Dongguan Aniree Industrial Limited

TEST REPORT

SCOPE OF WORK
FCC TESTING–DR350, DR350B, SG-F28

REPORT NUMBER
190716028SZN-001

ISSUE DATE **[REVISED DATE]**

23 July 2019 [----------]

PAGES
18

DOCUMENT CONTROL NUMBER
FCC ID JAB_A

Dongguan Aniree Industrial Limited

Application

For

Certification

FCC ID: 2AT2TDR350BF28

Obstacle Avoidance Drone

Model: DR350, DR350B, SG-F28

Brand Name: SKY RIDER

Digital devices & Peripherals Devices

Report No.: 190716028SZN-001

Prepared and Checked by:

Winkey Wang
Senior Project Engineer

Approved by:

Peter Kang
Senior Technical Supervisor
Date: 23 July 2019

Intertek Testing Services Shenzhen Ltd. Longhua Branch
101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China.
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MEASUREMENT / TECHNICAL REPORT

This report concerns (check one:) Original Grant X Class I Change __

Equipment Type: JAB-Part 15 Class B Digital Devices

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No ____X____

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No ____X____

If no, assumed Part 15, Subpart B for unintentional radiator – the new 47 CFR [10-01-18 Edition] provision.

Report prepared by:

Winkey Wang

Intertek Testing Services Shenzhen Ltd. Longhua Branch

101, 201, Building B, No. 308 Wuhe Avenue,Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China

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Table of Contents

1.0 SUMMARY OF TEST RESULT

Applicant:	Dongguan Aniree Industrial Limited
Applicant Address:	Building 10, Fuxing Industrial Area, Fuxing Road, Xiagang Village, Changan Town, Dongguan, China
Manufacturer:	Same as applicant
Manufacturer Address:	Same as applicant
Model No.:	DR350, DR350B, SG-F28
FCC ID:	2AT2TDR350BF28

Test Specification	Reference	Results
Radiated Emission	15.107	PASS
Conducted Emission	15.109	PASS

2.0 General Description

2.1 Product Description

The equipment under test (EUT) is a Obstacle Avoidance Drone/DR350 with Infrared remote receiving function. The EUT is powered by DC 3.7V by rechargeable battery or charged by DC 5V. The USB port only be used for charge purpose and without of data transmission function. For more detail information pls. refer to the user manual.

The Model: DR350B, SG-F28 are the same as the Model: DR350 in hardware aspect. The models are difference in packaging and marketing purpose only.

2.2 Related Submittal(s) Grants

This is an application for certification of a Class B digital devices & peripherals devices for Obstacle Avoidance Drone, and infrared remote control's functions were reported in the verification report: 190716028SZN-002.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2014). 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 shielding room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, ShenZhen, P.R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: CN1188).

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 ANSI C63.4 (2014).

The EUT was powered by DC 3.7V full rechargeable battery or charged with DC 5V during the test. Both standalone and charged by adapter or PC have been considered, only the worst data was reported in this report.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. The step by step procedure for maximizing emissions led to the data reported in Section 4.0.

For the charging mode, the rear of unit shall be flushed with the rear of the table.
For the normal work mode, the unit was operated standalone and placed at the centre of table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turn table, 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

N/A

3.4 Equipment Modification

Any modifications installed previous to testing by Dongguan Aniree Industrial Limited 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.

3.5 Measurement Uncertainty

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

Measurement Uncertainty	Uncertainty
AC conducted Emission	±3.6dB
Radiated Emission (Up to 1GHz)	±4.8dB

3.6 Support Equipment List and Description

Description	Manufacturer	Remark
USB cable (Provided by Client)	/	unshielded, 0.6m
Adapter (Provided by Intertek)	G-TiDE	HJ-50100
Laptop (Provided by Intertek)	HP Compaq	2510p

4.0 Emission Results

Data is included 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 reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$FS = RA + AF + CF - AG$

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/m
AG = Amplifier Gain in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$FS = RA + AF + CF - AG$

Example

Assume a receiver reading of 62.0dBμV is obtained. The antenna factor of 7.4dB/m and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The net field strength for comparison to the appropriate emission limit is 42dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0dBμV
AF = 7.4dB/m
CF = 1.6dB
AG = 29.0dB

$FS = 62 + 7.4 + 1.6 - 29 = 42\text{dB}\mu\text{V/m}$

Level in μV/m = Common Antilogarithm [(42dBμV/m)/20] = 125.9μV/m

4.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
At
955.444667MHz (Normal Work Mode)

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

4.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 7.3dB margin (Normal Work Mode)

TEST PERSONNEL:

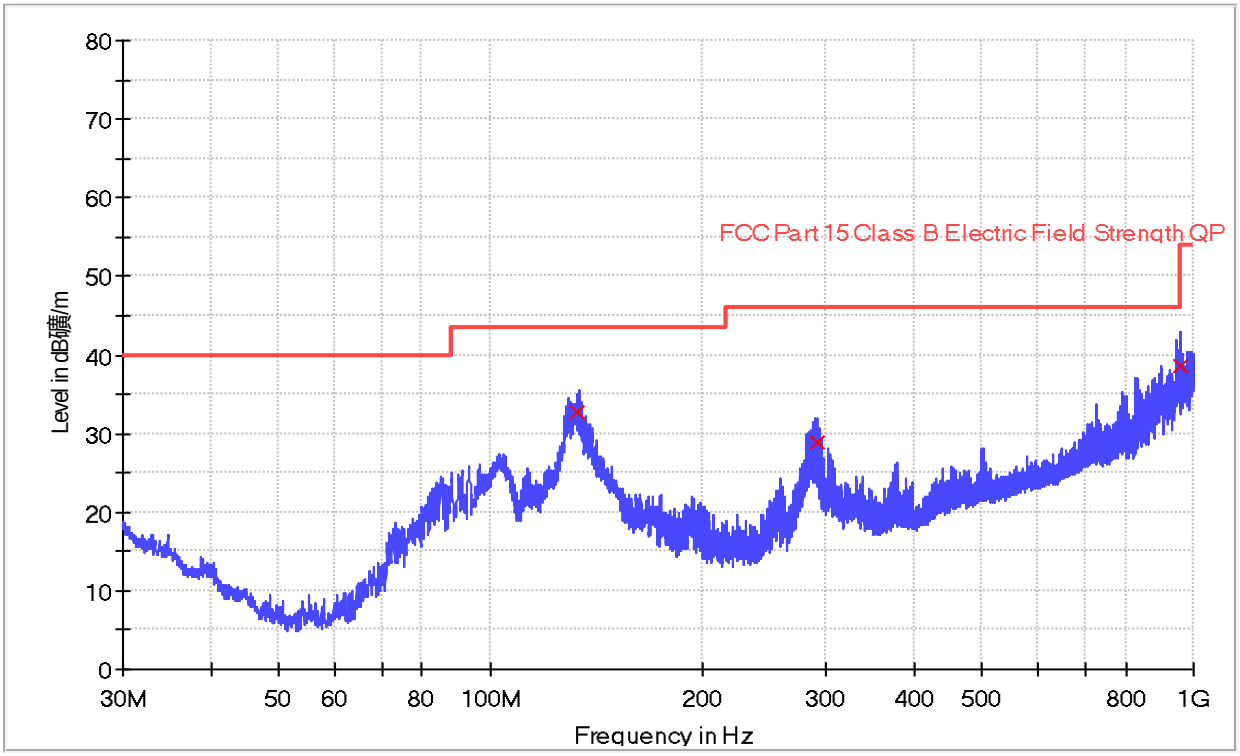
Sign on file

Winkey Wang, Senior Project Engineer
Typed/Printed Name

19 July 2019
Date

Applicant: Dongguan Aniree Industrial Limited
Date of Test: 19 July 2019 Model: DR350
Worst Case Operating Mode: Normal Work

Horizontal

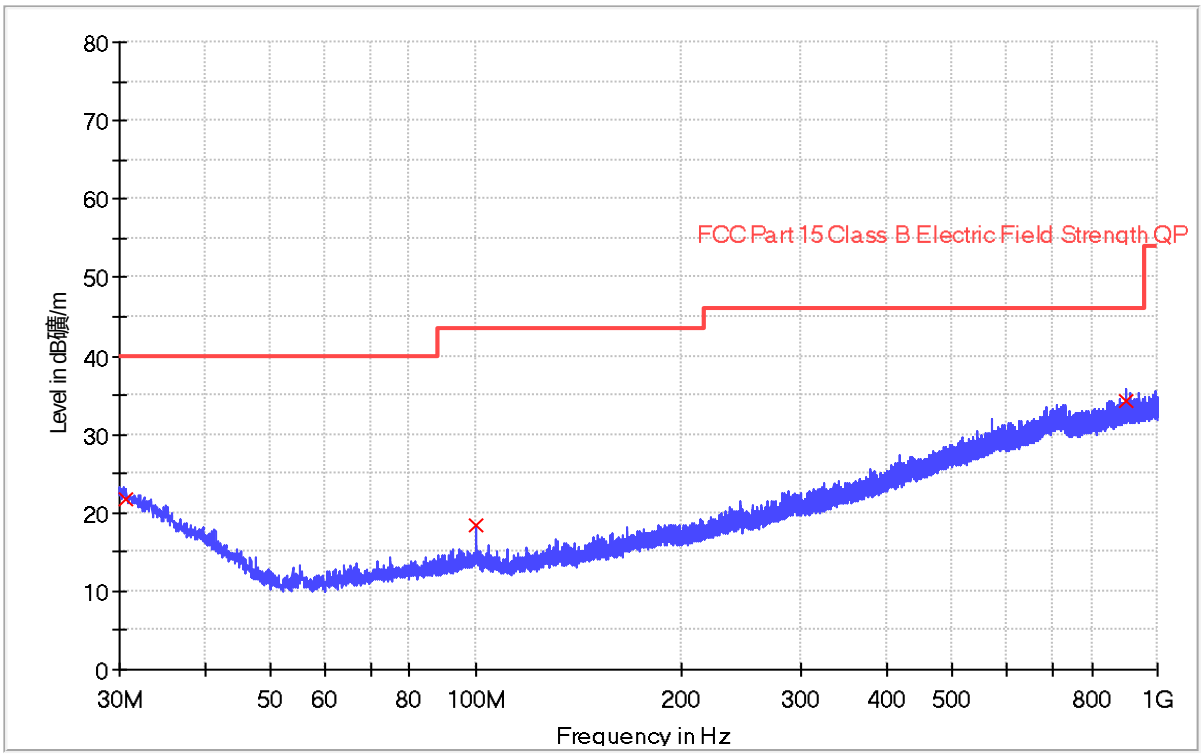


Frequency (MHz)	Quasi Peak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
132.399667	32.6	1000.0	120.000	100.0	H	10.6	10.9	43.5
290.800667	28.9	1000.0	120.000	100.0	H	16.7	17.1	46.0
955.444667	38.7	1000.0	120.000	100.0	H	28.3	7.3	46.0

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit Line(dBµV/m) – Level (dBµV/m)

Applicant: Dongguan Aniree Industrial Limited
Date of Test: 19 July 2019 Model: DR350
Worst Case Operating Mode: Normal Work

Vertical



Frequency (MHz)	Quasi Peak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
30.711333	21.8	1000.0	120.000	100.0	V	17.9	18.2	40.0
100.001667	18.5	1000.0	120.000	100.0	V	10.6	25.0	43.5
896.889000	34.2	1000.0	120.000	100.0	V	28.0	11.9	46.0

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit Line(dBµV/m) – Level (dBµV/m)

4.4 Conducted Emission at Mains Terminal

4.4.1 Conducted Emission Configuration Photograph

Worst Case Conducted Configuration
at
0.702000 MHz (Charging Mode)

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

4.5 Conducted Emission Data

Judgement: Passed by 11.9 dB margin(Charging Mode)

TEST PERSONNEL:

Sign on file

Winkey Wang, Senior Project Engineer
Typed/Printed Name

19 July 2019
Date

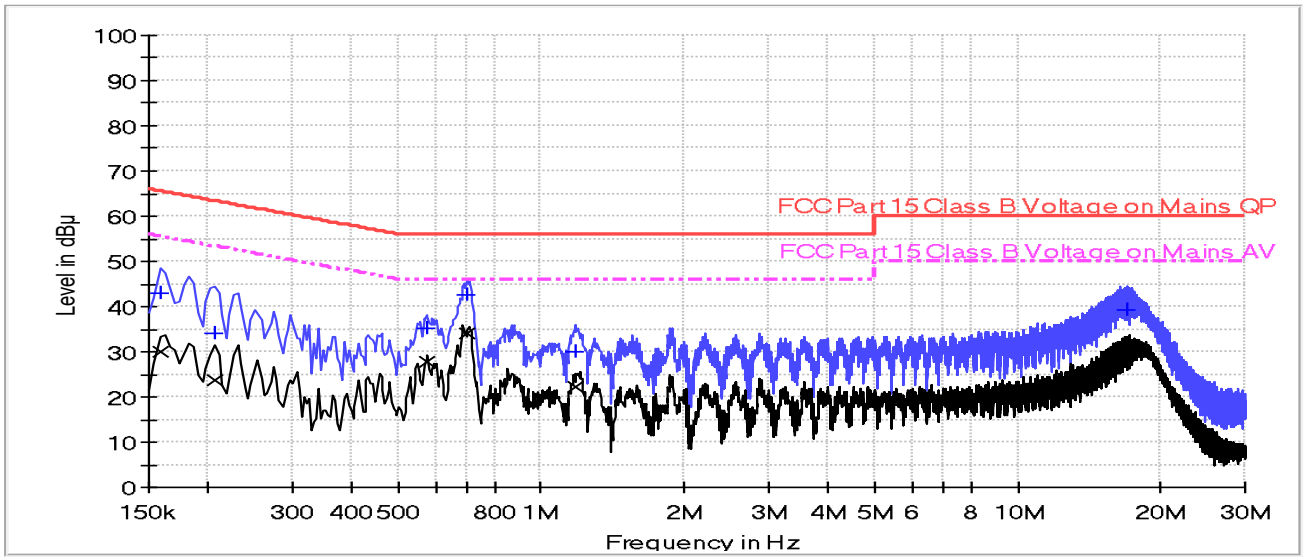
Conducted Emissions(150KHz~30MHz)

Applicant: Dongguan Aniree Industrial Limited

Model: DR350 Date of Test: 19 July 2019

Worst Case Operating Mode: Charging

Phase: Live



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	42.9	9.000	L1	9.7	22.7	65.6
0.206000	34.1	9.000	L1	9.7	29.3	63.4
0.574000	35.2	9.000	L1	9.8	20.8	56.0
0.702000	42.7	9.000	L1	9.8	13.3	56.0
1.182000	30.2	9.000	L1	9.8	25.8	56.0
17.014000	39.4	9.000	L1	10.3	20.6	60.0

Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	30.1	9.000	L1	9.7	25.5	55.6
0.206000	23.8	9.000	L1	9.7	29.6	53.4
0.574000	27.6	9.000	L1	9.8	18.4	46.0
0.702000	34.1	9.000	L1	9.8	11.9	46.0
1.182000	22.1	9.000	L1	9.8	23.9	46.0
17.014000	29.4	9.000	L1	10.3	20.6	50.0

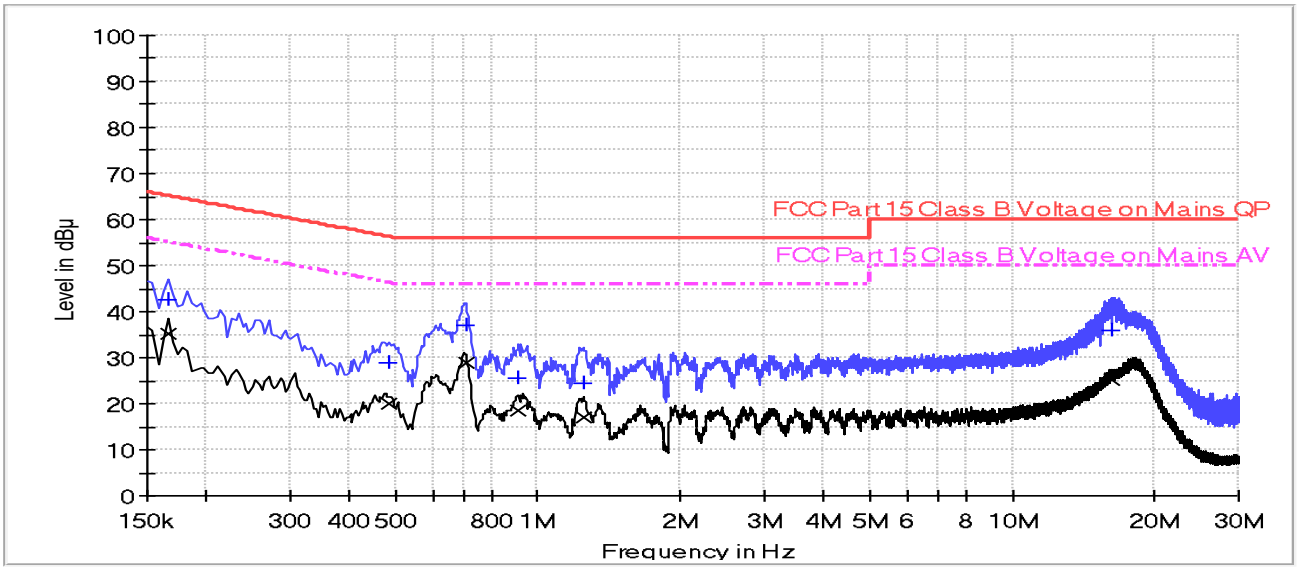
Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBµV) - Quasi Peak/Average (dBµV)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

Applicant: Dongguan Aniree Industrial Limited

Model: DR350 Date of Test: 19 July 2019

Worst Case Operating Mode: Charging

Phase: Neutral



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	42.4	9.000	N	9.7	22.8	65.2
0.486000	28.9	9.000	N	9.8	27.3	56.2
0.706000	37.1	9.000	N	9.8	18.9	56.0
0.910000	25.6	9.000	N	9.8	30.4	56.0
1.242000	24.4	9.000	N	9.8	31.6	56.0
16.266000	35.8	9.000	N	10.3	24.2	60.0

Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	35.3	9.000	N	9.7	19.9	55.2
0.486000	20.0	9.000	N	9.8	26.2	46.2
0.706000	29.0	9.000	N	9.8	17.0	46.0
0.910000	18.4	9.000	N	9.8	27.6	46.0
1.242000	17.0	9.000	N	9.8	29.0	46.0
16.266000	25.0	9.000	N	10.3	25.0	50.0

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBµV) - Quasi Peak/Average (dBµV)
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

5.0 Equipment Photographs

For electronic filing, photographs of the tested EUT are saved with filename: external photos.pdf and internal photos.pdf.

6.0 Product Labelling

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

7.0 Technical Specifications

For electronic filing, the block diagram of the tested EUT is saved with filename: block.pdf.

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.

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 computer peripheral operating under Part 15, Subpart B rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4- 2014.

The non-digital devices equipment under test (EUT) is placed on a styrene turntable which is four feet in diameter and approximately 0.8 meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The antenna height and polarization are varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions are in QP mode from the frequency band 30MHz to 1GHz with RBW setting 120kHz. Detector function for conducted emissions are in QP & AV mode and IFBW setting is 9kHz from the frequency band 150kHz to 30MHz.

For radiated emission, the frequency range scanned is 30MHz to 1GHz. For line-conducted emissions, the range scanned is 150kHz to 30MHz with RBW setting 9KHz.

The EUT is warmed up for 15 minutes prior to the test.

Conducted measurements are made as described in ANSI C63.4 - 2014.

10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-12	Biconilog Antenna	ETS	3142E	00166158	14-Sep-2018	14-Sep-2019
SZ061-08	Double-Ridged Waveguide Horn Antenna	ETS	3115	00092346	14-Sep-2018	14-Sep-2019
SZ061-15	Double-Ridged Waveguide Horn Antenna	ETS	3116C-PA	00224718	25-Oct-2018	25-Oct-2019
SZ056-03	Spectrum Analyzer	R&S	FSP30	101148	28-May-2019	28-May-2020
SZ185-01	EMI Receiver	R & S	ESCI	100547	04-Jan-2019	04-Jan-2020
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	15-Jan-2019	15-Jan-2020
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	15-Dec-2018	15-Dec-2020
SZ062-02	RF Cable	RADIALL	RG 213U	--	19-Jun-2019	19-Dec-2019
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	23-Feb-2019	23-Aug-2019
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	23-Feb-2019	23-Aug-2019
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	26-Oct-2018	26-Oct-2019
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	26-Oct-2018	26-Oct-2019
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	28-May-2019	28-May-2020
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Jan-2017	16-Jan-2020
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	--	10-Apr-2019	10-Oct-2019

**********End of Report**********