

# **Variant FCC Test Report**

Report No.: RF191202C10B-3

FCC ID: K7SG1S0001

Test Model: G1S0002

Received Date: Jun. 19, 2020

Test Date: Jul. 01 ~ Jul. 07, 2020

Issued Date: Aug. 17, 2020

Applicant: Belkin International, Inc.

Address: 12045 East Waterfront Drive, Playa Vista, USA, CA 90094

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Test Location (2): B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan

FCC Registration / 788550 / TW0003

Designation Number: 427177 / TW0011





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# **Release Control Record**

| Issue No.      | Description      | Date Issued   |
|----------------|------------------|---------------|
| RF191202C10B-3 | Original Release | Aug. 17, 2020 |

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#### **Certificate of Conformity** 1

**Product:** Smart Speaker

Brand: belkin

Test Model: G1S0002

Sample Status: Engineering Sample

Applicant: Belkin International, Inc

Test Date: Jul. 01 ~ Jul. 07, 2020

**Standards:** 47 CFR FCC Part 15, Subpart C (Section 15.247)

ANSI C63.10:2013

This report is issued as a supplementary report to BV CPS report no.: RF191202C10-3. This report shall be used by combining with its original report.

Gina Liu / Specialist Prepared by: Aug. 17, 2020

Approved by: Date: Aug. 17, 2020

Dylan Chiou / Senior Project Engineer



## 2 Summary of Test Results

|                            | 47 CFR FCC Part 15, Subpart C (Section 15.247)   |        |   |  |  |  |  |
|----------------------------|--|--------|---|--|--|--|--|
| FCC<br>Clause              | Test Item  | Result | Remarks   |  |  |  |  |
| 15.207                     | 15.207 AC Power Conducted Emission  15.205 / 15.209 / 15.247(d) Radiated Emissions and Band Edge Measurement |        | Meet the requirement of limit.  Minimum passing margin is -23.11 dB at 0.20783 MHz. |  |  |  |  |
| 15.209 /                   |  |        | Meet the requirement of limit.  Minimum passing margin is -18.44 dB at 631.8 MHz.   |  |  |  |  |
| 15.247(d)                  | 15.247(d) Antenna Port Emission  |        | Refer to Note   |  |  |  |  |
| 15.247(a)(2)               | 6 dB Bandwidth   | N/A    | Refer to Note   |  |  |  |  |
|                            | Occupied Bandwidth Measurement   | N/A    | Refer to Note   |  |  |  |  |
| 15.247(b)                  | 15.247(b) Conducted power  |        | Refer to Note   |  |  |  |  |
| 15.247(e)                  | Power Spectral Density   | N/A    | Refer to Note   |  |  |  |  |
| 15.203 Antenna Requirement |  | N/A    | Refer to Note   |  |  |  |  |

### Note:

- 1. Only Spurious Emissions below 1GHz and Conducted Emission tests had been performed for the addendum. Refer to original report for other test data.
- 2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 3. N/A: Not applicable

# 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement                        | Frequency          | Expanded Uncertainty (k=2) (±) |
|------------------------------------|--------------------|--------------------------------|
| Conducted Emissions at mains ports | 150 kHz ~ 30 MHz   | 2.79 dB                        |
|                                    | 9 kHz ~ 30 MHz     | 3.04 dB                        |
| Radiated Emissions up to 1 GHz     | 30 MHz ~ 200 MHz   | 2.0153 dB                      |
|                                    | 200 MHz ~ 1000 MHz | 2.0224 dB                      |
| Radiated Emissions above 1 GHz     | 1 GHz ~ 18 GHz     | 1.0121 dB                      |
| Radiated Effissions above 1 GHZ    | 18 GHz ~ 40 GHz    | 1.1508 dB                      |

## 2.2 Modification Record

There were no modifications required for compliance.



### 3 General Information

# 3.1 General Description of EUT

| Product               | Smart Speaker   |
|-----------------------|---|
| Brand                 | belkin  |
| Test Model            | G1S0002   |
| Status of EUT         | Engineering Sample  |
| Power Supply Rating   | 19.0 Vdc (Adapter)  |
| Madulation Type       | CCK, DQPSK, DBPSK for DSSS  |
| Modulation Type       | 64QAM, 16QAM, QPSK, BPSK for OFDM                                 |
| Modulation Technology | DSSS, OFDM  |
|                       | 802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps                              |
| Transfer Rate         | 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps |
|                       | 802.11n: up to 144.4 Mbps   |
| Operating Frequency   | 2412 ~ 2462 MHz   |
| Number of Channel     | 11 for 802.11b, 802.11g, 802.11n (HT20)                           |
| Antenna Type          | Dipole antenna with 4.34 dBi gain                                 |
| Antenna Connector     | lpex 1  |
| Accessory Device      | Adapter   |
| Data Cable Supplied   | N/A   |

### Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report of BV CPS report no.: RF191202C10-3. Difference compared with original report is listed as below. Therefore, test items for conducted emission and radiated emission below 1GHz test had been re-tested in this report.

| No. | Description   |  |  |  |
|-----|---|--|--|--|
| 1.  | Adding MF chip (Brand: Microchip; Model: MFI343S00177)  |  |  |  |
| 2.  | System changed to support Alexa Voice Service+Airplay 2 |  |  |  |
| 3.  | Adding new model (G1S0002)                              |  |  |  |

2. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

| Modulation Mode | Tx Function |
|-----------------|-------------|
| 802.11b         | 2TX         |
| 802.11g         | 2TX         |
| 802.11n (HT20)  | 2TX         |

3. The EUT contains following accessory devices.

| Product              | Brand  | Model                      | Description  |
|----------------------|--------|----------------------------|--|
| Switching<br>Adapter | belkin | DSA-65PFB-19 FUS<br>190342 | I/P: 100-240 Vac, 50/60 Hz, 1.5 A<br>O/P: 19 Vdc, 3.42 A<br>1.45 meter, non-shielded cable, with<br>one ferrite core |



4. The antenna information is listed as below.

| Antenna |                                 | Frequency (MHz) |      |      |      |      |      |      |
|---------|---------------------------------|-----------------|------|------|------|------|------|------|
| Туре    |                                 | 2400            | 2450 | 2500 | 5150 | 5470 | 5725 | 5850 |
|         | Peak Gain<br>(dBi)<br>Antenna 1 | 3.75            | 4.16 | 4.34 | 4.38 | 4.13 | 3.59 | 3.96 |
| Dipole  | Peak Gain<br>(dBi)<br>Antenna 2 | 2.64            | 2.64 | 2.67 | 2.75 | 3.81 | 3.26 | 2.54 |

- 5. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
- 6. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

# 3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 1       | 2412            | 7       | 2442            |
| 2       | 2417            | 8       | 2447            |
| 3       | 2422            | 9       | 2452            |
| 4       | 2427            | 10      | 2457            |
| 5       | 2432            | 11      | 2462            |
| 6       | 2437            |         |                 |



### 3.2.1 Test Mode Applicability and Tested Channel Detail

| EUT Configure | Applica | able To      | Description |  |
|---------------|---------|--------------|-------------|--|
| Mode          | RE<1G   | PLC          | Description |  |
| -             | V       | $\checkmark$ | -           |  |

Where

RE<1G: Radiated Emission below 1 GHz

PLC: Power Line Conducted Emission

# Radiated Emission Test (Below 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ⊠ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure<br>Mode | Mode    | Available<br>Channel | Tested Channel | Modulation<br>Technology | Modulation Type | Data Rate<br>(Mbps) |
|-----------------------|---------|----------------------|----------------|--------------------------|-----------------|---------------------|
| -                     | 802.11b | 1 to 11              | 11             | DSSS                     | DBPSK           | 1.0                 |

### **Power Line Conducted Emission Test:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☐ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure<br>Mode | Mode    | Available<br>Channel | Tested Channel | Modulation<br>Technology | Modulation Type | Data Rate<br>(Mbps) |
|-----------------------|---------|----------------------|----------------|--------------------------|-----------------|---------------------|
| -                     | 802.11b | 1 to 11              | 11             | DSSS                     | DBPSK           | 1.0                 |

### **Test Condition:**

| Applicable To | Environmental Conditions | Input Power    | Tested by    |  |
|---------------|--------------------------|----------------|--------------|--|
| RE<1G         | 25 deg. C, 65 % RH       | 120 Vac, 60 Hz | Harry Hsueh  |  |
| PLC           | 25 deg. C, 65 % RH       | 120 Vac, 60 Hz | Jisyong Wang |  |

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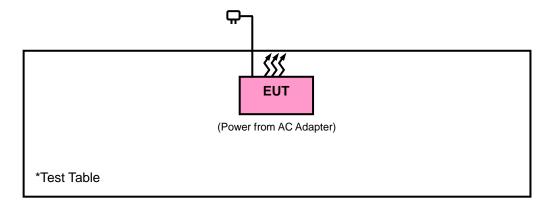
Reference No.: 200619C18



# 3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

## 3.3.1 Configuration of System under Test



# 3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

### **Test Standard:**

# **FCC Part 15, Subpart C (15.247)**

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

### **References Test Guidance:**

KDB 558074 D01 Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

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## 4 Test Types and Results

# 4.1 Radiated Emission and Bandedge Measurement

# 4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30 dB below the highest level of the desired power:

| Frequencies<br>(MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |  |  |
|----------------------|-----------------------------------|-------------------------------|--|--|
| 0.009 ~ 0.490        | 2400/F (kHz)                      | 300                           |  |  |
| 0.490 ~ 1.705        | 24000/F (kHz)                     | 30                            |  |  |
| 1.705 ~ 30.0         | 30                                | 30                            |  |  |
| 30 ~ 88              | 100                               | 3                             |  |  |
| 88 ~ 216             | 150                               | 3                             |  |  |
| 216 ~ 960            | 200                               | 3                             |  |  |
| Above 960            | 500                               | 3                             |  |  |

### NOTE:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level  $(dBuV/m) = 20 \log Emission level (uV/m)$ .
- 3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

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## 4.1.2 Test Instruments

| Description & Manufacturer                    | Model No.       | Serial No.  | Date of Calibration | Due Date of Calibration |
|---|-----------------|---|---------------------|-------------------------|
| Test Receiver Agilent Technologies            | N9038A          | MY52260177  | Aug. 26, 2019       | Aug. 25, 2020           |
| Spectrum Analyzer<br>ROHDE & SCHWARZ          | FSU43           | 101261  | Apr. 16, 2020       | Apr. 15, 2021           |
| Spectrum Analyzer<br>ROHDE & SCHWARZ          | FSW26           | 102023  | Oct. 08, 2019       | Oct. 07, 2020           |
| HORN Antenna<br>ETS-Lindgren                  | 3117            | 00143293  | Nov. 24, 2019       | Nov. 23, 2020           |
| BILOG Antenna<br>SCHWARZBECK                  | VULB 9168       | 9168-616  | Nov. 12, 2019       | Nov. 11, 2020           |
| HORN Antenna<br>SCHWARZBECK                   | BBHA 9170       | 9170-480  | Nov. 24, 2019       | Nov. 23, 2020           |
| Fixed Attenuator<br>Mini-Circuits             | MDCS18N-10      | MDCS18N-10-01   | Apr. 14, 2020       | Apr. 13, 2021           |
| Loop Antenna                                  | EM-6879         | 269   | Sep. 16, 2019       | Sep. 15, 2020           |
| Preamplifier<br>Agilent                       | 310N            | 187226  | Jun. 17, 2020       | Jun. 16, 2021           |
| Preamplifier<br>Agilent                       | 83017A          | MY39501357  | Jun. 17, 2020       | Jun. 16, 2021           |
| Power Meter<br>Anritsu                        | ML2495A         | 1012010   | Sep. 04, 2019       | Sep. 03, 2020           |
| Power Sensor<br>Anritsu                       | MA2411B         | 1315050   | Sep. 04, 2019       | Sep. 03, 2020           |
| RF signal cable<br>ETS-LINDGREN               | 5D-FB           | Cable-CH1-01(RFC<br>-SMS-100-SMS-12<br>0+RFC-SMS-100-S<br>MS-400) | Jun. 17, 2020       | Jun. 16, 2021           |
| RF signal cable<br>ETS-LINDGREN               | 8D-FB           | Cable-CH1-02(RFC<br>-SMS-100-SMS-24)                              | Jun. 17, 2020       | Jun. 17, 2021           |
| Boresight Antenna Fixture                     | FBA-01          | FBA-SIP01   | NA                  | NA                      |
| Software<br>BV ADT                            | E3<br>8.130425b | NA  | NA                  | NA                      |
| Antenna Tower<br>MF                           | NA              | NA  | NA                  | NA                      |
| Turn Table<br>MF                              | NA              | NA  | NA                  | NA                      |
| Antenna Tower &Turn<br>Table Controller<br>MF | MF-7802         | NA  | NA                  | NA                      |

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HsinTien Chamber 1.



### 4.1.3 Test Procedures

#### For Radiated Emission below 30 MHz

- 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. Parallel, perpendicular, and ground-parallel orientations 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 9 kHz at frequency below 30 MHz.

### For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
- 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 1 GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz. (11b: RBW = 1 MHz, VBW =10 Hz; 11g: RBW = 1 MHz, VBW = 1 kHz; 11n (HT20): RBW = 1 MHz, VBW = 1 kHz)
- 4. All modes of operation were investigated and the worst-case emissions are reported.

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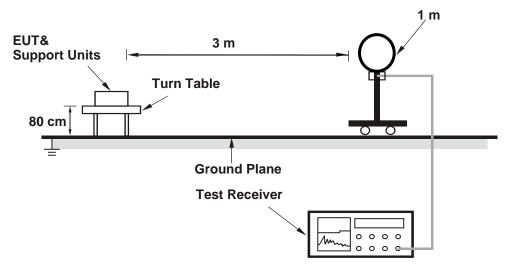


## 4.1.4 Deviation from Test Standard

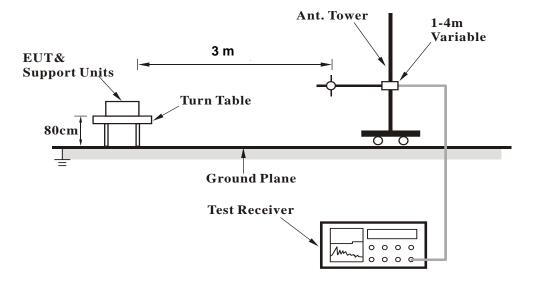
No deviation.

# 4.1.5 Test Set Up

## <Radiated Emission below 30 MHz>

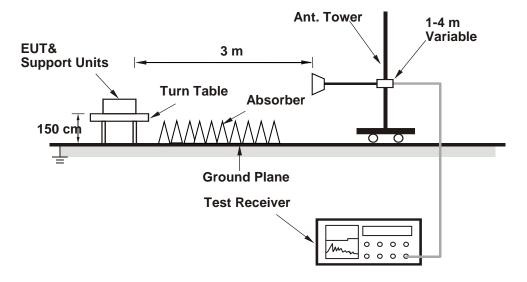


### <Radiated Emission 30 MHz to 1 GHz>





## <Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

# 4.1.6 EUT Operating Conditions

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.



## 4.1.7 Test Results

## 9 kHz ~ 30 MHz Data:

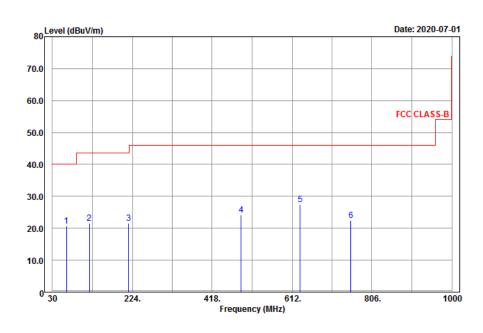
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

### 30 MHz ~ 1 GHz Worst-Case Data:

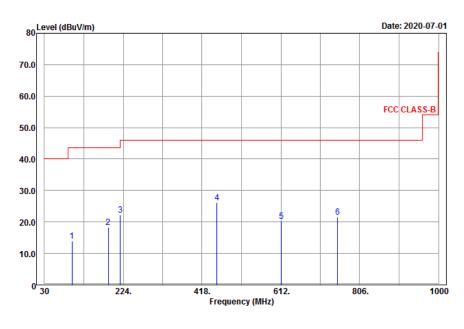
## 802.11b

| <b>EUT Test Condition</b> |                    | Measurement Detail |                              |  |
|---------------------------|--------------------|--------------------|------------------------------|--|
| Channel                   | Channel 11         | Frequency Range    | 30 MHz ~ 1 GHz               |  |
| Input Power               | 120 Vac, 60 Hz     | Detector Function  | Peak (PK)<br>Quasi-peak (QP) |  |
| Environmental Conditions  | 25 deg. C, 65 % RH | Tested By          | Harry Hsueh                  |  |

### Horizontal



## **Vertical**





|                    | Antenna Polarity & Test Distance: Horizontal at 3 m |                      |                  |                   |              |                        |                         |        |  |  |
|--------------------|---|----------------------|------------------|-------------------|--------------|------------------------|-------------------------|--------|--|--|
| Frequency<br>(MHz) | Emission<br>Level<br>(dBuV/m)                       | Read Level<br>(dBuV) | Factor<br>(dB/m) | Limit<br>(dBuV/m) | Margin (dB)  | Antenna<br>Height (cm) | Table Angle<br>(Degree) | Remark |  |  |
| 64.29              | 20.68   | 37.92                | -17.24           | 40                | -19.32       | 112                    | 132                     | Peak   |  |  |
| 119.91             | 21.54   | 40.98                | -19.44           | 43.5              | -21.96       | 105                    | 165                     | Peak   |  |  |
| 215.49             | 21.65   | 39.64                | -17.99           | 43.5              | -21.85       | 142                    | 157                     | Peak   |  |  |
| 488.3              | 24.15   | 36.69                | -12.54           | 46                | -21.85       | 165                    | 195                     | Peak   |  |  |
| 631.8              | 27.56   | 37.97                | -10.41           | 46                | -18.44       | 144                    | 187                     | Peak   |  |  |
| 755                | 22.41   | 30.82                | -8.41            | 46                | -23.59       | 104                    | 165                     | Peak   |  |  |
|                    |   | Antenn               | a Polarity &     | Test Dista        | nce: Vertica | l at 3 m               |                         |        |  |  |
| Frequency<br>(MHz) | Emission<br>Level<br>(dBuV/m)                       | Read Level<br>(dBuV) | Factor<br>(dB/m) | Limit<br>(dBuV/m) | Margin (dB)  | Antenna<br>Height (cm) | Table Angle<br>(Degree) | Remark |  |  |
| 97.5               | 13.87   | 31.33                | -17.46           | 43.5              | -29.63       | 112                    | 136                     | Peak   |  |  |
| 187.68             | 18.34   | 37.23                | -18.89           | 43.5              | -25.16       | 196                    | 187                     | Peak   |  |  |
| 216.57             | 22.15   | 40.1                 | -17.95           | 46                | -23.85       | 106                    | 165                     | Peak   |  |  |
| 454.7              | 26.1  | 39.29                | -13.19           | 46                | -19.9        | 102                    | 165                     | Peak   |  |  |
| 613.6              | 20.17   | 30.59                | -10.42           | 46                | -25.83       | 114                    | 157                     | Peak   |  |  |
| 751.5              | 21.66   | 30.15                | -8.49            | 46                | -24.34       | 105                    | 184                     | Peak   |  |  |

# Remarks:

- Emission Level = Read Level + Factor
   Margin value = Emission level Limit value.
- 2. The emission levels of other frequencies were very low against the limit.



### 4.2 Conducted Emission Measurement

### 4.2.1 Limits of Conducted Emission Measurement

| Eroguenov (MU=) | Conducted Limit (dBuV) |         |  |  |  |  |
|-----------------|------------------------|---------|--|--|--|--|
| Frequency (MHz) | Quasi-Peak             | Average |  |  |  |  |
| 0.15 - 0.5      | 66 - 56                | 56 - 46 |  |  |  |  |
| 0.50 - 5.0      | 56                     | 46      |  |  |  |  |
| 5.0 - 30.0      | 60                     | 50      |  |  |  |  |

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 4.2.2 Test Instruments

| Description & Manufacturer              | Model No.                | Serial No.     | Date of Calibration | Due Date of Calibration |
|---|--------------------------|----------------|---------------------|-------------------------|
| Test Receiver<br>ROHDE & SCHWARZ        | ESCI                     | 100613         | Dec. 11, 2019       | Dec. 10, 2020           |
| RF signal cable<br>Woken                | 5D-FB                    | Cable-cond1-01 | Sep. 05, 2019       | Sep. 04, 2020           |
| LISN<br>ROHDE & SCHWARZ<br>(EUT)        | ENV216                   | 101826         | Feb. 20, 2020       | Feb. 19, 2021           |
| LISN<br>ROHDE & SCHWARZ<br>(Peripheral) | ESH3-Z5                  | 100311         | Aug. 22, 2019       | Aug. 21, 2020           |
| Software<br>ADT                         | BV ADT_Cond_<br>V7.3.7.4 | NA             | NA                  | NA                      |

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

- 2. The test was performed in HwaYa Shielded Room 1.
- 3. The VCCI Site Registration No. is C-12040.



### 4.2.3 Test Procedures

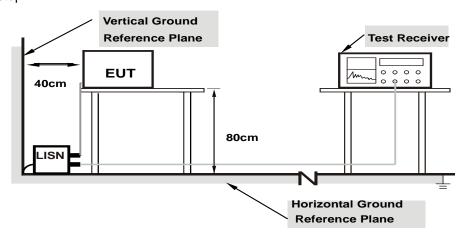
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit 20 dB) was not recorded.

**Note:** The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

### 4.2.4 Deviation from Test Standard

No deviation.

### 4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

### 4.2.6 EUT Operating Conditions

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.



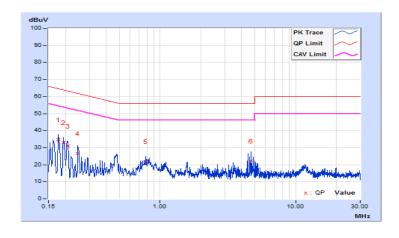
## 4.2.7 Test Results

| Frequency Range | 150kHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) /<br>Average (AV), 9kHz |
|-----------------|----------------|--|---|
| Input Power     | 120Vac, 60Hz   | Environmental Conditions                 | 25℃, 65%RH                              |
| Tested by       | Jisyong Wang   | Test Date                                | 2020/7/7                                |

|    | Phase Of Power : Line (L) |            |        |               |       |                |       |        |        |        |  |
|----|---------------------------|------------|--------|---------------|-------|----------------|-------|--------|--------|--------|--|
|    | Frequency                 | Correction | Readin | Reading Value |       | Emission Level |       | nit    | Margin |        |  |
| No |                           | Factor     | (dB    | uV)           | (dB   | (dBuV)         |       | (dBuV) |        | (dB)   |  |
|    | (MHz)                     | (dB)       | Q.P.   | AV.           | Q.P.  | AV.            | Q.P.  | AV.    | Q.P.   | AV.    |  |
| 1  | 0.17737                   | 9.62       | 25.04  | 20.69         | 34.66 | 30.31          | 64.61 | 54.61  | -29.95 | -24.30 |  |
| 2  | 0.19301                   | 9.62       | 23.50  | 20.73         | 33.12 | 30.35          | 63.91 | 53.91  | -30.79 | -23.56 |  |
| 3  | 0.20783                   | 9.62       | 21.19  | 20.56         | 30.81 | 30.18          | 63.29 | 53.29  | -32.48 | -23.11 |  |
| 4  | 0.24775                   | 9.63       | 17.09  | 15.87         | 26.72 | 25.50          | 61.83 | 51.83  | -35.11 | -26.33 |  |
| 5  | 0.78733                   | 9.67       | 12.19  | 10.15         | 21.86 | 19.82          | 56.00 | 46.00  | -34.14 | -26.18 |  |
| 6  | 4.67778                   | 9.80       | 12.35  | 10.04         | 22.15 | 19.84          | 56.00 | 46.00  | -33.85 | -26.16 |  |

## Remarks:

- 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
- 2. The emission levels of other frequencies were very low against the limit.
- 3. Margin value = Emission level Limit value
- 4. Correction factor = Insertion loss + Cable loss
- 5. Emission Level = Correction Factor + Reading Value



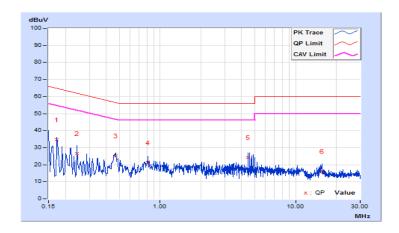


| Frequency Range | 150kHz ~ 30MHz | Detector Function & Resolution Bandwidth | Quasi-Peak (QP) /<br>Average (AV), 9kHz |
|-----------------|----------------|--|---|
| Input Power     | 120Vac, 60Hz   | Environmental Conditions                 | 25℃, 65%RH                              |
| Tested by       | Jisyong Wang   | Test Date                                | 2020/7/7                                |

|    | Phase Of Power : Neutral (N) |            |        |         |                |        |       |        |        |        |  |
|----|------------------------------|------------|--------|---------|----------------|--------|-------|--------|--------|--------|--|
|    | Frequency                    | Correction | Readin | g Value | Emission Level |        | Limit |        | Margin |        |  |
| No |                              | Factor     | (dB    | uV)     | (dB            | (dBuV) |       | (dBuV) |        | (dB)   |  |
|    | (MHz)                        | (dB)       | Q.P.   | AV.     | Q.P.           | AV.    | Q.P.  | AV.    | Q.P.   | AV.    |  |
| 1  | 0.17346                      | 9.65       | 25.06  | 20.69   | 34.71          | 30.34  | 64.79 | 54.79  | -30.08 | -24.45 |  |
| 2  | 0.24384                      | 9.65       | 16.84  | 13.30   | 26.49          | 22.95  | 61.96 | 51.96  | -35.47 | -29.01 |  |
| 3  | 0.47062                      | 9.67       | 15.49  | 12.04   | 25.16          | 21.71  | 56.50 | 46.50  | -31.34 | -24.79 |  |
| 4  | 0.81079                      | 9.69       | 11.63  | 10.78   | 21.32          | 20.47  | 56.00 | 46.00  | -34.68 | -25.53 |  |
| 5  | 4.47446                      | 9.83       | 14.42  | 11.87   | 24.25          | 21.70  | 56.00 | 46.00  | -31.75 | -24.30 |  |
| 6  | 15.61405                     | 9.99       | 6.33   | 4.10    | 16.32          | 14.09  | 60.00 | 50.00  | -43.68 | -35.91 |  |

### Remarks:

- 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
- 2. The emission levels of other frequencies were very low against the limit.
- 3. Margin value = Emission level Limit value
- 4. Correction factor = Insertion loss + Cable loss
- 5. Emission Level = Correction Factor + Reading Value





| 5 Pictures of Test Arrangements                       |  |
|---|--|
| Please refer to the attached file (Test Setup Photo). |  |
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## Appendix - Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

Hsin Chu EMC/RF/Telecom Lab

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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