

TTE Technology, Inc.

TEST REPORT

SCOPE OF WORK

FCC TESTING—43S425, 43S421, 43S423, 43S427, 43S425-MX, 43S427-MX, 43S425-CA, 43S427-CA, 43S4 followed by two character; may be followed by -MX or -CA.

REPORT NUMBER

200403042SZN-001

ISSUE DATE

15 April 2020

[REVISED DATE]

[-----]

PAGES

19

DOCUMENT CONTROL NUMBER

FCC ID JBP_B

© 2017 INTERTEK



TTE Technology, Inc.

Application
For
Certification
FCC ID: W8U43S426

LED TV**Model: 43S425**

Additional Models: 43S421, 43S423, 43S427, 43S425-MX, 43S427-MX, 43S425-CA, 43S427-CA, 43S4 followed by two character; may be followed by -MX or -CA.

Brand Name: TCL

Computer Peripheral

Report No.: 200403042SZN-001

Prepared and Checked by:

Approved by:

Ryan Chen
Engineer

Peter Kang
Senior Technical Supervisor
Date: 15 April 2020

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

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.

Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751

MEASUREMENT / TECHNICAL REPORT

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 [10-01-18 Edition] provision.

Report prepared by:

Ryan Chen
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
Phone: 86-755-8614 0682
Fax: 86-755-8601 6751

Table of Contents

| | | |
|-------------|--|-----------|
| 1.0 | SUMMARY OF TEST RESULT | 4 |
| 2.0 | General Description | 5 |
| 2.1 | Product Description | 5 |
| 2.2 | Related Submittal(s) Grants | 5 |
| 2.3 | Test Methodology | 5 |
| 2.4 | Test Facility | 5 |
| 3.0 | System Test Configuration | 6 |
| 3.1 | Justification | 6 |
| 3.2 | EUT Exercising Software | 6 |
| 3.3 | Special Accessories | 6 |
| 3.4 | Equipment Modification | 6 |
| 3.5 | Measurement Uncertainty | 7 |
| 3.6 | Support Equipment List and Description | 7 |
| 4.0 | Emission Results | 8 |
| 4.1 | Field Strength Calculation | 9 |
| 4.2 | Radiated Emission Configuration Photograph | 10 |
| 4.3 | Radiated Emission Data | 10 |
| 4.4 | Conducted Emission at Mains Terminal | 14 |
| 4.5 | Conducted Emission Data | 14 |
| 5.0 | Equipment Photographs | 17 |
| 6.0 | Product Labelling | 17 |
| 7.0 | Technical Specifications | 17 |
| 8.0 | Instruction Manual | 17 |
| 9.0 | Miscellaneous Information | 18 |
| 9.1 | Emissions Test Procedures | 18 |
| 10.0 | Test Equipment List | 19 |

1.0 SUMMARY OF TEST RESULT

Grantee: TTE Technology, Inc.

Grantee Address: 1860 Compton Ave, Corona, California, United States.

Manufacturer: TCL King Electrical Appliances (Huizhou) Co., Ltd.

Manufacturer Address: Sec. 19, Zhong Kai Development Zone for New & High-Level Tech Industries, Huizhou, Guangdong, China

MODEL: 43S425

FCC ID: W8U43S426

| 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 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: 43S421, 43S423, 43S427, 43S425-MX, 43S427-MX, 43S425-CA, 43S427-CA, 43S4 followed by two character; may be followed by -MX or -CA. are the same as the Model: 43S425 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 computer peripheral. Other digital functions were reported in the verification report: 200403042SZN-002.

The host contains a WIFI module, which has been granted under the FCC ID: 2AC23-WC1KR2601.

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 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, and only the worst-case 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.

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 29.25GHz 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.

3.2 EUT Exercising Software

N/A

3.3 Special Accessories

N/A

3.4 Equipment Modification

Any modifications installed previous to testing by TTE Technology, Inc. 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.

3.6 Support Equipment List and Description

| Description | Manufacturer | Model No. |
|-------------------|--------------|--------------------------|
| Laptop | HP | ProBook 430 G1 |
| Laptop | HP | Compaq2510p |
| Hard Disk | Smart.drive | HD-003 |
| 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 | N/A | Unshielded, Length 120cm |
| AV Cable Adaptor | TCL | Unshielded, Length 12cm |
| Tuner Resister | N/A | 75ohm |
| Remote Controller | TCL | N/A |
| Headphone | Sony | Unshielded, Length 110cm |
| Coaxial Cable | N/A | Shielded, Length 500cm |
| RJ45 Cable | N/A | Shielded, Length 450cm |
| Optical Cable | N/A | Unshielded, Length 130cm |

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 dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ 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:

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

Example

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

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

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

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

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

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

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

4.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
At
488.325000MHz (HDMI In 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 4.7dB margin (HDMI In Mode)

TEST PERSONNEL:

Sign on file

Ryan Chen, Engineer
Typed/Printed Name

12 April 2020
Date

Applicant: TTE Technology, Inc.

Date of Test: 12 April 2020

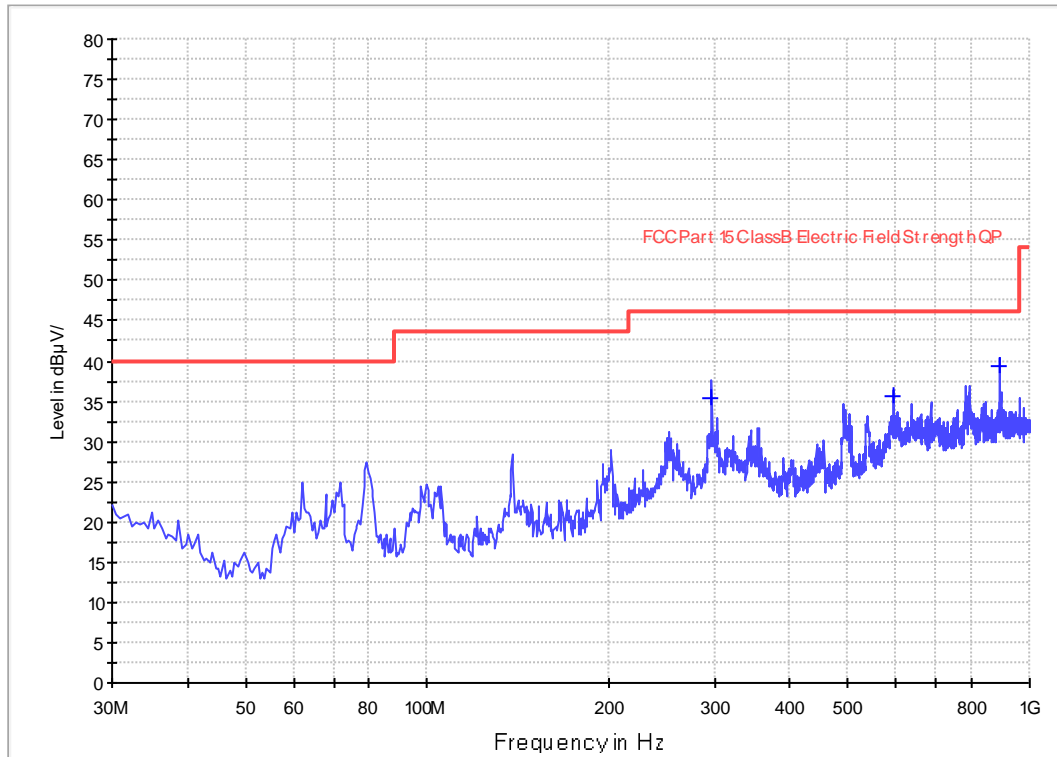
Worst Case Operating Mode:

Model: 43S425

HDMI In

Horizontal

FCC Part 15



| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Polarization | Corr. (dB) | Margin - QPK (dB) | Limit - QPK (dBµV/m) |
|-----------------|--------------------|-----------------|-----------------|--------------|------------|-------------------|----------------------|
| 296.750000 | 35.3 | 1000.0 | 120.000 | H | 16.7 | 10.7 | 46.0 |
| 593.570000 | 35.6 | 1000.0 | 120.000 | H | 24.1 | 10.4 | 46.0 |
| 890.390000 | 39.4 | 1000.0 | 120.000 | H | 27.7 | 6.6 | 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: TTE Technology, Inc.

Date of Test: 12 April 2020

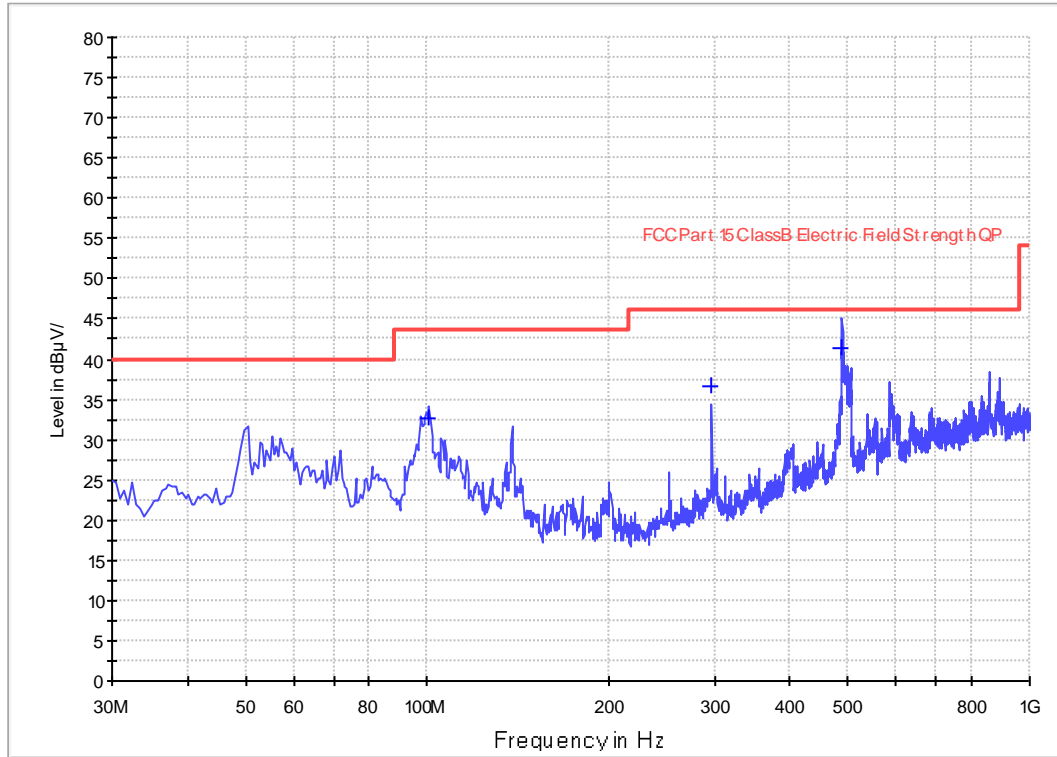
Worst Case Operating Mode:

Model: 43S425

HDMI In

Vertical

FCC Part 15



| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Polarization | Corr. (dB) | Margin - QPK (dB) | Limit - QPK (dBµV/m) |
|-----------------|--------------------|-----------------|-----------------|--------------|------------|-------------------|----------------------|
| 100.810000 | 32.5 | 1000.0 | 120.000 | V | 10.4 | 11.0 | 43.5 |
| 296.750000 | 36.6 | 1000.0 | 120.000 | V | 16.7 | 9.4 | 46.0 |
| 488.325000 | 41.3 | 1000.0 | 120.000 | V | 22.1 | 4.7 | 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: TTE Technology, Inc.
 Date of Test: 12 April 2020
 Worst Case Operating Mode:

Model: 43S425
 HDMI In

Table 1

Above 1GHz

| Polarization | Frequency (MHz) | Reading (dB μ V) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dB μ V/m) | Limit at 3m (dB μ V/m) | Margin (dB) | Detector |
|--------------|-----------------|----------------------|-------------------|---------------------|--------------------------|----------------------------|-------------|----------|
| Horizontal | 1595.1 | 64.4 | 36.6 | 28.9 | 56.7 | 74.0 | -17.3 | PK |
| Horizontal | 3169.2 | 54.7 | 36.3 | 37.0 | 55.4 | 74.0 | -18.6 | PK |
| Horizontal | 11411.8 | 55.9 | 36.4 | 39.3 | 58.8 | 74.0 | -15.2 | PK |
| Horizontal | 1595.1 | 49.7 | 36.6 | 28.9 | 42.0 | 54.0 | -12.0 | AV |
| Horizontal | 3169.2 | 42.7 | 36.3 | 37.0 | 43.4 | 54.0 | -10.6 | AV |
| Horizontal | 11411.8 | 43.6 | 36.4 | 39.3 | 46.5 | 54.0 | -7.5 | AV |
| Vertical | 1851.0 | 65.0 | 36.3 | 28.5 | 57.2 | 74.0 | -16.8 | PK |
| Vertical | 3179.3 | 63.1 | 36.5 | 36.8 | 63.4 | 74.0 | -10.6 | PK |
| Vertical | 11506.7 | 55.1 | 36.4 | 39.5 | 58.2 | 74.0 | -15.8 | PK |
| Vertical | 1851.0 | 44.7 | 36.3 | 28.5 | 36.9 | 54.0 | -17.1 | AV |
| Vertical | 3179.3 | 41.0 | 36.5 | 36.8 | 41.3 | 54.0 | -12.7 | AV |
| Vertical | 11506.7 | 43.4 | 36.4 | 39.5 | 46.5 | 54.0 | -7.5 | 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 29.25GHz.
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.

4.4 Conducted Emission at Mains Terminal

4.4.1 Conducted Emission Configuration Photograph

Worst Case Conducted Configuration
at
0.186000 MHz (HDMI In 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 16.4 dB margin(HDMI In Mode)

TEST PERSONNEL:

Sign on file

Ryan Chen, Engineer
Typed/Printed Name

08 April 2020
Date

Applicant: TTE Technology, Inc.

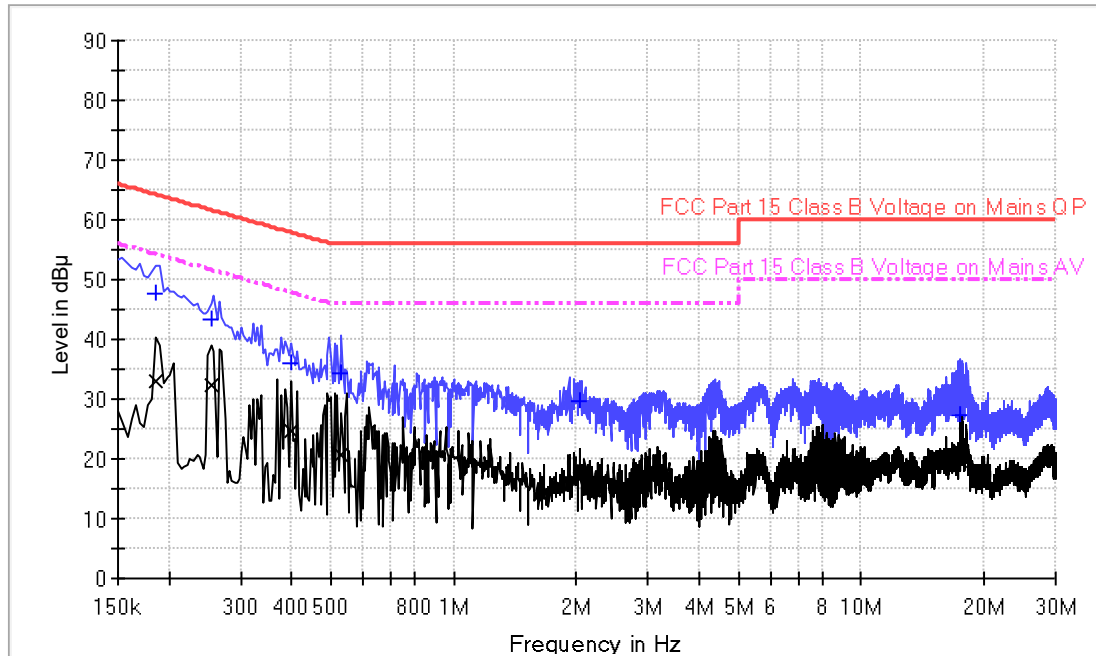
Date of Test: 08 April 2020

Model: 43S425

Operating Mode: HDMI IN with antenna grounded

Phase: Live

Conducted Emission Test - FCC



Result Table QP

| Frequency (MHz) | QuasiPeak (dB µV) | Line | Corr. (dB) | Margin (dB) | Limit (dB µV) |
|-----------------|-------------------|------|------------|-------------|---------------|
| 0.186000 | 47.8 | L | 9.7 | 16.4 | 64.2 |
| 0.254000 | 43.2 | L | 9.7 | 18.4 | 61.6 |
| 0.398000 | 36.2 | L | 9.7 | 21.7 | 57.9 |
| 0.530000 | 34.2 | L | 9.7 | 21.8 | 56.0 |
| 2.034000 | 29.6 | L | 9.7 | 26.4 | 56.0 |
| 17.530000 | 27.2 | L | 10.3 | 32.8 | 60.0 |

Result Table AV

| Frequency (MHz) | Average (dB µV) | Line | Corr. (dB) | Margin (dB) | Limit (dB µV) |
|-----------------|-----------------|------|------------|-------------|---------------|
| 0.186000 | 32.9 | L | 9.7 | 21.3 | 54.2 |
| 0.254000 | 32.2 | L | 9.7 | 19.4 | 51.6 |
| 0.398000 | 24.6 | L | 9.7 | 23.3 | 47.9 |
| 0.530000 | 20.7 | L | 9.7 | 25.3 | 46.0 |
| 2.034000 | 16.5 | L | 9.7 | 29.5 | 46.0 |
| 17.530000 | 19.7 | L | 10.3 | 30.3 | 50.0 |

Test Engineer: Ryan Chen

Applicant: TTE Technology, Inc.

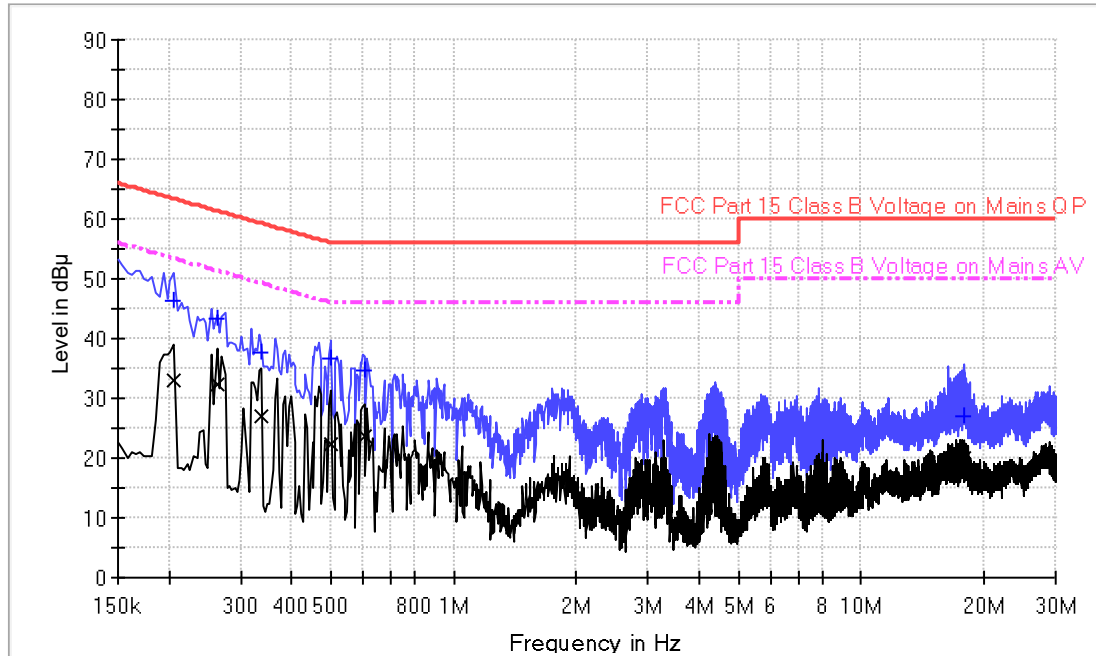
Date of Test: 08 April 2020

Model: 43S425

Operating Mode: HDMI IN with antenna grounded

Phase: Neutral

Conducted Emission Test - FCC



Result Table QP

| Frequency (MHz) | QuasiPeak (dB µV) | Line | Corr. (dB) | Margin (dB) | Limit (dB µV) |
|-----------------|-------------------|------|------------|-------------|---------------|
| 0.206000 | 46.4 | N | 9.7 | 17.0 | 63.4 |
| 0.262000 | 43.5 | N | 9.7 | 17.9 | 61.4 |
| 0.338000 | 37.8 | N | 9.7 | 21.5 | 59.3 |
| 0.498000 | 36.7 | N | 9.7 | 19.3 | 56.0 |
| 0.602000 | 34.7 | N | 9.7 | 21.3 | 56.0 |
| 17.854000 | 27.1 | N | 10.4 | 32.9 | 60.0 |

Result Table AV

| Frequency (MHz) | Average (dB µV) | Line | Corr. (dB) | Margin (dB) | Limit (dB µV) |
|-----------------|-----------------|------|------------|-------------|---------------|
| 0.206000 | 33.0 | N | 9.7 | 20.4 | 53.4 |
| 0.262000 | 32.3 | N | 9.7 | 19.1 | 51.4 |
| 0.338000 | 26.8 | N | 9.7 | 22.5 | 49.3 |
| 0.498000 | 22.4 | N | 9.7 | 23.6 | 46.0 |
| 0.602000 | 23.7 | N | 9.7 | 22.3 | 46.0 |
| 17.854000 | 20.0 | N | 10.4 | 30.0 | 50.0 |

Test Engineer: Ryan Chen

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 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 29.25GHz 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 29.25GHz. 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-2020 |
| SZ061-08 | Double-Ridged Waveguide Horn Antenna | ETS | 3115 | 00092346 | 07-Sep-2019 | 07-Sep-2021 |
| SZ061-15 | Double-Ridged Waveguide Horn Antenna | ETS | 3116C-PA | 00224718 | 25-Oct-2018 | 25-Oct-2020 |
| SZ056-03 | Spectrum Analyzer | R&S | FSP30 | 101148 | 28-May-2019 | 28-May-2020 |
| SZ185-01 | EMI Receiver | R & S | ESCI | 100547 | 24-Dec-2019 | 24-Dec-2020 |
| SZ181-04 | Preamplifier | Agilent | 8449B | 3008A02474 | 05-Jul-2019 | 05-Jul-2020 |
| SZ188-01 | Anechoic Chamber | ETS | RFD-F/A-100 | 4102 | 15-Dec-2018 | 15-Dec-2020 |
| SZ062-02 | RF Cable | RADIALL | RG 213U | -- | 16-Dec-2019 | 16-Jun-2020 |
| SZ062-05 | RF Cable | RADIALL | 0.04-26.5GHz | -- | 26-Feb-2020 | 26-Aug-2020 |
| SZ062-12 | RF Cable | RADIALL | 0.04-26.5GHz | -- | 26-Feb-2020 | 26-Aug-2020 |
| SZ185-02 | EMI Test Receiver | R&S | ESCI | 100692 | 29-Oct-2019 | 29-Oct-2020 |
| SZ187-01 | Two-Line V-Network | R&S | ENV216 | 100072 | 29-Oct-2019 | 29-Oct-2020 |
| SZ187-02 | Two-Line V-Network | R&S | ENV216 | 100073 | 28-May-2019 | 28-May-2020 |
| SZ188-03 | Shielding Room | ETS | RFD-100 | 4100 | 07-Jan-2020 | 07-Jan-2022 |
| SZ062-16 | RF Cable | HUBER+SUHNER | CBL2-BN-1m | -- | 30-Oct-2019 | 30-Oct-2020 |

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