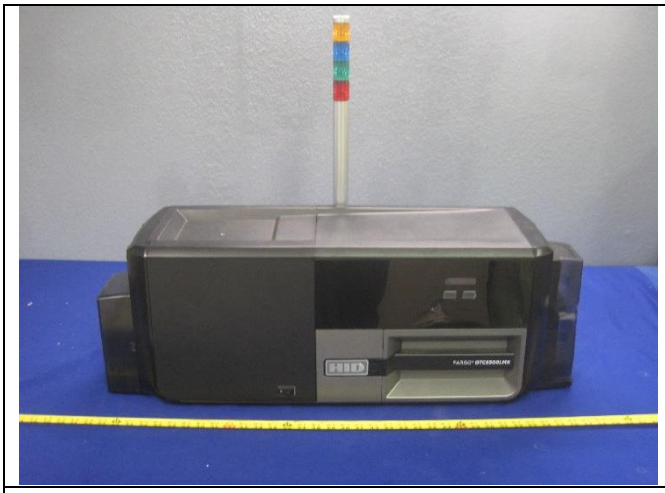
Pre-test mode

Prescan Test Mode		Note
Pre_test_mode_1	Normal Operating mode	-
Pre_test_mode_2	-	-
Pre_test_mode_3	-	-
Pre_test_mode_4	-	-
Remark: The EUT was functioning in its normal operating mode, Printing and Laminating ID Cards continually, while maintaining a link with the Laptop.		

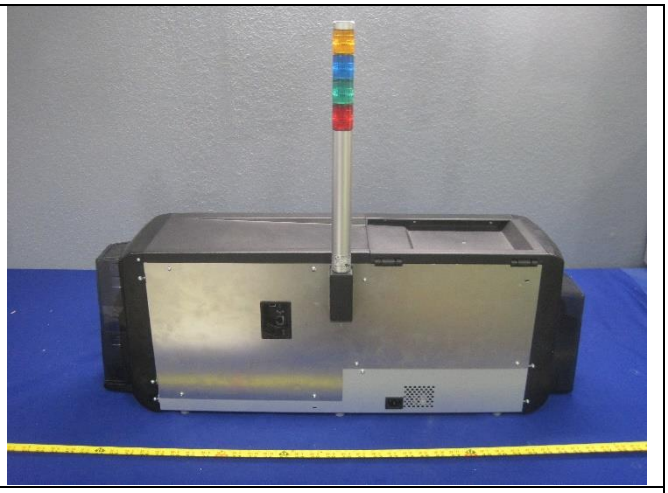
Final test mode

Final Test Mode		Note
Final_test_mode_1	Normal Operating mode	-
Final_test_mode_2	-	-
Final_test_mode_3	-	-
Final_test_mode_4	-	-
Remark: The EUT was functioning in its normal operating mode, Printing and Laminating ID Cards continually, while maintaining a link with the Laptop.		

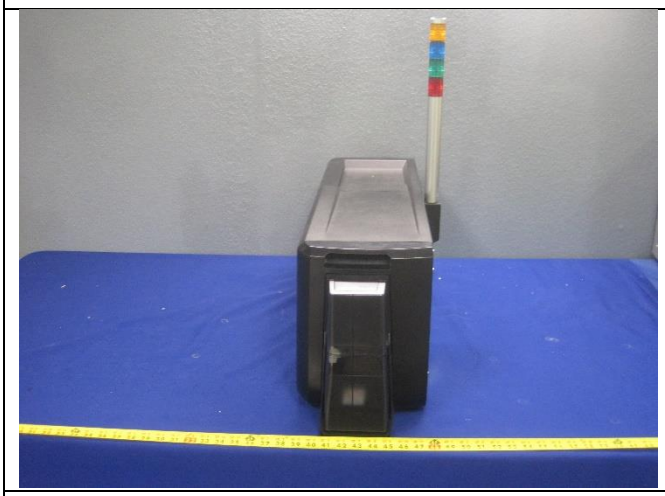
7.3 EUT Photos - External



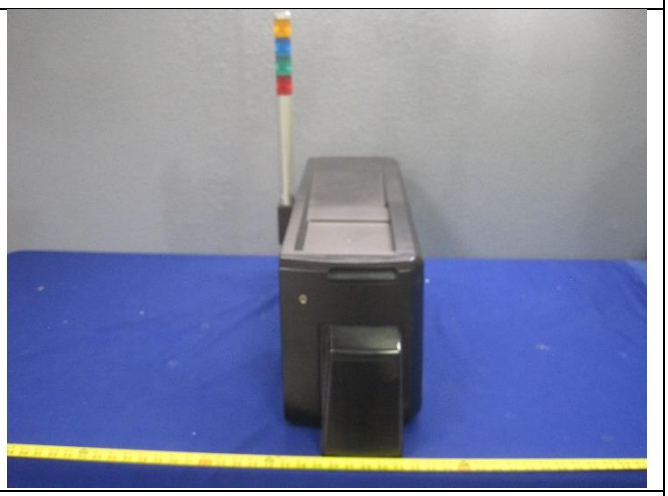
EUT – Front View



EUT – Rear View

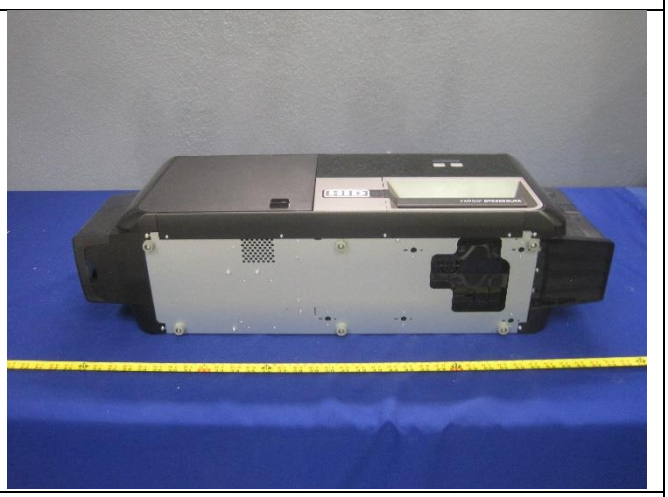


EUT – Left View



EUT – Right View

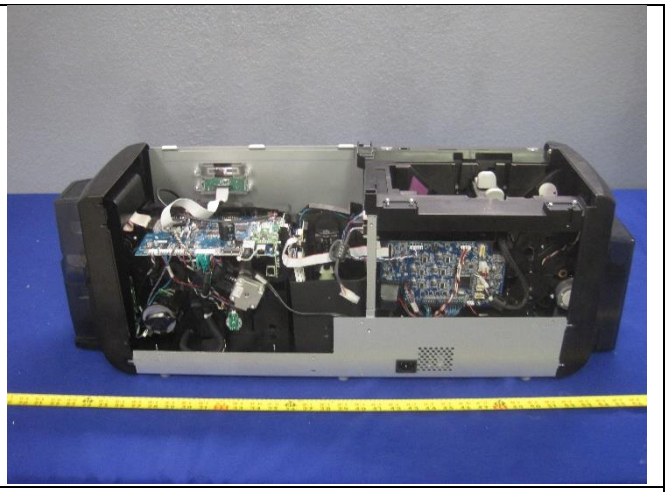
EUT – Top View



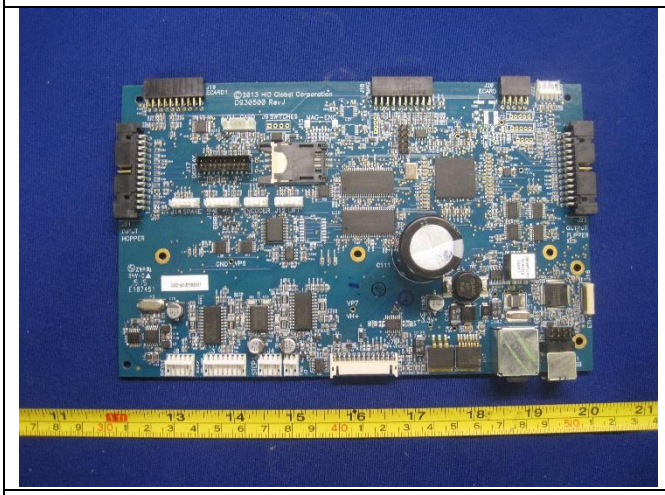
EUT – Bottom View

7.4 EUT Photos - Internal

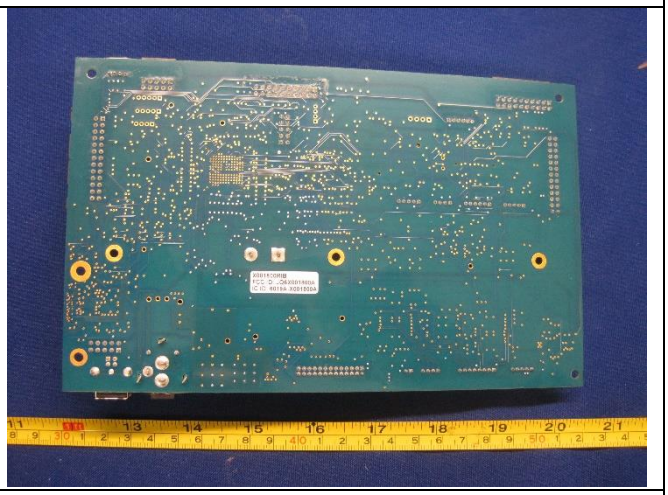
EUT With Enclosure



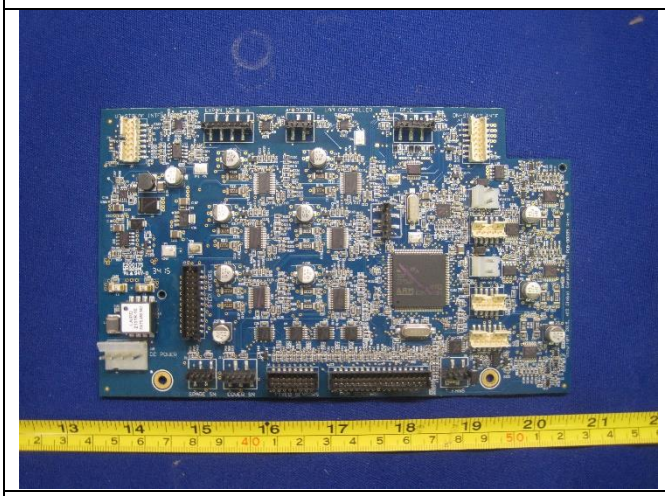
EUT Without Enclosure



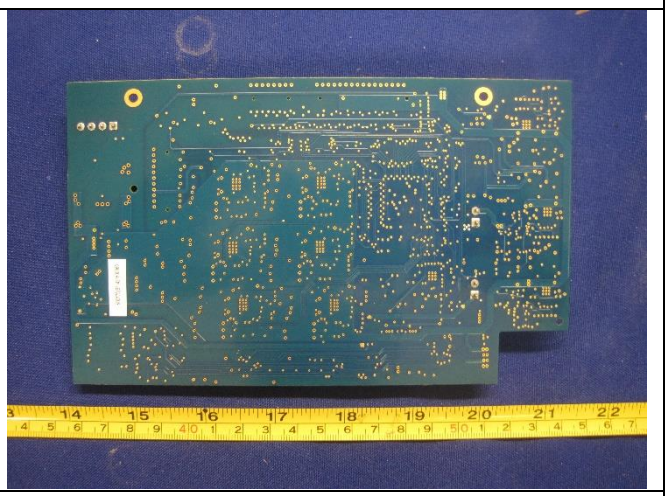
PCBA1 – Top View



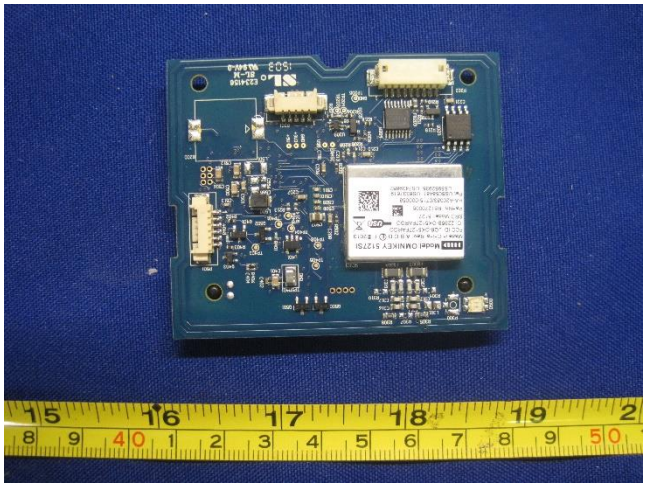
PCBA1 – Bottom View



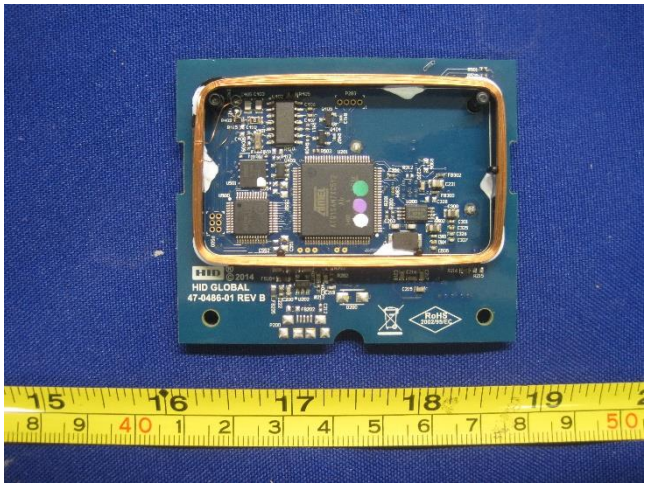
PCBA2 – Top View



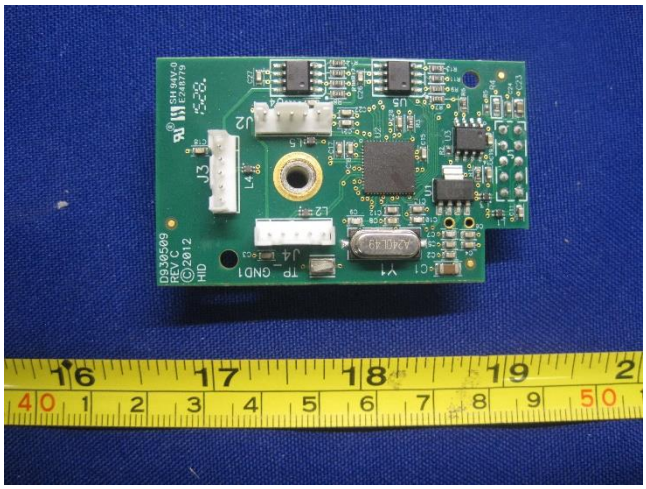
PCBA2 – Bottom View



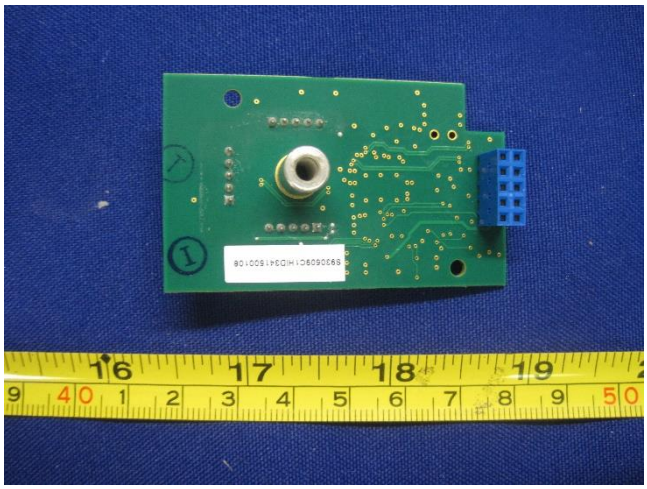
PCBA3 – Top View



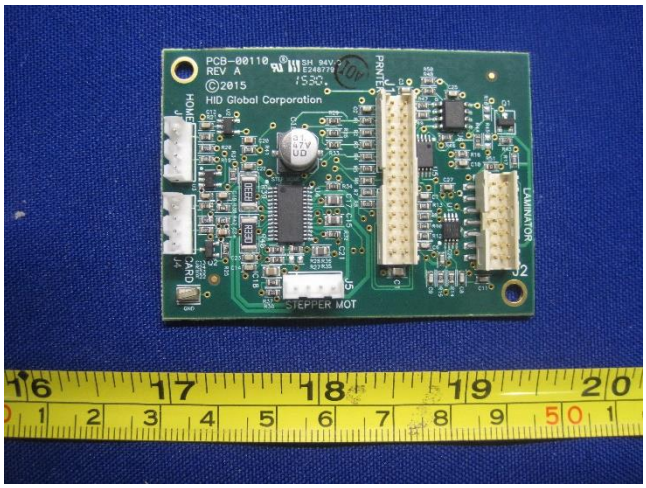
PCBA3 – Bottom View



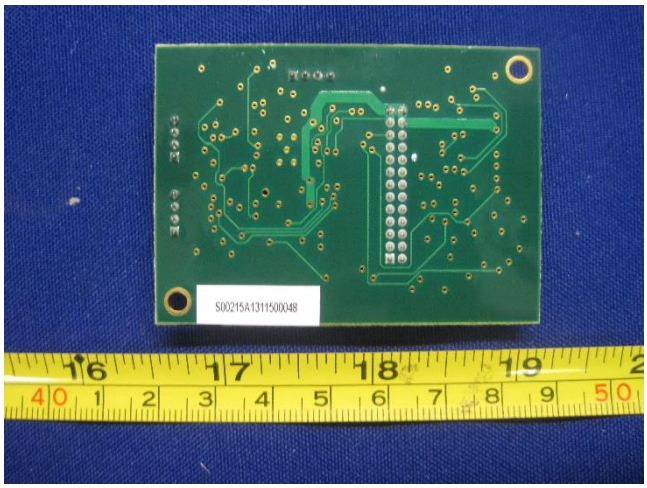
PCBA4 – Top View



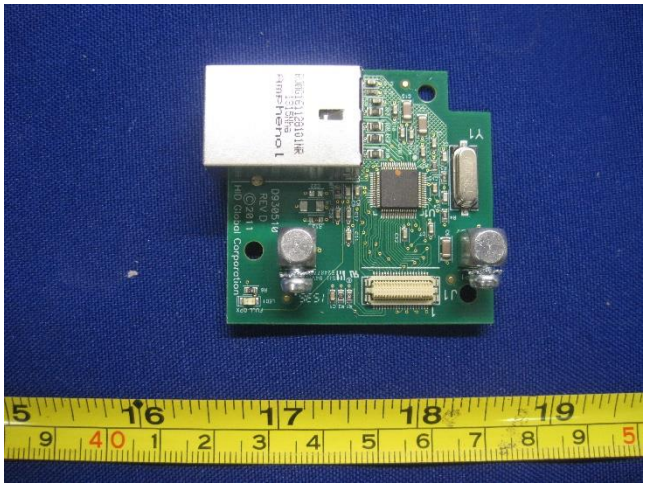
PCBA4 – Bottom View



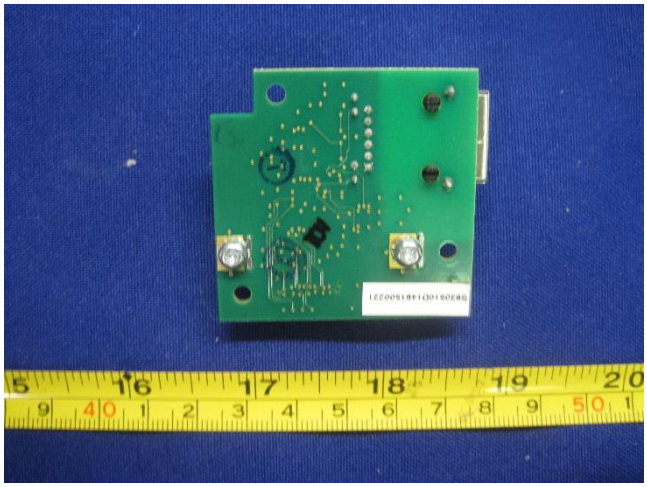
PCBA5 – Top View



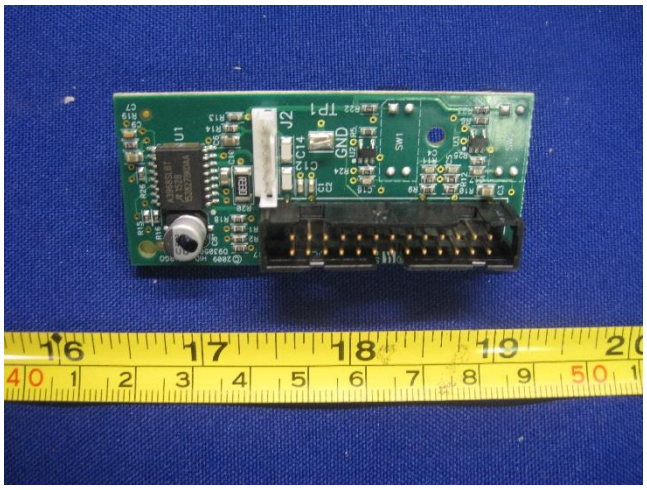
PCBA5 – Bottom View



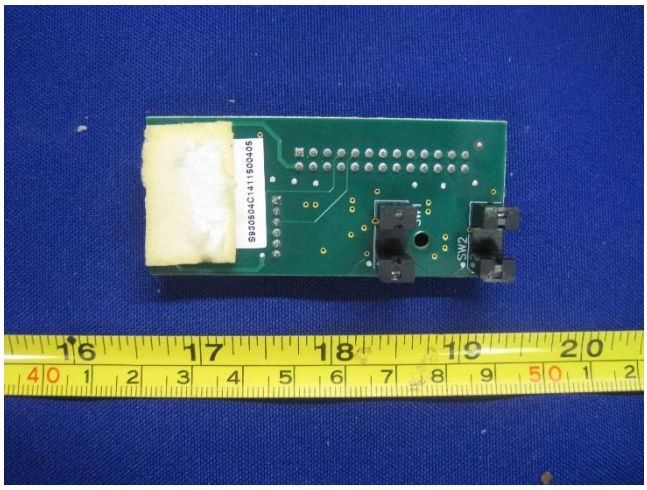
PCBA6 – Top View



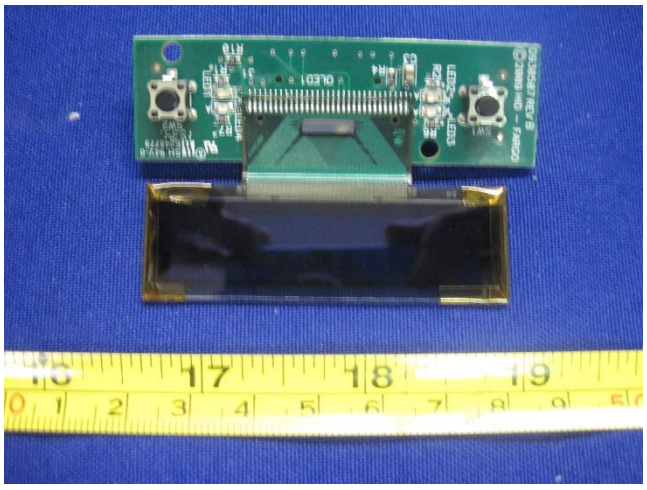
PCBA6 – Bottom View



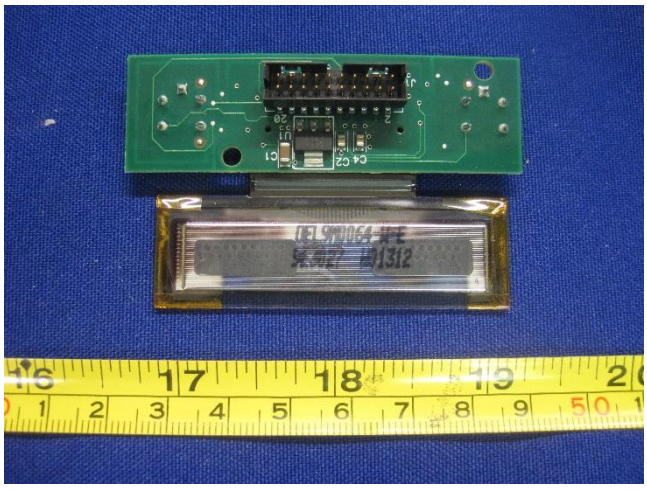
PCBA7 – Top View



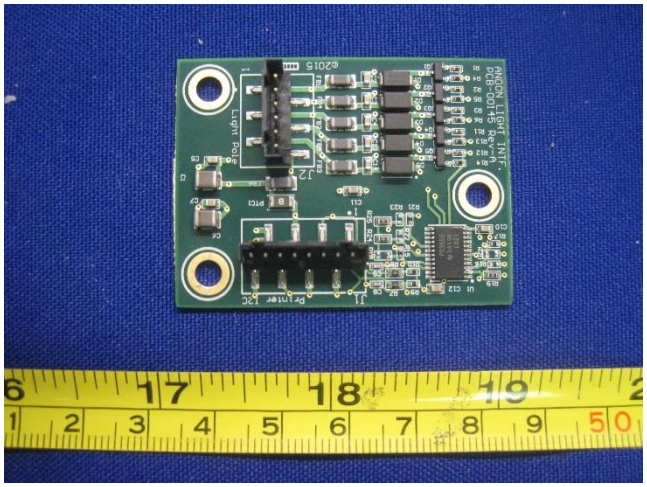
PCBA7 – Bottom View



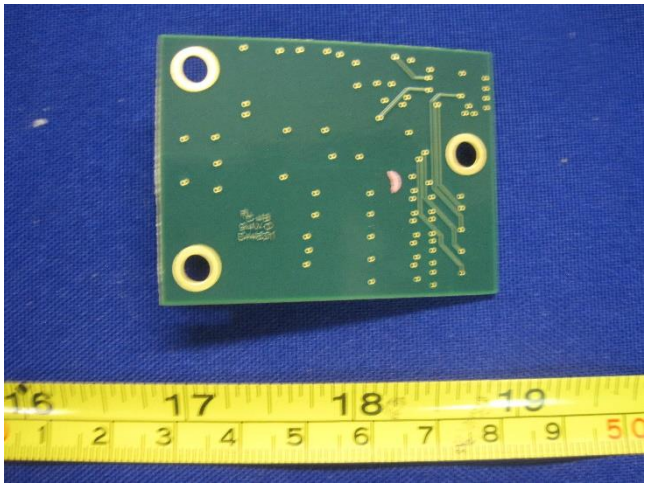
PCBA8 – Top View



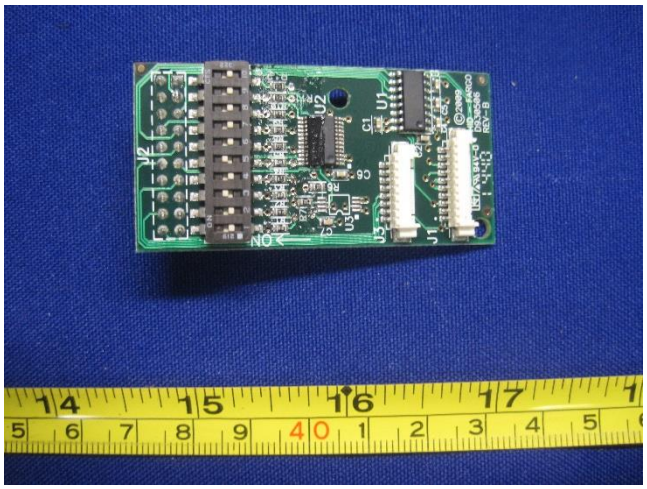
PCBA8 – Bottom View



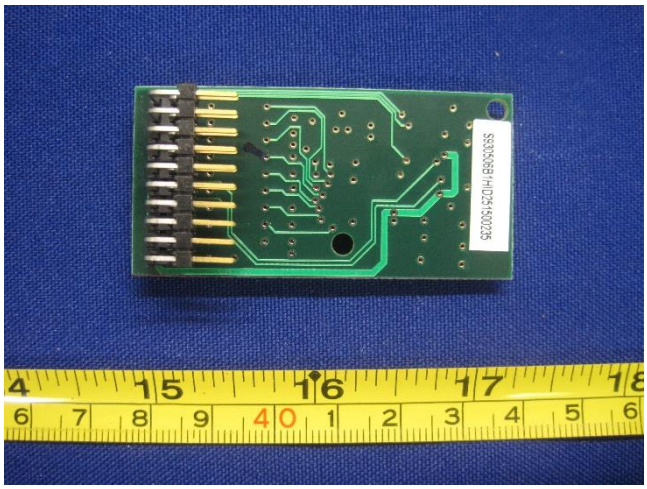
PCBA9 – Top View



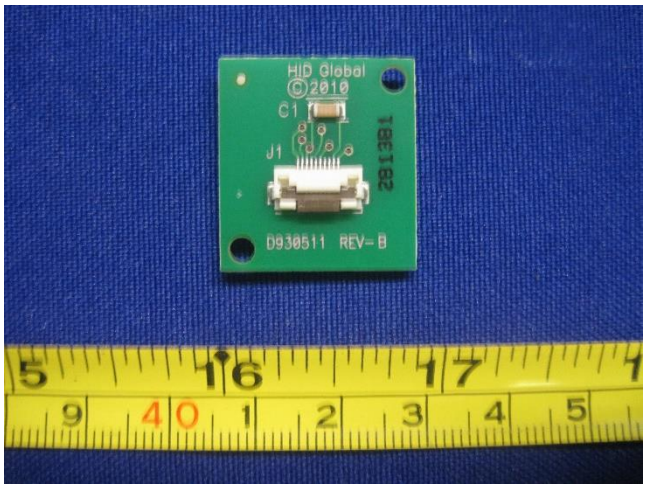
PCBA9 – Bottom View



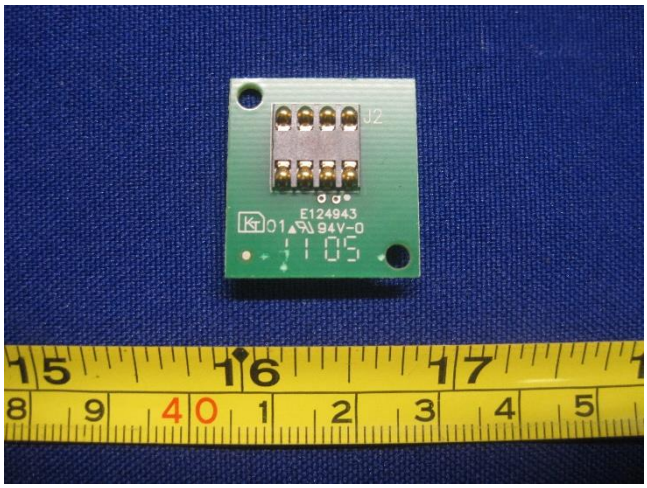
PCBA10 – Top View



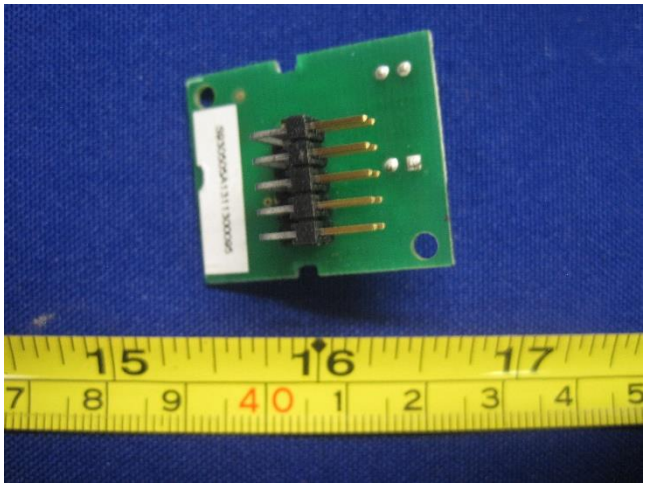
PCBA10 – Bottom View



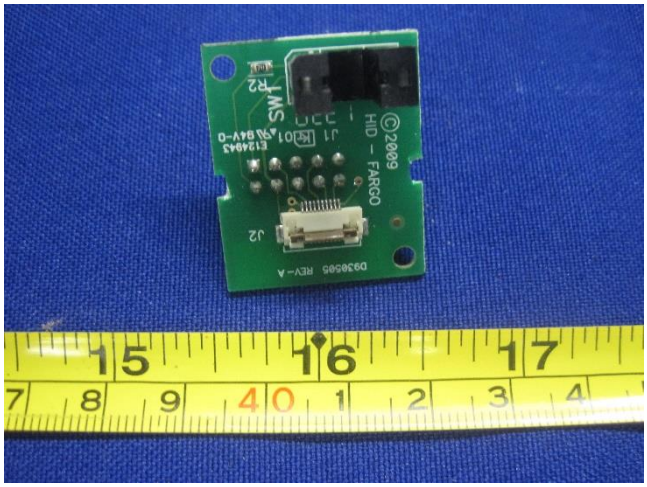
PCBA11 – Top View



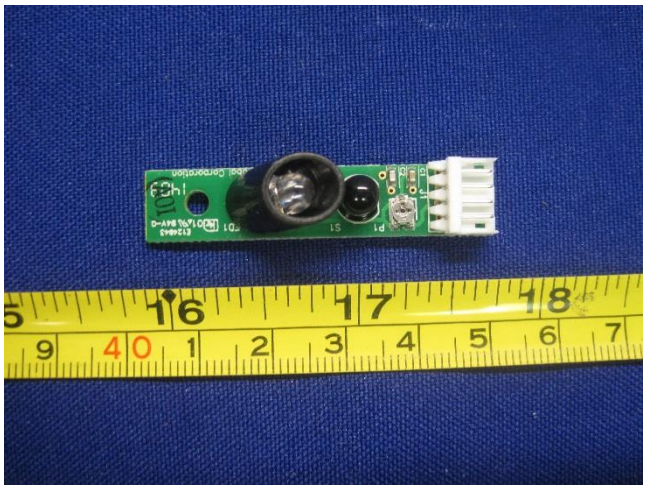
PCBA11 – Bottom View



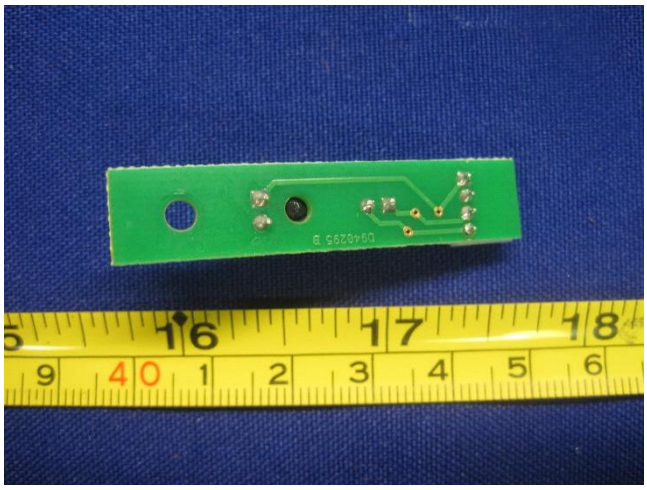
PCBA12 – Top View



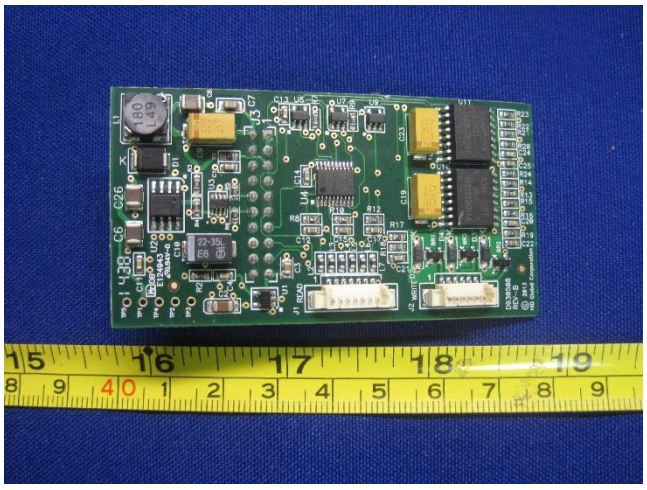
PCBA12 – Bottom View



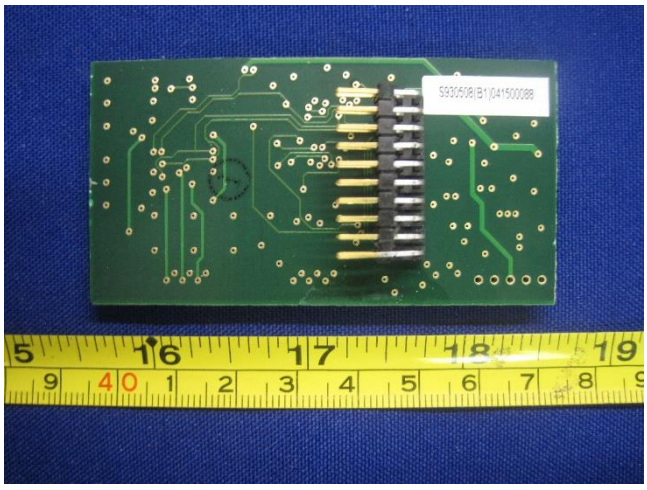
PCBA13 – Top View



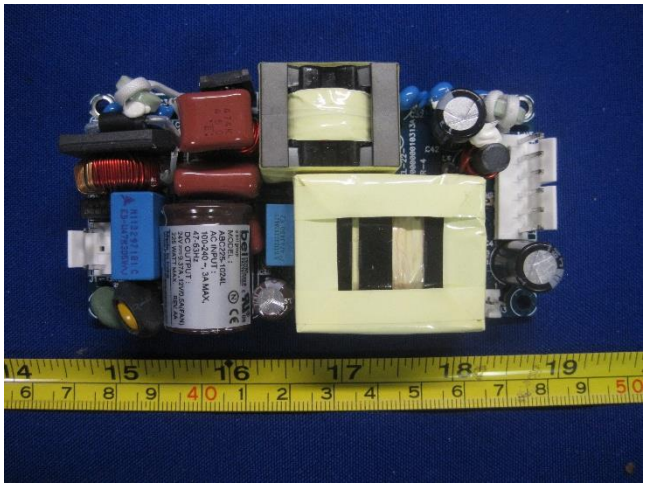
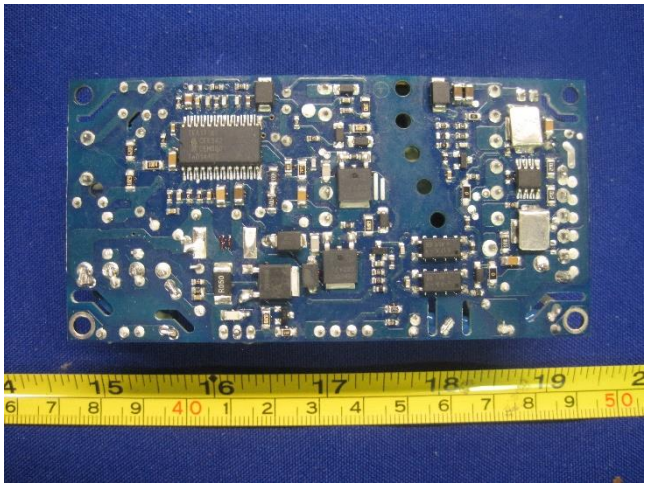
PCBA13 – Bottom View



PCBA14 – Top View



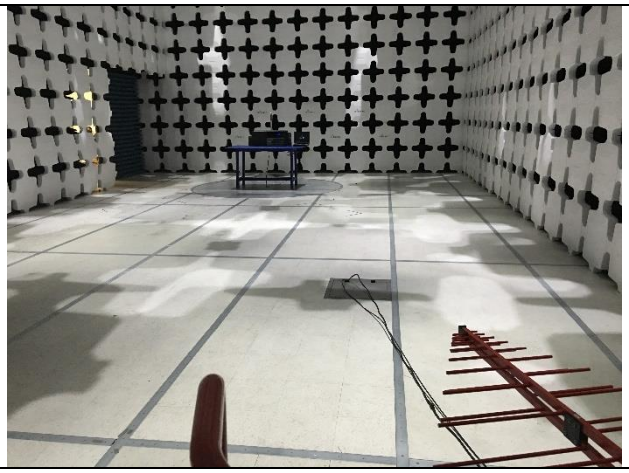
PCBA14 – Bottom View

	
PCBA15 – Top View	**PCBA15 – Bottom View**

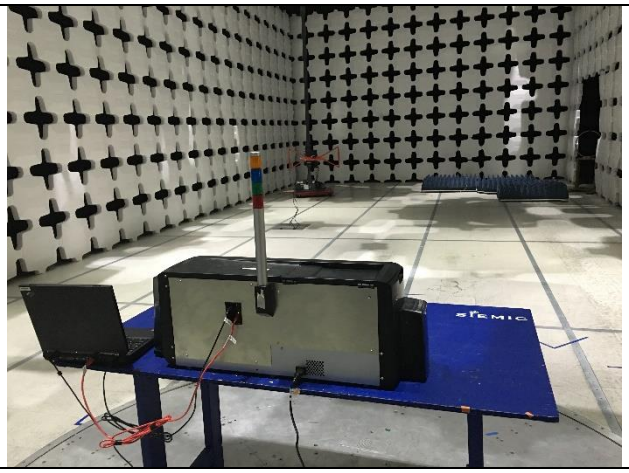
7.5 EUT Test Setup Photos

AC Line Conducted Emissions – Front View

AC Line Conducted Emissions – Rear View

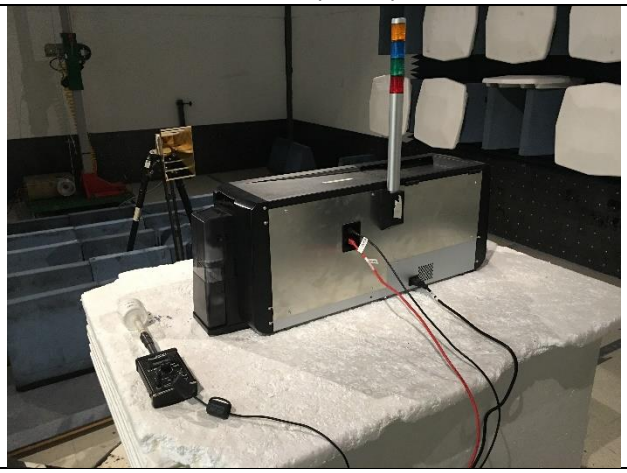


Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View

Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View

8 Supporting Equipment/Software and cabling Description

8.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	N/a	N/a	Lenovo	-
2	Router	DIR-500	N/a	D-Link	Used only for Signal line conducted emissions

8.2 I/O Ports

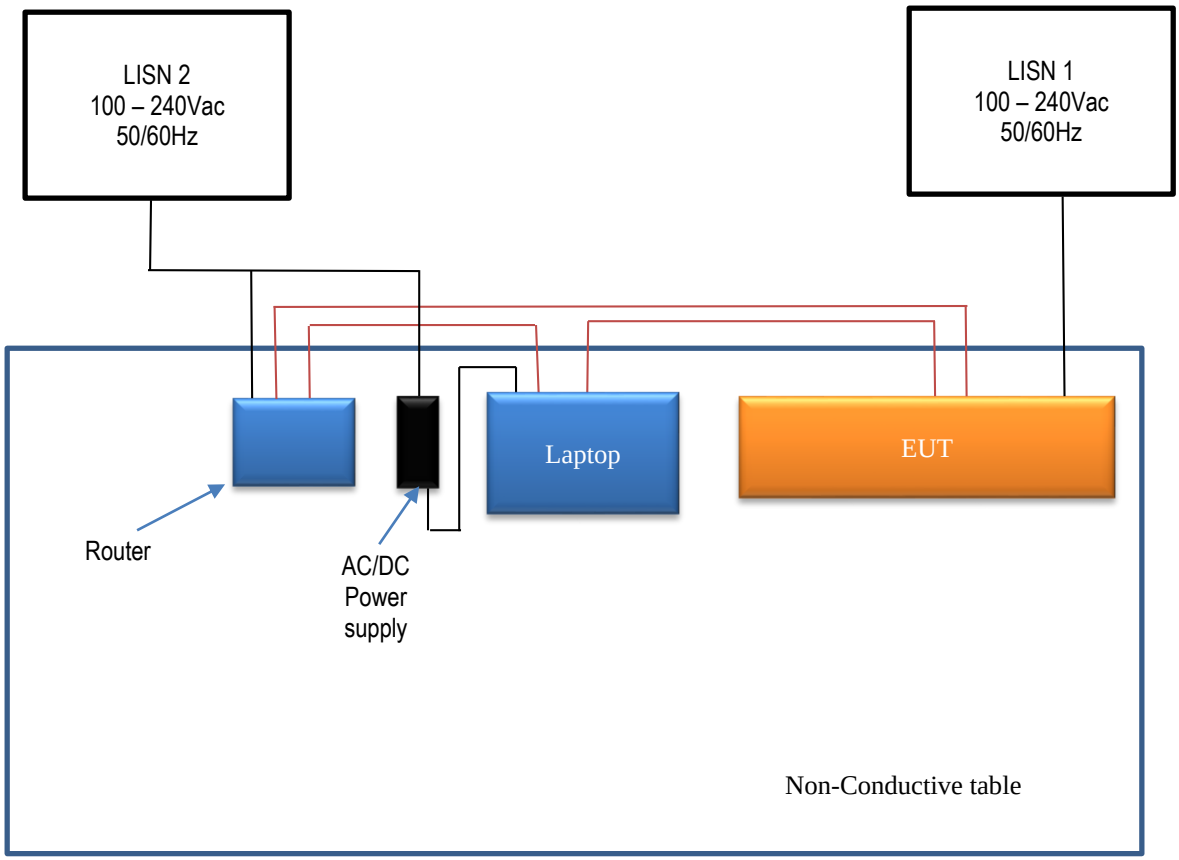
Item	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
1	EUT	USB	Laptop	USB	1.5	Shielded	-
2	EUT	RJ-45	Laptop	RJ-45	1.5	Unshielded	-
3	EUT	RJ-45	Router	RJ-45	1.5	Unshielded	note1
4	Router	RJ-45	Laptop	RJ-45	1.5	Unshielded	Note1

Note 1: Configuration was only used during signal line conducted emissions

8.3 Test Software Description

Test Item	Software	Description
1	HostControl_Lite	Test Software to set the EUT to print

8.4 System setup block diagram



9 Test Summary

Emissions			
Test Item	**Test standard**	**Test Method/Procedure**	**Pass / Fail**
Conducted Emissions	FCC 15 Subpart B (Class A) ICES 003 Issue 5:2012	ANSI C63.4:2014	☒ Pass ☐ Fail ☐ N/A
Radiated Spurious Emissions	FCC 15 Subpart B (Class A) ICES 003 Issue 5:2012	ANSI C63.4:2014	☒ Pass ☐ Fail ☐ N/A

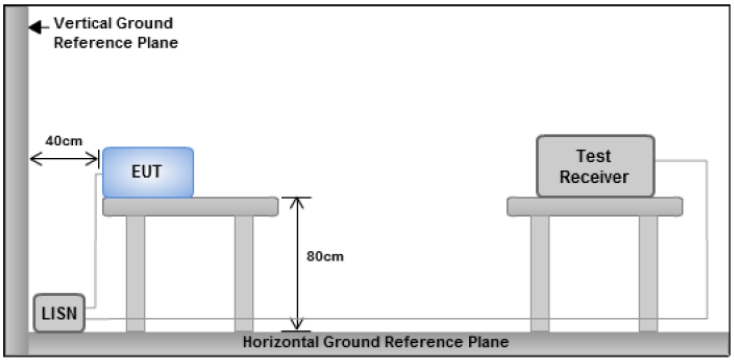
10 Measurement Uncertainty

Emissions			
Test Item	**Frequency Range**	**Description**	**Uncertainty**
AC Conducted Emissions	150KHz – 30MHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2	±3.5dB
Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Radiated Spurious Emissions	1GHz – 6GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+4.3dB/-4.1dB

11 Guideline for interference allowed

11.1 Conducted Emissions

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>§ 15.107
ICES-003</td><td>a)</td><td>For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits set in following table, as measured using a 50 μH/50 ohms LISN.

Limits for Conducted Emissions at the Mains Ports
<table>
<tr><th rowspan="2">Section</th><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBuV)</th></tr>
<tr><th>QP</th><th>Average</th></tr>
<tr><td rowspan="2">Class A devices</td><td>0.15 ~ 0.5</td><td>79</td><td>66</td></tr>
<tr><td>0.5 ~ 30</td><td>73</td><td>60</td></tr>
<tr><td colspan="4">NOTE 1 The lower limit shall apply at the transition frequencies.</td></tr>
</table></td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 

Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment was powered separately from another main supply.
5. The EUT was switched on and allowed to warm up to its normal operating condition.
6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.
7. High peaks, relative to the limit line, were then selected.
8. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. Both Quasi-peak and Average measurements were made.
9. All possible modes of operation were investigated. Only the 6 worst case emissions were measured and reported. All other emissions were relatively insignificant.</td></tr>
</table>

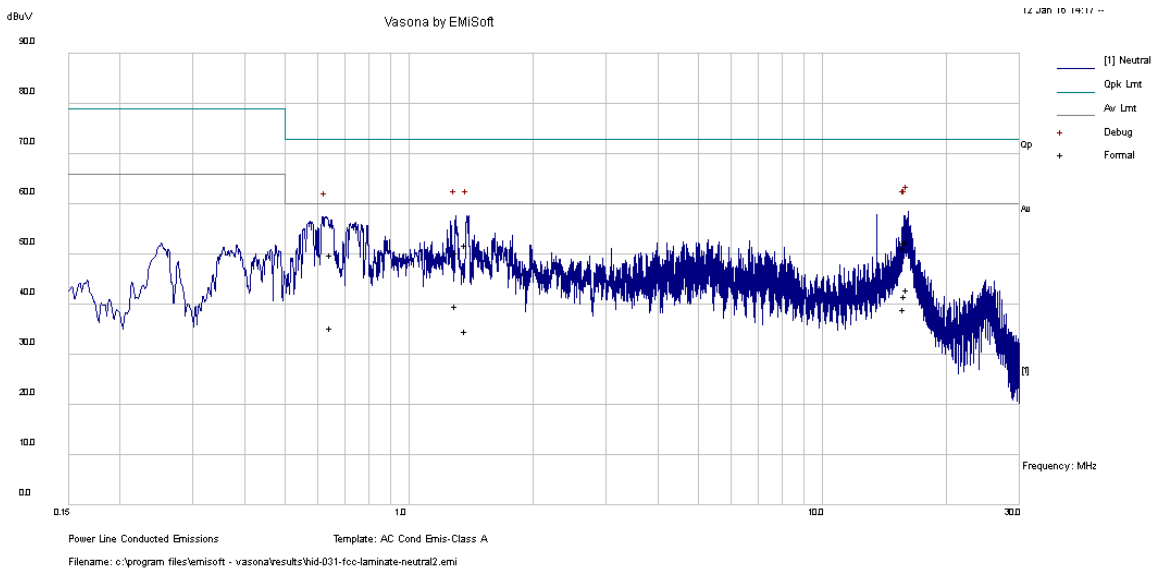
Description of the Conducted Emission Program	This EMC Measurement software, EMI Soft Vasona offers a common user interface for electromagnetic interference (EMI) measurements. This software is a modern and powerful tool for controlling and monitoring EMI test receivers and EMC test systems. It guarantees reliable collection, evaluation, and documentation of measurement results. Basically, this program will run a pre-scan measurement before it proceeds with the final measurement. The pre-scan routine will run the common scan range from 15 kHz to 30 MHz; the program will first start a peak and average scan on selectable measurement time and step size. After the program complete the pre-scan, this program will perform the Quasi Peak and Average measurement, based on the pre-scan peak data reduction result.
Sample Calculation Example	At 20 MHz limit = 250 μV = 47.96 dBμV Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.20 dB Q-P reading obtained directly from EMI Receiver = 40.00 dBμV (Calibrated for system losses) Therefore, Q-P margin = 47.96 – 40.00 = 7.96 i.e. **7.96 dB below limit**

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

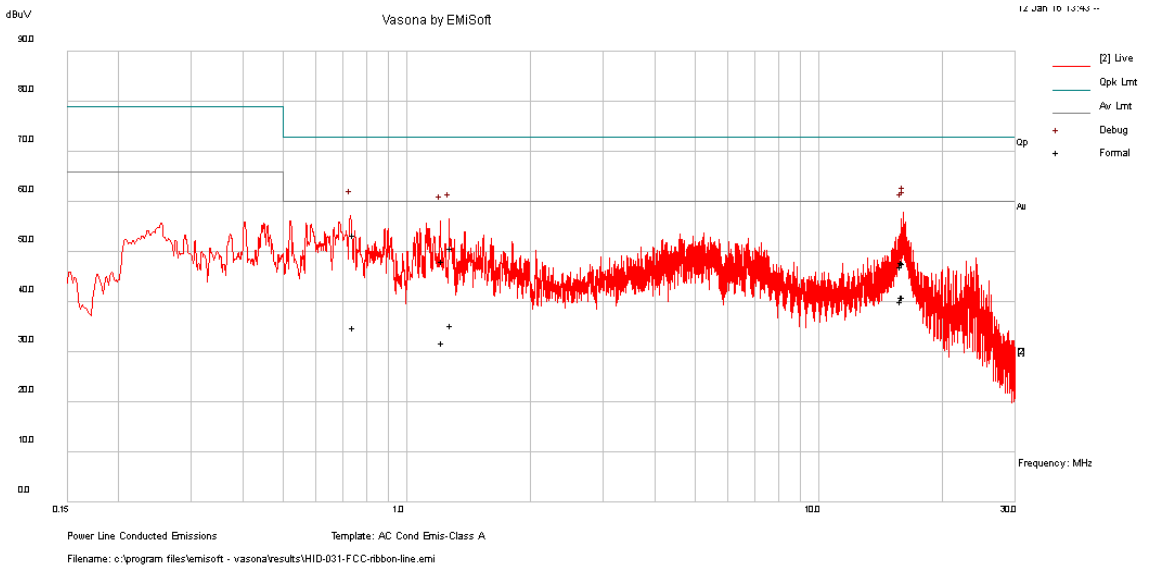
Conducted Emission Test Results per FCC 15 Subpart B (Class A) and ICES 003 Issue 5: 2012

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	20.8	Result:	☒ Pass ☐ Fail
	Humidity (%):	38		
	Atmospheric(mbar):	1019		
Mains Power:	120Vac, 60Hz			
Tested by:	Osvaldo Casorla			
Test Date:	12-Jan-16			
Remarks:	Neutral Line			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line/ Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
16.08	41.92	10.06	0.62	52.61	Quasi Peak	Neutral	73.00	-20.39	Pass
1.37	41.30	10.02	0.56	51.88	Quasi Peak	Neutral	73.00	-21.12	Pass
15.77	40.48	10.06	0.62	51.16	Quasi Peak	Neutral	73.00	-21.84	Pass
15.84	41.62	10.06	0.62	52.30	Quasi Peak	Neutral	73.00	-20.70	Pass
1.30	39.83	10.02	0.57	50.42	Quasi Peak	Neutral	73.00	-22.58	Pass
0.65	39.39	10.01	0.63	50.03	Quasi Peak	Neutral	73.00	-22.97	Pass
16.08	32.27	10.06	0.62	42.96	Average	Neutral	60.00	-17.05	Pass
1.37	24.18	10.02	0.56	34.76	Average	Neutral	60.00	-25.24	Pass
15.77	28.33	10.06	0.62	39.01	Average	Neutral	60.00	-21.00	Pass
15.84	30.98	10.06	0.62	41.66	Average	Neutral	60.00	-18.34	Pass
1.30	29.19	10.02	0.57	39.77	Average	Neutral	60.00	-20.23	Pass
0.65	24.65	10.01	0.63	35.29	Average	Neutral	60.00	-24.71	Pass

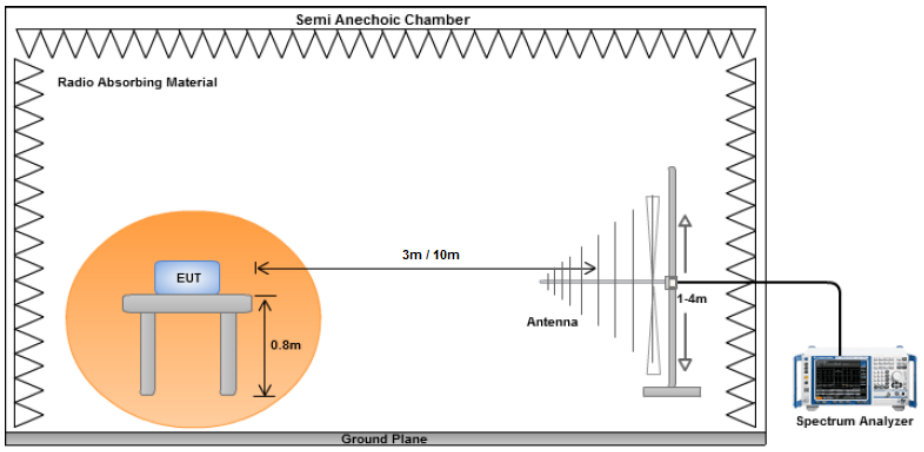
Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	20.8	Result:	☒ Pass ☐ Fail
	Humidity (%):	38		
	Atmospheric(mbar):	1019		
Mains Power:	120Vac, 60Hz			
Tested by:	Osvaldo Casorla			
Test Date:	12-Jan-16			
Remarks:	Phase Line			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line/ Neutral	Limit (dBuV)	Margin (dB)	Pass /Fail
16.01	37.25	10.06	0.62	47.93	Quasi Peak	Live	73.00	-25.07	Pass
0.74	42.80	10.01	0.61	53.42	Quasi Peak	Live	73.00	-19.58	Pass
16.04	37.09	10.06	0.62	47.77	Quasi Peak	Live	73.00	-25.23	Pass
1.28	40.18	10.02	0.57	50.77	Quasi Peak	Live	73.00	-22.23	Pass
15.86	36.36	10.06	0.62	47.04	Quasi Peak	Live	73.00	-25.96	Pass
1.22	37.71	10.02	0.57	48.30	Quasi Peak	Live	73.00	-24.70	Pass
16.01	30.40	10.06	0.62	41.09	Average	Live	60.00	-18.91	Pass
0.74	24.31	10.01	0.61	34.93	Average	Live	60.00	-25.07	Pass
16.04	30.38	10.06	0.62	41.06	Average	Live	60.00	-18.94	Pass
1.28	24.71	10.02	0.57	35.30	Average	Live	60.00	-24.70	Pass
15.86	29.57	10.06	0.62	40.25	Average	Live	60.00	-19.75	Pass
1.22	21.29	10.02	0.57	31.87	Average	Live	60.00	-28.13	Pass

11.2 Radiated Emissions (Below 1GHz)

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.109 ICES-003	a)	The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following: **Frequency range (MHz)** / **Field Strength (uV/m)** 30 – 88 / 90 88 – 216 / 150 216 960 / 210 Above 960 / 300	☒
Test Setup			
Procedure		1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table 2. The EUT was switched on and allowed to warm up to its normal operating condition. 3. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 4. A Quasi-peak measurement was then made for that frequency point. 5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured. 6. The frequency range covered was from 30MHz to 1GHz using the broadband antenna.	
Description of the Radiated Emissions Program		This EMC Measurement software, EMI Soft Vasona offers a common user interface for electromagnetic interference (EMI) measurements. This software is a modern and powerful tool for controlling and monitoring EMI test receivers and EMC test systems. It guarantees reliable collection, evaluation, and documentation of measurement results. Basically, this program will run a pre-scan measurement before it proceeds with the final measurement. The pre-scan routine will run the scan on four different antenna heights, 2 antenna polarity, and 360 degrees table rotation. For example, the program was set to run 30 MHz to 1 GHz scan; the program will first start from a meter antenna height and divide the 30 MHz to 1 GHz into 10 separate parts of maximum hold sweeps. Each parts of maximum hold sweep, the program will collect the data from 0 degree to 360 degrees table rotation. After the program complete the 1m scan, the antenna continues to rise to 2m and continue the scan. The step will repeated for all specified antenna height and polarity. This program will perform the Quasi Peak measurement after the signal maximization process and pre-scan routine. The final measurement will be based on the pre-scan data reduction result.	

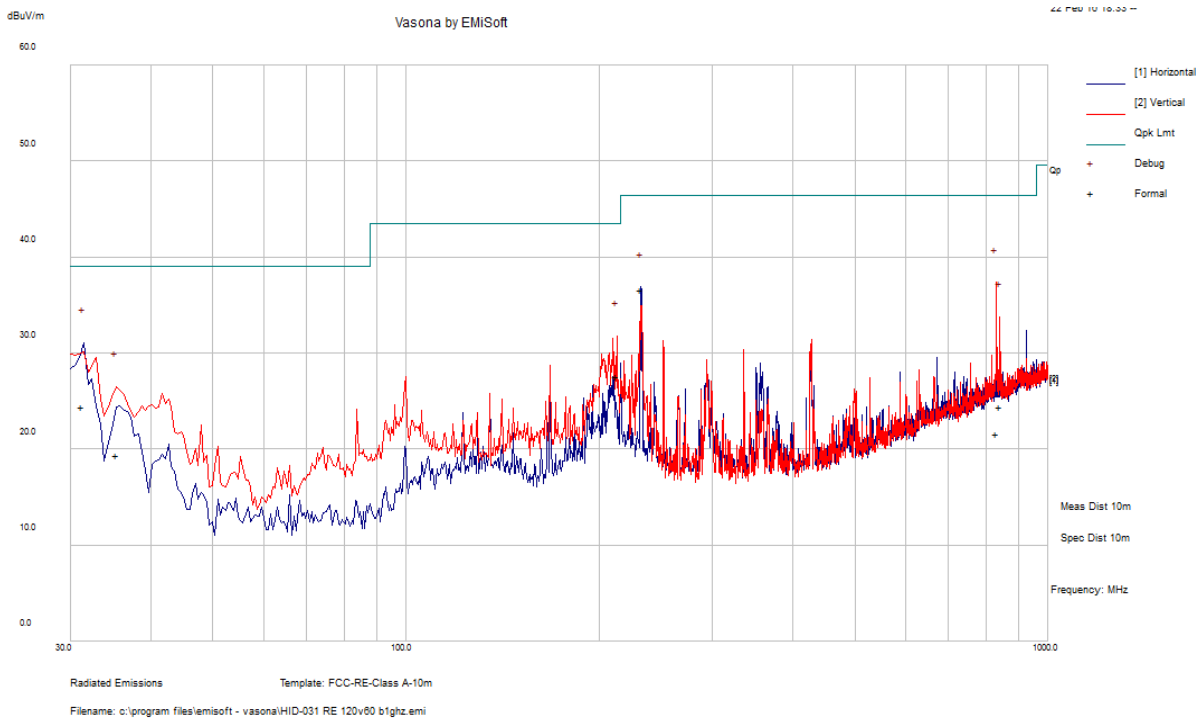
Sample Calculation Example	At 300 MHz limit = 200 μV/m = 46.00 dBμV/m Log-periodic antenna factor & cable loss at 300 MHz = 18.50 dB Q-P reading obtained directly from EMI Receiver = 40.00 dBμV/m (Calibrated level including antenna factors & cable losses) Therefore, Q-P margin = 46.00 – 40.00 = 6.00 i.e. **6 dB below limit**

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Radiated Emission Test Results (Below 1GHz)

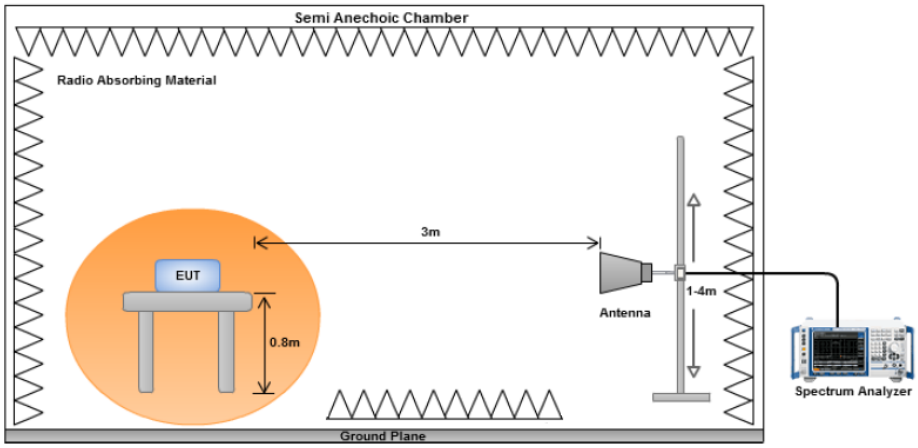
Test specification:	Radiated Emissions			
Environmental Conditions:	Temp(°C):	20.8	Result:	☒ Pass ☐ Fail
	Humidity (%):	38		
	Atmospheric(mbar):	1019		
Mains Power:	120Vac, 60Hz			
Tested by:	Osvaldo Casorla			
Test Date:	22-Feb-16			
Remarks:	30 – 1000 MHz			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
31.28	39.14	0.81	-15.57	24.38	Quasi Max	H	312.00	277.00	39.08	-14.70	Pass
829.95	33.04	5.19	-16.65	21.58	Quasi Max	V	200.00	16.00	46.44	-24.86	Pass
232.16	61.08	2.62	-27.12	36.57	Quasi Max	H	348.00	259.00	46.44	-9.87	Pass
213.01	53.01	2.48	-27.86	27.63	Quasi Max	V	149.00	15.00	43.52	-15.89	Pass
35.39	37.60	0.87	-19.10	19.37	Quasi Max	V	375.00	331.00	39.08	-19.71	Pass
839.94	35.96	5.13	-16.70	24.39	Quasi Max	V	104.00	187.00	46.44	-22.05	Pass

11.3 Radiated Spurious Emissions above 1GHz

Requirement(s):

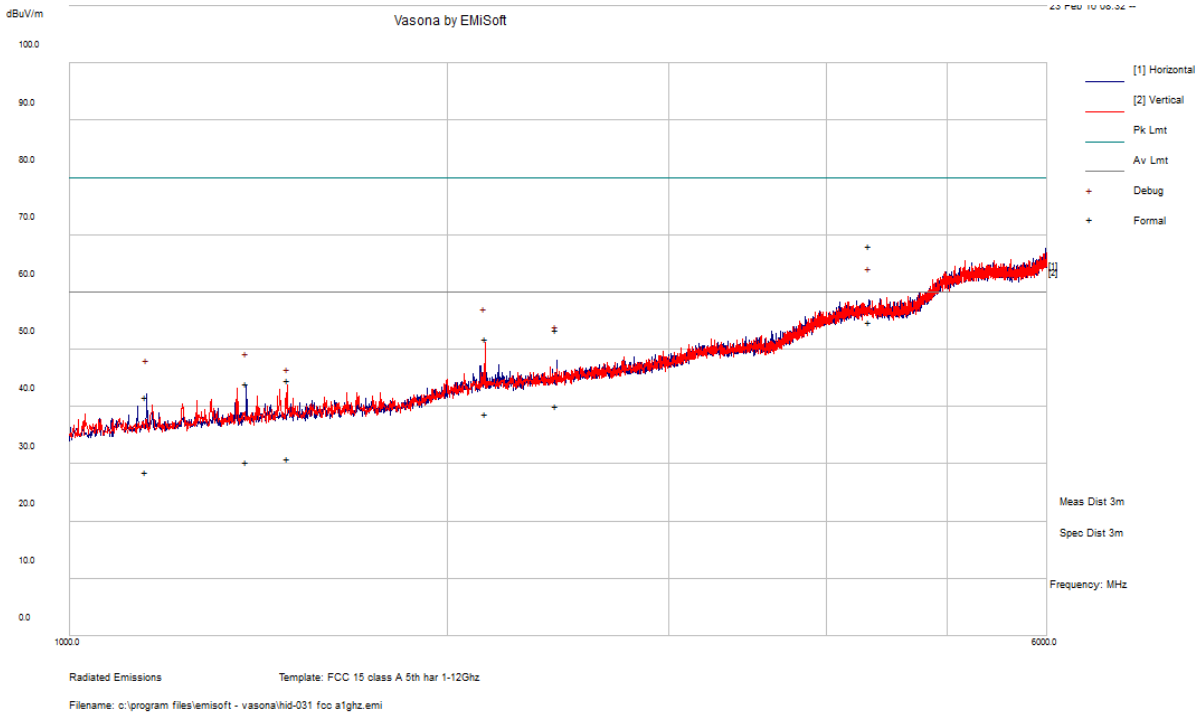
Spec	Item	Requirement	Applicable
§ 15.109 ICES-003	a)	The field strength of radiated emissions from a Class A digital device, as determined at a distance of 3 meters, shall not exceed the following: **Frequency range (GHz)** / **Average limit dB(uV/m)** / **Peak limit dB(uV/m)** Above 1 / 60 / 80	☒
Test Setup			
Procedure		1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table 2. The EUT was switched on and allowed to warm up to its normal operating condition. 3. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 4. A Peak and Average measurement was then made for that frequency point. 5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured. 6. The frequency range covered was from 1GHz to 6GHz (for FCC tests, until the 5th harmonic for operating frequencies ≥ 1000MHz) using a horn antenna.	

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Radiated Emission Test Results (Above 1GHz)

Test specification:	Radiated Emissions			
Environmental Conditions:	Temp(°C):	20.8	Result:	☒ Pass ☐ Fail
	Humidity (%):	38		
	Atmospheric(mbar):	1019		
Mains Power:	120Vac, 60Hz			
Tested by:	Osvaldo Casorla			
Test Date:	22-Feb-16			
Remarks:	1000 - 6000MHz			



Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
1150.82	36.76	6.59	-14.81	28.54	Average Max	H	167.00	205.00	60.00	-31.46	Pass
1150.82	49.87	6.59	-14.81	41.65	Peak Max	H	167.00	205.00	80.00	-38.35	Pass
1384.44	50.76	7.11	-13.88	43.98	Peak Max	H	111.00	148.00	80.00	-36.02	Pass
1384.44	37.07	7.11	-13.88	30.30	Average Max	H	111.00	148.00	60.00	-29.70	Pass
1491.31	50.55	7.56	-13.49	44.62	Peak Max	V	170.00	105.00	80.00	-35.38	Pass
1491.31	36.85	7.56	-13.49	30.92	Average Max	V	170.00	105.00	60.00	-29.08	Pass
2143.89	37.80	9.14	-8.23	38.71	Average Max	V	129.00	324.00	60.00	-21.29	Pass
2143.89	50.96	9.14	-8.23	51.87	Peak Max	V	129.00	324.00	80.00	-28.13	Pass
2439.32	51.01	9.61	-7.17	53.45	Peak Max	V	132.00	47.00	80.00	-26.55	Pass
2439.32	37.70	9.61	-7.17	40.14	Average Max	V	132.00	47.00	60.00	-19.86	Pass
4329.55	52.69	13.78	1.51	67.98	Peak Max	V	174.00	136.00	80.00	-12.02	Pass
4329.55	39.48	13.78	1.51	54.77	Average Max	V	174.00	136.00	60.00	-5.23	Pass

Annex A. TEST INSTRUMENT & METHOD

Instrument	Model	Serial #	Cal Cycle	Cal Due	In use
Conducted Emissions					
EMI Test Receiver	ESIB 40	100179	1 Year	06/03/2016	☒
V-LISN (150 kHz – 30 MHz)	NNLK 8129	8129-190	1 Year	08/21/2016	☒
LISN (9 kHz – 30 MHz)	MN2050B	1018	1 Year	08/07/2016	☒
TLISN	ISN T800	30814	1 Year	09/23/2016	☐
Radiated Emissions					
EMI Test Receiver (9 kHz – 6 GHz)	ESL6	100178	1 Year	05/27/2016	☒
Antenna - Biconlog (30 MHz – 2 GHz)	JB1	A030702	1 Year	08/15/2016	☒
DoubleRidged Waveguide Horn Antenna (1-18 GHz)	3115	10SL0059	1 Year	08/25/2016	☒
Horn Antenna (18-40 GHz)	AH-840	101013	1 Year	08/28/2016	☐
RF Pre-Amplifier	LPA-6-30	11140711	1 Year	02/19/2017	☒
Microwave Preamplifier (18-40 GHz)	PA-840	181251	1 Year	02/19/2016	☐
2.4 GHz Notch Filter	BRM50702	116	1 Year	02/24/2016	☐
5GHz Notch Filter	BRM50716	072	1 Year	09/11/2016	☐
10 Meters SAC	10M	N/A	1 Year	05/06/2016	☒

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1, A2, A3, A4, B1, B2, B3, B4, C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		**Radio & Telecommunications Terminal Equipment:** EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I, Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		**(Phase II)** OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		**Radio:** Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		**Radio**: A1. Terminal equipment for purpose of calling **Telecom**: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		**EMI:** KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI **EMS:** KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS
		Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68
		Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement
Australia CAB Recognition		**EMC:** AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4
		Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771
		Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016,AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2