



TESTING LABORATORY
CERTIFICATE#4323.01



FCC PART 15.231

TEST REPORT

For

Micron Electronics LLC.

1001 Yamato Road,Suite 400,Boca Raton,Florida,United States 33431

FCC ID: ZKQ-BOT4GV

| | |
|--|---------------------------------|
| Report Type: Original Report | Product Type: Tracker |
| Test Engineer: Winnie Yang <i>Winnie Yang</i> | |
| Report Number: RSHA190305001-00C | |
| Report Date: 2019-05-16 | |
| Reviewed By: Oscar Ye <i>Oscar Ye</i> RF Leader | |
| Prepared By: Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road,Kunshan,Jiangsu province,China Tel: +86-0512-86175000 Fax: +86-0512-88934268 www.baclcorp.com.cn | |

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

| | |
|---|-----------|
| GENERAL INFORMATION..... | 3 |
| PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) | 3 |
| OBJECTIVE | 3 |
| RELATED SUBMITTAL(S)/GRANT(S)..... | 3 |
| TEST METHODOLOGY | 3 |
| MEASUREMENT UNCERTAINTY | 4 |
| TEST FACILITY | 4 |
| SYSTEM TEST CONFIGURATION..... | 5 |
| JUSTIFICATION | 5 |
| EUT EXERCISE SOFTWARE | 5 |
| EQUIPMENT MODIFICATIONS | 5 |
| SUPPORT EQUIPMENT LIST AND DETAILS | 5 |
| EXTERNAL I/O CABLE..... | 5 |
| BLOCK DIAGRAM OF TEST SETUP | 6 |
| SUMMARY OF TEST RESULTS | 8 |
| TEST EQUIPMENT LIST | 9 |
| FCC§15.203 - ANTENNA REQUIREMENT..... | 10 |
| APPLICABLE STANDARD | 10 |
| ANTENNA CONNECTED CONSTRUCTION | 10 |
| FCC §15.207 (A) – AC LINE CONDUCTED EMISSIONS | 11 |
| APPLICABLE STANDARD | 11 |
| EUT SETUP | 11 |
| EMI TEST RECEIVER SETUP..... | 11 |
| TEST PROCEDURE | 12 |
| CORRECTED FACTOR & MARGIN CALCULATION | 12 |
| TEST RESULTS SUMMARY | 12 |
| TEST DATA | 12 |
| FCC §15.205, §15.209, §15.231 (E) - RADIATED EMISSIONS | 15 |
| APPLICABLE STANDARD | 15 |
| EUT SETUP | 15 |
| EMI TEST RECEIVER SETUP..... | 16 |
| TEST PROCEDURE | 16 |
| CORRECTED AMPLITUDE & MARGIN CALCULATION | 16 |
| TEST RESULTS SUMMARY | 17 |
| TEST DATA | 17 |
| FCC §15.231(C) - 20DB EMISSION BANDWIDTH TESTING..... | 24 |
| APPLICABLE STANDARD | 24 |
| TEST PROCEDURE | 24 |
| TEST DATA | 24 |
| FCC §15.231(E) - DEACTIVATION TESTING | 26 |
| APPLICABLE STANDARD | 26 |
| EUT SETUP | 26 |
| TEST DATA | 26 |

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

| | |
|--------------|--|
| Applicant | Micron Electronics LLC. |
| Tested Model | Bolt 4GV |
| Product Type | Tracker |
| Dimension | 127.95mm(L)*60.95mm(W)*48mm(H) |
| Power Supply | DC 3.6V from battery and DC 5V charging by adapter |

Adapter information:

Model: JT-H050200

Input: AC 100-240V, 50/60Hz 0.5A

Output: DC 5V, 2A

**All measurement and test data in this report was gathered from production sample serial number: 20190305001.
(Assigned by the BACL. The EUT supplied by the applicant was received on 20190305)*

Objective

This test report is prepared on behalf of *Micron Electronics LLC*. All the test measurements were performed according to the measurement procedure described in ANSI C63.10 - 2013.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209, 15.35(c) and 15.231 rules.

Related Submittal(s)/Grant(s)

FCC Part 15B JAB and Part 15.247 DTS submittal with FCC ID: ZKQ-BOT4GV.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10 - 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

| Item | | Uncertainty |
|------------------------------------|-------------|-------------|
| AC Power Lines Conducted Emissions | | 3.19 dB |
| RF conducted test with spectrum | | 0.9dB |
| Radiated emission | 30MHz~1GHz | 6.11dB |
| | 1GHz~6GHz | 4.45dB |
| | 6GHz ~18GHz | 5.23dB |
| Occupied Bandwidth | | 0.5kHz |
| Temperature | | 1.0°C |
| Humidity | | 6% |

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION**Justification**

Channel List:

| Channel | Frequency (MHz) |
|---------|-----------------|
| 1 | 433.5 |

EUT Exercise Software

RF test software: SecureCRT

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

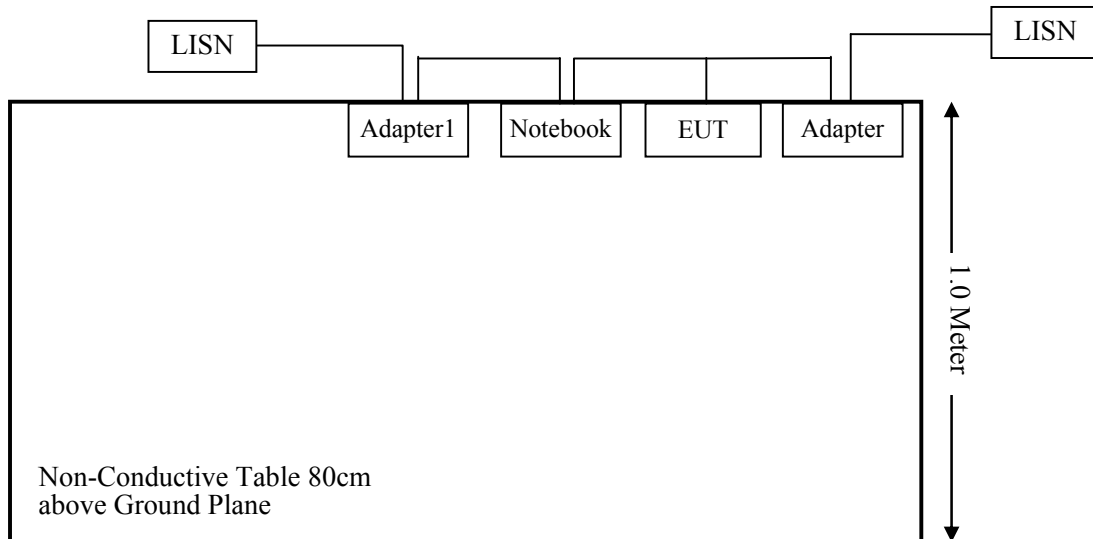
| Manufacturer | Description | Model | Serial Number |
|--------------|-------------|------------|---------------|
| DELL | Notebook | GX620 | D65874152 |
| DELL | Adapter1 | LA65NS0-00 | DF263 |

External I/O Cable

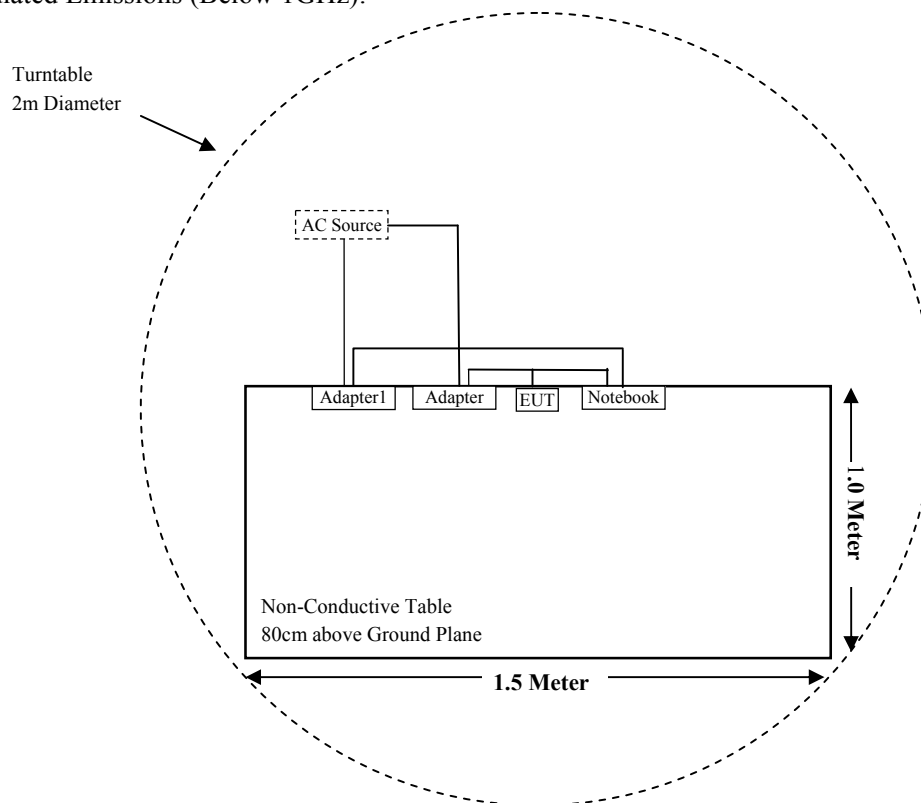
| Cable Description | Length (m) | From Port | To |
|--------------------|------------|-----------|-------------------|
| USB Extension Cord | 1.0 | EUT | Adapter/ Notebook |

Block Diagram of Test Setup

For Conducted Emissions:

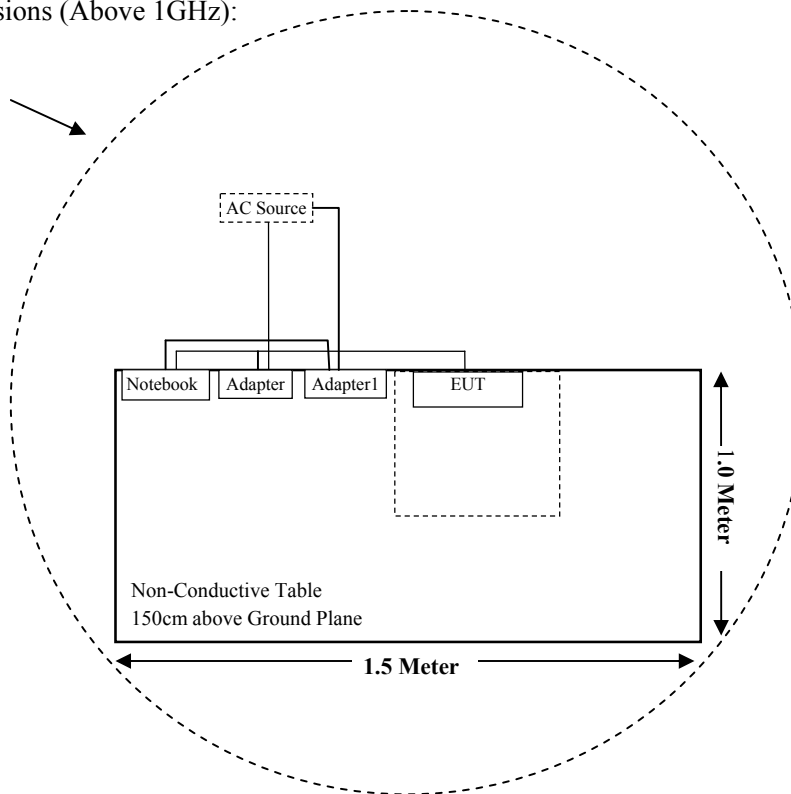


For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):

Turntable
2m Diameter



SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Result |
|------------------------------|-------------------------|-----------|
| §15.203 | Antenna Requirement | Compliant |
| §15.207(a) | Conducted Emissions | Compliant |
| §15.205, §15.209, §15.231(e) | Radiated Emissions | Compliant |
| §15.231 (c) | 20dB Emission Bandwidth | Compliant |
| §15.231 (e) | Deactivation | Compliant |

TEST EQUIPMENT LIST

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---|--------------------|------------|---------------|------------------|----------------------|
| Radiated Emission Test(Chamber 1#) | | | | | |
| Rohde & Schwarz | EMI Test Receiver | ESCI | 100195 | 2018-11-30 | 2019-11-29 |
| Rohde & Schwarz | Signal Analyzer | FSV40 | 101116 | 2018-07-23 | 2019-07-22 |
| Sunol Sciences | Broadband Antenna | JB3 | A090413-1 | 2016-12-26 | 2019-12-25 |
| Sonoma Instrunent | Pre-amplifier | 310N | 171205 | 2018-08-14 | 2019-08-13 |
| Rohde & Schwarz | Auto test Software | EMC32 | 100361 | / | / |
| MICRO-COAX | Coaxial Cable | Cable-8 | 008 | 2018-08-15 | 2019-08-14 |
| MICRO-COAX | Coaxial Cable | Cable-9 | 009 | 2018-08-15 | 2019-08-14 |
| MICRO-COAX | Coaxial Cable | Cable-10 | 010 | 2018-08-15 | 2019-08-14 |
| Radiated Emission Test(Chamber 2#) | | | | | |
| Rohde & Schwarz | EMI Test Receiver | ESU40 | 100207 | 2018-08-27 | 2019-08-26 |
| ETS-LINDGREN | Horn Antenna | 3115 | 9207-3900 | 2017-07-15 | 2020-07-14 |
| A.H.Systems, inc | Amplifier | 2641-1 | 491 | 2019-02-20 | 2020-02-19 |
| Rohde & Schwarz | Auto test Software | EMC32 | 100361 | / | / |
| MICRO-COAX | Coaxial Cable | Cable-6 | 006 | 2018-08-15 | 2019-08-14 |
| MICRO-COAX | Coaxial Cable | Cable-11 | 011 | 2018-08-15 | 2019-08-14 |
| MICRO-COAX | Coaxial Cable | Cable-12 | 012 | 2018-08-15 | 2019-08-14 |
| MICRO-COAX | Coaxial Cable | Cable-13 | 013 | 2018-08-15 | 2019-08-14 |
| Conducted Emission Test | | | | | |
| Rohde & Schwarz | EMI Test Receiver | ESCS30 | 834115/007 | 2018-11-30 | 2019-11-29 |
| Rohde & Schwarz | LISN | ESH3-Z5 | 862770/011 | 2018-11-30 | 2019-11-29 |
| Rohde & Schwarz | LISN | ENV216 | 3560655016 | 2018-11-30 | 2019-11-29 |
| BACL | Auto test Software | BACL-EMC | CE001 | / | / |
| Narda | Attenuator/6dB | 10690812-2 | 26850-6 | 2019-01-10 | 2020-01-09 |
| MICRO-COAX | Coaxial Cable | Cable-15 | 015 | 2018-08-15 | 2019-08-14 |

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Antenna Connected Construction

The EUT has an FPC antenna for 433.5MHz which was permanently attached and the antenna gain is 0.50 dBi; fulfill the requirement of this section. Please refer to EUT photos.

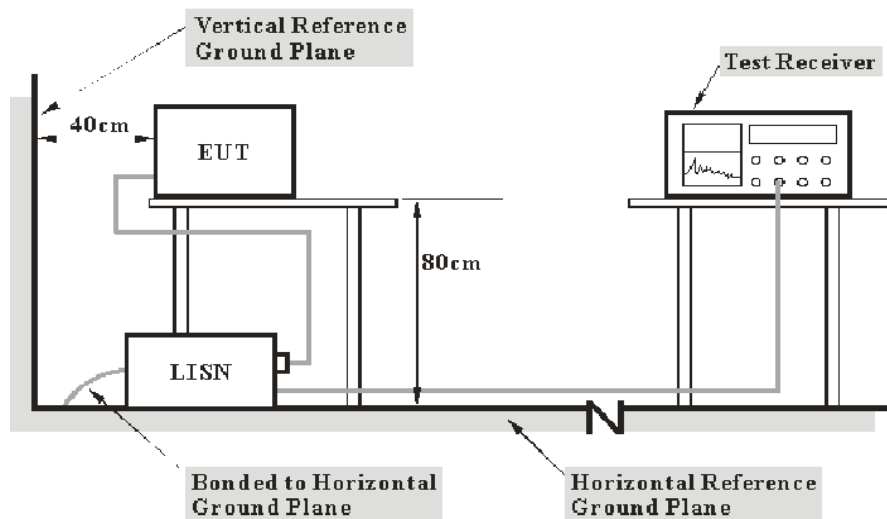
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

| Frequency Range | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz |

Test Procedure

ANSI C63.10-2013 clause 6.2

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Corrected Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$

The “**Margin**” column of the following data tables indicates the degree of Compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Corrected Amplitude (dB}\mu\text{V)}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Test Data

Environmental Conditions

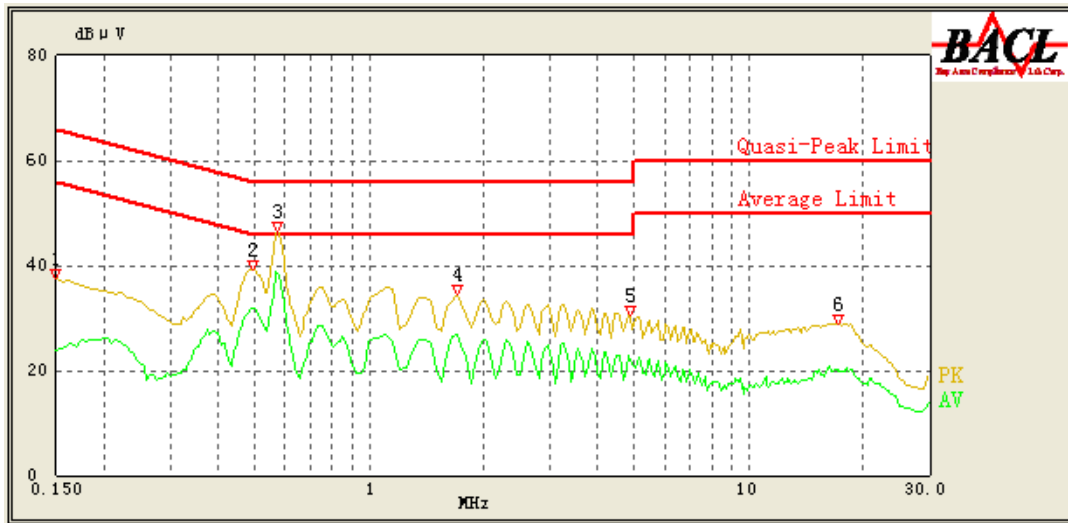
| | |
|--------------------|-----------|
| Temperature: | 20.2 °C |
| Relative Humidity: | 51 % |
| ATM Pressure: | 101.3 kPa |

The testing was performed by Winnie Yang on 2019-04-28.

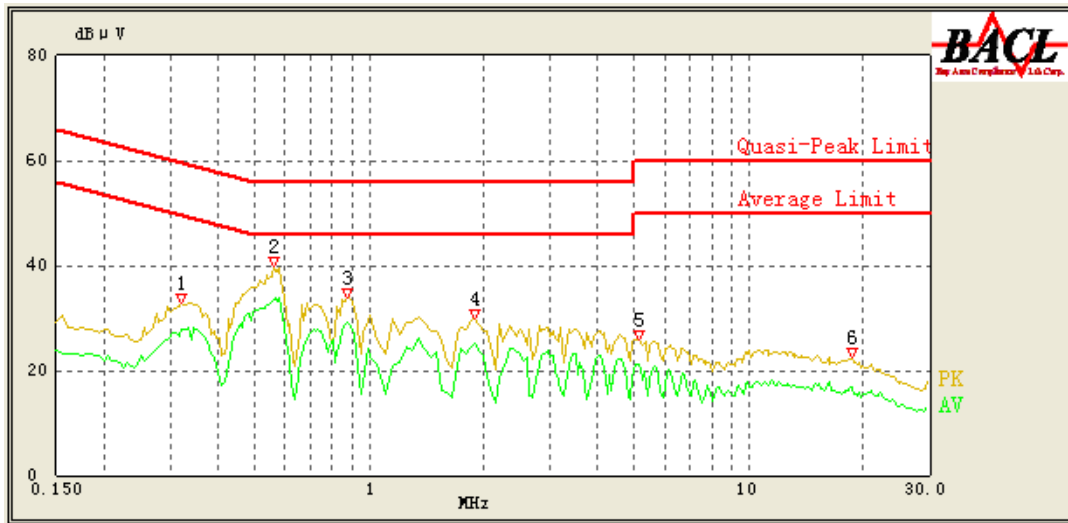
Test Result: Compliant.

EUT operation mode: Transmitting

AC 120V/60 Hz, Line



| Frequency (MHz) | Corrected Amplitude (dBμV) | Detector (PK/AV/QP) | Bandwidth (kHz) | Line | Corrected Factor (dB) | Limit (dBμV) | Margin (dB) | Comment |
|-----------------|----------------------------|---------------------|-----------------|------|-----------------------|--------------|-------------|------------|
| 0.150 | 37.64 | QP | 9.000 | L1 | 16.06 | 66.00 | 28.36 | Compliance |
| 0.150 | 23.77 | AV | 9.000 | L1 | 16.06 | 56.00 | 32.23 | Compliance |
| 0.495 | 39.29 | QP | 9.000 | L1 | 16.08 | 56.08 | 16.79 | Compliance |
| 0.495 | 32.00 | AV | 9.000 | L1 | 16.08 | 46.08 | 14.08 | Compliance |
| 0.575 | 46.52 | QP | 9.000 | L1 | 16.03 | 56.00 | 9.48 | Compliance |
| 0.575 | 38.63 | AV | 9.000 | L1 | 16.03 | 46.00 | 7.37 | Compliance |
| 1.700 | 34.53 | QP | 9.000 | L1 | 15.86 | 56.00 | 21.47 | Compliance |
| 1.700 | 26.93 | AV | 9.000 | L1 | 15.86 | 46.00 | 19.07 | Compliance |
| 4.850 | 30.40 | QP | 9.000 | L1 | 15.85 | 56.00 | 25.60 | Compliance |
| 4.850 | 22.15 | AV | 9.000 | L1 | 15.85 | 46.00 | 23.85 | Compliance |
| 17.250 | 28.87 | QP | 9.000 | L1 | 16.31 | 60.00 | 31.13 | Compliance |
| 17.250 | 19.92 | AV | 9.000 | L1 | 16.31 | 50.00 | 30.08 | Compliance |

AC 120V/60 Hz, Neutral

| Frequency (MHz) | Corrected Amplitude (dBμV) | Detector (PK/AV/QP) | Bandwidth (kHz) | Line | Corrected Factor (dB) | Limit (dBμV) | Margin (dB) | Comment |
|-----------------|----------------------------|---------------------|-----------------|------|-----------------------|--------------|-------------|------------|
| 0.320 | 32.91 | QP | 9.000 | N | 16.07 | 59.71 | 26.80 | Compliance |
| 0.320 | 27.96 | AV | 9.000 | N | 16.07 | 49.71 | 21.75 | Compliance |
| 0.560 | 39.89 | QP | 9.000 | N | 16.07 | 56.00 | 16.11 | Compliance |
| 0.560 | 33.51 | AV | 9.000 | N | 16.07 | 46.00 | 12.49 | Compliance |
| 0.875 | 33.79 | QP | 9.000 | N | 15.96 | 56.00 | 22.21 | Compliance |
| 0.875 | 29.02 | AV | 9.000 | N | 15.96 | 46.00 | 16.98 | Compliance |
| 1.900 | 29.77 | QP | 9.000 | N | 15.91 | 56.00 | 26.23 | Compliance |
| 1.900 | 25.05 | AV | 9.000 | N | 15.91 | 46.00 | 20.95 | Compliance |
| 5.150 | 25.97 | QP | 9.000 | N | 15.87 | 60.00 | 34.03 | Compliance |
| 5.150 | 21.27 | AV | 9.000 | N | 15.87 | 50.00 | 28.73 | Compliance |
| 18.800 | 22.60 | QP | 9.000 | N | 16.12 | 60.00 | 37.40 | Compliance |
| 18.800 | 16.74 | AV | 9.000 | N | 16.12 | 50.00 | 33.26 | Compliance |

Note:

1) Corrected Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

2) Margin (dB) = Limit (dBμV) – Corrected Amplitude (dBμV)

FCC §15.205, §15.209, §15.231 (e) - RADIATED EMISSIONS

Applicable Standard

FCC §15.205, §15.209, §15.231 (e)

According to §15.231 (e), the field strength of emissions from intentional radiators operated under this section shall not exceed the following

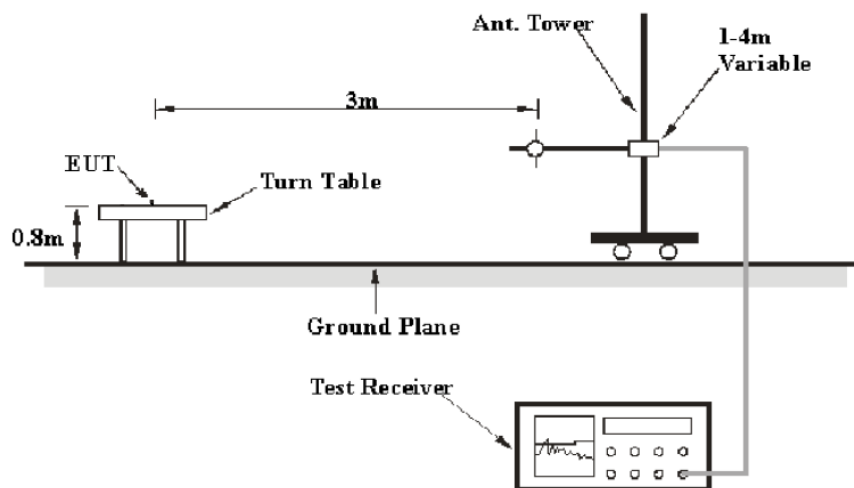
| Fundamental frequency (MHz) | Field strength of fundamental (microvolts/meter) | Field strength of spurious emission (microvolts/meter) |
|-----------------------------|--|--|
| 40.66-40.70 | 1,000 | 100 |
| 70-130 | 500 | 50 |
| 130-174 | 500 to 1,500 * | 50 to 150 * |
| 174-260 | 1,500 | 150 |
| 260-470 | 1,500 to 5,000 * | 150 to 500* |
| Above 470 | 5,000 | 500 |

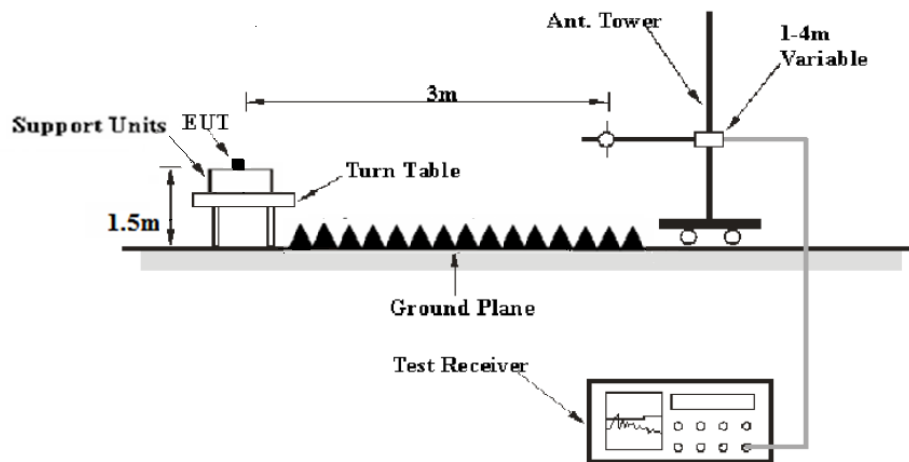
*Linear interpolations.

The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.

EUT Setup

Below 1GHz:



Above 1 GHz:

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10 - 2013. The specification used was the FCC 15 § 15.209, 15.205 and 15.231.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 5 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

| Frequency Range | RBW | Video B/W | IF B/W | Detector |
|-------------------|---------|-----------|--------|----------|
| 30 MHz – 1000MHz | 100 kHz | 300 kHz | / | QP |
| 1000MHz – 5000MHz | 1MHz | 3MHz | / | PK |

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude (dB μ V /m) = Meter Reading (dB μ V) + Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Corrected Amplitude (dB}\mu\text{V /m)}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.205, §15.209, §15.231 (e).

Test Data**Environmental Conditions**

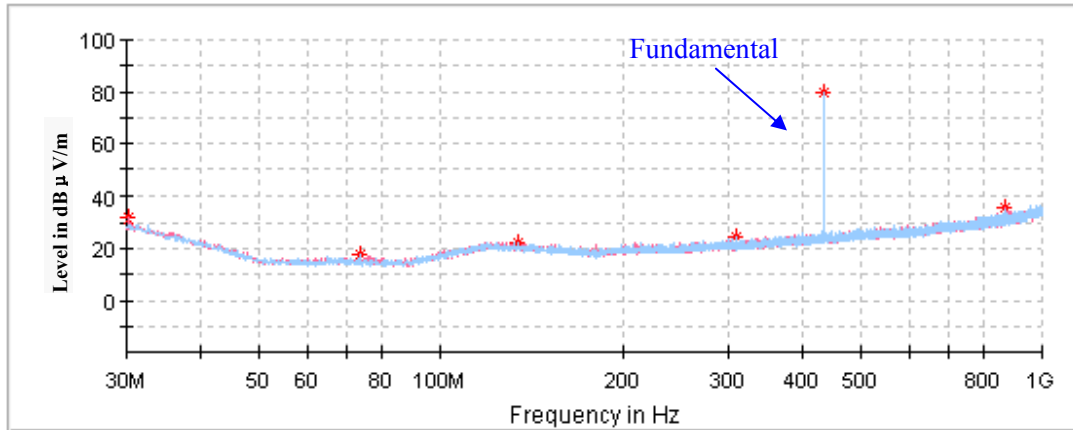
| | |
|---------------------------|----------------------|
| Temperature: | 24.3 °C-24.5°C |
| Relative Humidity: | 51 %-52 % |
| ATM Pressure: | 101.2 kPa -101.3 kPa |

The testing was performed by Winnie Yang from 2019-04-28 to 2019-05-16.

Test mode: Transmitting

30MHz-1GHz

(Pre-scan in the X,Y and Z axes of orientation, the worst case **Z-axis of orientation** was recorded.)



| Frequency (MHz) | Corrected Amplitude MaxPeak (dBµV /m) | Rx Antenna | | Turntable Degree | Corrected Factor (dB/m) | Limit (dBµV/m) | Margin (dB) |
|-----------------|---------------------------------------|-------------|-------------|------------------|-------------------------|----------------|-------------|
| | | Height (cm) | Polar (H/V) | | | | |
| 30.24250 | 31.06 | 150 | V | 336 | -4.1 | 52.85 | 21.79 |
| 73.65000 | 17.50 | 150 | H | 29 | -17.5 | 40.00 | 22.50 |
| 134.88125 | 22.61 | 150 | H | 280 | -11.8 | 43.50 | 20.89 |
| 309.48125 | 24.18 | 200 | H | 283 | -10.3 | 52.85 | 28.67 |
| 433.50000 | 80.10 | 100 | H | 132 | -7.7 | 92.85 | 12.75 |
| 867.11000 | 34.95 | 150 | V | 197 | -0.7 | 72.85 | 37.90 |

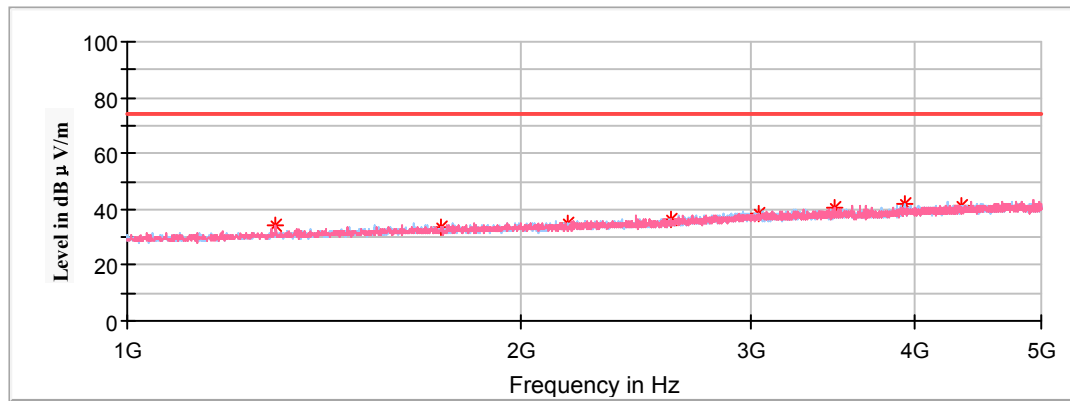
Field Strength of Average Emission

| Frequency (MHz) | Peak Measurement@3m (dBµV/m) | Height (cm) | Polar (H/V) | Duty Cycle Corrected Factor (dB) | Corrected Amplitude (dBµV/m) | FCC Part 15.231(e)/205/209 | |
|-----------------|------------------------------|-------------|-------------|----------------------------------|------------------------------|----------------------------|-------------|
| | | | | | | Limit (dBµV/m) | Margin (dB) |
| 433.50 | 80.10 | 100 | H | -7.94 | 72.16 | 72.85 | 0.69 |
| 867.11 | 34.95 | 150 | V | -7.94 | 27.95 | 52.85 | 25.84 |

1GHz-5 GHz

(Pre-scan in the X,Y and Z axes of orientation, the worst case **X-axis of orientation** was recorded.)

Full Spectrum



| Frequency (MHz) | Corrected Amplitude MaxPeak (dBμV /m) | Rx Antenna | | Turntable Degree | Corrected Factor (dB/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------|---------------------------------------|-------------|-------------|------------------|-------------------------|----------------|-------------|
| | | Height (cm) | Polar (H/V) | | | | |
| 1300.5 | 34.07 | 150 | V | 5 | -11.0 | 74.00 | 39.93 |
| 1734.0 | 33.78 | 200 | V | 249 | -9.1 | 74.00 | 40.22 |
| 2167.5 | 35.02 | 200 | H | 30 | -7.8 | 74.00 | 38.98 |
| 2601.0 | 36.57 | 150 | V | 144 | -6.4 | 74.00 | 37.43 |
| 3034.5 | 38.51 | 150 | V | 183 | -4.3 | 74.00 | 35.49 |
| 3468.0 | 40.34 | 200 | V | 317 | -3.6 | 74.00 | 33.66 |
| 3901.5 | 42.06 | 150 | H | 323 | -2.1 | 74.00 | 31.94 |
| 4335.0 | 41.19 | 200 | H | 106 | -1.3 | 74.00 | 32.81 |

Field Strength of Average Emission

| Frequency (MHz) | Peak Measurement@3m (dBμV/m) | Height (cm) | Polar (H/V) | Duty Cycle Corrected Factor (dB) | Corrected Amplitude (dBμV/m) | FCC Part 15.231(e)/205/209 | |
|--------------------|------------------------------------|----------------|----------------|--|------------------------------------|-------------------------------|----------------|
| | | | | | | Limit (dBμV/m) | Margin (dB) |
| 1300.5 | 34.07 | 150 | V | -7.94 | 26.13 | 54.00 | 27.87 |
| 1734.0 | 33.78 | 200 | V | -7.94 | 25.84 | 54.00 | 28.16 |
| 2167.5 | 35.02 | 200 | H | -7.94 | 27.08 | 54.00 | 26.92 |
| 2601.0 | 36.57 | 150 | V | -7.94 | 28.63 | 54.00 | 25.37 |
| 3034.5 | 38.51 | 150 | V | -7.94 | 30.57 | 54.00 | 23.43 |
| 3468.0 | 40.34 | 200 | V | -7.94 | 32.40 | 54.00 | 21.6 |
| 3901.5 | 42.06 | 150 | H | -7.94 | 34.12 | 54.00 | 19.88 |
| 4335.0 | 41.19 | 200 | H | -7.94 | 33.25 | 54.00 | 20.75 |

Note 1:

Corrected Factor (dB/m) = Antenna factor (RX) (dB/m) + Cable Loss (dB) – Amplifier Factor (dB)

Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV /m)

Note 2:

Calculate average value based on duty cycle corrected factor:

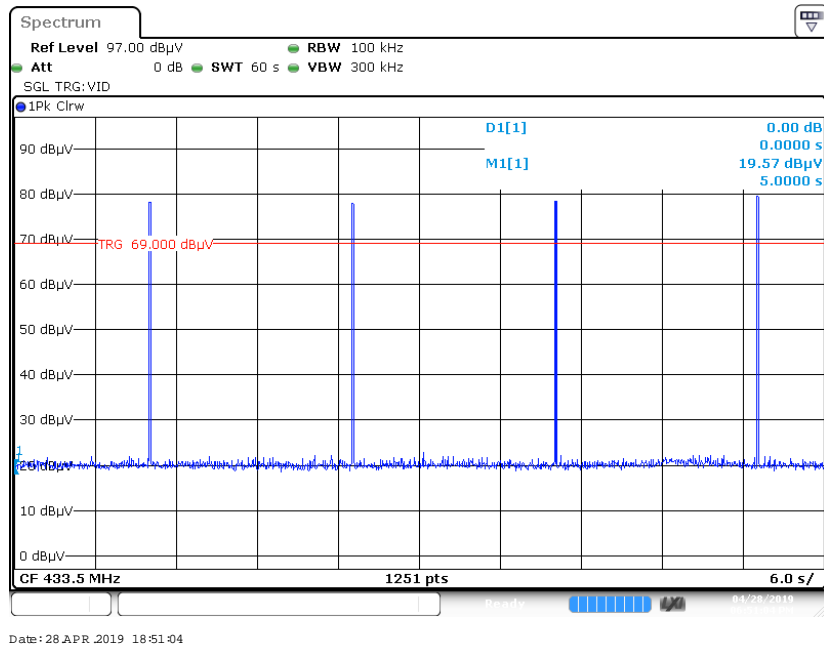
$$T_p = 100\text{ms}$$

$$T_{on} = \text{Burst1} * N1 + \text{Burst2} * N2 = 0.2174\text{ms} * 1 + 39.8551\text{ms} * 1 = 40.0725\text{ms}$$

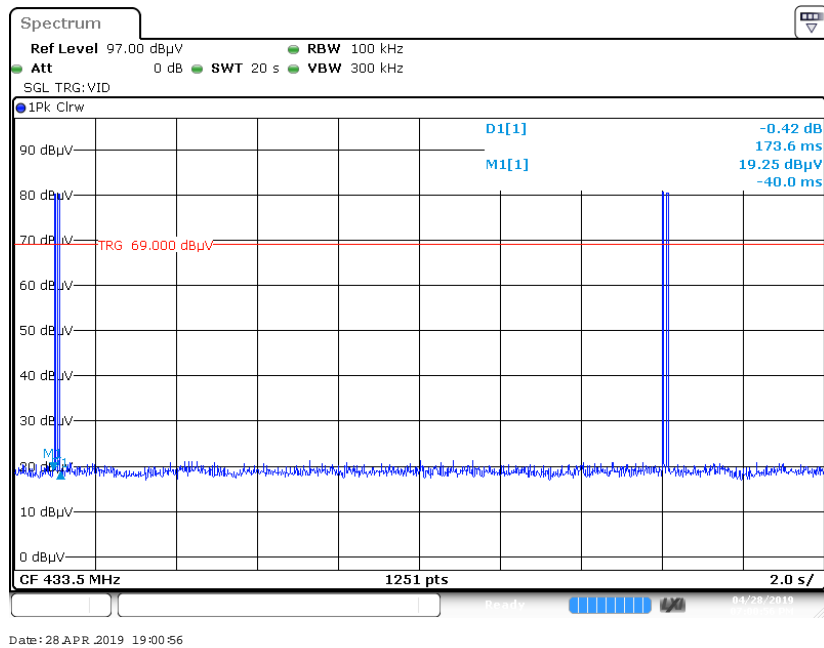
$$\text{Duty Cycle Corrected Factor} = 20 * \log(T_{on}/T_p) = 20 * \log(40.0725\text{ms}/100\text{ms}) = -7.94\text{dB}$$

$$\text{Average value} = \text{Peak value} + \text{Duty Cycle Corrected Factor}$$

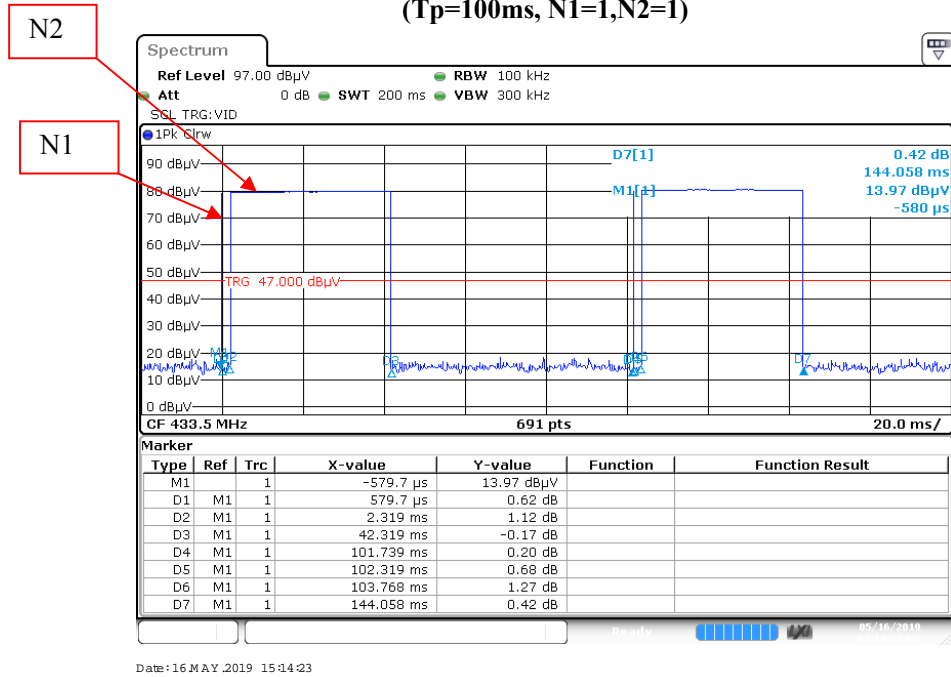
Duty Cycle



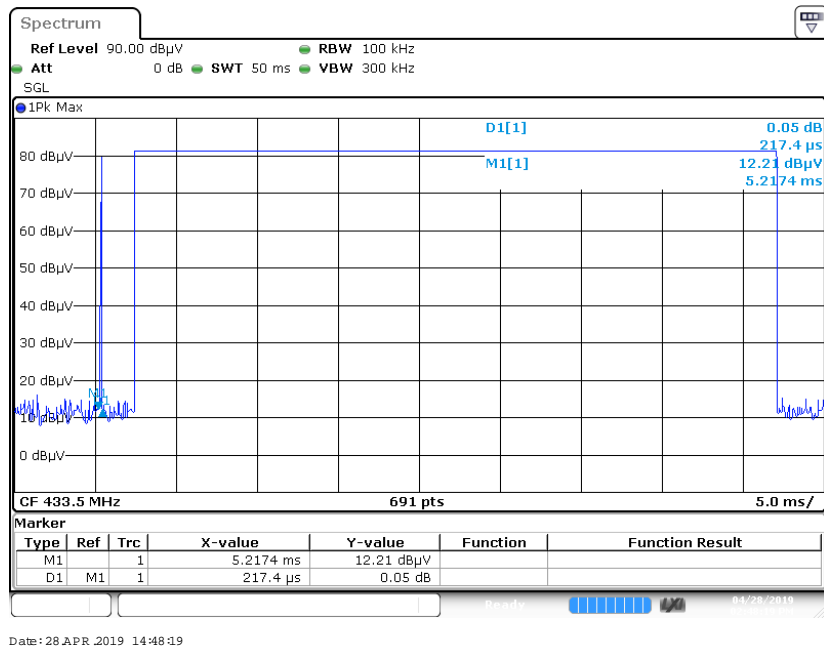
Duty Cycle



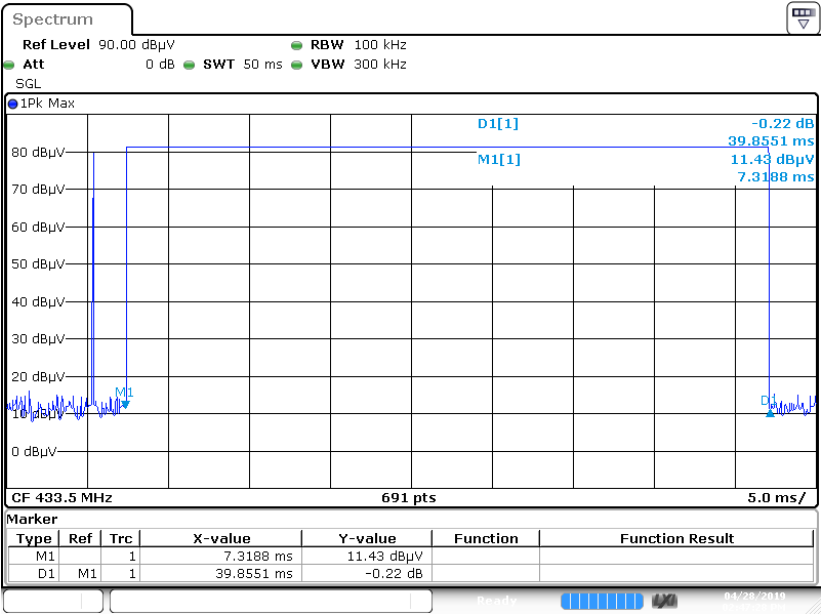
Duty Cycle ($T_p=100\text{ms}$, $N_1=1$, $N_2=1$)



Burst N1 ($T_{on}=0.2174\text{ms}$)



Burst N2
(Ton=39.8551ms)



Date: 28 APR 2019 14:47:28

FCC §15.231(c) - 20dB EMISSION BANDWIDTH TESTING

Applicable Standard

Per 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

| | |
|---------------------------|-----------|
| Temperature: | 24.3 °C |
| Relative Humidity: | 51 % |
| ATM Pressure: | 101.2 kPa |

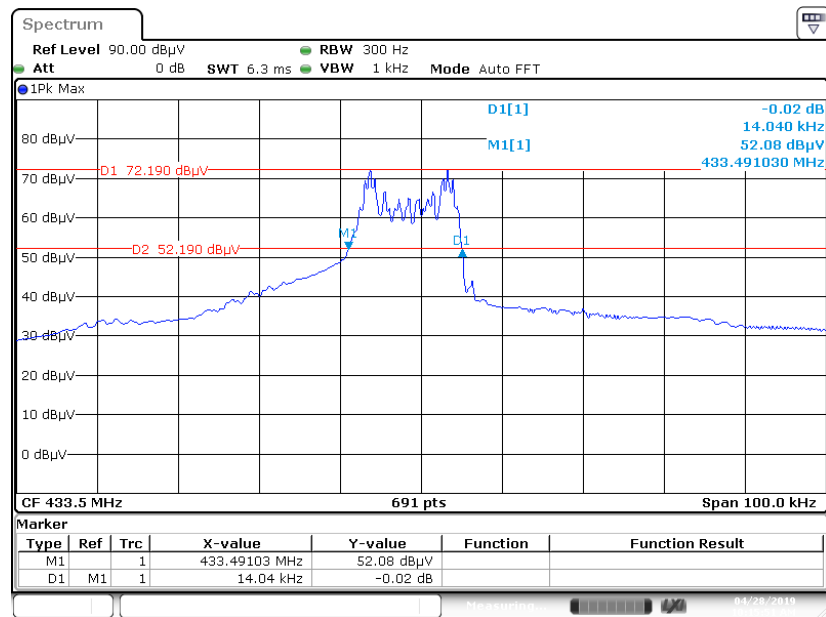
The testing was performed by Winnie Yang on 2019-04-28.

Test Mode: Transmitting

| Channel Frequency (MHz) | 20dB Bandwidth (kHz) | Limit (kHz) | Result |
|-------------------------|----------------------|-------------|--------|
| 433.5 | 14.04 | 1083.8 | Pass |

Note: Limit = 0.25% * Center Frequency = 0.25% * 433.5 MHz = 1083.8 kHz

20 dB Emission Bandwidth



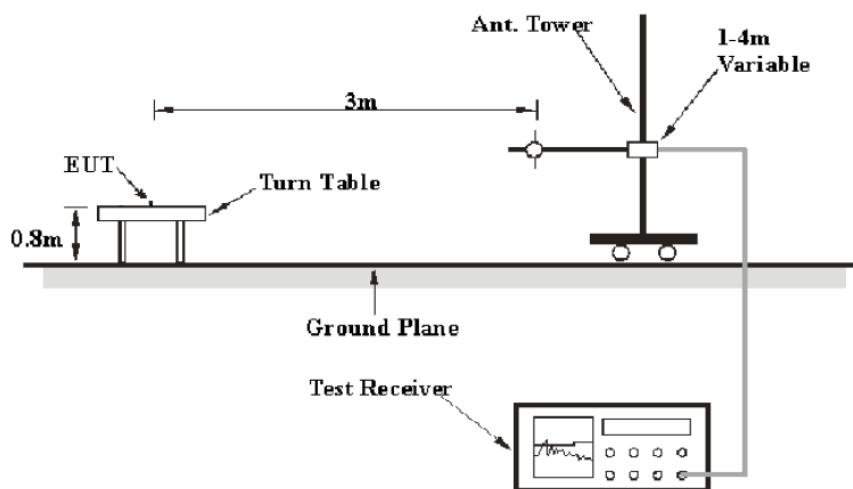
Date: 28 APR 2019 10:15:50

FCC §15.231(e) - DEACTIVATION TESTING

Applicable Standard

Per 15.231(e), devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

EUT Setup



The deactivation test was performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10- 2013. The specification used was the FCC 15.231(e) limits.

Test Data

Environmental Conditions

| | |
|--------------------|-----------|
| Temperature: | 24.3 °C |
| Relative Humidity: | 53 % |
| ATM Pressure: | 101.2 kPa |

The testing was performed by Winnie Yang on 2019-04-28.

Test mode: Transmitting

Deactivation

| Transmission period (s) | Limit (s) | Result |
|----------------------------|--------------|--------|
| 0.144 | < 1 | Pass |

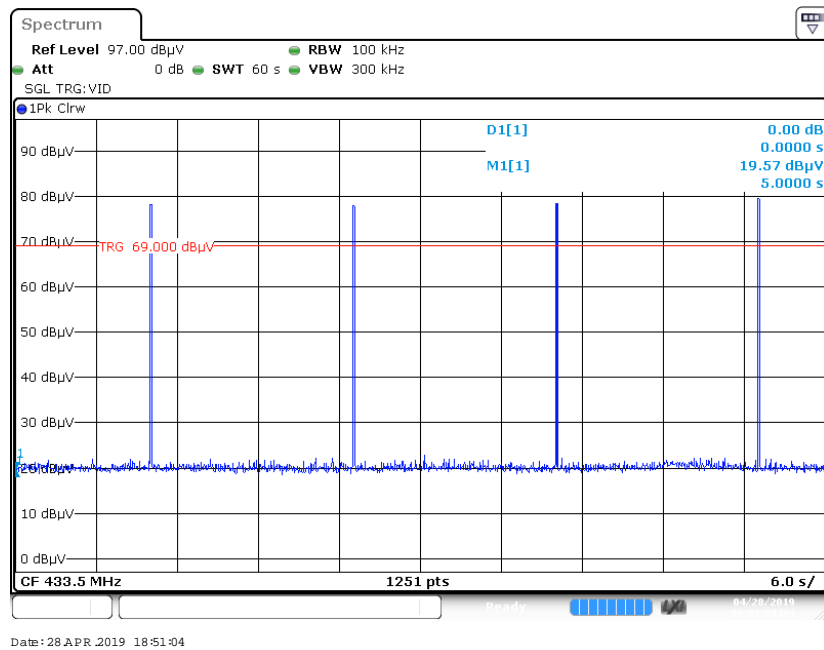
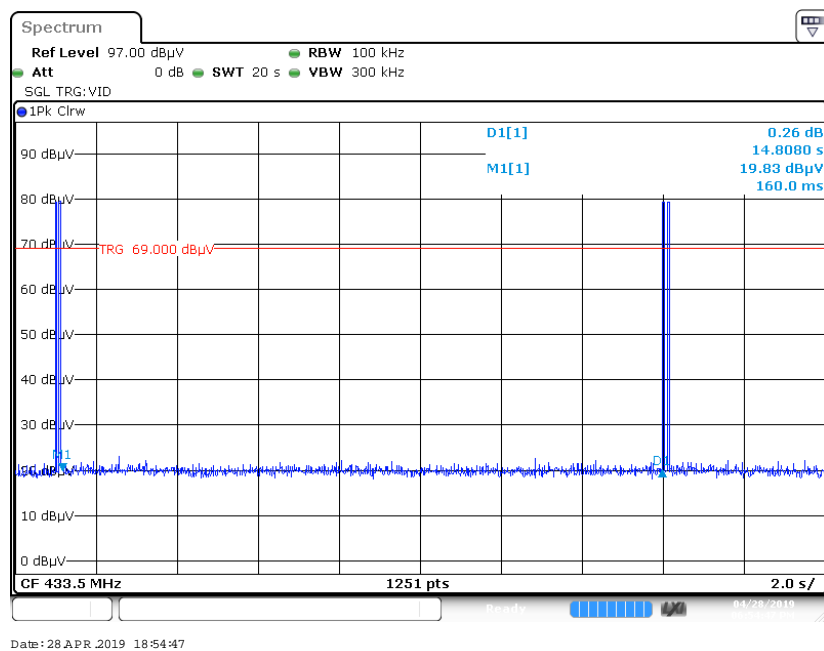
Silent period

| Silent period (s) | Limit (s) | Result |
|----------------------|--------------|--------|
| 14.8080 | >10 | Pass |

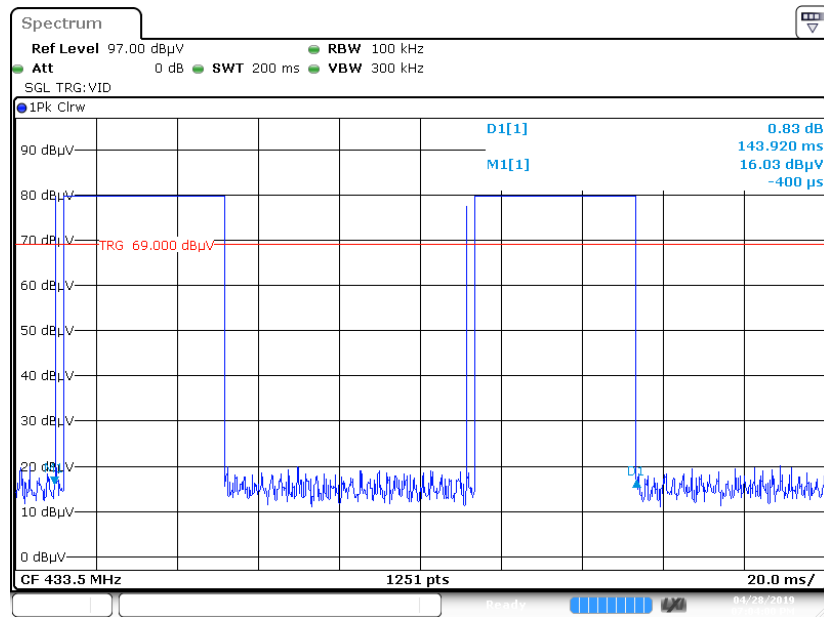
Note:

The silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

The duration time is 0.144s, $0.144 \times 30 = 4.32s$.

Transmission period**Silent period**

Duration time



***** END OF REPORT *****