Shenzhen Reflying Electronic Co., Ltd

TEST REPORT

SCOPE OF WORK
FCC TESTING–AW002-PB, RPB65

REPORT NUMBER
180119021SZN-001

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TEST REPORT

Intertek Report No.: 180119021SZN-001

Shenzhen Reflying Electronic Co., Ltd

Application
For
Certification

FCC ID: A7M-AW002-PB

Dual Charge Power Bank

Model: AW002-PB
Additional Model: RPB65

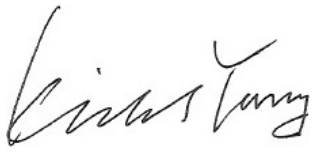
Report No.: 180119021SZN-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 18,
mention 47 CFR [10-1-16]

Prepared and Checked by:

Sign on File
Surel Guo
Engineer

Approved by:



Kidd Yang
Senior Project Engineer
Date: 1 February 2018

LIST OF EXHIBITS

INTRODUCTION

EXHIBIT 1: Summary of Tests

EXHIBIT 2: General Description

EXHIBIT 3: System Test Configuration

EXHIBIT 4: Measurement Results

EXHIBIT 5: Equipment Photographs

EXHIBIT 6: Product Labeling

EXHIBIT 7: Technical Specifications

EXHIBIT 8: Instruction Manual

EXHIBIT 9: Confidentiality Request

EXHIBIT 10: Miscellaneous Information

EXHIBIT 11: Test Equipment List

GENERAL INFORMATION

Applicant / Company:	Shenzhen Reflying Electronic Co., Ltd 6 Bldg, GaoXinJian Industrial zone, HePing village, Fuyong Town, Bao'an district, Shenzhen, Guangdong, China.
Equipment Under Test (EUT):	
Product Description:	Dual Charge Power Bank
Model:	AW002-PB, RPB65
Brand Name:	NA
Nominal operating frequency	550KHz
Maximum RF energy generated	2W
Sample Receipt Date:	19 January 2018
Test Conducted Date:	19 January 2018 to 31 January 2018
Issue Date:	01 February 2018
Test Site and Location:	Intertek Testing Services Shenzhen Ltd. Longhua Branch 1F/2F, Building B, QiaoAn Scientific Technology Park, Shangkeng Community, Guanhu Subdistrict, Longhua District, Shenzhen, P.R. China
Environmental Conditions:	Temperature: +10 to 40 °C Humidity: 10 to 90%

Table of Contents

1.0 Summary of Test Results 7

2.0 General Description 9

2.1 Product Description 9
2.2 Related Submittal(s) Grants 9
2.3 Test Methodology 9
2.4 Test Facility 9

3.0 System Test Configuration 11

3.1 Justification 11
3.2 EUT Exercising Software 11
3.3 Special Accessories 11
3.4 Measurement Uncertainty 11
3.5 Equipment Modification 11
3.6 Support Equipment List and Description 12

4.0 Measurement Results 14

4.1 Field Strength Calculation 14
4.2 Radiated Emission Configuration Photograph 15
4.3 Radiated Spurious Emission 15
4.4 Conducted Emission Configuration Photograph 17
4.5 Conducted Emission 17

5.0 Equipment Photographs 21

6.0 Product Labelling 23

7.0 Technical Specifications 25

8.0 Instruction Manual 27

9.0 Miscellaneous Information 29

9.1 Emissions Test Procedures 29
9.2 Radiated Emissions Test Setup 30
9.3 Conducted Emissions Test Configuration 30
9.4 Conducted Emissions Test Setup 30

10.0 Confidentiality Request 32

11.0 Test Equipment List 34

List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

EXHIBIT 1

SUMMARY OF TEST RESULTS

1.0 Summary of Test results

Dual Charge Power Bank

Model: AW002-PB

FCC ID: A7M-AW002-PB

TEST ITEM	REFERENCE	RESULTS
Field Strength Limit	18.305	Pass
Conduction Limit	18.307	Pass

EXHIBIT 2

GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Dual Charge Power Bank operating at 550 kHz. The EUT designed to work with client devices is incapable of transmitting any form of intelligent communication wirelessly. The EUT is powered by two DC 3.7V, 2600mAh rechargeable battery which can be charged by USB port. For more detailed features description, please refer to the user's manual.

The Model: RPB65 is the same as the Model: AW002-PB in hardware and electronic aspect. The difference in model number and appearance serve as marketing strategy.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of a wireless charger. And related report for FCC SDOC is subjected to report number: 180119020SZN-001.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the FCC procedures in MP-5, "Methods of Measurements of Radio Noise Emissions from Industrial, Scientific and Medical equipment (February 1986)", Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are Intertek **Testing Services Shenzhen Ltd. Longhua Branch** and located at 1F/2F, Building B, QiaoAn Scientific Technology Park, Shangkeng Community, Guanhu Subdistrict, Longhua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.

EXHIBIT 3

SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in MP5-1986.

The EUT was powered by two DC 3.7V, 2600mAh rechargeable battery which was charged by DC 5V, 2.1A with an adapter during the test. Only the worst case data was shown in the report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data report in Exhibit 4.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the styrene turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

3.2 EUT Exercising Software

N/A.

3.3 Special Accessories

There are no special accessories necessary for compliance of this product.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by Shenzhen Reflying Electronic Co., Ltd will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Detail
Adapter (Provided by Intertek)	G-TIDE	Model: AC59 Input: AC 100-240V, 50/60Hz, 0.35A Output: DC 5V, 2.1A
USB Cable	Reflying	unshielded, Length 30cm
Apple Watch	Apple	Series2
Dummy load	N/A	2.5Ω

EXHIBIT 4

MEASUREMENT RESULTS

4.0 Measurement Results

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

4.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG - AV

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

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

FS = RR + LF

where FS = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
AV = 5.0 dB
RR = 18.0 dBµV
LF = 9.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

4.2 Radiated Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

4.3 Radiated Spurious Emission

Worst Case Radiated Spurious Emission
at
0.063MHz

Judgement: Passed by 8.7dB margin

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: Shenzhen Reflying Electronic Co., Ltd
Date of Test: January 31, 2018 Model: AW002-PB
Worst Case Operating Mode: Charging and power transfer

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	0.010	33.1	0.0	20.8	53.9	63.5	-9.6
Horizontal	0.036	37.1	0.0	16.8	53.9	63.5	-9.6
Horizontal	0.063	38.4	0.0	16.4	54.8	63.5	-8.7
Horizontal	0.127	31.0	0.0	16.3	47.3	63.5	-16.2
Horizontal	0.187	37.3	0.0	16.4	53.7	63.5	-9.8
Horizontal	0.251	31.2	0.0	16.1	47.3	63.5	-16.2
Horizontal	0.550	34.6	0.0	17.8	52.4	63.5	-11.1

Notes:
1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Loop antenna is used for the emission under 30MHz.
5. Limits at 3 meter for radiated emissions below 30 MHz is converted from the Limits at 300 meter according to the Formula:
   $\text{Limits}_{\text{at 3 meter (dBµV/m)}} = \text{Limits}_{\text{at 30 meter (dBµV/m)}} + 20 \log(300/3)$
6. Other emissions more than 20dB below the limit are not reported.
7. The measurement uncertainty is ±4.8dB at a level of confidence of 95%.

4.4 Conducted Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.

4.5 Conducted Emission

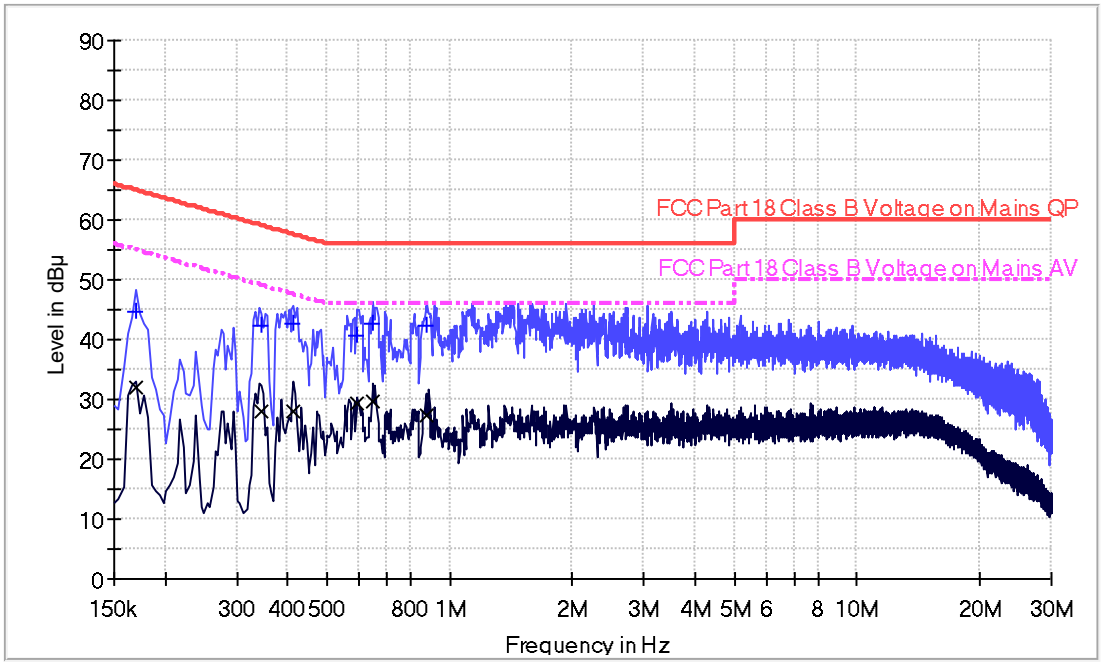
Worst Case Conducted Configuration
at
0.650MHz

Judgement: Passed by 13.2dB margin

Applicant: Shenzhen Reflying Electronic Co., Ltd
Date of Test: January 31, 2018 Model: AW002-PB
Worst Case Operating Mode: Charging and power transfer
Phase: Live

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 18.307: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB¦ÌV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
0.170000	44.5	9.000	L1	9.6	20.5	65.0
0.346000	42.5	9.000	L1	9.7	16.6	59.1
0.414000	42.7	9.000	L1	9.7	14.9	57.6
0.594000	40.7	9.000	L1	9.7	15.3	56.0
0.650000	42.8	9.000	L1	9.7	13.2	56.0
0.882000	42.5	9.000	L1	9.7	13.5	56.0

Limit and Margin AV

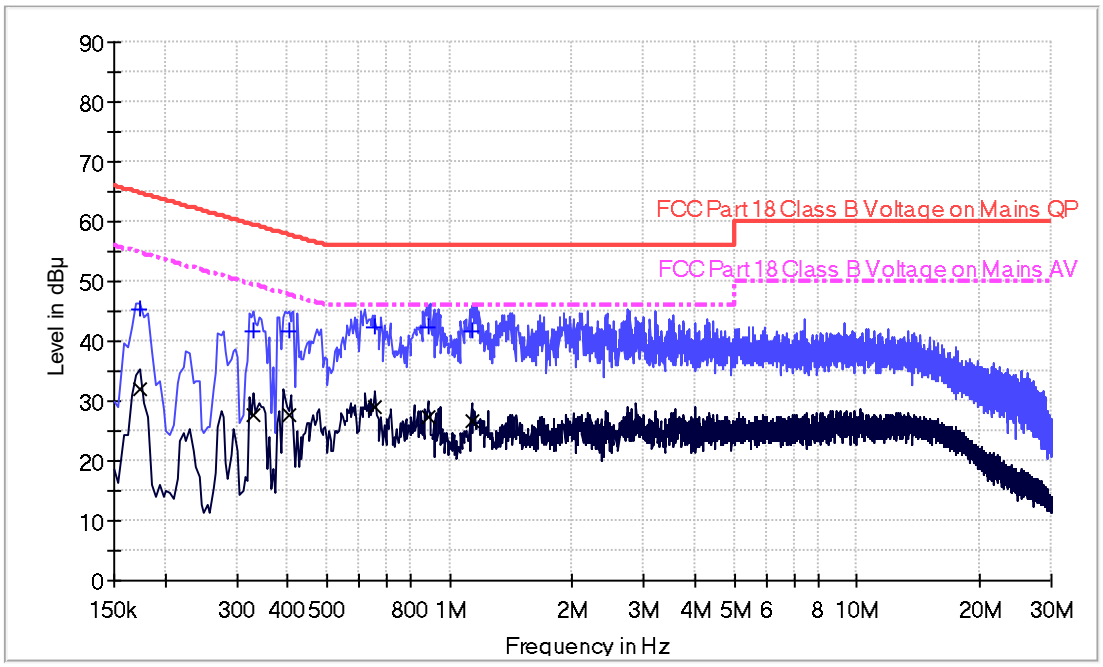
Frequency (MHz)	Average (dB¦ÌV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
0.170000	32.1	9.000	L1	9.6	22.9	55.0
0.346000	28.1	9.000	L1	9.7	21.0	49.1
0.414000	28.0	9.000	L1	9.7	19.6	47.6
0.594000	29.2	9.000	L1	9.7	16.8	46.0
0.650000	29.6	9.000	L1	9.7	16.4	46.0
0.882000	27.5	9.000	L1	9.7	18.5	46.0

Note: The measurement uncertainty is ±3.6dB at a level of confidence of 95%.

Applicant: Shenzhen Reflying Electronic Co., Ltd
Date of Test: January 31, 2018 Model: AW002-PB
Worst Case Operating Mode: Charging and power transfer
Phase: N

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 18.307: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB¦ÌV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
0.174000	45.3	9.000	N	9.7	19.5	64.8
0.330000	41.7	9.000	N	9.7	17.8	59.5
0.402000	41.8	9.000	N	9.7	16.0	57.8
0.654000	42.4	9.000	N	9.7	13.6	56.0
0.886000	42.3	9.000	N	9.7	13.7	56.0
1.142000	41.7	9.000	N	9.7	14.3	56.0

Limit and Margin AV

Frequency (MHz)	Average (dB¦ÌV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
0.174000	32.1	9.000	N	9.7	22.7	54.8
0.330000	27.6	9.000	N	9.7	21.9	49.5
0.402000	27.7	9.000	N	9.7	20.1	47.8
0.654000	29.0	9.000	N	9.7	17.0	46.0
0.886000	27.3	9.000	N	9.7	18.7	46.0
1.142000	26.7	9.000	N	9.7	19.3	46.0

Note: The measurement uncertainty is ±3.6dB at a level of confidence of 95%.

EXHIBIT 5

EQUIPMENT PHOTOGRAPHS

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

EXHIBIT 6

PRODUCT LABELLING

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

EXHIBIT 7

TECHNICAL SPECIFICATIONS

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 8

INSTRUCTION MANUAL

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 9

MISCELLANEOUS INFORMATION

9.0 Miscellaneous Information

This miscellaneous information includes emission measuring procedure.

9.1 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of Industrial, Scientific and Medical equipment operating under FCC methods of measurements of radio noise emissions from Industrial, Scientific and Medical equipment.

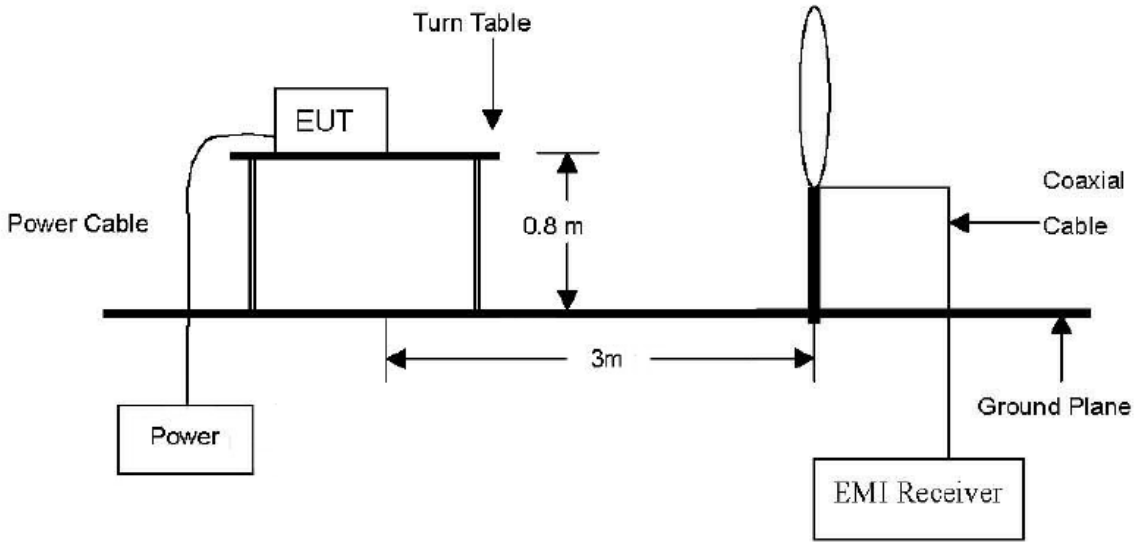
Initial measurements are made near the EUT with the measuring antenna 3 meters from the nearest part of the EUT. The dummy load specified in Sections 3.6 is used, as applicable. The EUT is rotated about its horizontal axis on the turntable, and the polarization and height of the receiving antenna are varied to obtain the highest field strength on the particular frequency under observation. Measurements at the 3 meter distance are made in a large room or outdoors; with the equipment and antenna located so as to minimize effects due to reflections from the building structure or other items in the field. For measurements above ICE: and at 3 meters, an antenna of small aperture (i.e. , a small horn, without its reflector) is used, because the field over the area of a large antenna would be non-uniform, and such an antenna would not have the gain normally expected.

At each test frequency, the reading of the field strength meter is observed during the heating cycle as the following factors are varied:

(1) EUT orientation;
(2) Antenna orientation;
(3) Antenna polarization

9.2 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



9.3 Conducted Emission Test Configuration

Conducted emissions test

Measurements of powerline conducted radio noise shall be expressed as the voltage developed across the 50-ohm port terminated by a 50-ohm measuring instrument. All voltage measurement shall be made at the plug end of the EUT power cord, e.g., by the use of mating plugs and receptacles on the EUT and LISN.

9.4 Conducted Emission Test Setup

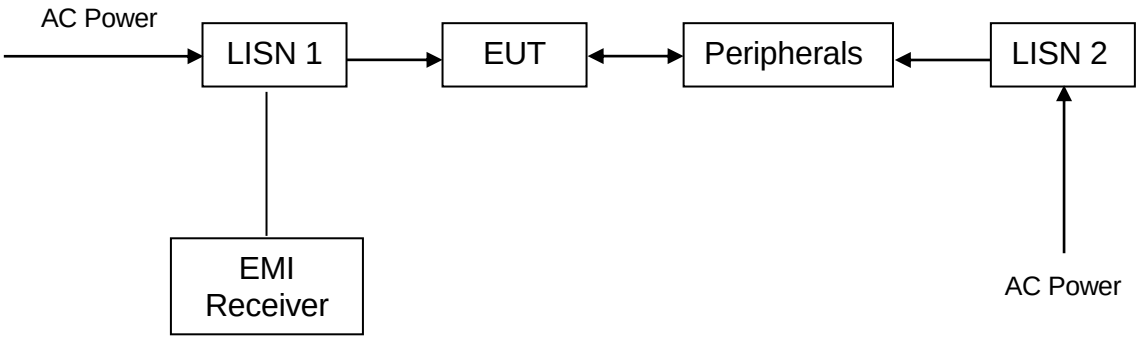


EXHIBIT 10

CONFIDENTIALITY REQUEST

10.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

EXHIBIT 11

TEST EQUIPMENT LIST

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	20-Sep-2017	20-Sep-2018
SZ185-01	EMI Receiver	R&S	ESCI	100547	9-Feb-2017	9-Feb-2018
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	26-May-2017	26-May-2018
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	1-Jun-2017	1-Jun-2018
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	7-Jul-2017	7-Jul-2018
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	9-Feb-2017	9-Feb-2018
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	16-Jan-2017	16-Jan-2019
SZ062-02	RF Cable	RADIALL	RG 213U	--	8-Jan-2017	8-Jul-2018
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	16-Sep-2017	16-Mar-2018
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	16-Sep-2017	16-Mar-2018
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	14-Jun-2017	14-Jun-2018
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	30-Oct-2017	30-Oct-2018
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	30-Oct-2017	30-Oct-2018
SZ187-02	Two-Line V-Network	R&S	ENV216	100072	12-Jul-2017	12-Jul-2018
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Jan-2017	16-Jan-2019