

# TTE Technology, Inc. (dba TCL North America)

## TEST REPORT

### SCOPE OF WORK

FCC TESTING—32S327, 32S327-MX, 32S327-CA, 32S3  
followed by two character; may be followed by -MX or -CA.

### REPORT NUMBER

180629007SZN-001

### ISSUE DATE

July 13, 2018

### [REVISED DATE]

[-----]

### PAGES

37

### DOCUMENT CONTROL NUMBER

FCC ID JBP\_B

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**TTE Technology, Inc. (dba TCL North America)**

Application  
For  
Certification  
**FCC ID: W8U32S327**

**LED TV**

**Model: 32S327**  
**Additional Models: 32S327-MX, 32S327-CA, 32S3 followed by two  
character; may be followed by -MX or -CA.**

**Brand Name: TCL**

Computer Peripheral

Report No.: 180629007SZN-001

Prepared and Checked by:

Approved by:

Leo Li  
Engineer

---

Kidd Yang  
Technical Supervisor  
Date: July 13, 2018

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**MEASUREMENT / TECHNICAL REPORT**

TTE Technology, Inc. (dba TCL North America)

MODEL: 32S327

Additional Models: 32S327-MX, 32S327-CA, 32S3 followed by two character; may be followed by -MX or -CA.

FCC ID: W8U32S327

This report concerns (check one:)      Original Grant ☒      Class I Change ☐

Equipment Type: JBP-Class B Computing Device Peripheral

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?      Yes ☐      No ☒

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 ☒

If no, assumed Part 15, Subpart B for unintentional radiator – the new 47 CFR [10-01-17 Edition] provision.

Report prepared by:

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| Exhibit Type        | File Description           | Filename             |
|---------------------|----------------------------|----------------------|
| Test Report         | Test Report                | report.pdf           |
| Test Setup Photo    | Radiated photos            | radiated photos.pdf  |
| Test Setup Photo    | Conducted photos           | conducted photos.pdf |
| External Photo      | External Photos            | external photos.pdf  |
| Internal Photo      | Internal Photos            | internal photos.pdf  |
| Block Diagram       | Block Diagram              | block.pdf            |
| ID Label / Location | Label Artwork and Location | label.pdf            |
| User Manual         | User Manual                | manual.pdf           |
| Cover Letter        | Confidential Letter        | request.pdf          |
| Cover Letter        | Letter of Agency           | agency.pdf           |

## EXHIBIT 1

### GENERAL DESCRIPTION

## 1.0 General Description

### 1.1 Product Description

The Equipment Under Test (EUT) is a LED TV. The device can be used to connect PC by HDMI port. The EUT is powered by AC 120V, 60Hz.

The EUT contains a module which can be operated in the frequency band of 2412MHz to 2462MHz in 802.11b, 802.11g and 802.11n-HT20 modes, 2422MHz to 2452MHz in 802.11n-HT40 mode, and 5180MHz to 5240MHz, 5745MHz to 5825MHz in 802.11a, 802.11n (20MHz, 40MHz) and 11ac (80MHz) modes.

The Model: 32S327-MX, 32S327-CA, 32S3 followed by two character; may be followed by -MX or -CA. are the same as the Model: 32S327 in hardware aspect. The models are difference in packaging and marketing purpose only.

### 1.2 Related Submittal(s) Grants

This is an application for certification of a computer peripheral. Other digital functions were reported in the verification report: 180629007SZN-002.

The host contains a WIFI module, which has been granted under the FCC ID: 2AC23-WC0HR2601.

### 1.3 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.

### 1.4 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 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 the FCC (Registration Number: CN1188).

## EXHIBIT 2

### SYSTEM TEST CONFIGURATION

## 2.0 System Test Configuration

### 2.1 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 device was powered by AC 120V/60Hz during the test. The host device contains a Wi-Fi module which was installed and operating during the test, only worst case was reported.

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 Exhibit 3.0.

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 placed on turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

The frequency ranges from 30MHz to 29.125GHz was searched for spurious emissions from the device. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

### 2.2 EUT Exercising Software

N/A

### 2.3 Special Accessories

N/A

### 2.4 Equipment Modification

Any modifications installed previous to testing by TTE Technology, Inc. (dba TCL North America) 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.

## 2.5 Measurement Uncertainty

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

## 2.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

| Description            | Manufacturer | Model No.                |
|------------------------|--------------|--------------------------|
| Laptop                 | Lenovo       | T420                     |
| Hard Disk              | Smart.drive  | HD-003                   |
| RJ45 Cable             | N/A          | Unshielded, Length 450cm |
| USB Cable              | Smart.drive  | Unshielded, Length 155cm |
| USB Memory             | SanDisk      | SDCZ36-002G-P36          |
| Dummy Load             | N/A          | N/A                      |
| HDMI Cable*3           | N/A          | UnShielded, Length 180cm |
| AV Cable*3             | N/A          | Unshielded, Length 120cm |
| Tuner Resister         | N/A          | 75ohm                    |
| Remote controller      | TCL          | N/A                      |
| Headphone              | Sony         | Unshielded, Length 110cm |
| Coaxial cable          | /            | Shielded, Length 500cm   |
| Optical cable          | /            | Unshielded, Length 130cm |
| AV Input cable adapter | TCL          | Unshielded, Length 28cm  |

## EXHIBIT 3

## EMISSION RESULTS

### 3.0 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.

### 3.1 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 dB $\mu$ V/m

RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V

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:

$$FS = RA + AF + CF - AG$$

## 3.2 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0dB $\mu$ V 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 42dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 62.0\text{dB}\mu\text{V}$$

$$AF = 7.4\text{dB/m}$$

$$CF = 1.6\text{dB}$$

$$AG = 29.0\text{dB}$$

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

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(42\text{dB}\mu\text{V/m})/20] = 125.9\mu\text{V/m}$$

### 3.3 Radiated Emission Configuration Photograph

Worst Case Radiated Emission  
At  
6997.3MHz (HDMI In Mode)

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

### 3.4 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 3.6dB margin (HDMI In Mode)

#### **TEST PERSONNEL:**

*Sign on file*

Leo Li, Engineer  
*Typed/Printed Name*

July 09, 2018  
*Date*

Applicant: TTE Technology, Inc. (dba TCL North America)

Date of Test: July 09, 2018

Model: 32S327

Worst Case Operating Mode:

HDMI In

Table 1

## Radiated Emissions

## Below 1GHz

| 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   | 148.5           | 48.0           | 20.0              | 9.5                 | 37.5               | 43.5                 | -6.0        |
| Horizontal   | 306.0           | 42.2           | 20.0              | 14.1                | 36.3               | 46.0                 | -9.7        |
| Horizontal   | 883.1           | 34.9           | 20.0              | 23.5                | 38.4               | 46.0                 | -7.6        |
| Vertical     | 148.0           | 47.6           | 20.0              | 9.5                 | 37.1               | 43.5                 | -6.4        |
| Vertical     | 300.0           | 44.5           | 20.0              | 13.9                | 38.4               | 46.0                 | -7.6        |
| Vertical     | 913.0           | 33.1           | 20.0              | 24.4                | 37.5               | 46.0                 | -8.5        |

## Above 1GHz

| Polarization | Frequency (MHz) | Reading (dBμV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) | Detector |
|--------------|-----------------|----------------|-------------------|---------------------|--------------------|----------------------|-------------|----------|
| Horizontal   | 1066.1          | 72.0           | 36.8              | 22.8                | 58.0               | 74.0                 | -16.0       | PK       |
| Horizontal   | 1928.6          | 56.1           | 36.5              | 28.4                | 48.0               | 74.0                 | -26.0       | PK       |
| Horizontal   | 6997.3          | 55.0           | 36.3              | 37.3                | 56.0               | 74.0                 | -18.0       | PK       |
| Horizontal   | 1066.1          | 46.7           | 36.8              | 22.8                | 32.7               | 54.0                 | -21.3       | AV       |
| Horizontal   | 1928.6          | 46.1           | 36.5              | 28.4                | 38.0               | 54.0                 | -16.0       | AV       |
| Horizontal   | 6997.3          | 44.4           | 36.3              | 37.3                | 45.4               | 54.0                 | -8.6        | AV       |
| Vertical     | 2132.8          | 63.5           | 36.5              | 28.2                | 55.2               | 74.0                 | -18.8       | PK       |
| Vertical     | 5759.6          | 52.8           | 36.4              | 35.6                | 52.0               | 74.0                 | -22.0       | PK       |
| Vertical     | 6997.3          | 59.2           | 36.3              | 37.3                | 60.2               | 74.0                 | -13.8       | PK       |
| Vertical     | 2132.8          | 44.0           | 36.5              | 28.2                | 35.7               | 54.0                 | -18.3       | AV       |
| Vertical     | 5759.6          | 44.7           | 36.4              | 35.6                | 43.9               | 54.0                 | -10.1       | AV       |
| Vertical     | 6997.3          | 49.4           | 36.3              | 37.3                | 50.4               | 54.0                 | -3.6        | AV       |

NOTES:

1. Quasi-Peak detector is used for frequency up to 1GHz, Peak detector and Average detector are used for frequency from 1GHz to 29.125GHz.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. All other emissions were at least 20 dB below the applicable limits.

Test Engineer: Leo Li

### 3.5 Conducted Emission at Mains Terminal

#### 3.5.1 Conducted Emission Configuration Photograph

Worst Case Conducted Configuration  
at  
0.922 MHz (HDMI In Mode)

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

### 3.6 Conducted Emission Data

Judgement: Passed by 10.1 dB margin(HDMI In Mode)

#### **TEST PERSONNEL:**

*Sign on file*

Leo Li, Engineer  
*Typed/Printed Name*

July 01, 2018  
*Date*

Company: TTE Technology, Inc. (dba TCL North America)

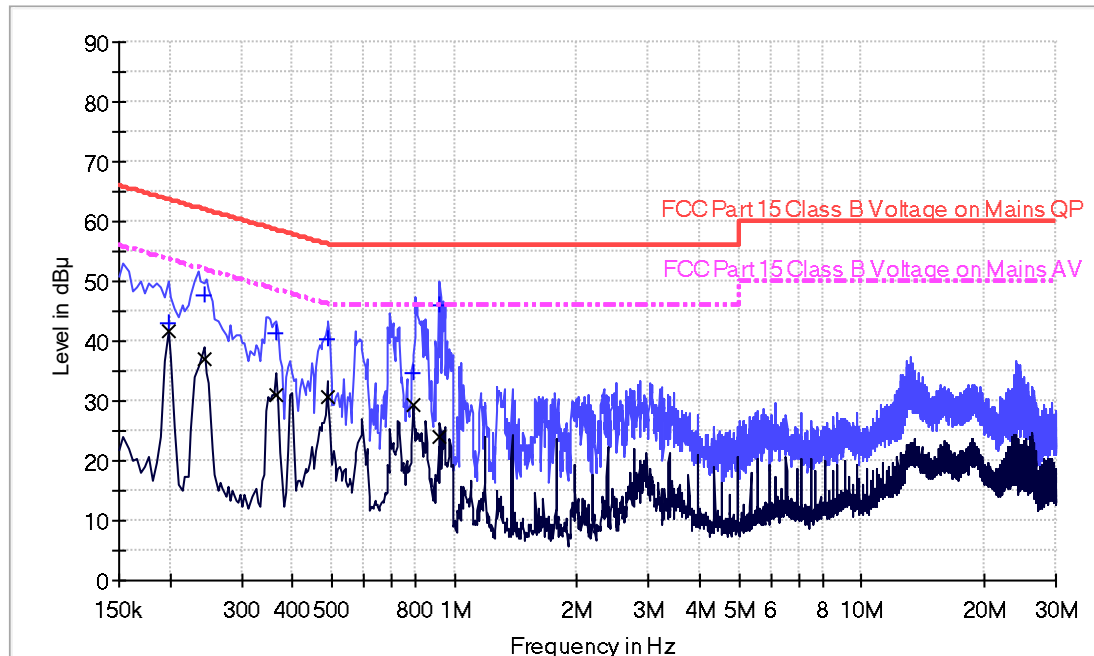
Date of Test: July 01, 2018

Model: 32S327

Operating Mode: HDMI in with antenna grounded

Phase: Live

## Conducted Emission Test - FCC



### Result Table QP

| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|
| 0.198000        | 43.0             | 9.000           | L1   | 9.7        | 20.7        | 63.7         |
| 0.242000        | 47.5             | 9.000           | L1   | 9.7        | 14.5        | 62.0         |
| 0.366000        | 41.3             | 9.000           | L1   | 9.7        | 17.3        | 58.6         |
| 0.486000        | 40.3             | 9.000           | L1   | 9.7        | 15.9        | 56.2         |
| 0.790000        | 34.6             | 9.000           | L1   | 9.7        | 21.4        | 56.0         |
| 0.922000        | 45.9             | 9.000           | L1   | 9.7        | 10.1        | 56.0         |

### Result Table AV

| Frequency (MHz) | Average (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|
| 0.198000        | 41.6           | 9.000           | L1   | 9.7        | 12.1        | 53.7         |
| 0.242000        | 37.2           | 9.000           | L1   | 9.7        | 14.8        | 52.0         |
| 0.366000        | 30.9           | 9.000           | L1   | 9.7        | 17.7        | 48.6         |
| 0.486000        | 30.5           | 9.000           | L1   | 9.7        | 15.7        | 46.2         |
| 0.790000        | 29.2           | 9.000           | L1   | 9.7        | 16.8        | 46.0         |
| 0.922000        | 24.0           | 9.000           | L1   | 9.7        | 22.0        | 46.0         |

Test Engineer: Leo Li

Company: TTE Technology, Inc. (dba TCL North America)

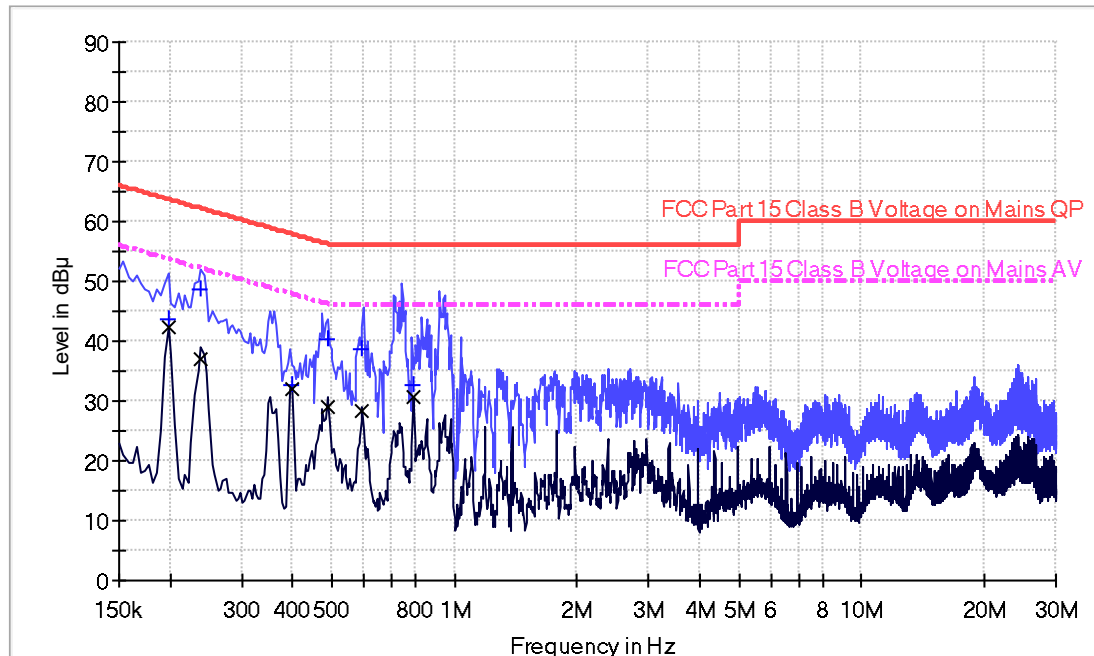
Date of Test: July 01, 2018

Model: 32S327

Operating Mode: HDMI In with antenna grounded

Phase: Neutral

## Conducted Emission Test - FCC



### Result Table QP

| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|
| 0.198000        | 43.6             | 9.000           | N    | 9.7        | 20.1        | 63.7         |
| 0.238000        | 48.6             | 9.000           | N    | 9.7        | 13.6        | 62.2         |
| 0.398000        | 32.7             | 9.000           | N    | 9.7        | 25.2        | 57.9         |
| 0.486000        | 40.5             | 9.000           | N    | 9.7        | 15.7        | 56.2         |
| 0.594000        | 38.6             | 9.000           | N    | 9.7        | 17.4        | 56.0         |
| 0.790000        | 32.7             | 9.000           | N    | 9.7        | 23.3        | 56.0         |

### Result Table AV

| Frequency (MHz) | Average (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|
| 0.198000        | 42.3           | 9.000           | N    | 9.7        | 11.4        | 53.7         |
| 0.238000        | 37.2           | 9.000           | N    | 9.7        | 15.0        | 52.2         |
| 0.398000        | 32.1           | 9.000           | N    | 9.7        | 15.8        | 47.9         |
| 0.486000        | 29.0           | 9.000           | N    | 9.7        | 17.2        | 46.2         |
| 0.594000        | 28.4           | 9.000           | N    | 9.7        | 17.6        | 46.0         |
| 0.790000        | 30.5           | 9.000           | N    | 9.7        | 15.5        | 46.0         |

Test Engineer: Leo Li

## EXHIBIT 4

## EQUIPMENT PHOTOGRAPHS

#### 4.0 Equipment Photographs

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

## EXHIBIT 5

## PRODUCT LABELLING

## 5.0 Product Labelling

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

## EXHIBIT 6

### TECHNICAL SPECIFICATIONS

## 6.0 Technical Specifications

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

## EXHIBIT 7

## INSTRUCTION MANUAL

## 7.0 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 8

### MISCELLANEOUS INFORMATION

## 8.0 Miscellaneous Information

This miscellaneous information includes emission measuring procedure.

## 8.1 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 computer peripheral 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 and in PK & AV mode from frequency band 1GHz to 29.125GHz with RBW setting 1MHz. 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 29.125GHz. For line-conducted emissions, the range scanned is 150kHz to 30MHz with RBW setting 9KHz.

## 8.2 Emissions Test Procedures (cont'd)

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

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

## EXHIBIT 9

### TEST EQUIPMENT LIST

## 9.0 Test Equipment List

| Equipment No. | Equipment          | Manufacturer | Model No.    | Serial No.     | Cal. Date   | Due Date    |
|---------------|--------------------|--------------|--------------|----------------|-------------|-------------|
| SZ061-04      | Biconilog Antenna  | ETS          | 3142C        | 00078828       | 17-Oct-2017 | 17-Oct-2018 |
| SZ061-08      | Horn Antenna       | ETS          | 3115         | 00092346       | 20-Sep-2017 | 20-Sep-2018 |
| SZ056-03      | Spectrum Analyzer  | R&S          | FSP30        | 101148         | 01-Jun-2018 | 01-Jun-2019 |
| SZ185-01      | EMI Receiver       | R & S        | ESCI         | 100547         | 24-Jan-2018 | 24-Jan-2019 |
| SZ181-04      | Preamplifier       | Agilent      | 8449B        | 3008A02474     | 24-Jan-2018 | 24-Jan-2019 |
| SZ188-01      | Anechoic Chamber   | ETS          | RFD-F/A-100  | 4102           | 16-Jan-2017 | 16-Jan-2019 |
| SZ062-02      | RF Cable           | RADIAL       | RG 213U      | --             | 2-Jun-2018  | 2-Dec-2018  |
| SZ062-05      | RF Cable           | RADIAL       | 0.04-26.5GHz | --             | 09-Mar-2018 | 09-Sep-2018 |
| SZ062-12      | RF Cable           | RADIAL       | 0.04-26.5GHz | --             | 09-Mar-2018 | 09-Sep-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       | 100073         | 15-Jul-2017 | 15-Jul-2018 |
| SZ188-03      | Shielding Room     | ETS          | RFD-100      | 4100           | 16-Jan-2017 | 16-Jan-2019 |
| SZ062-16      | RF Cable           | HUBER+SUHNER | CBL2-BN-1m   | 110127-2231000 | 30-Oct-2017 | 30-Oct-2018 |