

CERTIFICATION

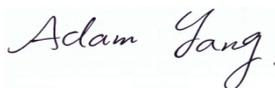
Applicant : American Power Conversion Holding Inc. Taiwan Branch
Address : 3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Manufacturer : American Power Conversion Holding Inc. Taiwan Branch
Address : 3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Description of EUT : Uninterruptible Power System
Trade Name : APC
Model Number : BX1500M
Product Series : BX1500MXXXXXXXX, BX1350MXXXXXXXX ("X" can be 0-9, A-Z, "-" or blank)
Type of Test : FCC Part 15 Subpart B
Technical Standard : **Emission**
FCC Part 15 : Subpart B Class B
CISPR 22 : 2008 Class B
ANSI C63.4 : 2014
Report Number : HA161122-FD
Receipt Date : 07-DEC-2016
Issue Date : 08-DEC-2016
Test Result : **Compliance**

The above equipment was tested by *HongAn TECHNOLOGY CO., LTD.*, for compliance with the requirement set forth in the FCC Rules and Regulation Part 15, Subpart B and the measurement procedures were based on ANSI C63.4.

Note :

1. The results of the test report relate only to the sample tested.
2. The test report shall not be reproduced without the written approval of *HongAn TECHNOLOGY CO., LTD.*

Approved by:



Adam Yang / Section Manager



HongAn TECHNOLOGY CO., LTD.

HongAn TECHNOLOGY EMC Laboratory

NO.15-1, CWEISHUH KENG, CWEIPIN VILLAGE,
LINKOU DIST, NEW TAIPEI CITY, TAIWAN, R.O.C.

TEL : +886-2-26030362

FAX : +886-2-26019259

E-mail : hatlab@ms19.hinet.net

BSMI Registration No. : SL2-IN-E-0023,SL2-IS-E-0023,
SL2-A1-E-0023,SL2-R1-E-0023,
SL2-R2-E-0023,SL2-L1-E-0023

FCC Designation No. : TW1071, TW1163

TAF Accreditation No. : 1163

VCCI Registration No. : R-2156, C-2329, T-219, G-696



FCC COMPLIANCE TEST REPORT

Technical Statement of Conformity
in accordance with FCC Part 15 Subpart B

The Product

Equipment Under Test	: Uninterruptible Power System
Model Number	: BX1500M
Product Series	: BX1500MXXXXXXXX, BX1350MXXXXXXXX ("X" can be 0-9, A-Z, "-" or blank)
Report Number	: HA161122-FD
Issue Date	: 08-DEC-2016
Test Result	: Compliance

is produced by

American Power Conversion Holding Inc. Taiwan Branch
3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.



HongAn TECHNOLOGY CO., LTD.
HongAn TECHNOLOGY EMC Laboratory

NO.15-1, CWEISHUH KENG, CWEIPIN VILLAGE,
LINKOU DIST, NEW TAIPEI CITY,
TAIWAN, R. O. C.

TEL: +886-2-26030362
FAX: +886-2-26019259
E-mail: hatlab@ms19.hinet.net

BSMI Registration No.: SL2-IN-E-0023, SL2-A1-E-0023,
SL2-IS-E-0023, SL2-R1-E-0023,
SL2-R2-E-0023, SL2-L1-E-0023

FCC Designation No.: TW1071, TW1163
TAF Accreditation No.: 1163
VCCI Registration No.: R-2156, C-2329, T-219, G-696

Contents

1	General Description	5
1.1	Description of Equipment Under Test	5
1.2	Test Facility	6
1.3	Test Instruments	6
1.4	Test Methodology	7
1.5	Auxiliary Equipments	7
1.6	Block Diagram	8
1.7	Identifying the Final Test Mode	8
1.8	Final Test Mode	8
1.9	Condition of Power Supply	8
1.10	EUT Configuration	8
2	Conducted Emission Test	9
2.1	Test Instruments	9
2.2	Test Configuration and Procedure	9
2.3	Conducted Limit	10
2.4	Test Result	10
3	Radiated Emission Test – Below 1 GHz	15
3.1	Test Instruments	15
3.2	Test Configuration and Procedure	15
3.3	Radiated Limit	16
3.4	Test Result	16
4	Radiated Emission Test – Above 1GHz	21
4.1	Test Instruments	21
4.2	Test Configuration and Procedure	21
4.3	Test Limit	22
4.4	Test Result	22
5	Photographs of Test	23
5.1	Conducted Emission Test	23
5.2	Radiated Emission Test – Below 1 GHz	24
6	Photographs of EUT	25

Verification

Applicant : American Power Conversion Holding Inc. Taiwan Branch

Manufacturer : American Power Conversion Holding Inc. Taiwan Branch

Equipment Under Test : Uninterruptible Power System

Model Number : BX1500M

Product Series : BX1500MXXXXXXXX, BX1350MXXXXXXXX ("X" can be 0-9, A-Z, "-" or blank)

Sample Received Date : 05-DEC-2016

Test Standards :

Emission :

FCC Part 15 Subpart B Class B

CISPR 22 : 2008 Class B

ANSI C63.4 : 2014

Remark

This report details the results of the test carried out on one sample. The test results are contained in this test report and HongAn Technology Co., Ltd. assumes full responsibility for the accuracy and completeness of these tests. This report shows the EUT is technically compliant with FCC Part 15 Subpart B and CISPR 22 Class B official requirements. The test procedure is in compliance with ANSI C63.4. This report applies to the above sample only and shall not be reproduced in part without written approval of HongAn Technology Co., Ltd..

Mei Cheng

Documented by: _____ **Date:** 08-DEC-2016

Mei Cheng / ADM. Dept. Staff

M.S. Shi

Tested by: _____ **Date:** 07-DEC-2016

M.S. Shi / ENG. Dept. Staff

Adam Yang

Approved by: _____ **Date:** 08-DEC-2016

Adam Yang / SEC. Manager

Summary of Test Result

Emission			
Test Standard	Test Item	Test Result	Remark
FCC Part15 Subpart B CISPR22 Class B ANSI C63.4	Conducted Emission	Pass	Highest Emission (LINE Mode) L: 0.76MHz, A.V. 21.90dBuV, Margin -24.10dBuV N: 12.85MHz, A.V. 26.94dBuV, Margin -23.06dBuV
			Highest Emission (Battery Mode) L: 0.16MHz, Q.P. 57.85dBuV, Margin -7.45dBuV N: 0.16MHz, Q.P. 59.15dBuV, Margin -6.23dBuV
FCC Part15 Subpart B CISPR22 Class B ANSI C63.4	Radiated Emission (Below 1GHz)	Pass	Highest Emission(LINE Mode) H: 192.05MHz, 22.98dBuV, Margin -7.02dB Antenna Height 392cm, Turntable Angle 155° V: 193.25MHz, 23.83dBuV, Margin -6.17dB Antenna Height 105cm, Turntable Angle 170°
			Highest Emission(Battery Mode) H: 192.05MHz, 24.97dBuV, Margin -5.03dB Antenna Height 395cm, Turntable Angle 91° V: 30.38MHz, 25.67dBuV, Margin -4.33dB Antenna Height 100cm, Turntable Angle 136°
FCC Part15 Subpart B CISPR22 Class B ANSI C63.4	Radiated Emission (Above 1GHz)	N/A	The highest frequency of the internal sources of the EUT is less than 108MHz, the measurement shall only be made up to 1GHz. Hence, the test item is not required.

Measurement Uncertainty

The following measurement uncertainty has been calculated for Emission Tests performed on the EUT as specified in CISPR 16-4-2:

Test Item		Uncertainty
Conducted Emission		± 4.34dB
Radiated Emission	Below 1GHz	± 5.87dB
	Above 1GHz	± 4.03dB

This reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k = 2, providing a level of confidence of approximately 95%.

1 General Description

1.1 Description of Equipment Under Test

Equipment Under Test	: Uninterruptible Power System
Model Number	: BX1500M
Product Series	: BX1500MXXXXXXXXXX, BX1350MXXXXXXXXXX ("X" can be 0-9, A-Z, "-" or blank)
Applicant	: American Power Conversion Holding Inc. Taiwan Branch
Address of Applicant	: 3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Manufacturer	: American Power Conversion Holding Inc. Taiwan Branch
Address of Manufacturer	: 3F., No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan R.O.C.
Power Supply	AC 120V, 60Hz, 12A <input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Non-Shielded <input type="checkbox"/> Detachable <input checked="" type="checkbox"/> Un-Detachable, 1.8m <input type="checkbox"/> w Ferrite Core <input checked="" type="checkbox"/> w/o Ferrite Core
I/O Port	: Battery Backup Outlet *5, Surge Outlet *5, Data Port*1(USB & Serial), Network In Port*1, Network Out Port *1, Cable In Port *1,Cable Out Port *1
Data Cable	Data Cable*1(USB to Serial) <input checked="" type="checkbox"/> Shielded <input type="checkbox"/> Non-Shielded <input checked="" type="checkbox"/> Detachable, 1.9m <input type="checkbox"/> Un-Detachable <input checked="" type="checkbox"/> w Ferrite Core*1 <input type="checkbox"/> w/o Ferrite Core Coaxial Cable*1 <input checked="" type="checkbox"/> Shielded <input type="checkbox"/> Non-Shielded <input checked="" type="checkbox"/> Detachable, 0.9m <input type="checkbox"/> Un-Detachable <input type="checkbox"/> w Ferrite Core <input checked="" type="checkbox"/> w/o Ferrite Core
Description of EUT	<p>Dimensions : 39 cm (L) X 10 cm (W) X 25 cm (H)</p> <p>Highest Frequency of the Internal Source : <108MHz</p> <p>Position : <input checked="" type="checkbox"/>Table-top / <input type="checkbox"/>Floor-standing</p> <p>Intended Function : The EUT is a Uninterruptible Power System.</p> <p>Product Variance : The manufacturer declares that the only difference between the series is on their output rating. HongAn is only responsible for the test result of the main test sample.</p>

1.2 Test Facility

All the Conducted and Radiated Emission Tests are performed at No. 15-1, Cweishuh Keng, Cweipin Village, Linkou, New Taipei City, Taiwan, R.O.C.

1.3 Test Instruments

Instruments Used for Emission Measurement

Instrument Name	Manufacture Mode	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
LISN	EMCO	3810/2NM	9702-1820	03-Aug-2016	03-Aug-2017
LISN	EMCO	3810/2NM	9702-1821	03-Aug-2016	03-Aug-2017
RF Current Probe	FCC	F-33-4	53	19-May-2016	19-May-2017
Impedance Stabilization Network (ISN)	TESEQ	ISN T800	30838	18-Aug-2016	18-Aug-2017
EMI Receiver	R&S	ESR	101970	12-Oct-2016	12-Oct-2017
EMI Receiver	R&S	ESCI	100931	21-Jul-2016	21-Jul-2017
Spectrum Analyzer	R&S	FSV 30	101629	30-Jan-2016	30-Jan-2017
Preamplifier	WIRELESS	FPA-6592G	060050	24-Aug-2016	24-Aug-2017
Preamplifier	HD	HD17187	004	20-May-2016	20-May-2017
Bilog Antenna	TESEQ	CBL6111D	25769	22-Feb-2016	22-Feb-2017
Bilog Antenna	TESEQ	CBL6111D	38521	10-Oct-2016	10-Oct-2017
Double-Ridged Waveguide Horn	EMCO	3115	9912-5992	23-May-2016	23-May-2017

※ The test equipments used are calibrated and can be traced to National ITRI and International Standards.

1.4 Test Methodology

All Conducted and Radiated Emission Tests were performed according to the procedures stated in FCC Part 15 Subpart B Sec. 15.31.

1.5 Auxiliary Equipments

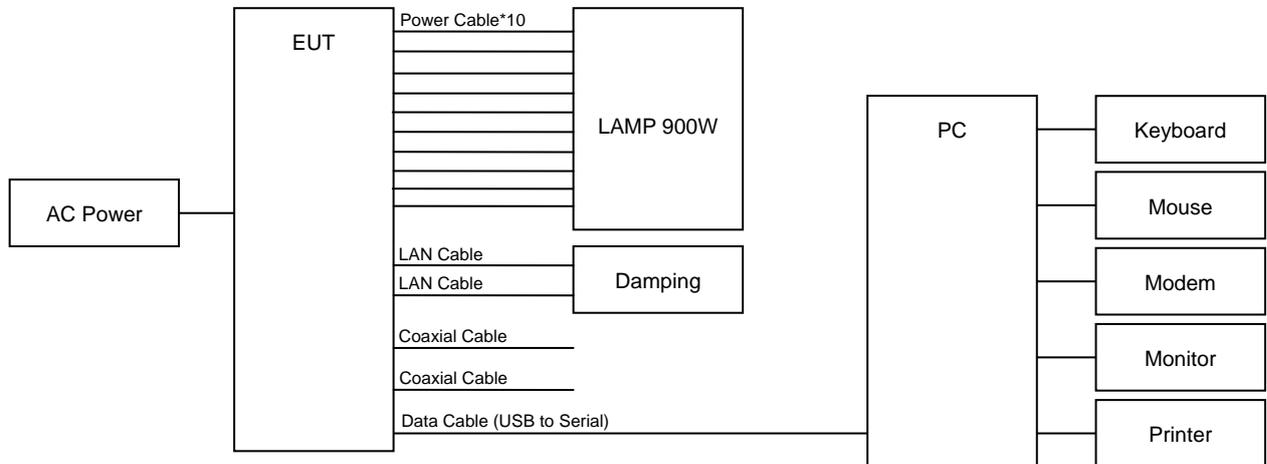
1.5.1 Provided by HongAn Technology Co., Ltd. for Emission Test.

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Description	
						Data Cable	Power Cable
01	PC	HP ProDesk 400G2 MT	SGH528TFSC	BSMI ID 33001 FCC	Hewlett Packard	N/A	N/A
02	Keyboard	PK110U	AUT10340044 09	CE Mark, FCC DoC, BSMI ID R41108	ASUS	Shielded(Foil) *1.5m	N/A
03	Mouse	MO96UOB	96NO35688	CE Mark, FCC DoC, BSMI ID R41108	ASUS	Shielded(Foil) *1.8m	N/A
04	Modem	E210	N/A	CE Mark, FCC DoC	MAIAC	Shielded(Braid) *1m	Unshielded *1m with EMI core*1
05	Monitor	E1709Wc	CN-0J672H-64 180-042-3CRH	CE FCC BSMI R33037	DELL	N/A	N/A
06	Printer	C2642A	TH85M1M2J4	CE Mark, FCC DoC	Hewlett Packard	Shielded(Braid) *1.6m	AC to Adapter unshielded *1.8m, Adapter to Printer unshielded *0.9m
07	LAMP*4	200W	N/A	N/A	N/A	N/A	N/A
08	LAMP	100W	N/A	N/A	N/A	N/A	N/A
09	Power Cable*10	N/A	N/A	N/A	N/A	N/A	Non-shielded, Detachable, 1.8m, W/O core

1.5.2 Provided by the Manufacturer

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Description	
						Data Cable	Power Cable
01	Coaxial Cable	N/A	N/A	N/A	N/A	Shielded, Detachable, 0.9m, W/O core	N/A
02	LAN Cable*2	N/A	N/A	N/A	N/A	Shielded, Detachable, 2m, W/O core	N/A

1.6 Block Diagram



1.7 Identifying the Final Test Mode

1. Line mode (900W).
2. Battery mode (900W).

Note: The additional power cords do not increase the disturbance level by 2dB. Therefore, the Final EMC Assessment was performed for the Line mode and Battery mode.

1.8 Final Test Mode

1. Line mode.
2. Battery mode.

1.9 Condition of Power Supply

AC 120 V; 60 Hz

1.10 EUT Configuration

1. Setup the EUT and peripheral as shown in Section 1.6.
2. Turn on the power of all equipments.
3. Activate the selected Final Test Mode shown in Sec. 1.8.

2 Conducted Emission Test

2.1 Test Instruments

Refer to Sec. 1.3 Test Instruments.

2.2 Test Configuration and Procedure

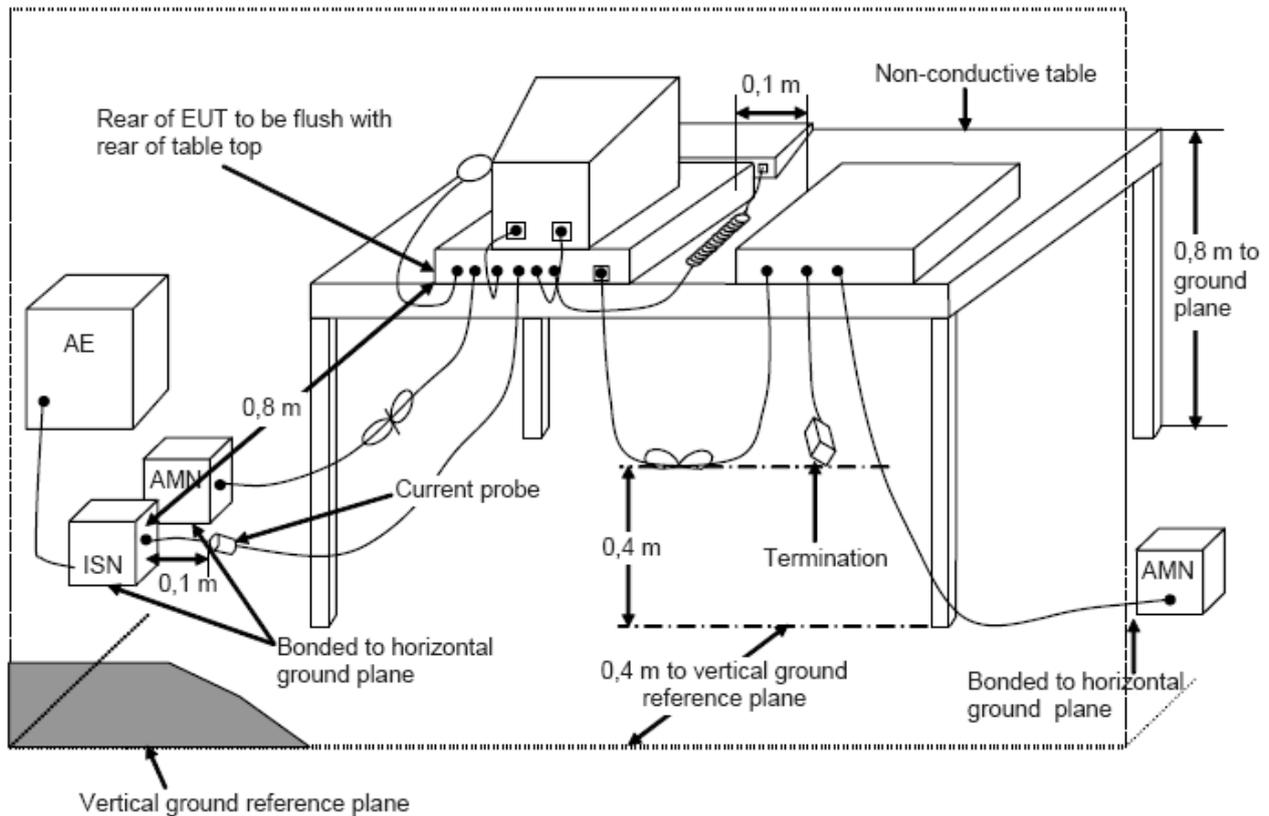


Table-top Equipment

- The EUT was placed on a non-conductive table which was 80 cm above the horizontal coupling plane. The rear of the EUT was 40 cm from the vertical coupling plane.
- The excess interface cables were folded at the cable center into a bundle no longer than 40 cm, so that the bundles were on the table.
- The EUT was connected to the main power through a L.I.S.N. This set up provided 50 ohm / 50 μ H coupling impedance for the measuring equipment.
- All auxiliary equipment received power from a second L.I.S.N.
- The conducted emissions were measured between the Line Phase and the PE ground and between the Neutral Phase and the PE ground using an EMI Receiver.
- The values were recorded.

2.3 Conducted Limit

CISPR 22 / FCC Part 15 B

Frequency (MHz)	<input type="checkbox"/> Class A		<input checked="" type="checkbox"/> Class B	
	Q.P. (Quasi-Peak)	A.V. (Average)	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 to 0.50	79	66	66 to 56	56 to 46
0.50 to 5.0	73	60	56	46
5.0 to 30	73	60	60	50

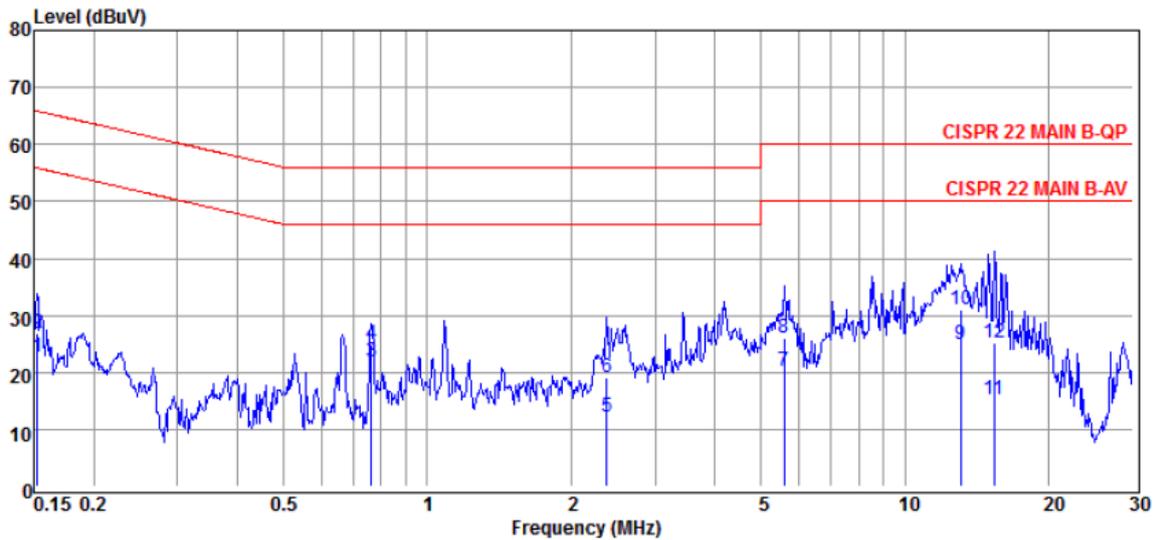
2.4 Test Result

PASS

The final tests data are shown on the following page(s).

Conducted Emission Test Data-Line mode

Test Date : 06-DEC-2016 Power Line : Line
 Temperature : 25°C Humidity : 50%

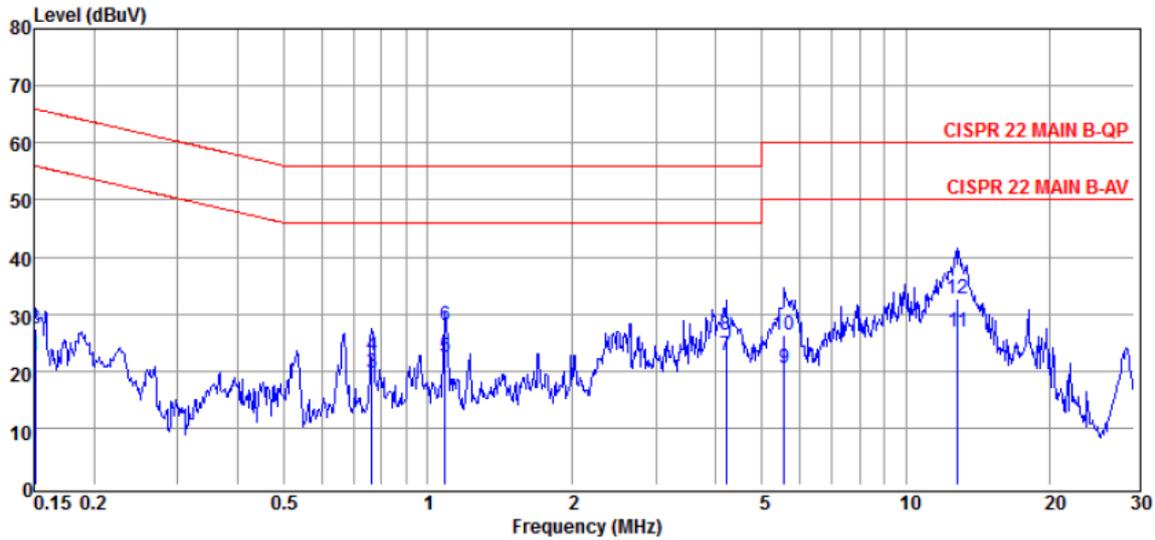


No.	Freq MHz	Reading dBμV	C.F dB	Result dBμV	Limit dBμV	Margin dB	Power Line	Remark
1	0.15	22.45	0.12	22.57	55.87	-33.30	LINE	Average
2	0.15	26.84	0.12	26.96	65.87	-38.91	LINE	QP
3	0.76	21.79	0.11	21.90	46.00	-24.10	LINE	Average
4	0.76	24.67	0.11	24.78	56.00	-31.22	LINE	QP
5	2.37	11.85	0.20	12.05	46.00	-33.95	LINE	Average
6	2.37	18.92	0.20	19.12	56.00	-36.88	LINE	QP
7	5.59	19.97	0.35	20.32	50.00	-29.68	LINE	Average
8	5.59	25.79	0.35	26.14	60.00	-33.86	LINE	QP
9	13.06	24.27	0.72	24.99	50.00	-25.01	LINE	Average
10	13.06	30.29	0.72	31.01	60.00	-28.99	LINE	QP
11	15.39	14.29	0.87	15.16	50.00	-34.84	LINE	Average
12	15.39	24.26	0.87	25.13	60.00	-34.87	LINE	QP

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Result = Reading + C.F
 3. Margin = Result – Limit

Conducted Emission Test Data-Line mode

Test Date : 06-DEC-2016 Power Line : Neutral
 Temperature : 25°C Humidity : 50%

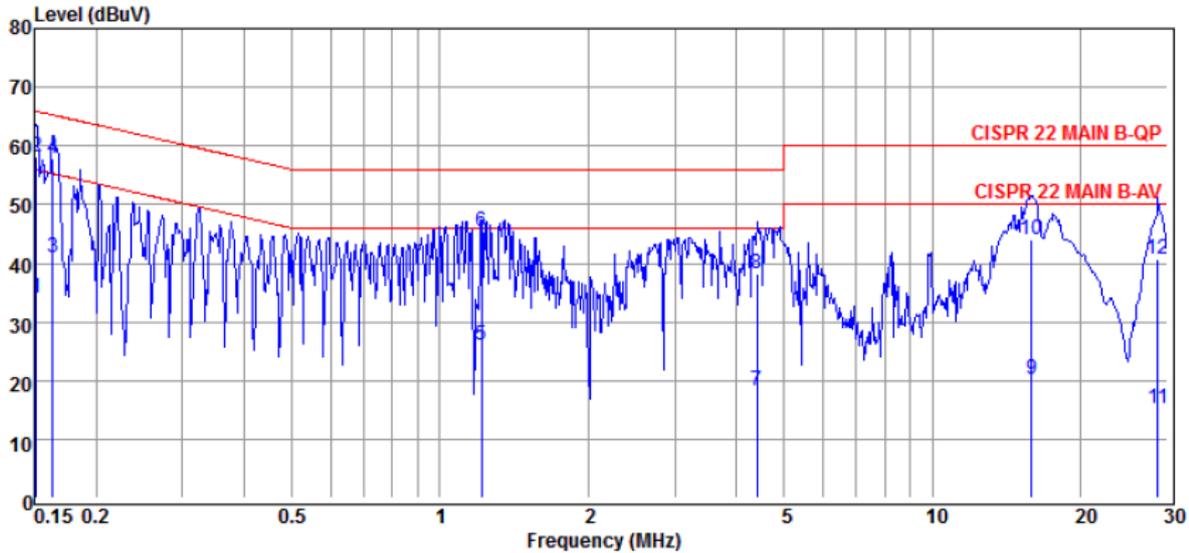


No.	Freq MHz	Reading dBμV	C.F dB	Result dBμV	Limit dBμV	Margin dB	Power Line	Remark
1	0.15	22.70	0.11	22.81	55.96	-33.15	NEUTRAL	Average
2	0.15	27.39	0.11	27.50	65.96	-38.46	NEUTRAL	QP
3	0.76	19.42	0.11	19.53	46.00	-26.47	NEUTRAL	Average
4	0.76	22.71	0.11	22.82	56.00	-33.18	NEUTRAL	QP
5	1.09	22.41	0.12	22.53	46.00	-23.47	NEUTRAL	Average
6	1.09	27.79	0.12	27.91	56.00	-28.09	NEUTRAL	QP
7	4.20	22.53	0.28	22.81	46.00	-23.19	NEUTRAL	Average
8	4.20	26.03	0.28	26.31	56.00	-29.69	NEUTRAL	QP
9	5.56	20.25	0.35	20.60	50.00	-29.40	NEUTRAL	Average
10	5.56	26.07	0.35	26.42	60.00	-33.58	NEUTRAL	QP
11	12.85	26.19	0.75	26.94	50.00	-23.06	NEUTRAL	Average
12	12.85	31.99	0.75	32.74	60.00	-27.26	NEUTRAL	QP

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Result = Reading + C.F
 3. Margin = Result – Limit

Conducted Emission Test Data-Battery mode

Test Date : 06-DEC-2016 Power Line : Line
 Temperature : 25°C Humidity : 50%

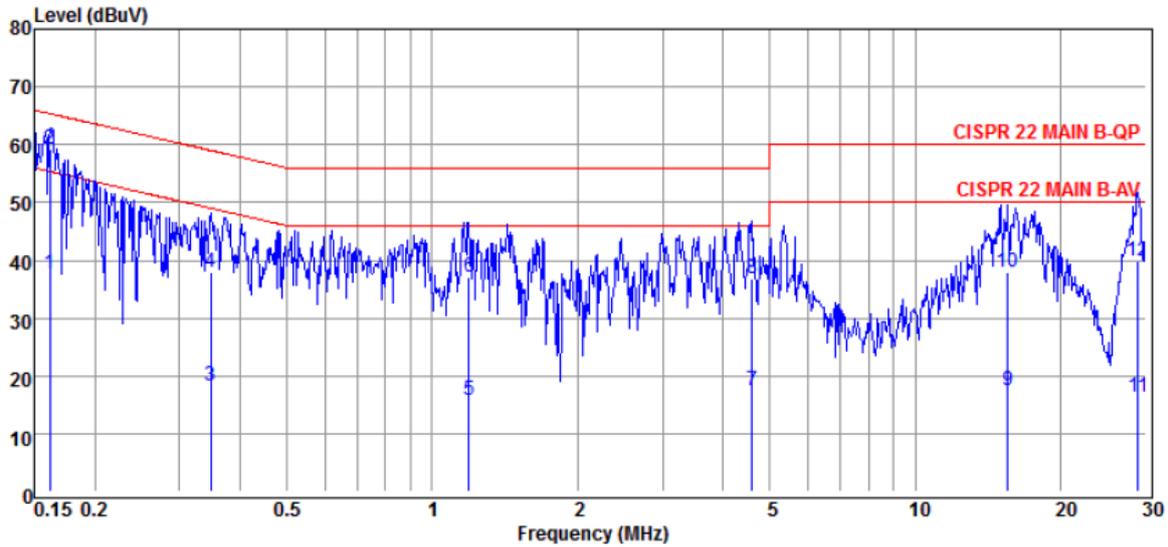


No.	Freq MHz	Reading dBμV	C.F dB	Result dBμV	Limit dBμV	Margin dB	Power Line	Remark
1	0.15	33.83	0.12	33.95	55.91	-21.96	LINE	Average
2	0.15	57.98	0.12	58.10	65.91	-7.81	LINE	QP
3	0.16	40.85	0.11	40.96	55.30	-14.34	LINE	Average
4	0.16	57.74	0.11	57.85	65.30	-7.45	LINE	QP
5	1.22	25.86	0.13	25.99	46.00	-20.01	LINE	Average
6	1.22	45.27	0.13	45.40	56.00	-10.60	LINE	QP
7	4.41	18.07	0.29	18.36	46.00	-27.64	LINE	Average
8	4.41	37.91	0.29	38.20	56.00	-17.80	LINE	QP
9	15.89	19.28	0.89	20.17	50.00	-29.83	LINE	Average
10	15.89	43.02	0.89	43.91	60.00	-16.09	LINE	QP
11	28.76	13.75	1.58	15.33	50.00	-34.67	LINE	Average
12	28.76	39.15	1.58	40.73	60.00	-19.27	LINE	QP

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Result = Reading + C.F
 3. Margin = Result – Limit

Conducted Emission Test Data-Battery mode

Test Date : 06-DEC-2016 Power Line : Neutral
 Temperature : 25°C Humidity : 50%



No.	Freq MHz	Reading dB μ V	C.F dB	Result dB μ V	Limit dB μ V	Margin dB	Power Line	Remark
1	0.16	37.46	0.10	37.56	55.38	-17.82	NEUTRAL	Average
2	0.16	59.05	0.10	59.15	65.38	-6.23	NEUTRAL	QP
3	0.35	18.11	0.09	18.20	49.00	-30.80	NEUTRAL	Average
4	0.35	37.94	0.09	38.03	59.00	-20.97	NEUTRAL	QP
5	1.19	15.52	0.13	15.65	46.00	-30.35	NEUTRAL	Average
6	1.19	36.89	0.13	37.02	56.00	-18.98	NEUTRAL	QP
7	4.60	17.07	0.31	17.38	46.00	-28.62	NEUTRAL	Average
8	4.60	36.56	0.31	36.87	56.00	-19.13	NEUTRAL	QP
9	15.55	16.47	0.94	17.41	50.00	-32.59	NEUTRAL	Average
10	15.55	36.92	0.94	37.86	60.00	-22.14	NEUTRAL	QP
11	28.91	14.59	1.79	16.38	50.00	-33.62	NEUTRAL	Average
12	28.91	38.20	1.79	39.99	60.00	-20.01	NEUTRAL	QP

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Result = Reading + C.F
 3. Margin = Result – Limit

3 Radiated Emission Test – Below 1 GHz

3.1 Test Instruments

Refer to Sec. 1.3 Test Instruments.

3.2 Test Configuration and Procedure

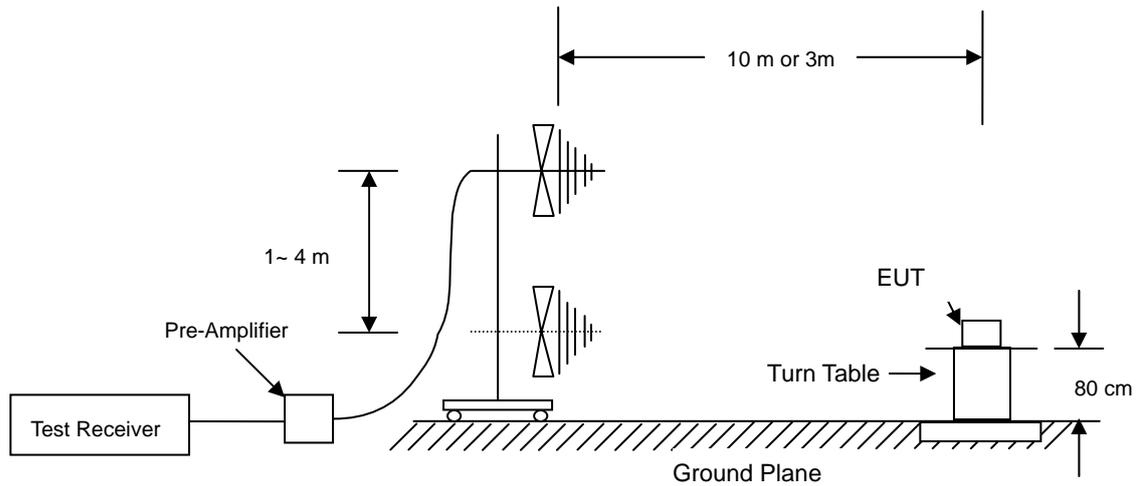


Table-top Equipment

- The EUT was placed on a non-conductive turntable which was 80cm above the horizontal ground plane. The EUT was set 10m or 3m away from the receiving antenna that was mounted on a non-conductive mast.
- Main cables draped to the ground plane and were routed to the mains power outlet. The mains power outlet was bonded to and did not protrude above the ground plane.
- The antenna was adjusted between 1m and 4m in height above the ground plane and the Antenna-to-EUT azimuth was also varied during the measurements to find the top 6 maximum meter readings within the frequency range limit as indicated in Sec 3.3.
- The radiated emissions were measured when the Antenna-to-EUT polarization was set horizontally and vertically.
- The values were recorded.

3.3 Radiated Limit

FCC Part 15 Subpart B

	<input type="checkbox"/> Class A (10m)		<input type="checkbox"/> Class B (3m)	
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Quasi-Peak ($\text{dB}\mu\text{V/m}$)	Field Strength ($\mu\text{V/m}$)	Quasi-Peak ($\text{dB}\mu\text{V/m}$)
30 to 88	90	39.0	100	40.0
88 to 216	150	43.5	150	43.5
216 to 960	210	46.5	200	46.0
Above 960	300	49.5	500	54.0

Emission Level ($\text{dB}\mu\text{V/m}$) = 20 Log Emission Level ($\mu\text{V/m}$)

CISPR 22

	<input type="checkbox"/> Class A (10m)	<input checked="" type="checkbox"/> Class B (10m)
Frequency (MHz)	Quasi-Peak ($\text{dB}\mu\text{V/m}$)	Quasi-Peak ($\text{dB}\mu\text{V/m}$)
30 to 230	40.0	30.0
230 to 1000	47.0	37.0

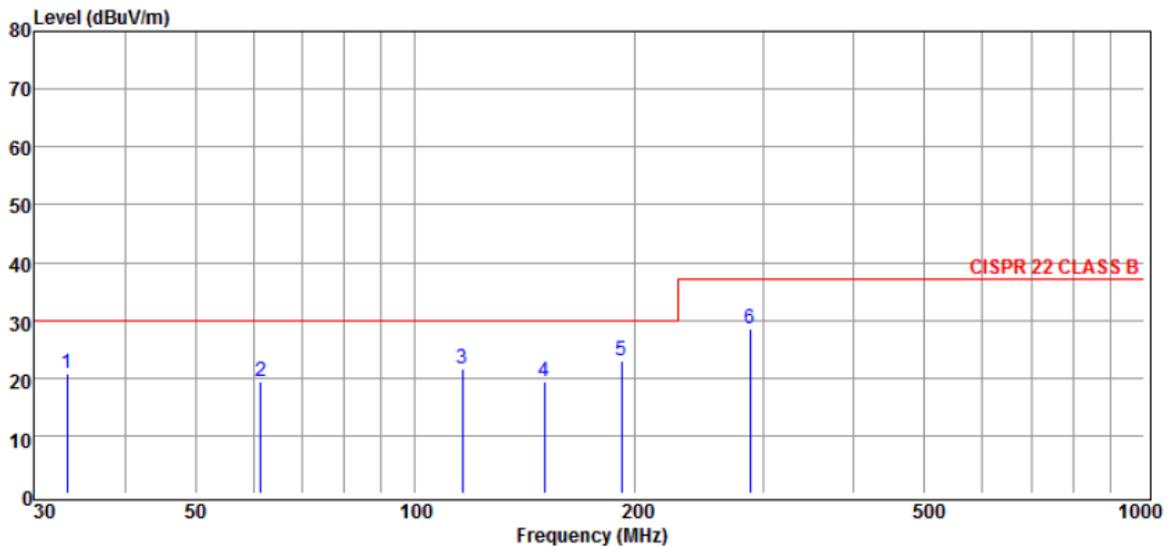
3.4 Test Result

PASS

The final tests data are shown on the following page(s).

Radiated Emission Test Data-Line mode

Test Date : 06-DEC-2016 Polarization : Horizontal
 Temperature : 26°C Humidity : 51%

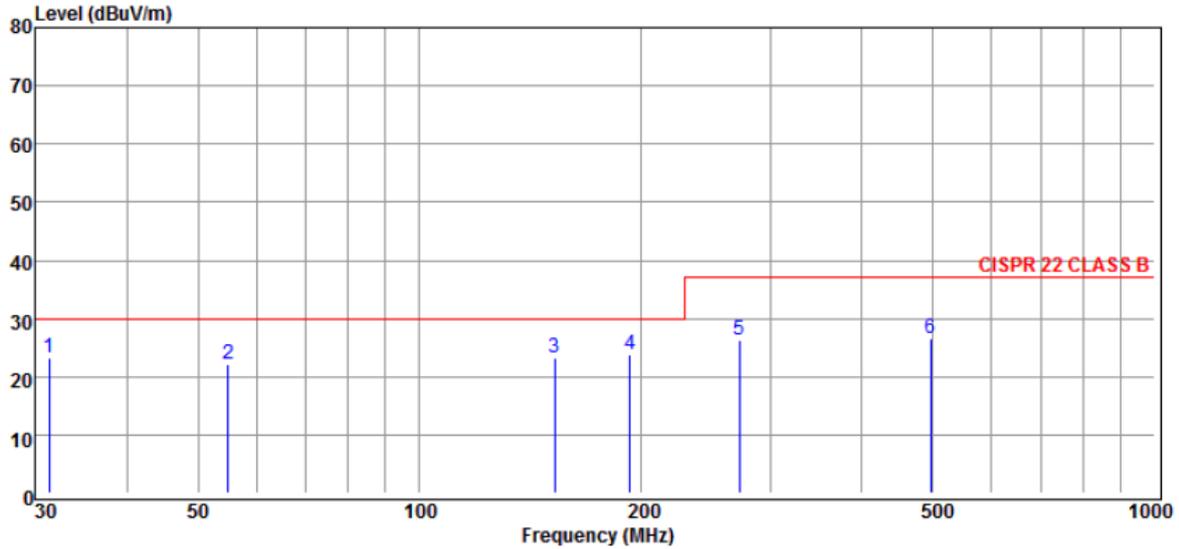


No.	Freq MHz	Reading dBμV	C.F dB	Result dBμV/m	Limit dBμV/m	Margin dB	Height cm	Angle deg	Antenna Pol.	Remark
1	33.32	27.97	-7.15	20.82	30.00	-9.18	400	46	HORIZONTAL	QP
2	61.36	37.51	-18.02	19.49	30.00	-10.51	400	113	HORIZONTAL	QP
3	116.13	33.80	-12.24	21.56	30.00	-8.44	397	79	HORIZONTAL	QP
4	150.32	31.61	-12.22	19.39	30.00	-10.61	395	84	HORIZONTAL	QP
5	192.05	37.11	-14.13	22.98	30.00	-7.02	392	155	HORIZONTAL	QP
6	288.01	37.38	-8.86	28.52	37.00	-8.48	390	90	HORIZONTAL	QP

- Remark :
1. All readings are Quasi-Peak values.
 2. Result = Reading + C.F
 3. Margin = Result – Limit

Radiated Emission Test Data-Line mode

Test Date : 06-DEC-2016 Polarization : Vertical
 Temperature : 26°C Humidity : 51%

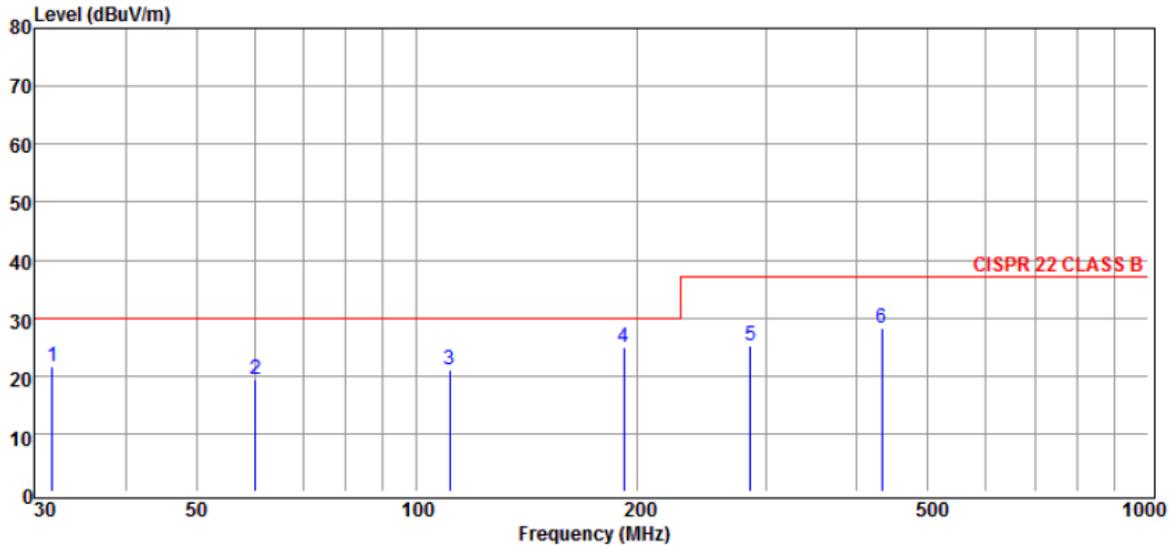


No.	Freq MHz	Reading dBμV	C.F dB	Result dBμV/m	Limit dBμV/m	Margin dB	Height cm	Angle deg	Antenna Pol.	Remark
1	31.35	29.35	-6.10	23.25	30.00	-6.75	100	69	VERTICAL	QP
2	54.89	38.99	-16.97	22.02	30.00	-7.98	100	38	VERTICAL	QP
3	152.71	35.62	-12.31	23.31	30.00	-6.69	101	250	VERTICAL	QP
4	193.25	37.92	-14.09	23.83	30.00	-6.17	105	170	VERTICAL	QP
5	272.23	35.31	-9.08	26.23	37.00	-10.77	108	40	VERTICAL	QP
6	496.40	28.73	-2.21	26.52	37.00	-10.48	112	122	VERTICAL	QP

- Remark :
1. All readings are Quasi-Peak values.
 2. Result = Reading + C.F
 3. Margin = Result – Limit

Radiated Emission Test Data- Battery mode

Test Date : 06-DEC-2016 Polarization : Horizontal
 Temperature : 26°C Humidity : 51%

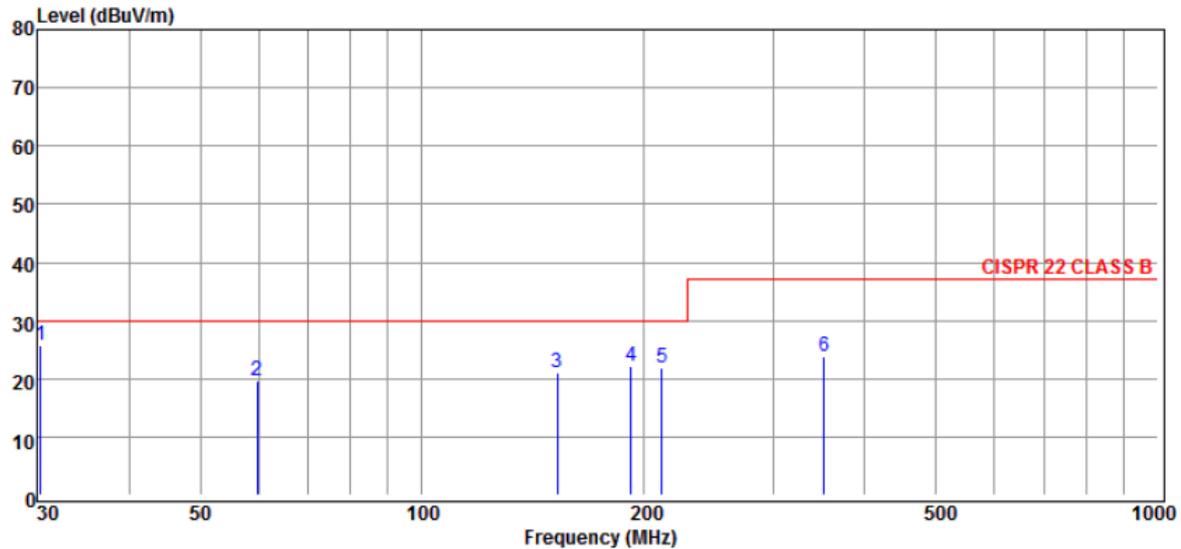


No.	Freq MHz	Reading dBμV	C.F dB	Result dBμV/m	Limit dBμV/m	Margin dB	Height cm	Angle deg	Antenna Pol.	Remark
1	31.77	27.96	-6.28	21.68	30.00	-8.32	400	150	HORIZONTAL	QP
2	60.22	37.44	-18.06	19.38	30.00	-10.62	400	48	HORIZONTAL	QP
3	110.99	33.49	-12.57	20.92	30.00	-9.08	397	126	HORIZONTAL	QP
4	192.05	39.10	-14.13	24.97	30.00	-5.03	395	91	HORIZONTAL	QP
5	286.01	33.99	-8.94	25.05	37.00	-11.95	392	77	HORIZONTAL	QP
6	432.27	32.35	-4.19	28.16	37.00	-8.84	381	130	HORIZONTAL	QP

- Remark :
1. All readings are Quasi-Peak values.
 2. Result = Reading + C.F
 3. Margin = Result – Limit

Radiated Emission Test Data-Battery mode

Test Date : 06-DEC-2016 Polarization : Vertical
 Temperature : 26°C Humidity : 51%



No.	Freq MHz	Reading dBμV	C.F dB	Result dBμV/m	Limit dBμV/m	Margin dB	Height cm	Angle deg	Antenna Pol.	Remark
1	30.38	31.20	-5.53	25.67	30.00	-4.33	100	136	VERTICAL	QP
2	59.81	37.64	-18.03	19.61	30.00	-10.39	100	25	VERTICAL	QP
3	152.62	33.45	-12.31	21.14	30.00	-8.86	102	140	VERTICAL	QP
4	192.42	36.35	-14.12	22.23	30.00	-7.77	105	78	VERTICAL	QP
5	212.09	35.51	-13.55	21.96	30.00	-8.04	108	92	VERTICAL	QP
6	352.35	31.08	-7.14	23.94	37.00	-13.06	112	100	VERTICAL	QP

- Remark :
1. All readings are Quasi-Peak values.
 2. Result = Reading + C.F
 3. Margin = Result – Limit

4 Radiated Emission Test – Above 1GHz

4.1 Test Instruments

Refer to Sec. 1.3 Test Instruments.

4.2 Test Configuration and Procedure

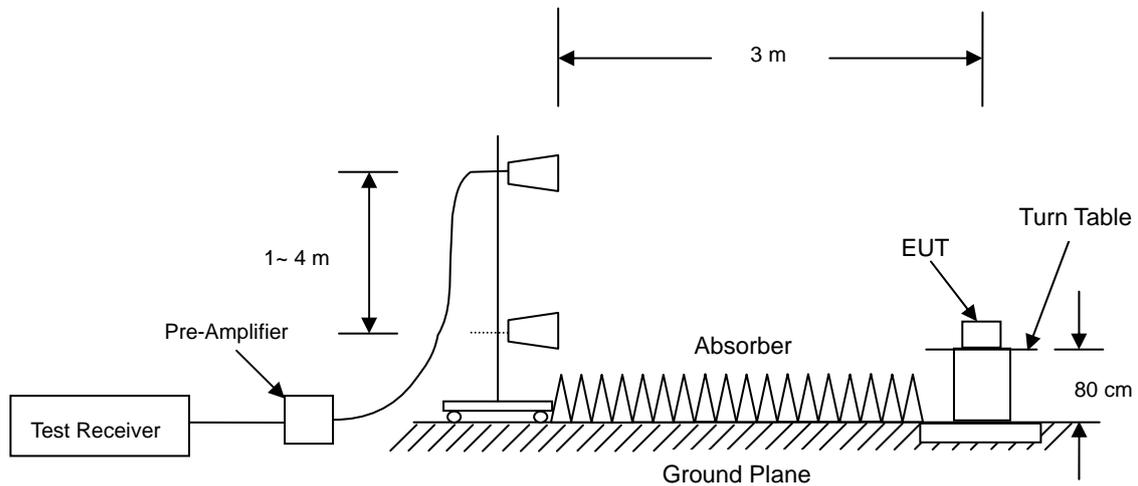


Table-top Equipment

- The EUT was placed on a non-conductive turntable which was 80cm above the horizontal ground plane. The EUT was set 3m away from the receiving antenna that was mounted on a non-conductive mast.
- Main cables draped to the ground plane and were routed to the mains power outlet. The mains power outlet was bonded to and did not protrude above the ground plane.
- The antenna was adjusted between 1m and 4m in height above the ground plane and the Antenna-to-EUT azimuth was also varied during the measurements to find the top 6 maximum meter readings within the frequency range limit as indicated in Sec 4.3.
- The radiated emissions were measured when the Antenna-to-EUT polarization was set horizontally and vertically.
- The values were recorded.

4.3 Test Limit

FCC Part 15 Subpart B

Frequency GHz	Class A at 10m			Class B at 3m		
	Field Strength (μ V/m)	Average (dB μ V/m)	Peak (dB μ V/m)	Field Strength (μ V/m)	Average (dB μ V/m)	Peak (dB μ V/m)
Above 1GHz	300	49.5	69.5	500	54	74

Note : 1. The lower limit shall apply at the transition frequencies.

2. Emission level (dB μ V/m) = 20 log Emission level (μ V/m).

3. The measurement above 1GHz is at close-in 3m, and determine the limit **L2** corresponding to the close-in distance **d2** by applying the following relation: **L2=L1(d1/d2)**, where **L1** is the specified limit in microvolts per meter (**μ V/m**) at the distance **d1(10m)**, **L2** is the new limit for distance **d2(3m)**.

So the new Class A limit above 1GHz at 3m is as following table:

Frequency GHz	Class A at 3m	
	Average (dB μ V/m)	Peak (dB μ V/m)
Above 1GHz	60	80

4.4 Test Result

Not applicable

※The highest frequency of the internal sources of the EUT is less than 108MHz. Hence, above 1GHz Radiated Measurement shall not be made.

5 Photographs of Test

5.1 Conducted Emission Test



Front View



Rear View

5.2 Radiated Emission Test – Below 1 GHz



Front View



Rear View

6 Photographs of EUT



Front View of EUT



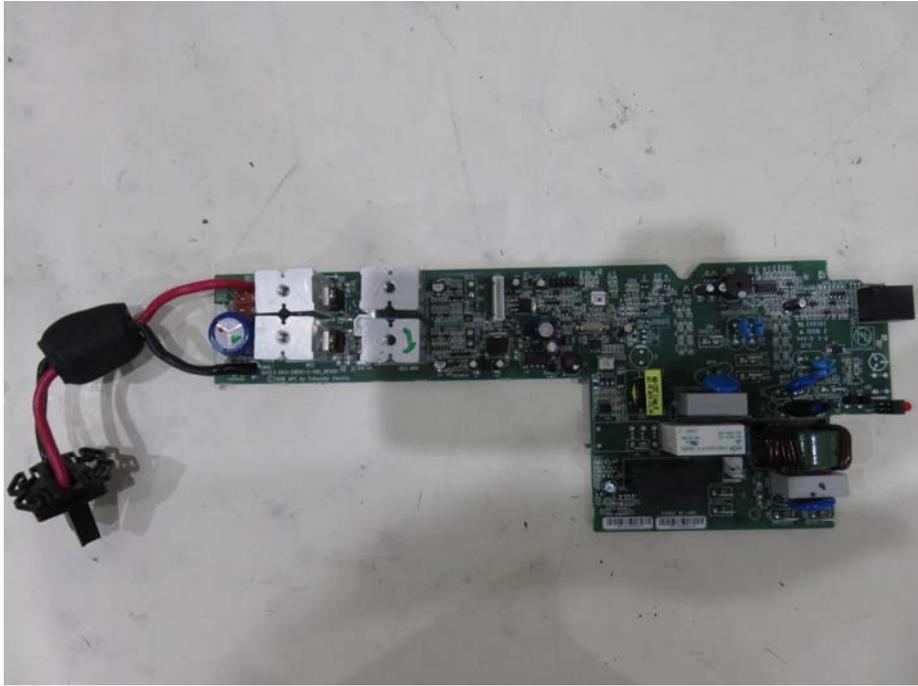
Rear View of EUT



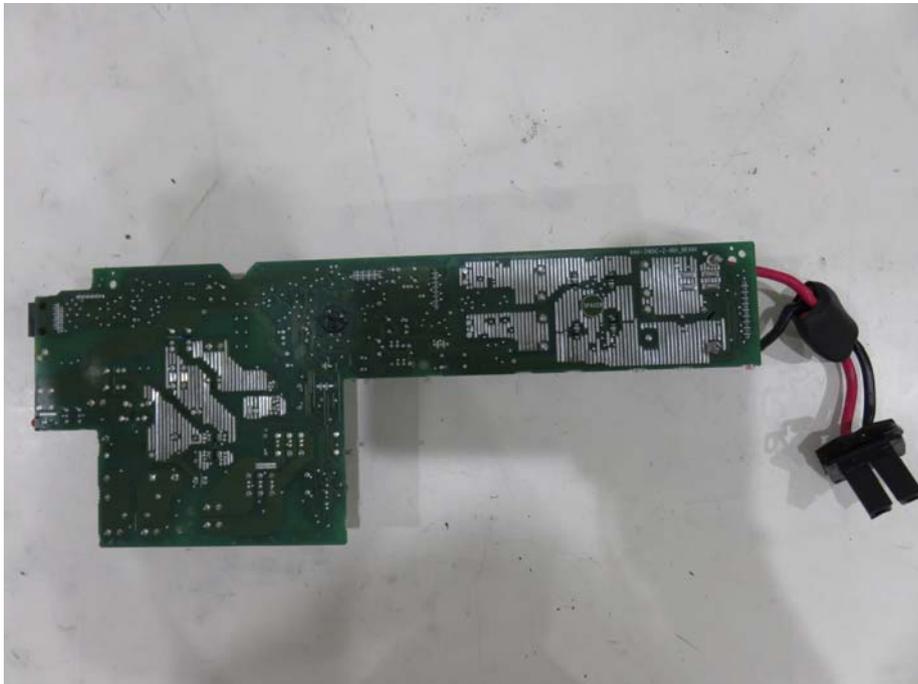
Inside View of EUT



View of the I/O Port



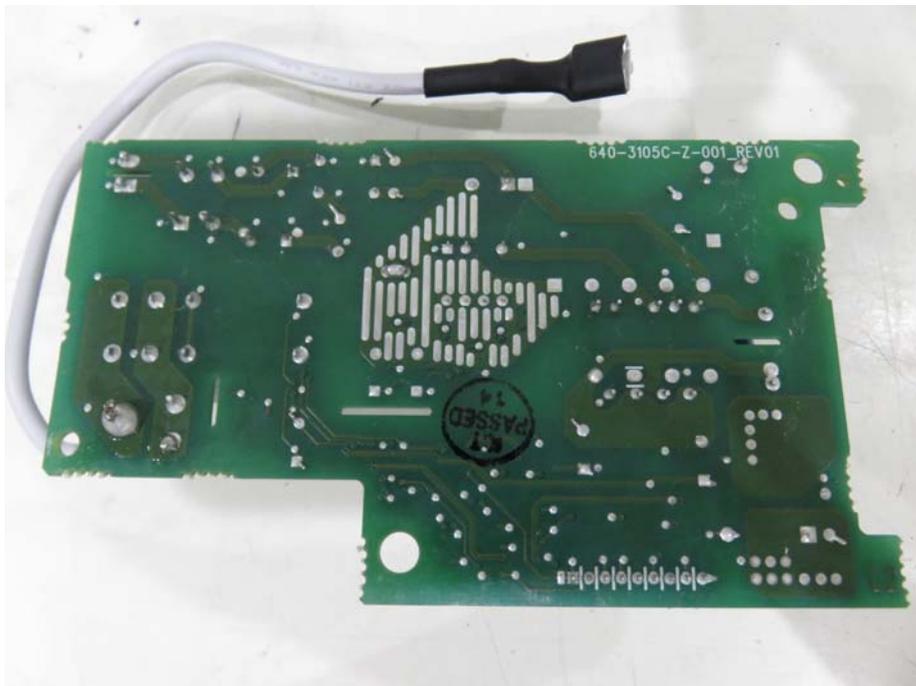
Front View of the PCB 1



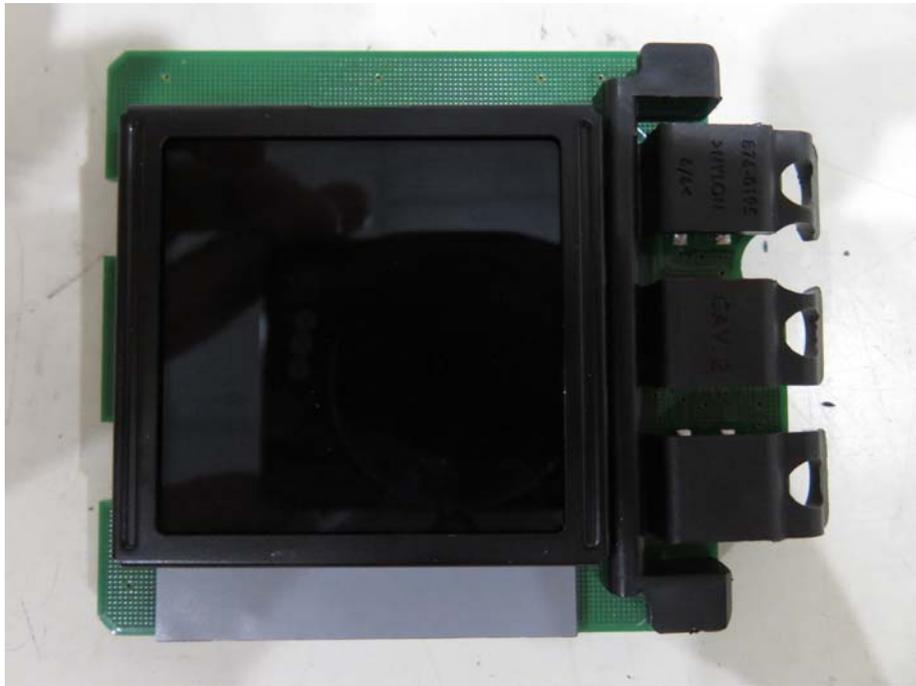
Rear View of the PCB 1



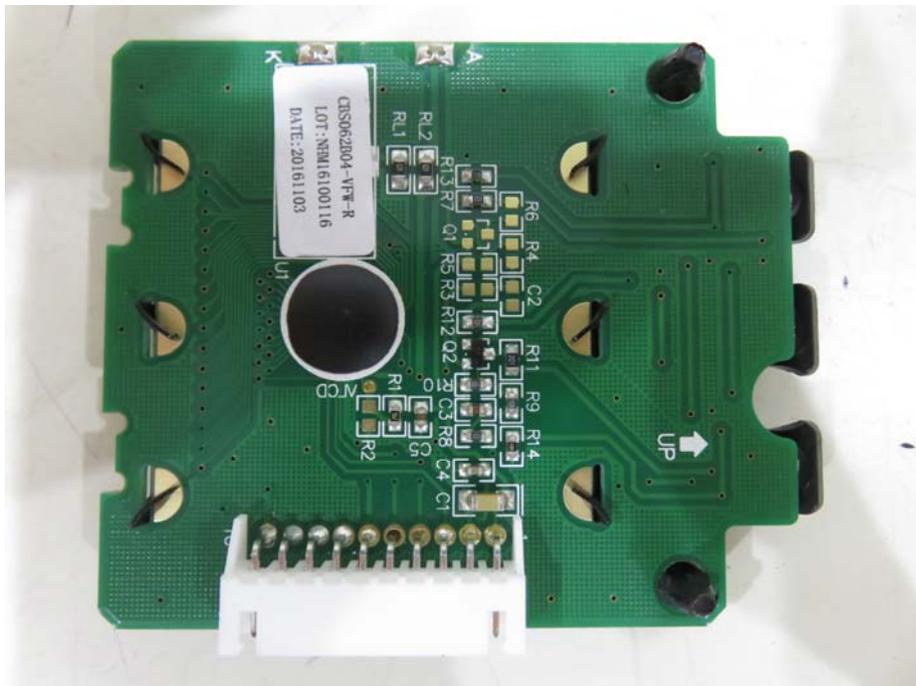
Front View of the PCB 2



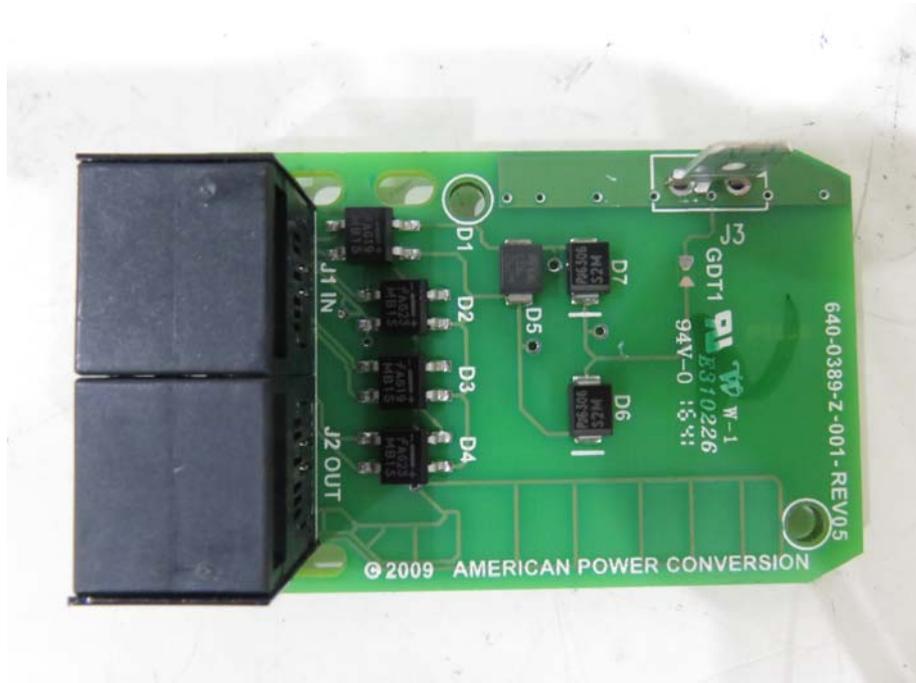
Rear View of the PCB 2



Front View of the PCB 3



Rear View of the PCB 3



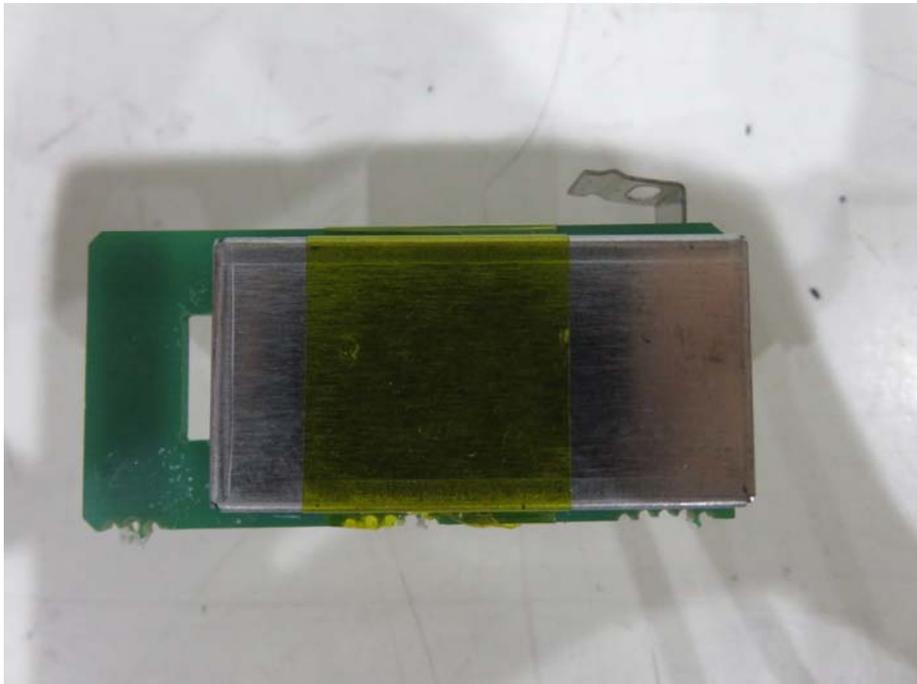
Front View of the PCB 4



Rear View of the PCB 4



Front View of the PCB 5



Rear View of the PCB 5



View of the Transformer



View of the Battery



View of the Data Cable (USB to Serial)



View of the Coaxial Cable