

FCC PART 15.247

TEST REPORT

For

Zhongshan K-mate General Electronics Co.,Ltd

NO.2 ,5th Xinsheng Street,Gangkou Town, Zhongshan City, Guangdong,China

FCC ID: WAD-BTH033L

| | |
|---|--|
| Report Type: Original Report | Product Type: Bluetooth Stereo Headset |
| Test Engineer: Dean Liu | <i>Dean Liu</i> |
| Report Number: RDG150713005-00B | |
| Report Date: 2015-07-20 | |
| Reviewed By: Sula Huang RF Leader | <i>Sula Huang</i> |
| Test Laboratory: Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 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. (Dongguan). 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..... | 4 |
| PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)..... | 4 |
| OBJECTIVE..... | 4 |
| RELATED SUBMITTAL(S)/GRANT(S)..... | 4 |
| TEST METHODOLOGY..... | 4 |
| TEST FACILITY..... | 4 |
| SYSTEM TEST CONFIGURATION..... | 5 |
| DESCRIPTION OF TEST CONFIGURATION..... | 5 |
| EQUIPMENT MODIFICATIONS..... | 5 |
| EUT EXERCISE SOFTWARE..... | 5 |
| SUPPORT EQUIPMENT LIST AND DETAILS..... | 5 |
| EXTERNAL CABLE..... | 6 |
| BLOCK DIAGRAM OF TEST SETUP..... | 6 |
| SUMMARY OF TEST RESULTS..... | 7 |
| FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE..... | 8 |
| APPLICABLE STANDARD..... | 8 |
| FCC §15.203 - ANTENNA REQUIREMENT..... | 9 |
| APPLICABLE STANDARD..... | 9 |
| ANTENNA CONNECTOR CONSTRUCTION..... | 9 |
| FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS..... | 10 |
| APPLICABLE STANDARD..... | 10 |
| MEASUREMENT UNCERTAINTY..... | 10 |
| EUT SETUP..... | 10 |
| EMI TEST RECEIVER SETUP..... | 11 |
| TEST PROCEDURE..... | 11 |
| CORRECTED AMPLITUDE & MARGIN CALCULATION..... | 11 |
| TEST EQUIPMENT LIST AND DETAILS..... | 12 |
| TEST RESULTS SUMMARY..... | 12 |
| TEST DATA..... | 12 |
| FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS..... | 15 |
| APPLICABLE STANDARD..... | 15 |
| MEASUREMENT UNCERTAINTY..... | 15 |
| EUT SETUP..... | 15 |
| EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP..... | 16 |
| TEST PROCEDURE..... | 16 |
| CORRECTED AMPLITUDE & MARGIN CALCULATION..... | 17 |
| TEST EQUIPMENT LIST AND DETAILS..... | 17 |
| TEST RESULTS SUMMARY..... | 17 |
| TEST DATA..... | 17 |
| FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH..... | 21 |
| APPLICABLE STANDARD..... | 21 |
| TEST PROCEDURE..... | 21 |
| TEST EQUIPMENT LIST AND DETAILS..... | 21 |
| TEST DATA..... | 21 |
| FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER..... | 24 |

APPLICABLE STANDARD24
TEST PROCEDURE24
4. TEST EQUIPMENT LIST AND DETAILS24
TEST DATA24

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE.....27
APPLICABLE STANDARD27
TEST PROCEDURE27
TEST EQUIPMENT LIST AND DETAILS.....27
TEST DATA27

FCC §15.247(e) - POWER SPECTRAL DENSITY29
APPLICABLE STANDARD29
TEST PROCEDURE29
TEST EQUIPMENT LIST AND DETAILS.....29
TEST DATA29

DECLARATION LETTER32

FEMVAL

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The Zhongshan K-mate General Electronics Co.,Ltd's product, model number: BTH033L (FCC ID: WAD-BTH033L) (the "EUT") in this report was a *Bluetooth Stereo Headset*, which was measured approximately: 16.5cm (L) x 17.6 cm (W) x 3.2cm(H), rated input voltage: DC 3.7V from rechargeable Li-ion battery or DC5V charging from USB port.

Note: The series product, model BTH033L and BTH033LN are electrically identical, the difference between them are model name and color of appearance, we selected BTH033L for fully testing, the details was explained in the attached declaration letter.

All measurement and test data in this report was gathered from production sample serial number: 150713005 (Assigned by BACL, Dongguan). The EUT was received on 2015-07-13.

Objective

This report is prepared on behalf of *Zhongshan K-mate General Electronics Co.,Ltd.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communications Commission's rules

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Related Submittal(s)/Grant(s)

FCC Part 15C DSS submissions with FCC ID: WAD-BTH033L.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 06, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in testing mode, which was provided by manufacturer.

For Bluetooth LE mode, 40 channels are provided for testing:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 0 | 2402 | 20 | 2442 |
| 1 | 2404 | ... | ... |
| ... | ... | ... | ... |
| ... | ... | ... | ... |
| .. | ... | 38 | 2478 |
| 19 | 2440 | 39 | 2480 |

EUT was tested with channel 0, 19 and 39.

The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

The worst condition (maximum power with 100% duty cycle) was setting by the software as following table:

| Test Mode | Test Software Version | CSR_BT_Tester | | |
|-----------|-----------------------|---------------|---------|---------|
| BLE | Test Frequency | 2402MHz | 2440MHz | 2480MHz |
| | BLE | N/A | N/A | N/A |

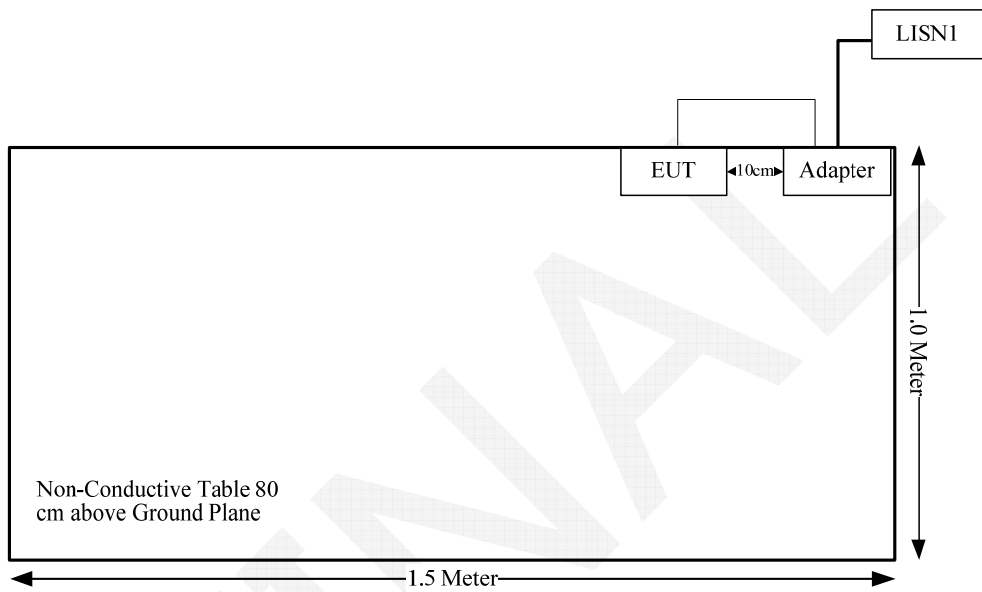
Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number |
|--------------|-------------|------------|---------------|
| DVE | Adapter | DSC-5CU-05 | / |

External Cable

| Cable Description | Shielding Type | Ferrite Core | Length (m) | From Port | To |
|-------------------|----------------|--------------|------------|---------------------|-----|
| USB | no | no | 0.9 | USB Port of Adapter | EUT |

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Result |
|-------------------------------------|--|------------|
| FCC §15.247 (i) & §1.1310 & §2.1093 | RF Exposure | Compliance |
| §15.203 | Antenna Requirement | Compliance |
| §15.207 (a) | AC Line Conducted Emissions | Compliance |
| §15.247(d) | Spurious Emissions at Antenna Port | Compliance |
| §15.205, §15.209, §15.247(d) | Spurious Emissions | Compliance |
| §15.247 (a)(2) | 6 dB Emission Bandwidth | Compliance |
| §15.247(b)(3) | Maximum conducted output power | Compliance |
| §15.247(d) | 100 kHz Bandwidth of Frequency Band Edge | Compliance |
| §15.247(e) | Power Spectral Density | Compliance |

FCC §15.247 (i) & §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

According to §15.247(i) and §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v05r02:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Measurement Result

The maximum conducted average output power = 6.23 dBm (4.20mW) at 2480 MHz
 $[(\text{max. power of channel, mW})/(\text{min. test separation distance, mm})][\sqrt{f(\text{GHz})}]$
 $= 4.20/5 \cdot (\sqrt{2.48}) = 1.32 < 3.0$

So the stand-alone SAR evaluation is not necessary.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Connector Construction

The EUT has one integral antenna arrangement, which was permanently attached and the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 1, then:

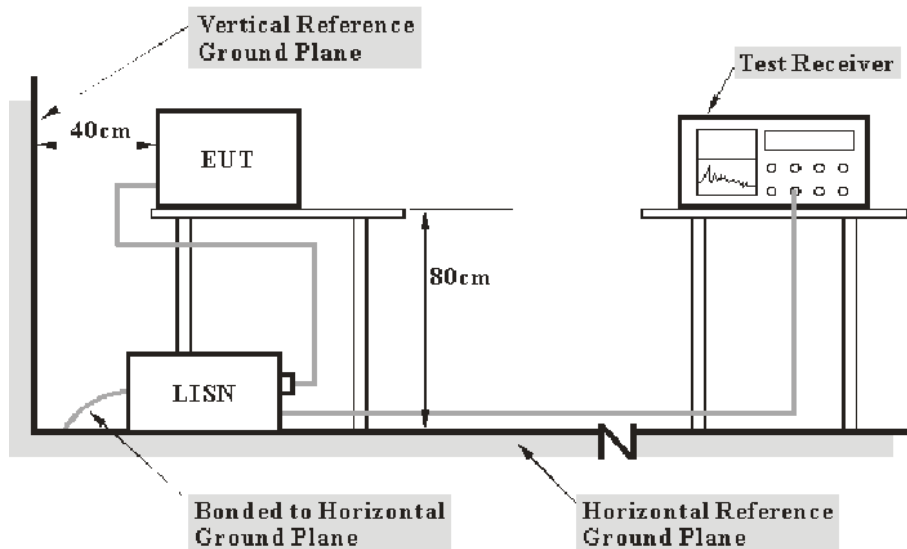
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Based on CISPR 16-4-2-2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.46 dB (150 kHz to 30 MHz).

Table 1 – Values of U_{cispr}

| Measurement | U_{cispr} |
|---|-------------|
| Conducted disturbance at mains port using AMN (150 kHz to 30 MHz) | 3.4 dB |

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 setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

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

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

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

$$C_f = A_C + VDF$$

Herein,

V_C (cord. Reading): corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN

C_f : Correction Factor

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--------------|--------------------|---------|---------------|------------------|----------------------|
| R&S | EMI Test Receiver | ESCS 30 | 830245/006 | 2014-10-20 | 2015-10-20 |
| R&S | L.I.S.N | ESH2-Z5 | 892107/021 | 2015-06-09 | 2016-06-09 |
| R&S | Two-line V-network | ENV 216 | 3560.6550.12 | 2014-12-11 | 2015-12-11 |
| R&S | Test Software | EMC32 | Version8.53.0 | N/A | N/A |

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

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

9.50 dB at 0.563041 MHz in the Line conducted mode

Test Data

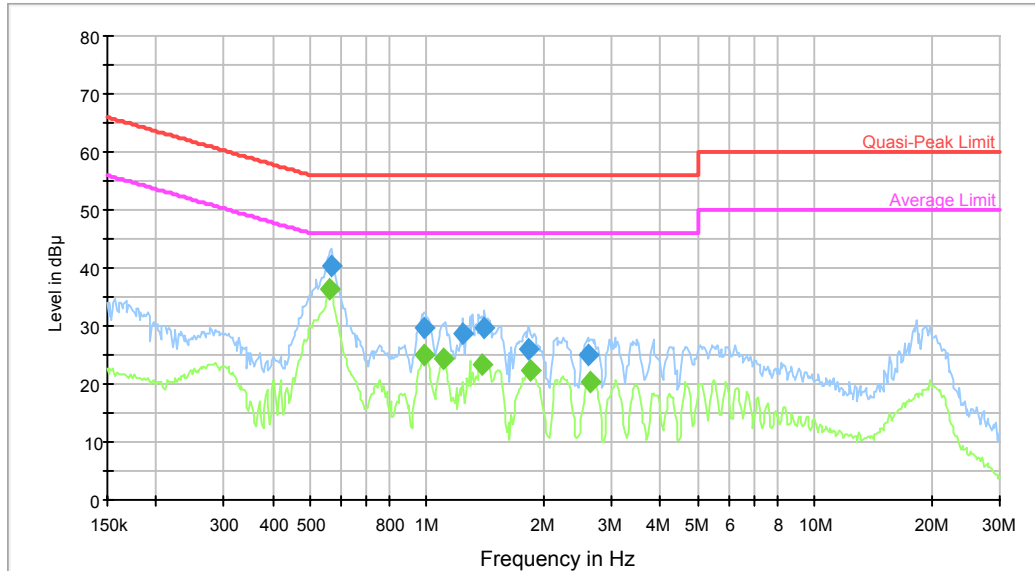
Environmental Conditions

| | |
|---------------------------|----------|
| Temperature: | 26.8 °C |
| Relative Humidity: | 58 % |
| ATM Pressure: | 99.4 kPa |

The testing was performed by Dean Liu on 2015-07-17.

Test Mode: Transmitting

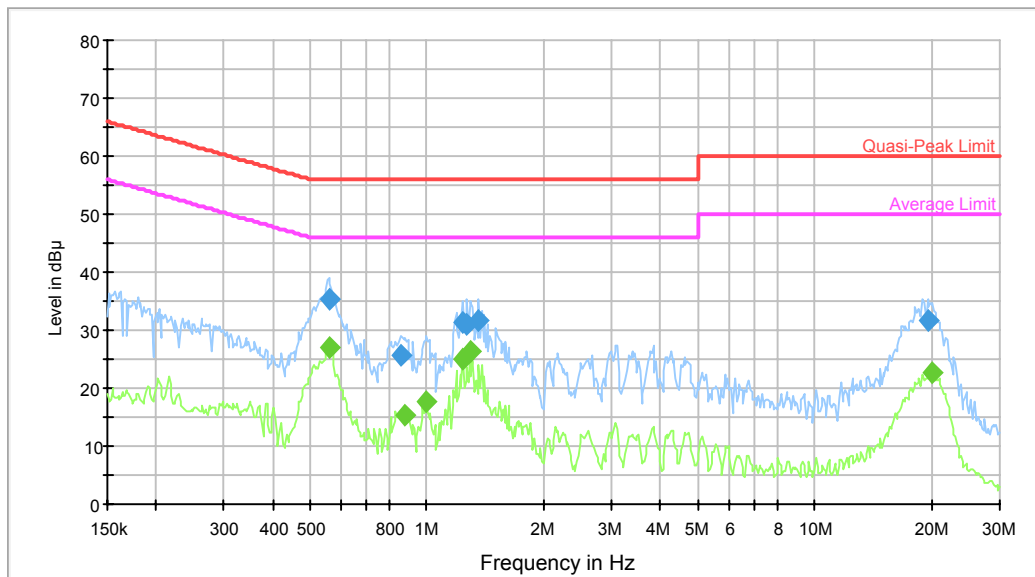
AC120 V, 60 Hz, Line:



| Frequency (MHz) | QuasiPeak (dBµV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|------------|
| 0.567545 | 40.3 | 9.000 | L1 | 10.2 | 15.7 | 56.0 | Compliance |
| 0.983506 | 29.6 | 9.000 | L1 | 10.4 | 26.4 | 56.0 | Compliance |
| 1.239175 | 28.8 | 9.000 | L1 | 10.4 | 27.2 | 56.0 | Compliance |
| 1.407671 | 29.7 | 9.000 | L1 | 10.4 | 26.3 | 56.0 | Compliance |
| 1.831043 | 26.1 | 9.000 | L1 | 10.4 | 29.9 | 56.0 | Compliance |
| 2.599932 | 25.1 | 9.000 | L1 | 10.5 | 30.9 | 56.0 | Compliance |

| Frequency (MHz) | Average (dBµV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) | Comment |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|------------|
| 0.563041 | 36.5 | 9.000 | L1 | 10.1 | 9.5 | 46.0 | Compliance |
| 0.983506 | 25.0 | 9.000 | L1 | 10.4 | 21.0 | 46.0 | Compliance |
| 1.108371 | 24.4 | 9.000 | L1 | 10.4 | 21.6 | 46.0 | Compliance |
| 1.385415 | 23.2 | 9.000 | L1 | 10.4 | 22.8 | 46.0 | Compliance |
| 1.845692 | 22.2 | 9.000 | L1 | 10.4 | 23.8 | 46.0 | Compliance |
| 2.641698 | 20.5 | 9.000 | L1 | 10.5 | 25.5 | 46.0 | Compliance |

AC120 V, 60 Hz, Neutral:



| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment |
|-----------------|------------------|-----------------|------|------------|-------------|--------------|------------|
| 0.558572 | 35.3 | 9.000 | N | 10.1 | 20.7 | 56.0 | Compliance |
| 0.858911 | 25.5 | 9.000 | N | 10.4 | 30.5 | 56.0 | Compliance |
| 1.239175 | 31.4 | 9.000 | N | 10.4 | 24.6 | 56.0 | Compliance |
| 1.269154 | 30.9 | 9.000 | N | 10.4 | 25.1 | 56.0 | Compliance |
| 1.363512 | 31.7 | 9.000 | N | 10.4 | 24.3 | 56.0 | Compliance |
| 19.519859 | 31.7 | 9.000 | N | 10.9 | 28.3 | 60.0 | Compliance |

| Frequency (MHz) | Average (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|------------|
| 0.563041 | 27.0 | 9.000 | N | 10.1 | 19.0 | 46.0 | Compliance |
| 0.872708 | 15.5 | 9.000 | N | 10.4 | 30.5 | 46.0 | Compliance |
| 0.999305 | 17.8 | 9.000 | N | 10.4 | 28.2 | 46.0 | Compliance |
| 1.239175 | 25.1 | 9.000 | N | 10.4 | 20.9 | 46.0 | Compliance |
| 1.289541 | 26.4 | 9.000 | N | 10.4 | 19.6 | 46.0 | Compliance |
| 20.152030 | 22.8 | 9.000 | N | 11.0 | 27.2 | 50.0 | Compliance |

FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 2, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 2, then:

- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:

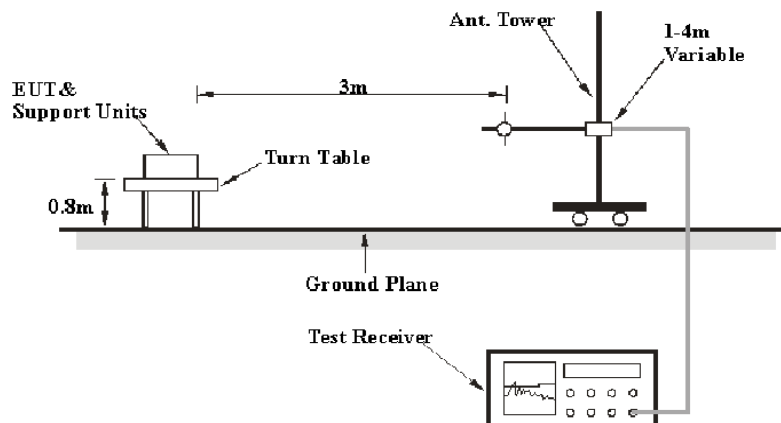
- 30M~200MHz: 5.0 dB
- 200M~1GHz: 6.2 dB
- 1G~6GHz: 4.45 dB
- 6G~18GHz: 5.23 dB

Table 2 – Values of U_{cispr}

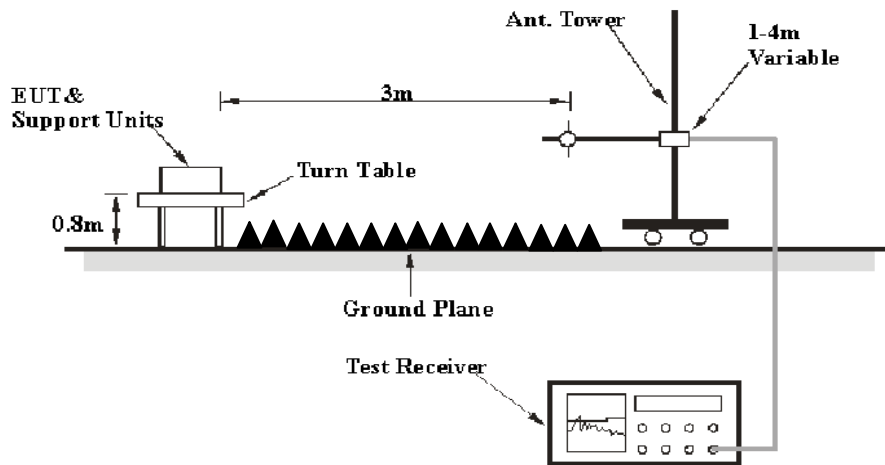
| Measurement | U_{cispr} |
|--|-------------|
| Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz) | 6.3 dB |
| Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz) | 5.2 dB |
| Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz) | 5.5 dB |

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.247 limits. The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

| Frequency Range | RBW | Video B/W | IF B/W | Detector |
|-------------------|---------|-----------|---------|----------|
| 30 MHz – 1000 MHz | 120 kHz | 300 kHz | 120 kHz | QP |
| Above 1 GHz | 1MHz | 3 MHz | / | PK |
| | 1MHz | 10 Hz | / | Ave. |

Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------------|-------------------|---------------------|--------------------|------------------|----------------------|
| R&S | EMI Test Receiver | ESCI | 100224 | 2015-05-09 | 2016-05-09 |
| Sunol Sciences | Antenna | JB3 | A060611-3 | 2014-07-28 | 2017-07-27 |
| HP | Amplifier | 8447E | 2434A02181 | 2014-09-01 | 2015-09-01 |
| Agilent | Spectrum Analyzer | E4440A | SG43360054 | 2014-12-04 | 2015-12-04 |
| ETS LINDGREN | Horn Antenna | 3115 | 000 527 35 | 2012-09-06 | 2015-09-06 |
| Mini-Circuit | Amplifier | ZVA-213-S+ | 054201245 | 2015-02-19 | 2016-02-19 |
| Ducommun Technologies | Horn Antenna | ARH-4223-02 | 1007726-01 1304 | 2014-06-16 | 2017-06-15 |
| Quinstar | Amplifier | QLW- 18405536-JO | 15964001001 | 2014-09-06 | 2015-09-06 |

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

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Section 15.205, 15.209 and 15.247, with the worst margin reading of:

9.74 dB at 2483.5 MHz in the Vertical polarization

Test Data

Environmental Conditions

| | |
|---------------------------|----------|
| Temperature: | 27.2 °C |
| Relative Humidity: | 42 % |
| ATM Pressure: | 99.7 kPa |

* The testing was performed by Dean Liu on 2015-07-14.

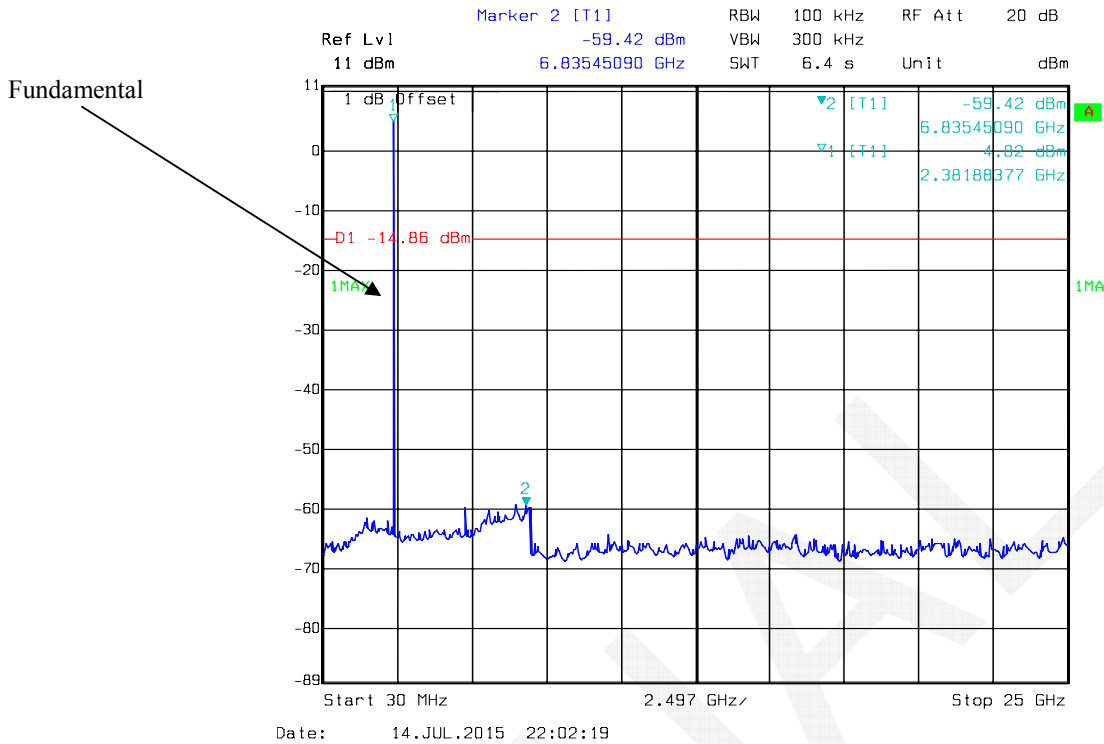
Test Mode: Transmitting

| Frequency (MHz) | Receiver | | Rx Antenna | | Cable loss (dB) | Amplifier Gain (dB) | Corrected Amplitude (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|--------------------------|----------------|---------------------|-------------|-------------|-----------------|---------------------|------------------------------|----------------|-------------|
| | Reading (dBµV) | Detector (PK/QP/AV) | Polar (H/V) | Factor (dB) | | | | | |
| Low Channel: 2402 MHz | | | | | | | | | |
| 2402 | 66.19 | PK | H | 25.65 | 3.66 | 0.00 | 95.50 | N/A | N/A |
| 2402 | 54.13 | AV | H | 25.65 | 3.66 | 0.00 | 83.44 | N/A | N/A |
| 2402 | 66.56 | PK | V | 25.65 | 3.66 | 0.00 | 95.87 | N/A | N/A |
| 2402 | 54.63 | AV | V | 25.65 | 3.66 | 0.00 | 83.94 | N/A | N/A |
| 2390 | 26.42 | PK | V | 25.61 | 3.63 | 0.00 | 55.66 | 74.00 | 18.34 |
| 2390 | 12.99 | AV | V | 25.61 | 3.63 | 0.00 | 42.23 | 54.00 | 11.77 |
| 4804 | 33.05 | PK | V | 30.59 | 5.06 | 27.41 | 41.29 | 74.00 | 32.71 |
| 4804 | 19.76 | AV | V | 30.59 | 5.06 | 27.41 | 28.00 | 54.00 | 26.00 |
| 7206 | 30.9 | PK | V | 34.09 | 6.61 | 25.91 | 45.69 | 74.00 | 28.31 |
| 7206 | 18.42 | AV | V | 34.09 | 6.61 | 25.91 | 33.21 | 54.00 | 20.79 |
| 9608 | 30.36 | PK | V | 35.96 | 8.53 | 27.55 | 47.30 | 74.00 | 26.70 |
| 9608 | 17.09 | AV | V | 35.96 | 8.53 | 27.55 | 34.03 | 54.00 | 19.97 |
| 1735 | 38.37 | PK | V | 24.07 | 2.70 | 27.62 | 37.52 | 74.00 | 36.48 |
| 1735 | 24.94 | AV | V | 24.07 | 2.70 | 27.62 | 24.09 | 54.00 | 29.91 |
| 400.54 | 29.4 | QP | V | 16.20 | 2.43 | 21.77 | 26.26 | 46.00 | 19.74 |
| Middle Channel: 2440 MHz | | | | | | | | | |
| 2440 | 67.97 | PK | H | 25.74 | 3.76 | 0.00 | 97.47 | N/A | N/A |
| 2440 | 56.69 | AV | H | 25.74 | 3.76 | 0.00 | 86.19 | N/A | N/A |
| 2440 | 68.08 | PK | V | 25.74 | 3.76 | 0.00 | 97.58 | N/A | N/A |
| 2440 | 57.17 | AV | V | 25.74 | 3.76 | 0.00 | 86.67 | N/A | N/A |
| 4880 | 33.68 | PK | V | 30.79 | 5.18 | 27.42 | 42.23 | 74.00 | 31.77 |
| 4880 | 20.03 | AV | V | 30.79 | 5.18 | 27.42 | 28.58 | 54.00 | 25.42 |
| 7320 | 30.22 | PK | V | 34.37 | 6.75 | 25.88 | 45.46 | 74.00 | 28.54 |
| 7320 | 17.61 | AV | V | 34.37 | 6.75 | 25.88 | 32.85 | 54.00 | 21.15 |
| 9760 | 29.65 | PK | V | 36.32 | 8.62 | 27.21 | 47.38 | 74.00 | 26.62 |
| 9760 | 16.23 | AV | V | 36.32 | 8.62 | 27.21 | 33.96 | 54.00 | 20.04 |
| 2920 | 37.73 | PK | V | 26.99 | 6.19 | 27.54 | 43.37 | 74.00 | 30.63 |
| 2920 | 24.23 | AV | V | 26.99 | 6.19 | 27.54 | 29.87 | 54.00 | 24.13 |
| 3190 | 32.43 | PK | V | 27.81 | 6.26 | 27.38 | 39.12 | 74.00 | 34.88 |
| 3190 | 20.07 | AV | V | 27.81 | 6.26 | 27.38 | 26.76 | 54.00 | 27.24 |
| 400.54 | 29.6 | QP | V | 16.20 | 2.43 | 21.77 | 26.46 | 46.00 | 19.54 |
| High Channel: 2480 MHz | | | | | | | | | |
| 2480 | 69.73 | PK | H | 25.85 | 3.68 | 0.00 | 99.26 | N/A | N/A |
| 2480 | 58.58 | AV | H | 25.85 | 3.68 | 0.00 | 88.11 | N/A | N/A |
| 2480 | 70.1 | PK | V | 25.85 | 3.68 | 0.00 | 99.63 | N/A | N/A |
| 2480 | 59.3 | AV | V | 25.85 | 3.68 | 0.00 | 88.83 | N/A | N/A |
| 2483.5 | 30.83 | PK | V | 25.86 | 3.67 | 0.00 | 60.36 | 74.00 | 13.64 |
| 2483.5 | 14.73 | AV | V | 25.86 | 3.67 | 0.00 | 44.26 | 54.00 | 9.74 |
| 4960 | 34.9 | PK | V | 31.00 | 5.34 | 27.43 | 43.81 | 74.00 | 30.19 |
| 4960 | 21.29 | AV | V | 31.00 | 5.34 | 27.43 | 30.20 | 54.00 | 23.80 |
| 7440 | 30.64 | PK | V | 34.66 | 6.89 | 25.97 | 46.22 | 74.00 | 27.78 |
| 7440 | 17.94 | AV | V | 34.66 | 6.89 | 25.97 | 33.52 | 54.00 | 20.48 |
| 9920 | 29.73 | PK | V | 36.71 | 8.71 | 26.66 | 48.49 | 74.00 | 25.51 |
| 9920 | 16.49 | AV | V | 36.71 | 8.71 | 26.66 | 35.25 | 54.00 | 18.75 |
| 2920 | 37.31 | PK | V | 26.99 | 6.19 | 27.54 | 42.95 | 74.00 | 31.05 |
| 2920 | 24.92 | AV | V | 26.99 | 6.19 | 27.54 | 30.56 | 54.00 | 23.44 |
| 400.54 | 30.1 | QP | V | 16.20 | 2.43 | 21.77 | 26.96 | 46.00 | 19.04 |

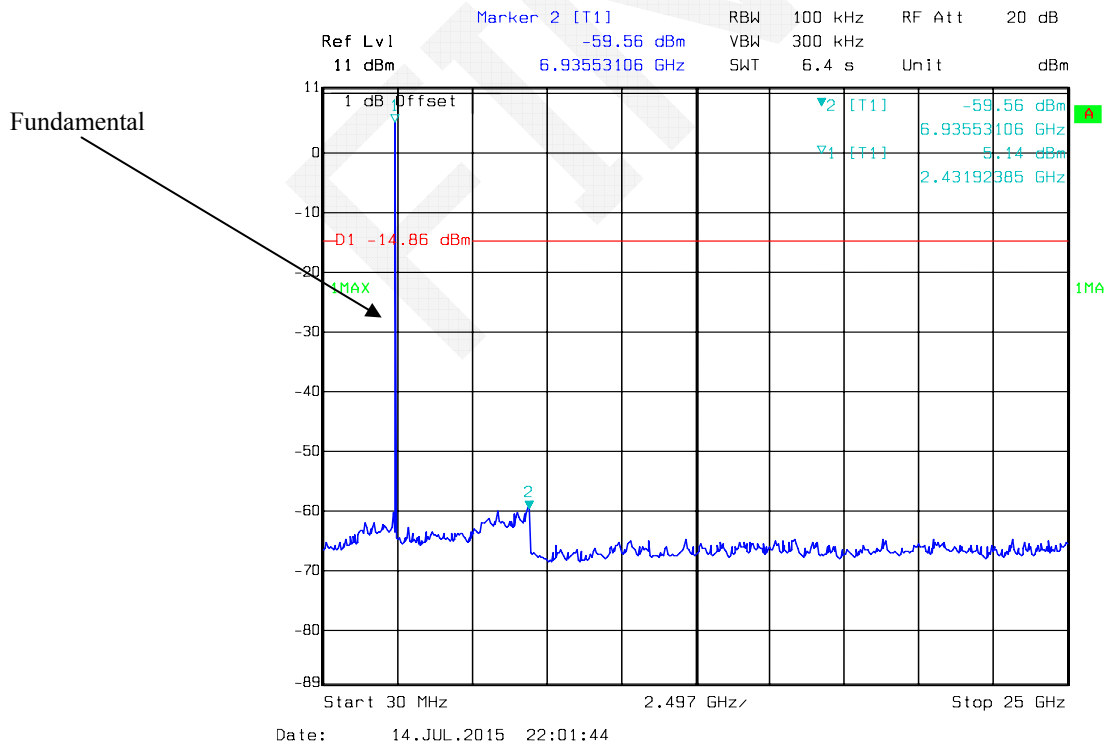
**within measurement uncertainty!*

Conducted Spurious Emissions at Antenna Port

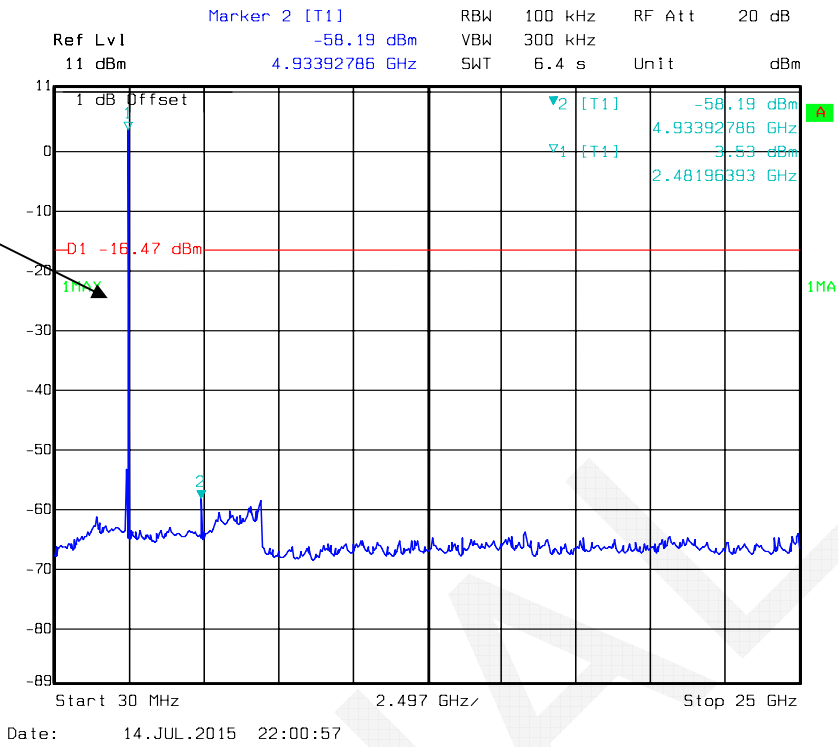
BLE Low Channel



BLE Middle Channel



BLE High Channel



Fundamental

FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH

Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r03

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------|-------|---------------|------------------|----------------------|
| R&S | Spectrum Analyzer | FSEM | DE31388 | 2015-05-09 | 2016-05-09 |

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

Test Data

Environmental Conditions

| | |
|--------------------|----------|
| Temperature: | 26.4°C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 99.7 kPa |

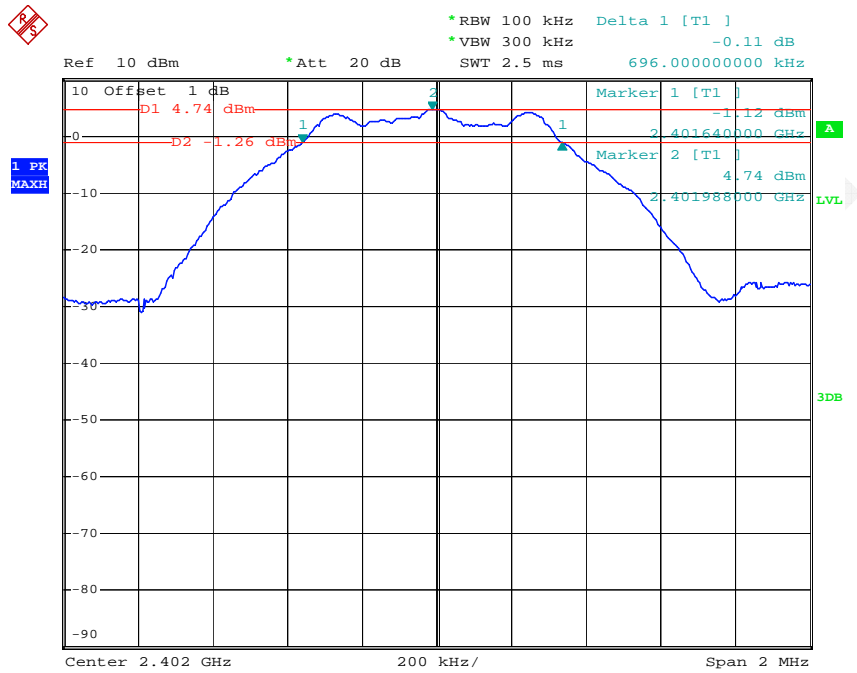
* The testing was performed by Dean Liu on 2015-07-14.

Test Mode: Transmitting

Test Result: Compliant. Please refer to the following table and plots.

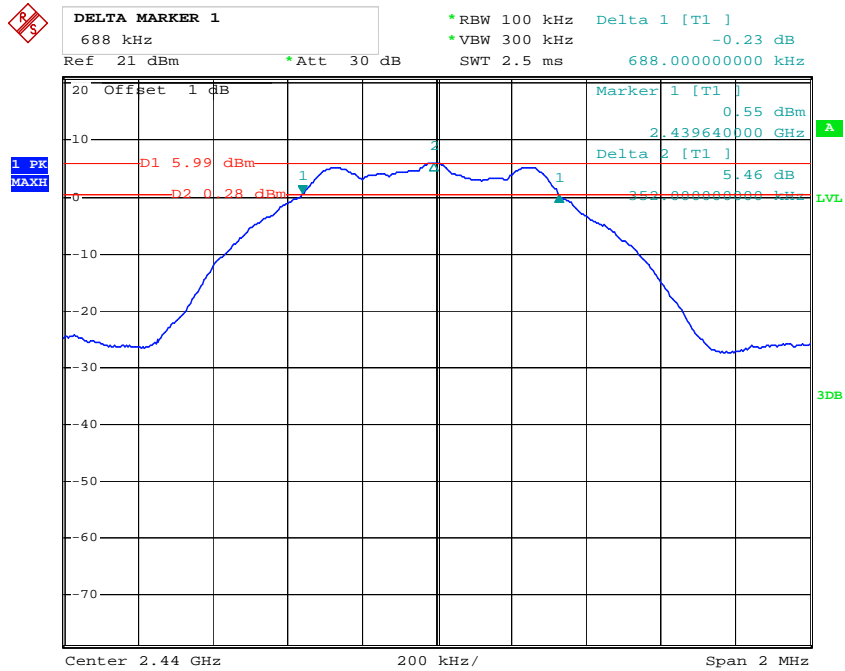
| Test mode | Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Limit (MHz) |
|-----------|---------|-----------------|----------------------|-------------|
| BLE | Low | 2402 | 0.696 | ≥0.5 |
| | Middle | 2440 | 0.688 | ≥0.5 |
| | High | 2480 | 0.708 | ≥0.5 |

Low Channel



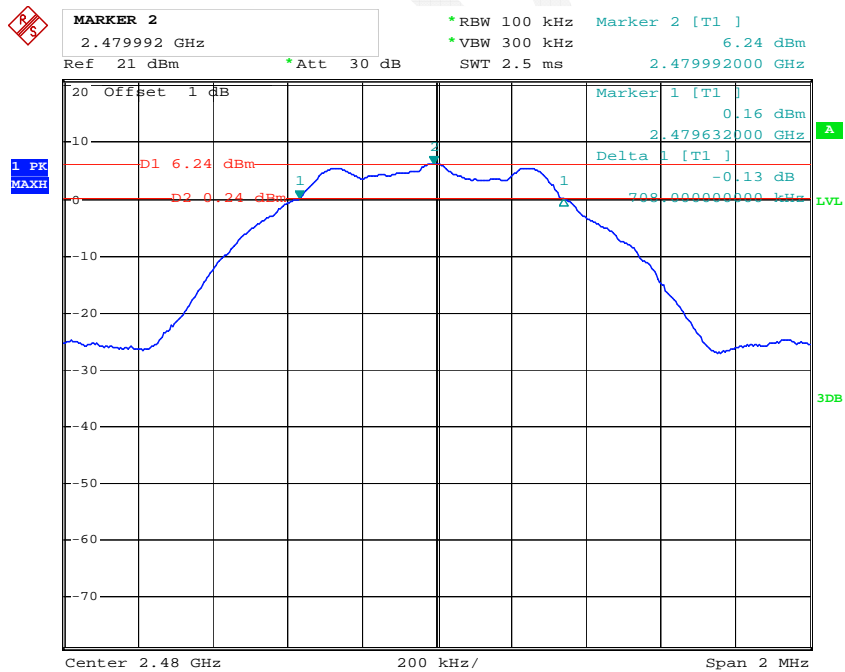
Date: 14.JUL.2015 20:34:06

Middle Channel



Date: 14.JUL.2015 21:26:55

High Channel



Date: 14.JUL.2015 21:29:01

FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r03

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to test equipment.
3. Add a correction factor to the display.



4. Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------|-------|---------------|------------------|----------------------|
| R&S | Spectrum Analyzer | FSEM | DE31388 | 2015-05-09 | 2016-05-09 |

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

Test Data

Environmental Conditions

| | |
|--------------------|----------|
| Temperature: | 26.4°C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 99.7 kPa |

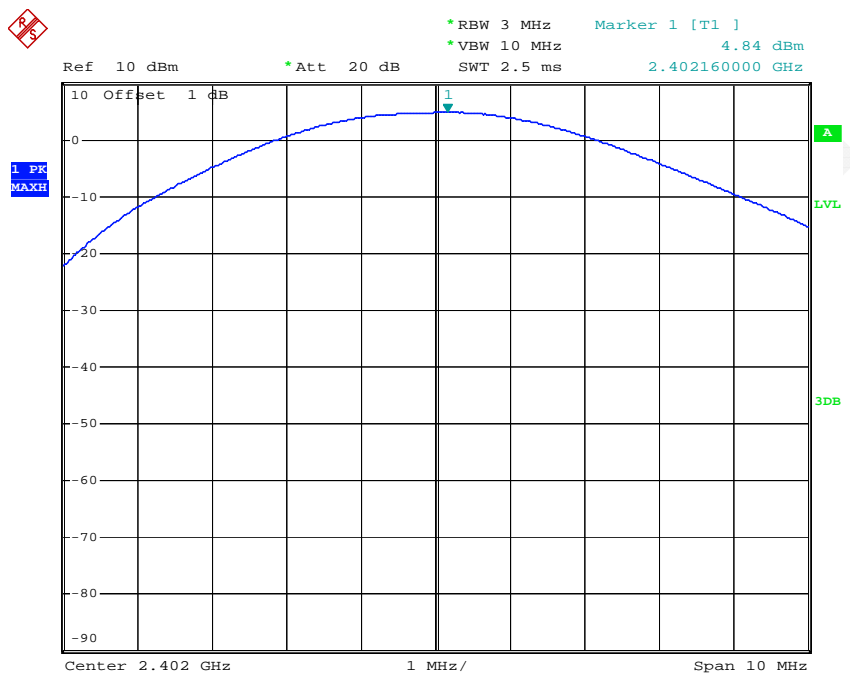
* The testing was performed by Dean Liu on 2015-07-14.

Test Mode: Transmitting (BLE)

Test Result: Compliant. Please refer to the following table.

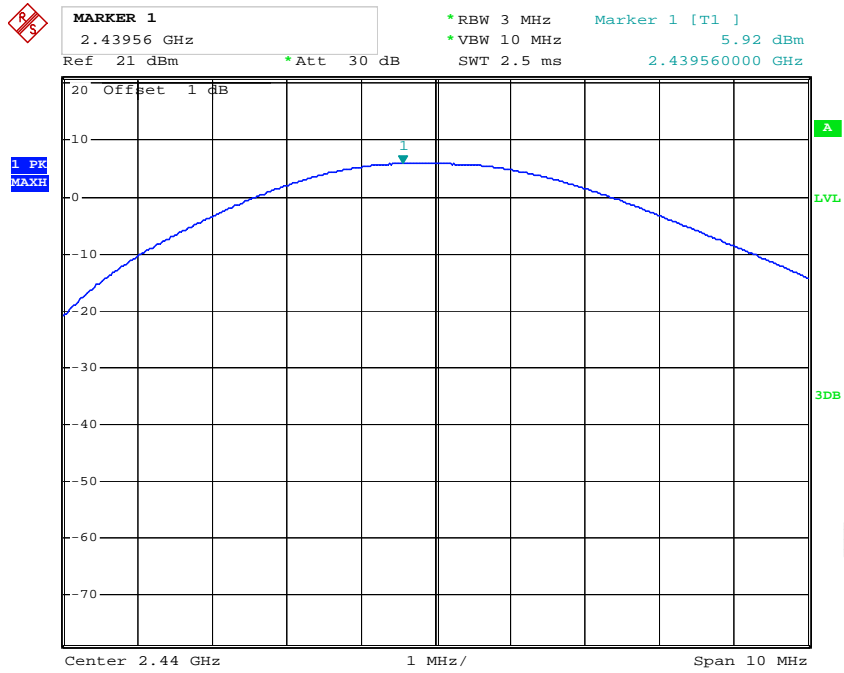
| Test mode | Channel | Frequency | Max Peak Conducted Output Power | Limit | Result |
|-----------|---------|-----------|---------------------------------|-------|--------|
| | | (MHz) | (dBm) | (dBm) | |
| BLE | Low | 2402 | 4.84 | 30 | PASS |
| | Middle | 2440 | 5.92 | 30 | PASS |
| | High | 2480 | 6.23 | 30 | PASS |

Low Channel



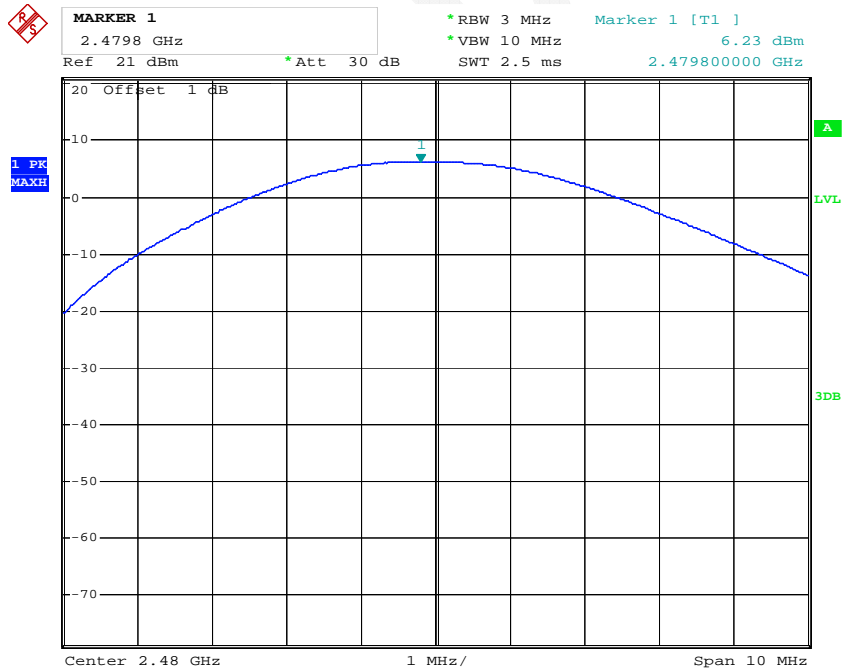
Date: 14.JUL.2015 20:34:35

Middle Channel



Date: 14.JUL.2015 21:22:48

High Channel



Date: 14.JUL.2015 21:22:03

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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 its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---------------------|--------------------|--------------|----------------------|-------------------------|-----------------------------|
| R&S | Spectrum Analyzer | FSEM | DE31388 | 2015-05-09 | 2016-05-09 |

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

Test Data

Environmental Conditions

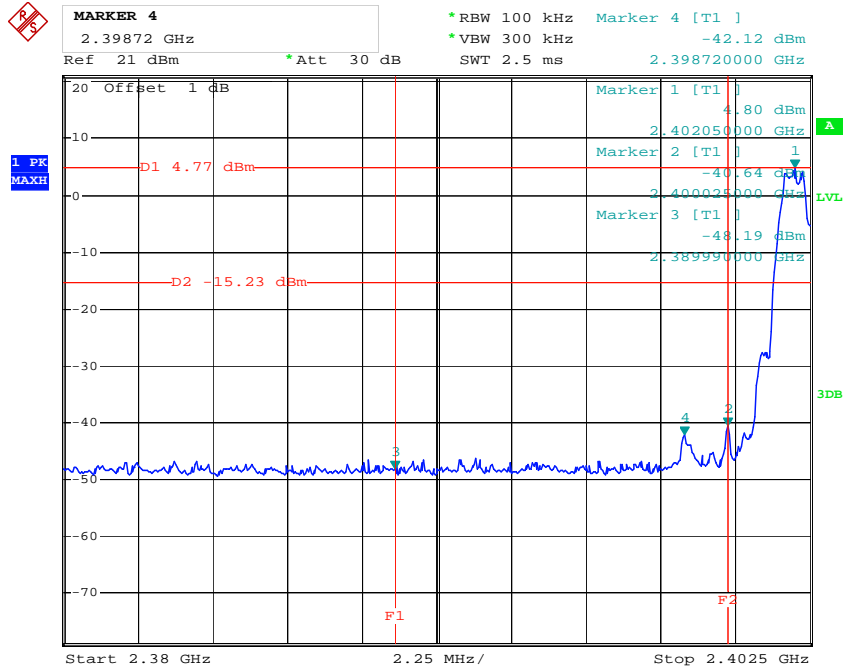
| | |
|---------------------------|----------|
| Temperature: | 26.4°C |
| Relative Humidity: | 56 % |
| ATM Pressure: | 99.7 kPa |

* The testing was performed by Dean Liu on 2015-07-14.

Test mode: Transmitting

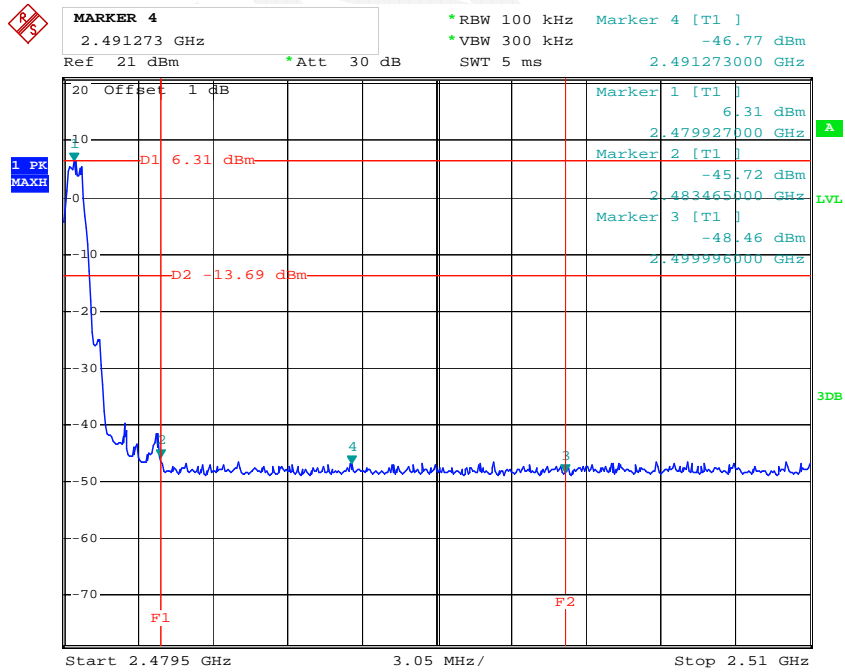
Test Result: Compliant. Please refer to following plots.

BLE Band Edge , Left Side



Date: 14.JUL.2015 21:42:38

BLE Band Edge, Right Side



Date: 14.JUL.2015 21:39:10

FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r03

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set the VBW $\geq 3 \times \text{RBW}$.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------|-------|---------------|------------------|----------------------|
| R&S | Spectrum Analyzer | FSEM | DE31388 | 2015-05-09 | 2016-05-09 |

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

Test Data

Environmental Conditions

| | |
|--------------------|---------------|
| Temperature: | 26.5~26.7°C |
| Relative Humidity: | 56~57 % |
| ATM Pressure: | 99.4~99.7 kPa |

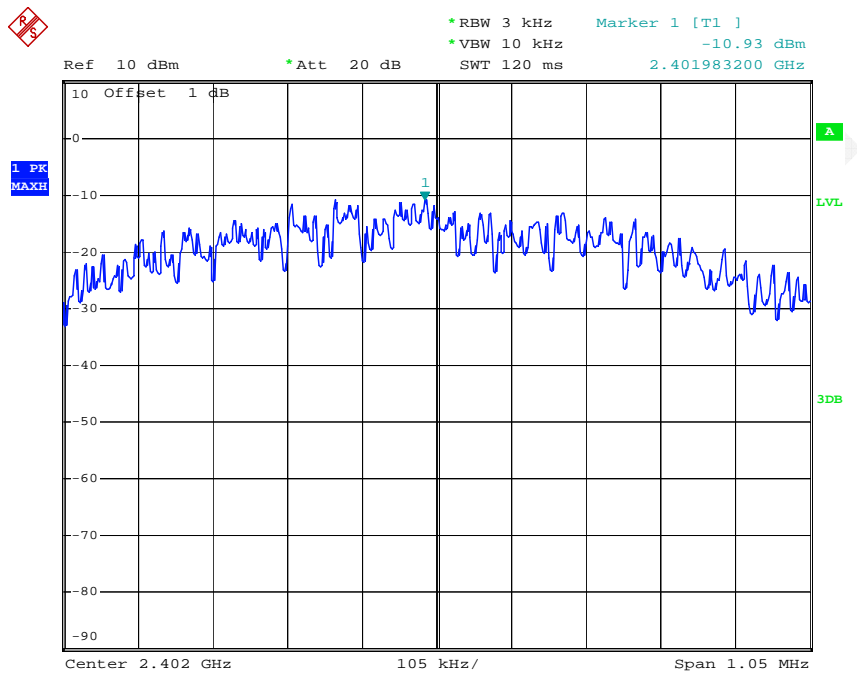
* The testing was performed by Dean Liu on 2015-07-14&2015-07-17.

Test Mode: Transmitting

Test Result: Compliant. Please refer to the following table and plots

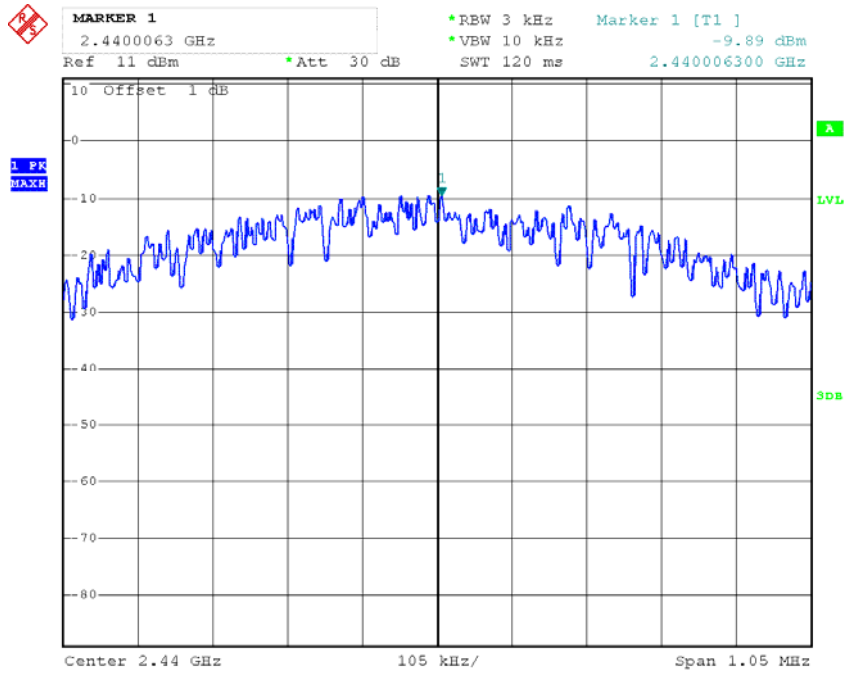
| Test mode | Channel | Frequency (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) |
|-----------|---------|-----------------|----------------|------------------|
| BLE | Low | 2402 | -10.93 | ≤8 |
| | Middle | 2440 | -9.89 | ≤8 |
| | High | 2480 | -9.74 | ≤8 |

Power Spectral Density, Low Channel



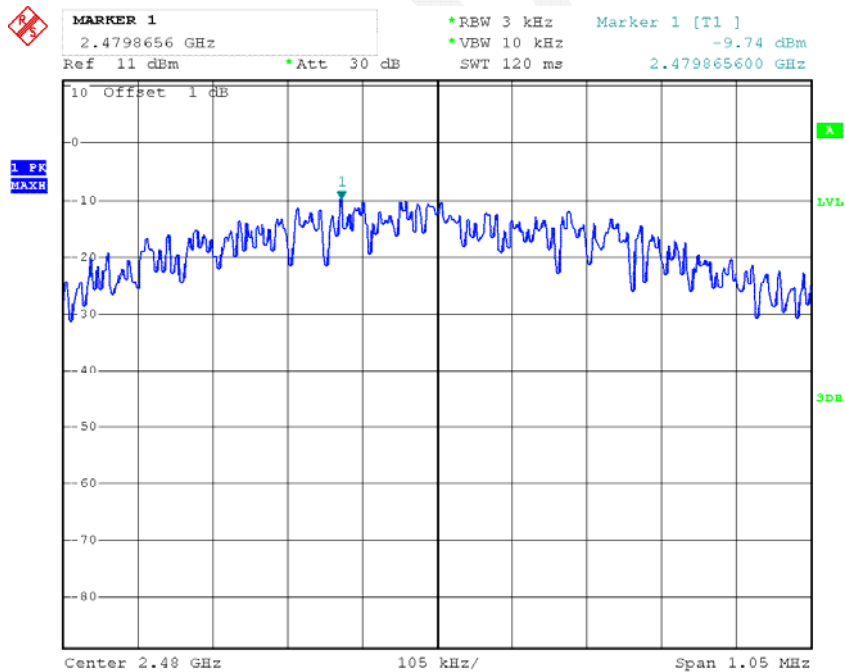
Date: 14.JUL.2015 20:34:44

Power Spectral Density, Middle Channel



Date: 17.JUL.2015 14:57:14

Power Spectral Density, High Channel



Date: 17.JUL.2015 14:56:16

DECLARATION LETTER



Zhongshan K-mate General Electronics Co.,Ltd.
NO.2 ,5th Xinsheng Street,Gangkou Town, Zhongshan City, Guangdong,China
Tel: +86 760 88668055 Fax: +86 760 88668055

DECLARATION OF SIMILARITY

2015-07-17

To: Bay Area Compliance Laboratories Corp.
1274 Anvilwood Avenue Sunnyvale, CA 94089

Dear Sir or Madam:

We, Zhongshan K-mate General Electronics Co.,Ltd., hereby declare that testing model product: Bluetooth Stereo Headset , Model number: BTH033L.Multiple Models: BTH033LN. Multiple Models have the same appearance, structure, PCB, Material and function to the testing product's model, are only are different form model name and color of appearance.

Besides the differences in the above, we declare the products are identical. We guarantee all the information provided above is true, and notice that we'll bear all the consequences caused by any false information or concealing.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Signature

Decai Liu

A handwritten signature in black ink that reads "Decai Liu".

CEO

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