

LG Electronics USA EMC TEST REPORT

Report Type: FCC Part 18 EMC report

Model: See Page 2

REPORT NUMBER: 191102677SHA-002

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| Applicant: | LG Electronics USA 1000 Sylvan Avenue, Englewood Cliffs, New Jersey, United States |
|---------------------|---|
| Manufacturing Site: | LG Electronics Tianjin Appliances Co., Ltd. No.9 Jinwei Road, Bei Chen Dist., Tianjin 300402, People's Republic of China |
| Product Name: | Microwave oven |
| Type/Model: | DVM7195#####; JNM7196#####; JVM7195##### (# represents "A to Z" or "0 to 9" or blank, according to exterior design, color, cooking utensil or market) |
| FCC ID: | BEJV2272TAB |

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 18 (2018): Industrial, Scientific, and Medical Equipment

FCC/OET MP-5 (1986): FCC methods of Measurements of Radio Noise Emissions From Industrial, Scientific, and Medical Equipment

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Content

| RE | REVISION HISTORY | | | |
|----|------------------|---|-----|--|
| Μ | EASU | REMENT RESULT SUMMARY | . 5 | |
| 1 | G | ENERAL INFORMATION | . 6 | |
| | 1.1 | DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) | 6 | |
| | 1.2 | DESCRIPTION OF TEST FACILITY | | |
| 2 | т | EST SPECIFICATIONS | 7 | |
| 2 | | | | |
| | 2.1 | STANDARDS OR SPECIFICATION | | |
| | 2.2 | MODE OF OPERATION DURING THE TEST | | |
| | 2.3 | TEST SOFTWARE LIST | | |
| | 2.4 | | | |
| | 2.5 | | | |
| | 2.6 | TEST ENVIRONMENT CONDITION: | | |
| | 2.7 2.8 | INSTRUMENT LIST MEASUREMENT UNCERTAINTY | | |
| | - | | | |
| 3 | 0 | PERATING FREQUENCY | 10 | |
| | 3.1 | LIMIT | 10 | |
| | 3.2 | Measurement Procedure | 10 | |
| | 3.3 | Test Results | 10 | |
| 4 | R | F OUTPUT POWER MEASUREMENT | 11 | |
| | 4.1 | Сіміт | 11 | |
| | 4.2 | Measurement Procedure | 11 | |
| | 4.3 | TEST RESULTS | 11 | |
| 5 | R | ADIATION HAZARD MEASUREMENT | 12 | |
| | 5.1 | Сіміт | 12 | |
| | 5.1 5.2 | LIMIT | | |
| | 5.2 5.3 | Test Results | | |
| ~ | | | | |
| 6 | ĸ | | | |
| | 6.1 | Limit | | |
| | 6.2 | Measurement Procedure | | |
| | 6.3 | TEST CONFIGURATION | | |
| | 6.4 | Test Results of Radiated Emissions | 17 | |
| 7 | C | ONDUCTED EMISSION | 23 | |
| | 7.1 | Liмit | 23 | |
| | 7.2 | TEST CONFIGURATION | 23 | |
| | 7.3 | Measurement Procedure | 24 | |
| | 7.4 | Test Results of Power line conducted emission | 25 | |
| AF | PEND | DIX I: PHOTOGRAPH OF TEST SETUP | 27 | |
| AF | PEN | DIX II: PHOTOGRAPH OF EQUIPMENT UNDER TEST | 27 | |
| | | | | |



Revision History

| Report No. | Version | Description | Issued Date |
|------------------|---------|-------------------------|-------------------|
| 191102677SHA-002 | Rev. 01 | Initial issue of report | December 18, 2019 |
| | | | |
| | | | |



Measurement result summary

| TEST ITEM | FCC REFERANCE | RESULT |
|---|---------------|--------|
| Conducted Emission (150 kHz to 30 MHz) | 18.307(b) | Pass |
| Radiated Emission (9 kHz to 30 MHz) | 18.305(b) | Pass |
| Radiated Emission (30 MHz to1 GHz) | 18.305(b) | Pass |
| Radiated Emission (1 GHz to 25 GHz) | 18.305(b) | Pass |
| Operating Frequency | Clause 4.5 | Pass |
| RF Output Power Measurement | Clause 4.3 | Pass |

Notes: 1: NA =Not Applicable

2. Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

3: Additions, Deviations and Exclusions from Standards: None.

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1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

| Product name: | Microwave oven |
|-----------------------|--|
| | DVM7195#####; JNM7196#####; JVM7195##### |
| | (# represents "A to Z" or "0 to 9" or blank, according to exterior design, |
| Type/Model: | color, cooking utensil or market) |
| Brand Name: | LG, GE, Café-Pro, Profile |
| | The EUT is a Microwave oven which have series models, and they are same except for different appearance or different sellers use different |
| Description of EUT: | model name. The model DVM7195SK5SS was chosen as representative. |
| Rating: | AC 120V 60Hz Input: 1700W |
| Frequency: | 2450MHz (Class B/Group 2) |
| EUT type: | Table top 🔲 Floor standing |
| Software Version: | / |
| Hardware Version: | / |
| Sample received date: | November 25, 2019 |
| Date of test: | November 25, 2019 ~ December 13, 2019 |

1.2 Description of Test Facility

| Name: | Intertek Testing Services Shanghai | |
|------------|--|--|
| Address: | Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China | |
| Telephone: | 86 21 61278200 | |
| Telefax: | 86 21 54262353 | |

| The test facility is recognized, | CNAS Accreditation Lab Registration No. CNAS L0139 |
|--|---|
| certified, or accredited by these organizations: | FCC Accredited Lab Designation Number: CN1175 |
| organizations. | IC Registration Lab CAB identifier.: CN0051 |
| | VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252 |
| | A2LA Accreditation Lab Certificate Number: 3309.02 |

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 18 (2018) FCC/OET MP-5 (1986)

2.2 Mode of operation during the test

Within this test report, EUT was tested under all available operation modes and tested under its rating voltage and frequency. Other voltage and frequency is specified if used.

Worst test mode: Working mode with full power

2.3 Test software list

| Test Items | Software | Manufacturer | Version |
|--------------------|----------|--------------|---------|
| Conducted emission | ESxS-K1 | R&S | V2.1.0 |
| Radiated emission | ES-K1 | R&S | V1.71 |

2.4 Test peripherals list

| Item No. | o. Name Band and Model | | Description | |
|----------|------------------------|----|-------------|--|
| 1 | Beaker | NA | 1000mL | |
| | | | | |

2.5 Test Load Description

Load for power output measurement, frequency measurement, radiation hazard test: 1000 milliliters of water in the beaker located in the center of the oven;

Load for measurement of radiation on second and third harmonic: Two loads, one of 700 and the other of 300 milliliters, of water are used. Each load is tested both with the beaker located in the center of the oven and with it in the right front corner.

Load for all other measurements: 700 milliliters of water, with the beaker located in the center of the oven.



2.6 Test environment condition:

| Test items | Temperature | Humidity |
|--------------------|-------------|----------|
| Radiated Emissions | 22°C | 55% RH |
| Conducted Emission | 21°C | 52% RH |

2.7 Instrument list

| Conducted Emission | | | | | |
|-----------------------|-----------------------|-------------------|-----------------|--------------|------------|
| Used | Equipment | Manufacturer | Туре | Internal no. | Due date |
| > | Test Receiver | R&S | ESCS 30 | EC 2107 | 2020-07-14 |
| > | A.M.N. | R&S | ESH2-Z5 | EC 3119 | 2020-11-29 |
| | A.M.N. | R&S | ENV4200 | EC 3558 | 2020-06-11 |
| \checkmark | Shielded room | Zhongyu | - | EC 2838 | 2020-01-13 |
| Radiate | d Emission | | | | |
| Used | Equipment | Manufacturer | Туре | Internal no. | Due date |
| | Test Receiver | R&S | ESIB 26 | EC 3045 | 2020-09-12 |
| • | Test Receiver | R&S | ESCI 7 | EC 4501 | 2020-09-12 |
| | Active loop antenna | Schwarzbeck | FMZB1519 | EC 5345 | 2020-03-14 |
| • | Bilog Antenna | TESEQ | CBL 6112D | EC 4206 | 2019-12-10 |
| • | Horn antenna | R&S | HF 906 | EC 3049 | 2020-11-16 |
| • | Horn antenna | ETS | 3117 | EC 4792-1 | 2020-02-25 |
| • | Horn antenna | ΤΟΥΟ | HAP18-26W | EC 4792-3 | 2020-07-09 |
| • | Pre-amplifier | R&S | Pre-amp 18 | EC5881 | 2020-06-11 |
| • | Semi-anechoic chamber | Albatross project | - | EC 3048 | 2020-07-31 |
| Additional instrument | | | | | |
| Used | Equipment | Manufacturer | Туре | Internal no. | Due date |
| | Therom-Hygrograph | ZJ1-2A | S.M.I.F. | EC 3783 | 2020-03-10 |
| • | Pressure meter | YM3 | Shanghai Mengde | EC 3320 | 2020-07-01 |

2.8 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Test item | Measurement uncertainty |
|---|-------------------------|
| Radiated Emissions in restricted frequency bands below 1GHz | \pm 4.90dB |
| Radiated Emissions in restricted frequency bands above 1GHz | \pm 5.02dB |
| Power line conducted emission | \pm 3.19dB |

3 Operating Frequency

Test result: Pass

3.1 Limit

ISM equipment may be operated on any frequency above 9 kHz. And the frequency band 2400-2500MHz is allocated for use by ISM equipment. (§18.301)

| ISM frequency | Tolerance |
|---------------|------------|
| 6.78 MHz | ±15.0 kHz |
| 13.56 MHz | ±7.0 kHz |
| 27.12 MHz | ±163.0 kHz |
| 40.68 MHz | ±20.0 kHz |
| 915 MHz | ±13.0 MHz |
| 2,450 MHz | ±50.0 MHz |
| 5,800 MHz | ±75.0 MHz |
| 24,125 MHz | ±125.0 MHz |
| 61.25 GHz | ±250.0 MHz |
| 122.50 GHz | ±250.0 MHz |
| 245.00 GHz | ±10 GHz |

3.2 Measurement Procedure

a) Frequency for Normal Voltage

The operating frequency was measured using a spectrum analyzer. Starting with the EUT at room temperature, a 1000mL water load was placed in the center of the oven and the oven was operated at maximum output power. The fundamental operating frequency was monitored until the water load was reduced to 20 percent of the original load.

b) Frequency for Line Voltage

The EUT was operated / warmed by at least 10 minutes of use with a 1000 mL water load at room temperature at the beginning of the test. Then the operating frequency was monitored as the input voltage was varied between 80 and 125 percent of the nominal rating.

3.3 Test Results

| Item | START Frequency (MHz) | STOP Frequency (MHz) |
|------------------------------|-----------------------|----------------------|
| Frequency for Normal Voltage | 2401.7 | 2471.6 |
| Frequency for Line Voltage | 2402.3 | 2471.4 |

4 RF Output Power Measurement

Test result: Pass

4.1 Limit

NA

4.2 Measurement Procedure

The EUT in microwave mode with full power.

Formula:

$$P = \frac{4,187 \cdot m_{\rm w} \left(T_2 - T_1\right) + 0,55 \cdot m_{\rm c} \left(T_2 - T_0\right)}{t}$$

NOTE:

P is the microwave power output (W) mw is the mass of the water (g) mc is the mass of the container (g) T0 is the ambient temperature (°C) T_1 is the initial temperature of the water (°C) T_2 is the final temperature of the water (°C) t is the heating time (s), excluding the magnetron filament heating-up time (s).

4.3 Test Results

| Quantity of | Mass of the | Ambient | Initial | Final | Heating | Power |
|-------------|-------------|-------------|-------------|-------------|---------|--------|
| Water | container | temperature | temperature | temperature | time | output |
| [ml] | [g] | [°C] | [°C] | [°C] | [s] | [W] |
| 1 000 | 72 | 25.0 | 10.0 | 34.2 | 120 | 844.4 |

5 Radiation Hazard Measurement

Test result: Pass

5.1 Limit

A maximum of 1.0mW/cm² is allowed in accordance with the applicable FCC standards. Hence, microwave leakage in the as-received condition with the oven door closed was below the maximum allowed.

5.2 Measurement Procedure

The EUT was set-up according to the FCC MP-5 and FCC Part 18 for Radiation Hazard Measurement. The measurement was using a microwave leakage meter to measure the Radiation leakage in the as-received condition with the oven door closed. A 1000ml water load in a beaker was located in the center of the oven and the Microwave Oven was set to maximum power. While the oven operating, the microwave meter will check the leakage and then record the maximum leakage.

5.3 Test Results

There was no microwave leakage exceeding a power level of 0.15mW/cm² observed at any point 5cm or more from the external surface of the oven.

6 Radiated Emissions

Test result: Pass

6.1 Limit

- (a) ISM equipment operation on a frequency specified in §18.301 is permitted unlimited radiated energy in the band specified for that frequency.
- (b) The field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following:

| Equipment | Operating frequency | RF Power generated by equipment (watts) | Field strength limit (uV/m) | Distance (meters) |
|---------------------------|------------------------|--|--------------------------------|----------------------|
| Any type unless otherwise | Any ISM | Below 500 | 25 | 300 |
| specified (miscellaneous) | frequency | 500 or more | 25 × SQRT(power/500) | 300 |

RF Power = 844.4W according to clause 4.3

Limit = 20lg(25*SQRT(power/500)) + 20lg(300/3) = 30.2+40 = 70.2dBuV/m @ 3m distance.

6.2 Measurement Procedure

For Radiated emission below 30MHz:

- a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) Both X and Y axes of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.



For Radiated emission above 30MHz:

- a) The EUT was placed on the top of a rotating table 1.0 meters above the ground at 3-meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

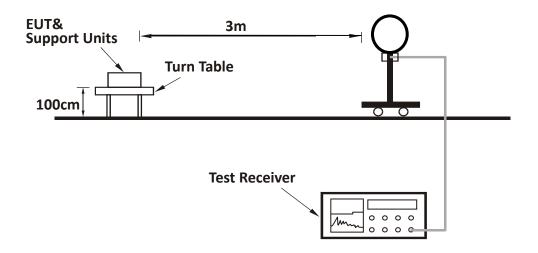
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 3 x RBW (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported

Report No.: 191102677SHA-002

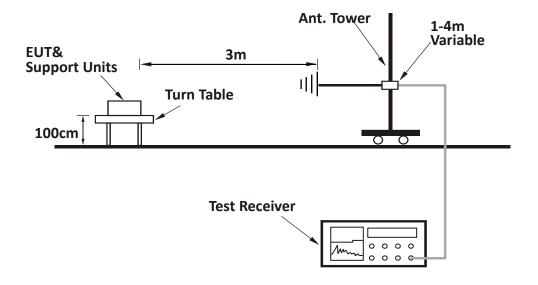
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6.3 Test Configuration

For Radiated emission below 30MHz:

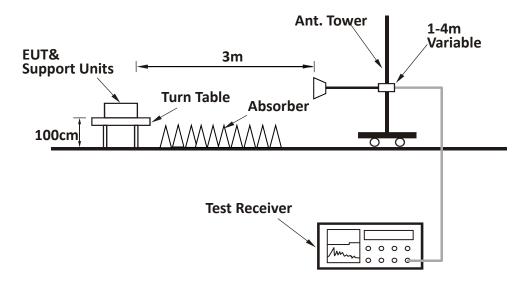


For Radiated emission 30MHz to 1GHz:



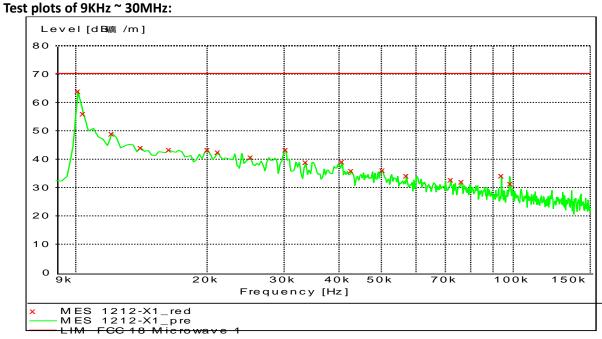


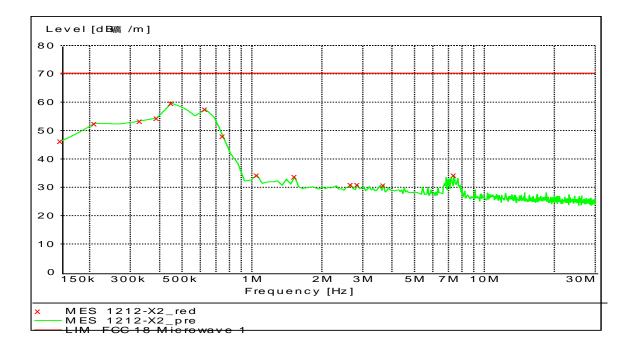
For Radiated emission above 1GHz:



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6.4 Test Results of Radiated Emissions



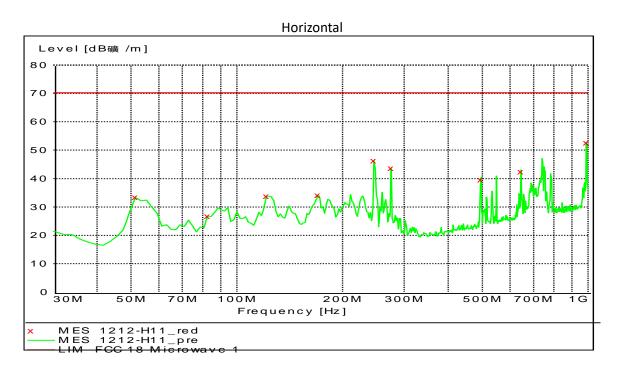


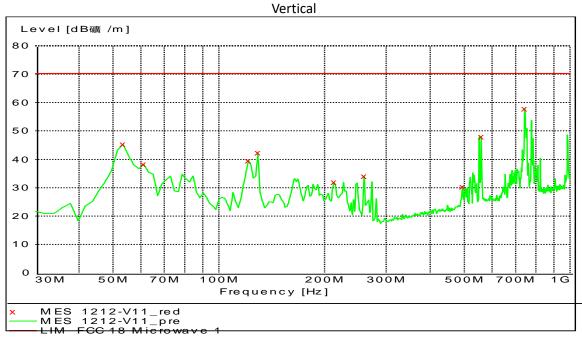
| Test data of 9KHz ~ 30MHz: | Test | data | of | 9КНz ~ | 30MHz: |
|----------------------------|------|------|----|--------|--------|
|----------------------------|------|------|----|--------|--------|

| Antenna | Frequency (MHz) | Corrected Reading (dBuV/m) | Correct Factor (dB/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---------|--------------------|----------------------------------|--------------------------|-------------------|----------------|----------|
| X/Y | 0.0101300 | 64.00 | 20.00 | 70.20 | 6.20 | РК |
| X/Y | 0.0104130 | 56.10 | 20.00 | 70.20 | 14.10 | РК |
| X/Y | 0.0121080 | 49.10 | 20.00 | 70.20 | 21.10 | РК |
| X/Y | 0.0301920 | 43.40 | 20.30 | 70.20 | 26.80 | РК |
| X/Y | 0.0335830 | 38.90 | 20.30 | 70.20 | 31.30 | РК |
| X/Y | 0.0406470 | 39.10 | 20.30 | 70.20 | 31.10 | РК |
| X/Y | 0.0426250 | 35.90 | 20.30 | 70.20 | 34.30 | РК |
| X/Y | 0.0502550 | 36.10 | 20.30 | 70.20 | 34.10 | РК |
| X/Y | 0.0940520 | 34.30 | 20.30 | 70.20 | 35.90 | РК |
| X/Y | 0.1500000 | 46.20 | 20.20 | 70.20 | 24.00 | РК |
| X/Y | 0.2098200 | 52.50 | 20.10 | 70.20 | 17.70 | РК |
| X/Y | 0.3294590 | 53.40 | 20.10 | 70.20 | 16.80 | РК |
| X/Y | 0.3892790 | 54.40 | 20.00 | 70.20 | 15.80 | РК |
| X/Y | 0.4490980 | 59.70 | 20.00 | 70.20 | 10.50 | РК |
| X/Y | 0.6285570 | 57.50 | 20.10 | 70.20 | 12.70 | РК |
| X/Y | 0.7481960 | 48.10 | 20.10 | 70.20 | 22.10 | РК |
| X/Y | 1.0472950 | 34.30 | 20.20 | 70.20 | 35.90 | РК |
| X/Y | 1.5258520 | 33.70 | 20.20 | 70.20 | 36.50 | РК |
| X/Y | 7.3881760 | 34.20 | 20.20 | 70.20 | 36.00 | РК |

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Test plots of 30MHz ~ 1GHz:





Test data of 30MHz ~ 1GHz:

| Antenna | Frequency (MHz) | Corrected Reading (dBuV/m) | Correct Factor (dB/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---------|--------------------|----------------------------------|--------------------------|-------------------|----------------|----------|
| н | 51.38 | 33.40 | 8.50 | 70.20 | 36.80 | РК |
| Н | 82.48 | 26.70 | 8.40 | 70.20 | 43.50 | РК |
| Н | 121.36 | 33.70 | 13.30 | 70.20 | 36.50 | РК |
| Н | 169.96 | 34.10 | 10.90 | 70.20 | 36.10 | РК |
| Н | 245.77 | 46.40 | 13.70 | 70.20 | 23.80 | РК |
| Н | 274.93 | 43.60 | 14.90 | 70.20 | 26.60 | РК |
| Н | 494.59 | 39.70 | 19.60 | 70.20 | 30.50 | РК |
| Н | 644.27 | 42.40 | 21.20 | 70.20 | 27.80 | РК |
| Н | 988.34 | 52.70 | 24.60 | 70.20 | 17.50 | РК |
| V | 53.33 | 45.30 | 8.10 | 70.20 | 24.90 | РК |
| V | 61.10 | 38.20 | 7.10 | 70.20 | 32.00 | РК |
| V | 121.36 | 39.50 | 13.30 | 70.20 | 30.70 | РК |
| V | 129.14 | 42.30 | 13.00 | 70.20 | 27.90 | РК |
| V | 212.73 | 31.90 | 10.90 | 70.20 | 38.30 | РК |
| V | 259.38 | 34.10 | 15.30 | 70.20 | 36.10 | РК |
| V | 494.59 | 30.40 | 19.60 | 70.20 | 39.80 | РК |
| V | 558.74 | 48.00 | 20.40 | 70.20 | 22.20 | РК |
| V | 743.41 | 57.90 | 22.20 | 70.20 | 12.30 | РК |

Test data of 1GHz ~ 18GHz:

| Antenna | Frequency (MHz) | Corrected Reading (dBuV/m) | Correct Factor (dB/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---------|--------------------|----------------------------------|--------------------------|-------------------|----------------|----------|
| Н | 1306.61 | 30.40 | -10.60 | 70.20 | 39.80 | PK |
| Н | 1749.50 | 34.10 | -8.20 | 70.20 | 36.10 | РК |
| Н | 2328.66 | 35.00 | -4.60 | 70.20 | 35.20 | PK |
| Н | 2737.47 | 64.30 | -4.00 | 70.20 | 5.90 | PK |
| Н | 4236.47 | 64.90 | 1.30 | 70.20 | 5.30 | РК |
| Н | 4679.36 | 64.10 | 2.30 | 70.20 | 6.10 | РК |
| Н | 7438.88 | 65.20 | 7.40 | 70.20 | 5.00 | PK |
| Н | 9925.85 | 52.80 | 13.60 | 70.20 | 17.40 | AV |
| Н | 11084.17 | 52.90 | 14.20 | 70.20 | 17.30 | AV |
| Н | 14559.12 | 57.00 | 14.00 | 70.20 | 13.20 | AV |
| V | 1000.00 | 30.20 | -11.70 | 70.20 | 40.00 | РК |
| V | 1613.23 | 33.70 | -9.10 | 70.20 | 36.50 | PK |
| V | 1851.70 | 35.10 | -7.60 | 70.20 | 35.10 | PK |
| V | 2737.47 | 67.50 | -4.00 | 70.20 | 2.70 | PK |
| V | 4236.47 | 67.30 | 1.30 | 70.20 | 2.90 | PK |
| V | 5428.86 | 66.20 | 4.60 | 70.20 | 4.00 | РК |
| V | 6893.79 | 63.10 | 7.60 | 70.20 | 7.10 | РК |
| V | 9891.78 | 50.40 | 13.40 | 70.20 | 19.80 | AV |
| V | 11118.24 | 61.00 | 14.20 | 70.20 | 9.20 | AV |
| V | 14865.73 | 55.30 | 13.90 | 70.20 | 14.90 | AV |

| Test data of 18GHz ~ 25GHz: | Test dat | a of 18GHz | ~ 25GHz: |
|-----------------------------|----------|------------|----------|
|-----------------------------|----------|------------|----------|

| Antenna | Frequency (MHz) | Corrected Reading (dBuV/m) | Correct Factor (dB/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---------|--------------------|----------------------------------|--------------------------|-------------------|----------------|----------|
| Н | 18266.53 | 54.30 | 3.70 | 70.20 | 15.90 | PK |
| Н | 18617.23 | 52.60 | 4.00 | 70.20 | 17.60 | РК |
| Н | 19430.86 | 63.20 | 5.60 | 70.20 | 7.00 | РК |
| Н | 19949.9 | 57.50 | 5.70 | 70.20 | 12.70 | PK |
| Н | 20525.05 | 45.30 | 5.50 | 70.20 | 24.90 | РК |
| Н | 21913.83 | 46.90 | 6.60 | 70.20 | 23.30 | РК |
| Н | 21927.86 | 44.10 | 6.60 | 70.20 | 26.10 | РК |
| Н | 23260.52 | 43.50 | 7.40 | 70.20 | 26.70 | РК |
| Н | 23541.08 | 43.40 | 7.20 | 70.20 | 26.80 | РК |
| Н | 24621.24 | 42.30 | 6.60 | 70.20 | 27.90 | РК |
| V | 18182.36 | 57.10 | 3.70 | 70.20 | 13.10 | РК |
| V | 19052.1 | 57.90 | 4.80 | 70.20 | 12.30 | РК |
| V | 19571.14 | 65.90 | 5.80 | 70.20 | 4.30 | РК |
| V | 19991.98 | 56.00 | 5.70 | 70.20 | 14.20 | РК |
| V | 20805.61 | 46.50 | 5.70 | 70.20 | 23.70 | РК |
| V | 21773.55 | 55.20 | 6.70 | 70.20 | 15.00 | РК |
| V | 21969.94 | 49.80 | 6.60 | 70.20 | 20.40 | РК |
| V | 23386.77 | 43.50 | 7.30 | 70.20 | 26.70 | РК |
| V | 23555.11 | 47.10 | 7.10 | 70.20 | 23.10 | РК |
| V | 24579.16 | 47.10 | 6.60 | 70.20 | 23.10 | РК |

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.

2. Corrected Reading = Original Receiver Reading + Correct Factor

3. Margin = Limit - Corrected Reading

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB, Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV, Limit = 40.00dBuV/m. Then Correct Factor = 30.20 + 2.00 - 32.00 = 0.20dB/m; Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m; Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.

7 Conducted Emission

Test result: Pass

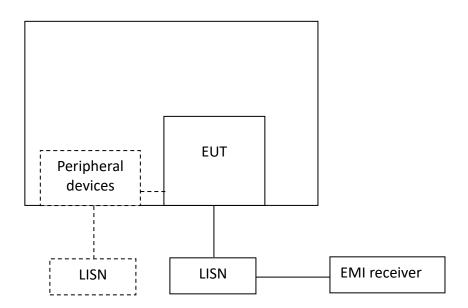
7.1 Limit

| Frequency range | Limits dB(μV) | | |
|-----------------|------------------|-----------|--|
| (MHz) | (MHz) Quasi-peak | | |
| 0.15 ~ 0.5 | 66 ~ 56 * | 56 ~ 46 * | |
| 0.5 ~ 5 | 56 | 46 | |
| 5 ~ 30 | 60 | 50 | |

Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz

2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

7.2 Test Configuration





7.3 Measurement Procedure

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

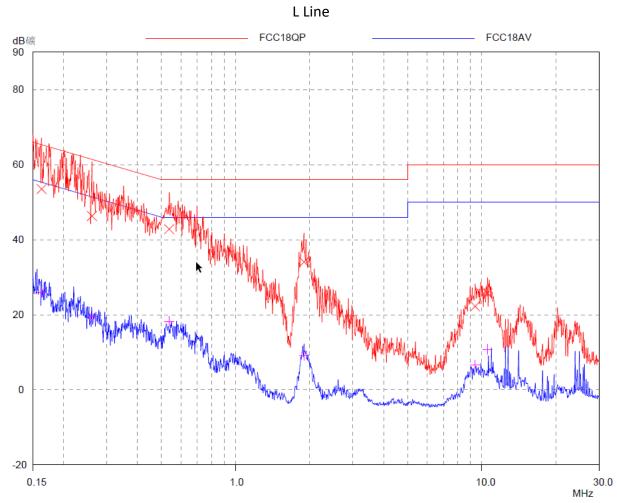
Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

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7.4 Test Results of Power line conducted emission

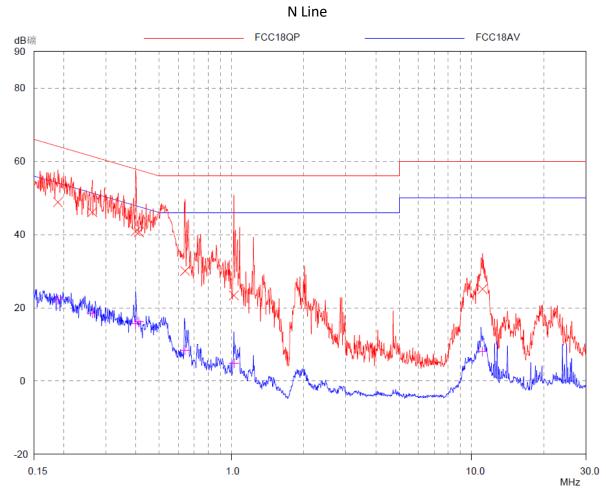
Test Curve:



Test Data:

| Frequency | Quasi-peak | | | Average | | |
|-----------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|
| (MHz) | level dB(μV) | Limit dB(µV) | Margin (dB) | level dB(μV) | limit dB(μV) | Margin (dB) |
| 0.163 | 53.49 | 65.30 | 11.81 | 25.89 | 55.30 | 29.41 |
| 0.261 | 46.33 | 61.39 | 15.06 | 19.46 | 51.39 | 31.93 |
| 0.538 | 42.81 | 56.00 | 13.19 | 18.23 | 46.00 | 27.77 |
| 1.900 | 34.06 | 56.00 | 21.94 | 9.14 | 46.00 | 36.86 |
| 9.418 | 22.24 | 60.00 | 37.76 | 6.58 | 50.00 | 43.42 |
| 10.574 | 25.69 | 60.00 | 34.31 | 10.78 | 50.00 | 39.22 |

Test Curve:



Test Data:

| Frequency (MHz) | Quasi-peak | | | Average | | |
|--------------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|
| | level dB(μV) | Limit dB(µV) | Margin (dB) | level dB(μV) | limit dB(μV) | Margin (dB) |
| 0.189 | 48.83 | 64.08 | 15.25 | 22.18 | 54.08 | 31.90 |
| 0.263 | 46.11 | 61.33 | 15.22 | 18.50 | 51.33 | 32.83 |
| 0.399 | 40.89 | 57.88 | 16.99 | 15.57 | 47.88 | 32.31 |
| 0.412 | 40.65 | 57.61 | 16.96 | 16.20 | 47.61 | 31.41 |
| 0.641 | 30.07 | 56.00 | 25.93 | 8.49 | 46.00 | 37.51 |
| 1.023 | 23.39 | 56.00 | 32.61 | 4.92 | 46.00 | 41.08 |
| 11.137 | 25.11 | 60.00 | 34.89 | 8.00 | 50.00 | 42.00 |

Remark: 1. Correct Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.

2. Corrected Reading = Original Receiver Reading + Correct Factor

3. Margin = Limit - Corrected Reading

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.



Appendix I: Photograph of test setup

Refer to Test set up photos.

Appendix II: Photograph of equipment under test

Refer to EUT External photos and Internal photos.