

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC164886

1 of 45 Page:

FCC Radio Test Report FCC ID: 2ADUC-TW410

Original Grant

Report No. TB-FCC164886

TSKY CO., LTD **Applicant**

Equipment Under Test (EUT)

EUT Name TW410

Model No. TW410HR

Serial Model No. TW410

Brand Name Canmore

Receipt Date 2019-03-20

2019-03-21 to 2019-03-29 **Test Date**

Issue Date 2019-03-30

FCC Part 15: 2018, Subpart C(15.247) **Standards**

Test Method ANSI C63.10: 2013

Conclusions PASS

In the configuration tested, the EUT complied with the standards specified above,

Test/Witness

Engineer

Engineer

Supervisor

Engineer Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

TB-RF-074-1.0

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Revision History

| Report No. | Version | Description | Issued Date |
|--------------|---------|-------------------------|--------------------------|
| TB-FCC164886 | Rev.01 | Initial issue of report | 2019-03-30 |
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1. General Information about EUT

1.1 Client Information

| Applicant | • | TSKY CO., LTD |
|--------------|---|---|
| Address | | 21F2, No.8, Ziqiang S. Rd., Zhubei City, Hsinchu County 302, Taiwan |
| Manufacturer | | TSKY CO., LTD |
| Address | ÷ | 21F2, No.8, Ziqiang S. Rd., Zhubei City, Hsinchu County 302, Taiwan |

1.2 General Description of EUT (Equipment Under Test)

| EUT Name | | TW410 | | | |
|------------------------|----|--|---|--|--|
| Models No. | 1 | TW410HR, TW410 | | | |
| Model Difference | 1: | All these models are the same PCB, layout and electrical circuit, the only different is model. | | | |
| | | Operation Frequency: | Bluetooth 4.0(BLE): 2402MHz~2480MHz | | |
| | 4 | Number of Channel: | Bluetooth 4.0(BLE): 40 channels see note(3) | | |
| Product | | RF Output Power: | BLE:-4.753 dBm | | |
| Description | | Antenna Gain: | 0dBi Ceramic Antenna | | |
| | | Modulation Type: | GFSK | | |
| | | Bit Rate of Transmitter: | 1Mbps(GFSK) | | |
| Power Supply | : | DC Voltage Supply from USB Cable. DC Voltage supplied by Li-ion battery. | | | |
| Power Rating | | Input: DC 5V0.5A by USB Cab | | | |
| Software Version | | V1.0 | | | |
| Hardware Version | | V1.0 | | | |
| Connecting I/O Port(S) | : | Please refer to the User | Please refer to the User's Manual | | |

Note:

This Test Report is FCC Part 15.247 for Bluetooth BLE, the test procedure follows the FCC KDB 558074 D01 DTS Means Guidance v05.

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



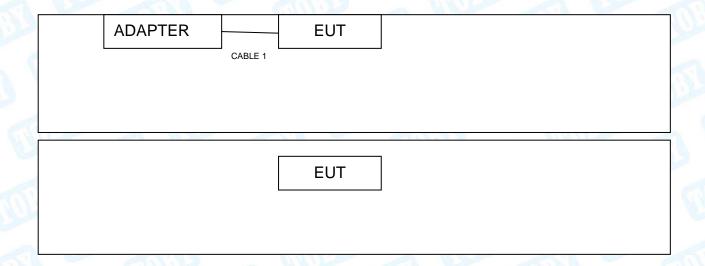
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(2) Antenna information provided by the applicant.

(3) Channel List:

| | | 11 11 11 | | | |
|---------|--------------------|----------|--------------------|---------|--------------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 00 | 2402 | 14 | 2430 | 28 | 2458 |
| 01 | 2404 | 15 | 2432 | 29 | 2460 |
| 02 | 2406 | 16 | 2434 | 30 | 2462 |
| 03 | 2408 | 17 | 2436 | 31 | 2464 |
| 04 | 2410 | 18 | 2438 | 32 | 2466 |
| 05 | 2412 | 19 | 2440 | 33 | 2468 |
| 06 | 2414 | 20 | 2442 | 34 | 2470 |
| 07 | 2416 | 21 | 2444 | 35 | 2472 |
| 08 | 2418 | 22 | 2446 | 36 | 2474 |
| 09 | 2420 | 23 | 2448 | 37 | 2476 |
| 10 | 2422 | 24 | 2450 | 38 | 2478 |
| 11 | 2424 | 25 | 2452 | 39 | 2480 |
| 12 | 2426 | 26 | 2454 | | |
| 13 | 2428 | 27 | 2456 | | |

1.3 Block Diagram Showing the Configuration of System Tested





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1.4 Description of Support Units

| Equipment Information | | | | | |
|-----------------------|---------------|------------|--------------|----------|--|
| Name | Model | FCC ID/VOC | Manufacturer | Used "√" | |
| ADAPTER | FJ-SW1202000U | | 1 | V | |

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

| For Conducted Test | | | | |
|-----------------------------|-------------|--|--|--|
| Final Test Mode Description | | | | |
| Charging+TX Mode | 9 | | | |
| | Description | | | |

| For Radiated Test | | | | |
|-----------------------------|----------------------------|--|--|--|
| Final Test Mode Description | | | | |
| Mode 2 | TX Mode | | | |
| Mode 3 | TX Mode (Channel 00/20/39) | | | |

Note:

(1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels, and the worst case data rate as follows:

BLE Mode: GFSK Modulation Transmitting mode.

- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a portable unit; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.



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1.6 Description of Test Software Setting

During testing channel& Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF setting.

| Test Software Version | n/a | | |
|-----------------------|----------|---------|----------|
| Frequency | 2402 MHz | 2442MHz | 2480 MHz |
| BLE GFSK | DEF | DEF | DEF |

1.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

| Test Item | Parameters | Expanded Uncertainty (U _{Lab}) |
|---------------------|-------------------|--|
| | Level Accuracy: | |
| Conducted Emission | 9kHz~150kHz | ±3.42 dB |
| | 150kHz to 30MHz | ±3.42 dB |
| Radiated Emission | Level Accuracy: | ±4.60 dB |
| Radiated Emission | 9kHz to 30 MHz | ±4.00 dB |
| Radiated Emission | Level Accuracy: | ±4.40 dB |
| Radiated Effilssion | 30MHz to 1000 MHz | ±4.40 db |
| Redicted Emission | Level Accuracy: | .4.20 dB |
| Radiated Emission | Above 1000MHz | ±4.20 dB |



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1.8 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01. FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.



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2. Test Summary

| Standard S | ection | 2011 | EU11775 | |
|-----------------------------|--------------------|---|----------|--------|
| FCC IC | | Test Item | Judgment | Remark |
| 15.203 | | Antenna Requirement | PASS | N/A |
| 15.207(a) | RSS-GEN 7.2.4 | Conducted Emission | PASS | N/A |
| 15.205&15.247(d) | RSS-GEN 7.2.2 | Band-Edge & Unwanted Emissions into Restricted Frequency | PASS | N/A |
| 15.247(a)(2) | RSS 247 5.2 (1) | 6dB Bandwidth | PASS | N/A |
| 15.247(b)(3) | RSS 247 5.4 (4) | Conducted Max Output Power | PASS | N/A |
| 15.247(e) | RSS 247 5.2 (2) | Power Spectral Density | PASS | N/A |
| 15.205, 15.209&15.247(d) | RSS 247 5.5 | Transmitter Radiated Spurious &Unwanted Emissions into Restricted Frequency | PASS | N/A |

Note: N/A is an abbreviation for Not Applicable.



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3. Test Equipment

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Due Date | |
|----------------------------|----------------------------------|-------------------|---------------|---------------|------------------|--|
| EMI Test Receiver | Rohde & Schwarz | ESCI | 100321 | Jul. 18, 2018 | Jul. 17, 2019 | |
| RF Switching Unit | Compliance Direction Systems Inc | RSU-A4 | 34403 | Jul. 18, 2018 | Jul. 17, 2019 | |
| AMN | SCHWARZBECK | NNBL 8226-2 | 8226-2/164 | Jul. 18, 2018 | Jul. 17, 2019 | |
| LISN | Rohde & Schwarz | ENV216 | 101131 | Jul. 18, 2018 | Jul. 17, 2019 | |
| Radiation Emission | n Test | <u>'</u> | <u> </u> | | | |
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Due Date | |
| Spectrum Analyzer | Agilent | E4407B | MY45106456 | Jul. 18, 2018 | Jul. 17, 2019 | |
| EMI Test Receiver | Rohde & Schwarz | ESPI | 100010/007 | Jul. 18, 2018 | Jul. 17, 2019 | |
| Bilog Antenna | ETS-LINDGREN | 3142E | 00117537 | Jan. 27, 2019 | Jan. 26, 2020 | |
| Bilog Antenna | ETS-LINDGREN | 3142E | 00117542 | Jan. 27, 2019 | Jan. 26, 2020 | |
| Horn Antenna | ETS-LINDGREN | 3117 | 00143207 | Mar.03, 2019 | Mar. 02, 2020 | |
| Horn Antenna | ETS-LINDGREN | 3117 | 00143209 | Mar.03, 2019 | Mar. 02, 202 | |
| Loop Antenna | SCHWARZBECK | FMZB 1519 B | 1519B-059 | Jan. 27, 2019 | Jan. 26, 2020 | |
| Pre-amplifier | Sonoma | 310N | 185903 | Mar.04, 2019 | Mar. 03, 2020 | |
| Pre-amplifier | HP | 8449B | 3008A00849 | Mar.03, 2019 | Mar. 02, 2020 | |
| Cable | HUBER+SUHNER | 100 | SUCOFLEX | Mar.03, 2019 | Mar. 02, 2020 | |
| Positioning Controller | ETS-LINDGREN | 2090 | N/A | N/A | N/A | |
| Antenna Conducte | ed Emission | | | | | |
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Due Date | |
| Spectrum Analyzer | Agilent | E4407B | MY45106456 | Jul. 18, 2018 | Jul. 17, 2019 | |
| Spectrum Analyzer | Rohde & Schwarz | ESCI | 100010/007 | Jul. 18, 2018 | Jul. 17, 2019 | |
| MXA Signal Analyzer | Agilent | N9020A | MY49100060 | Sep. 15, 2018 | Sep. 14, 2019 | |
| Vector Signal Generator | Agilent | N5182A | MY50141294 | Sep. 15, 2018 | Sep. 14, 2019 | |
| Analog Signal Generator | Agilent | N5181A | MY50141953 | Sep. 15, 2018 | Sep. 14, 2019 | |
| 319 | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO26 | Sep. 15, 2018 | Sep. 14, 2019 | |
| | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO29 | Sep. 15, 2018 | Sep. 14, 2019 | |
| RF Power Sensor | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO31 | Sep. 15, 2018 | Sep. 14, 2019 | |
| | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO33 | Sep. 15, 2018 | Sep. 14, 2019 | |



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4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

4.1.2 Test Limit

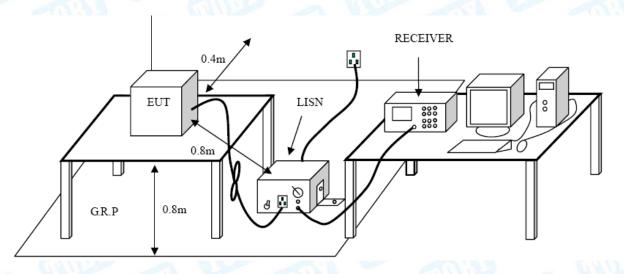
Conducted Emission Test Limit

| | Maximum RF Line Voltage (dBμV) | | | | | |
|---------------|--------------------------------|---------------|--|--|--|--|
| Frequency | Quasi-peak Level | Average Level | | | | |
| 150kHz~500kHz | 66 ~ 56 * | 56 ~ 46 * | | | | |
| 500kHz~5MHz | 56 | 46 | | | | |
| 5MHz~30MHz | 60 | 50 | | | | |

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.



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I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9 kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Da5ta

Please refer to the Attachment A.



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5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 15.247(d)

5.1.2 Test Limit

Radiated Emission Limits (9kHz~1000MHz)

| Frequency (MHz | Field Strength (microvolt/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 |

Radiated Emission Limit (Above 1000MHz)

| Frequency | Distance Meters(at 3m) | | | | |
|------------|------------------------|---------------------|--|--|--|
| (MHz) | Peak (dBuV/m) | Average (dBuV/m) | | | |
| Above 1000 | 74 | 54 | | | |

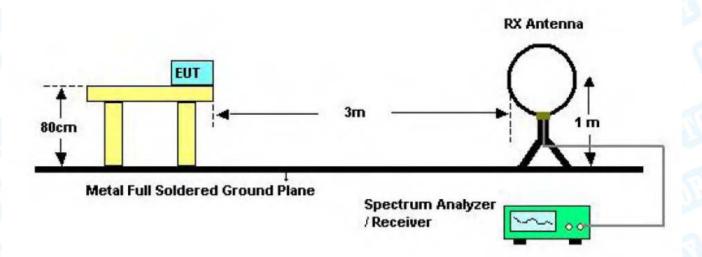
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m)

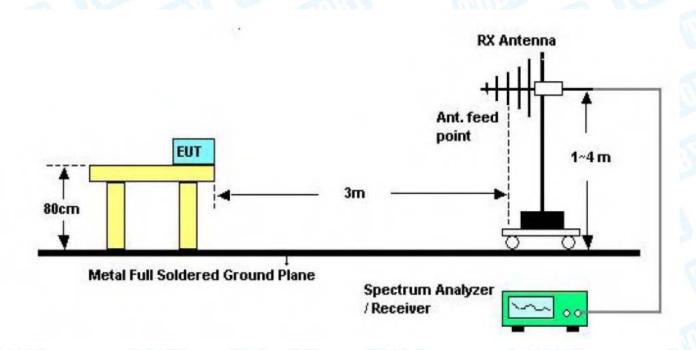


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5.2 Test Setup



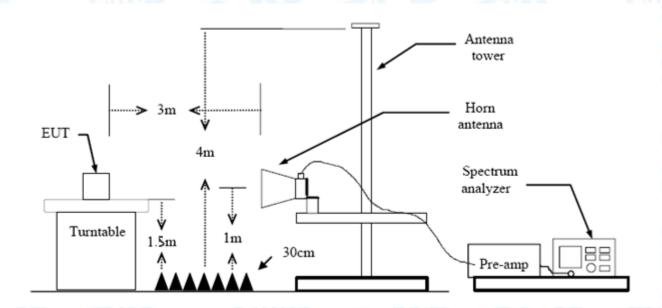
Below 30MHz Test Setup



Below 1000MHz Test Setup



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Above 1GHz Test Setup

5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.



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5.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

5.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Please refer to the Attachment B.



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6. Restricted Bands Requirement

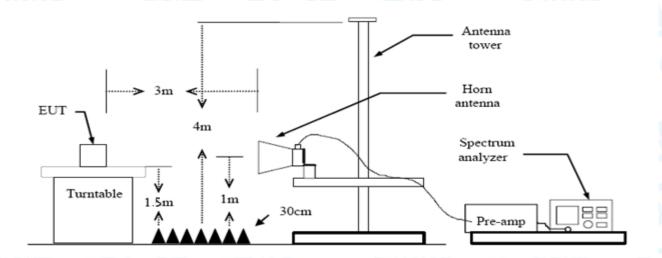
6.1 Test Standard and Limit

6.1.1 Test Standard FCC Part 15.247(d) FCC Part 15.205

6.1.2 Test Limit

| Restricted Frequency | Distance Meters(at 3m) | | | | |
|----------------------|------------------------|---------------------|--|--|--|
| Band (MHz) | Peak (dBuV/m) | Average (dBuV/m) | | | |
| 2310 ~2390 | 74 | 54 | | | |
| 2483.5 ~2500 | 74 | 54 | | | |

6.2 Test Setup



6.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector



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mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

6.4 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

6.5 Test Data

Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Please refer to the Attachment C.



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7. Bandwidth Test

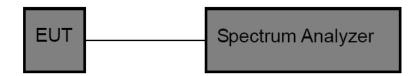
7.1 Test Standard and Limit

7.1.1 Test Standard FCC Part 15.247 (a)(2)

7.1.2 Test Limit

| FCC P | FCC Part 15 Subpart C(15.247)/RSS-247 | | | | | | | | |
|-----------|---------------------------------------|----------------------|--|--|--|--|--|--|--|
| Test Item | Limit | Frequency Range(MHz) | | | | | | | |
| Bandwidth | >=500 KHz (6dB bandwidth) | 2400~2483.5 | | | | | | | |

7.2 Test Setup



7.3 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.
- (3)Measure the channel separation the spectrum analyzer was set to Resolution Bandwidth:100 kHz, and Video Bandwidth:300 kHz, Detector: Peak, Sweep Time set auto.

7.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, middle and high channel for the test.

7.5 Test Data

Please refer to the Attachment D.



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8. Peak Output Power Test

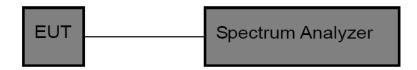
8.1 Test Standard and Limit

8.1.1 Test Standard FCC Part 15.247 (b)(3)

8.1.2 Test Limit

| FCC Part 15 Subpart C(15.247)/RSS-247 | | | | | | | | |
|---------------------------------------|------------------|----------------------|--|--|--|--|--|--|
| Test Item | Limit | Frequency Range(MHz) | | | | | | |
| Peak Output Power | 1 Watt or 30 dBm | 2400~2483.5 | | | | | | |

8.2 Test Setup



8.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement is according to section 9.1.1 of KDB 558074 D01 DTS Meas Guidance v05.

- (1) Set the RBW≥DTS Bandwidth
- (2) Set VBW≥3*RBW
- (3) Set Span≥3*RBW
- (4) Sweep time=auto
- (5) Detector= peak
- (6) Trace mode= maxhold.
- (7) Allow trace to fully stabilize, and then use peak marker function to determine the peak amplitude level.

8.4 EUT Operating Condition

The EUT was set to continuously transmitting in the max power during the test.

8.5 Test Data

Please refer to the Attachment E.



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9. Power Spectral Density Test

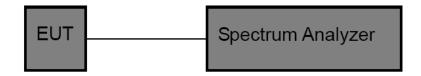
9.1 Test Standard and Limit

9.1.1 Test Standard FCC Part 15.247 (e)

9.1.2 Test Limit

| FCC Part 15 Subpart C(15.247) | | | | | | | |
|-------------------------------|--------------------|----------------------|--|--|--|--|--|
| Test Item | Limit | Frequency Range(MHz) | | | | | |
| Power Spectral Density | 8dBm(in any 3 kHz) | 2400~2483.5 | | | | | |

9.2 Test Setup



9.3 Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyser center frequency to DTS channel center frequency.
- (3) Set the span to 1.5 times the DTS bandwidth.
- (4) Set the RBW to: 3 kHz(5) Set the VBW to: 10 kHz
- (6) Detector: peak
- (7) Sweep time: auto
- (8) Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

9.4 EUT Operating Condition

The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

9.5 Test Data

Please refer to the Attachment F.



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10. Antenna Requirement

10.1 Standard Requirement

10.1.1 Standard FCC Part 15.203

10.1.2 Requirement

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 use of a standard antenna jack or electrical connector is prohibited.

10.2 Antenna Connected Construction

The gains of the antenna used for transmitting is 0dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

10.3 Result

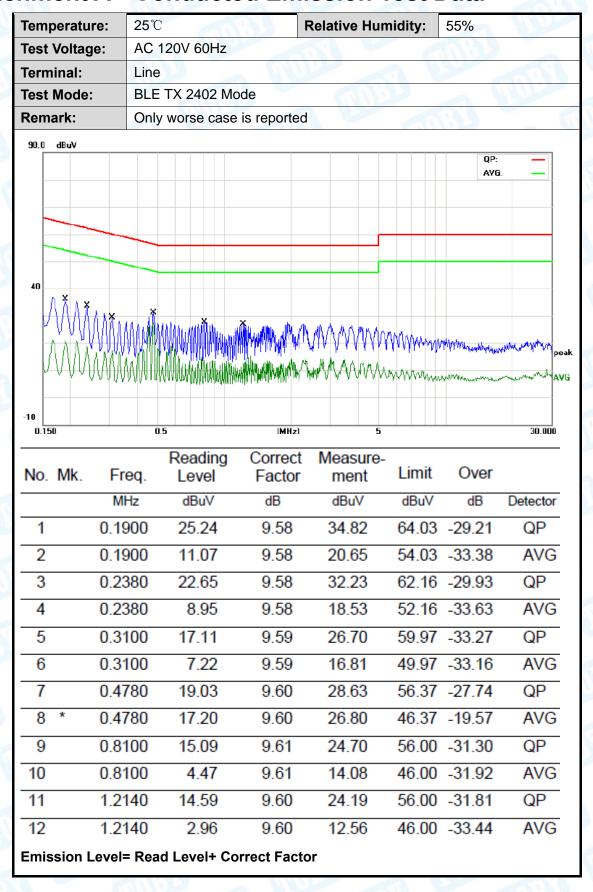
The EUT antenna is a Ceramic Antenna. It complies with the standard requirement.

| Antenna Type | |
|------------------------------------|----------|
| ⊠Permanent attached antenna | ALL THE |
| Unique connector antenna | |
| ☐Professional installation antenna | J. Thirt |



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Attachment A-- Conducted Emission Test Data





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| Temperature | 25°C | C | | Relative H | umidity: | 55% | | | | |
|--|---|--|--|--|---|--|--|--|--|--|
| Test Voltage | : AC | 120V 60Hz | 130 | - Offi | 1 | | | | | |
| Terminal: | Neu | utral | 1 | 111 | 6 | MINE | | | | |
| Test Mode: | BLE | TX 2402 M | ode | | 1 6 | | | | | |
| Remark: | Onl | y worse case | e is reported | THE PERSON NAMED IN | | 1 N | The same | | | |
| 90.0 dBuV | | | | | | 0.0 | | | | |
| | | | | | | QP: AVG: | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| 40 A X | ¥ | | | | | | | | | |
| /\/\/\ <u>*</u> | An., 100. | 11M | Xi Xi | 4. 4 | | | | | | |
| $\frac{1}{\sqrt{\lambda}} \frac{\sqrt{\lambda}}{\sqrt{\lambda}} \frac{\sqrt{\lambda}}{\lambda}} \frac{\sqrt{\lambda}}{\sqrt{\lambda}} \frac{\sqrt{\lambda}}{\lambda}} \frac{\sqrt{\lambda}}{\sqrt{\lambda}} \frac{\sqrt{\lambda}}$ | AAAAAAAA | | | {\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | AYAAAAAAAAAAA | harana de la como de l | WANTED TO DE | | | |
| | Ah aanna kuu | | | MWww | | 7 40 - 11. | | | | |
| ע טיי איי | AAAAAAAAAAAA | ZYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYYY | ATTER THE STREET OF THE STREET | 1 1 2 , 4 1 1 1 1 1 1 | h AMANANA WANGA | 48400mmpayoona | A Commence of the A | | | |
| -10 | | | | | | | | | | |
| 0.150 | 0.9 | 5 | (MHz) | 5 | | | 30.000 | | | |
| | | | | | | | | | | |
| | | Deeding | Onmost | Managema | | | | | | |
| No. Mk. | Freg. | Reading Level | Correct Factor | Measure- ment | Limit | Over | | | | |
| No. Mk. | Freq. | Level | Factor | ment | | | Detector | | | |
| | MHz | Level dBuV | Factor dB | ment dBuV | dBuV | dB | | | | |
| 1 | MHz 0.1900 | dBuV 25.13 | Factor dB 9.65 | ment dBuV 34.78 | dBuV 64.03 | dB -29.25 | QP | | | |
| 1 2 | MHz 0.1900 0.1900 | dBuV 25.13 12.60 | Factor dB 9.65 9.65 | ment dBuV 34.78 22.25 | dBuV 64.03 54.03 | dB -29.25 -31.78 | QP AVG | | | |
| 1 2 3 | MHz 0.1900 0.1900 0.2580 | Level dBuV 25.13 12.60 16.54 | 9.65 9.65 9.60 | ment dBuV 34.78 22.25 26.14 | dBuV 64.03 54.03 61.49 | dB -29.25 -31.78 -35.35 | QP AVG QP | | | |
| 1 2 3 | MHz 0.1900 0.1900 | dBuV 25.13 12.60 | Factor dB 9.65 9.65 | ment dBuV 34.78 22.25 | dBuV 64.03 54.03 61.49 | dB -29.25 -31.78 | QP AVG QP | | | |
| 1 2 3 4 | MHz 0.1900 0.1900 0.2580 | Level dBuV 25.13 12.60 16.54 | 9.65 9.65 9.60 | ment dBuV 34.78 22.25 26.14 | dBuV 64.03 54.03 61.49 51.49 | dB -29.25 -31.78 -35.35 | QP AVG QP AVG | | | |
| 1 2 3 4 5 | MHz 0.1900 0.1900 0.2580 0.2580 | Level dBuV 25.13 12.60 16.54 6.78 | 9.65 9.65 9.60 9.60 | ment dBuV 34.78 22.25 26.14 16.38 | dBuV 64.03 54.03 61.49 51.49 56.51 | dB -29.25 -31.78 -35.35 -35.11 | QP AVG QP AVG | | | |
| 1 2 3 4 5 6 * | MHz 0.1900 0.1900 0.2580 0.2580 0.4700 | Level dBuV 25.13 12.60 16.54 6.78 15.06 | 9.65 9.65 9.60 9.58 | ment dBuV 34.78 22.25 26.14 16.38 24.64 | dBuV 64.03 54.03 61.49 51.49 56.51 46.51 | dB -29.25 -31.78 -35.35 -35.11 -31.87 | QP AVG QP AVG QP | | | |
| 1 2 3 4 5 6 * | MHz 0.1900 0.1900 0.2580 0.2580 0.4700 0.4700 0.5899 | Level dBuV 25.13 12.60 16.54 6.78 15.06 10.02 11.61 | 9.65 9.65 9.60 9.60 9.58 9.58 | ment dBuV 34.78 22.25 26.14 16.38 24.64 19.60 21.19 | dBuV 64.03 54.03 61.49 51.49 56.51 46.51 56.00 | dB -29.25 -31.78 -35.35 -35.11 -31.87 -26.91 -34.81 | QP AVG QP AVG QP AVG | | | |
| 1 2 3 4 5 6 * 7 | MHz 0.1900 0.1900 0.2580 0.2580 0.4700 0.4700 0.5899 0.5899 | Level dBuV 25.13 12.60 16.54 6.78 15.06 10.02 11.61 6.02 | 9.65 9.65 9.60 9.60 9.58 9.58 9.58 | ment dBuV 34.78 22.25 26.14 16.38 24.64 19.60 21.19 15.60 | dBuV 64.03 54.03 61.49 51.49 56.51 46.51 56.00 | dB -29.25 -31.78 -35.35 -35.11 -31.87 -26.91 -34.81 -30.40 | QP AVG QP AVG QP AVG | | | |
| 1 2 3 4 5 6 * 7 8 | MHz 0.1900 0.1900 0.2580 0.2580 0.4700 0.4700 0.5899 0.5899 1.2460 | Level dBuV 25.13 12.60 16.54 6.78 15.06 10.02 11.61 6.02 1.50 | 9.65 9.65 9.60 9.60 9.58 9.58 9.58 9.58 | ment dBuV 34.78 22.25 26.14 16.38 24.64 19.60 21.19 15.60 11.09 | dBuV 64.03 54.03 61.49 51.49 56.51 46.51 56.00 46.00 | dB -29.25 -31.78 -35.35 -35.11 -31.87 -26.91 -34.81 -30.40 -44.91 | QP AVG QP AVG QP AVG QP AVG | | | |
| 1 2 3 4 5 6 * 7 8 9 | MHz 0.1900 0.1900 0.2580 0.2580 0.4700 0.4700 0.5899 0.5899 1.2460 1.2460 | Level dBuV 25.13 12.60 16.54 6.78 15.06 10.02 11.61 6.02 1.50 -4.14 | 9.65 9.65 9.60 9.60 9.58 9.58 9.58 9.59 | ment dBuV 34.78 22.25 26.14 16.38 24.64 19.60 21.19 15.60 11.09 5.45 | dBuV 64.03 54.03 61.49 51.49 56.51 46.51 56.00 46.00 | dB -29.25 -31.78 -35.35 -35.11 -31.87 -26.91 -34.81 -30.40 -44.91 -40.55 | AVG QP AVG QP AVG QP AVG | | | |
| 1 2 3 4 5 6 * 7 8 9 10 | MHz 0.1900 0.1900 0.2580 0.2580 0.4700 0.4700 0.5899 0.5899 1.2460 | Level dBuV 25.13 12.60 16.54 6.78 15.06 10.02 11.61 6.02 1.50 | 9.65 9.65 9.60 9.60 9.58 9.58 9.58 9.58 | ment dBuV 34.78 22.25 26.14 16.38 24.64 19.60 21.19 15.60 11.09 | dBuV 64.03 54.03 61.49 51.49 56.51 46.51 56.00 46.00 56.00 | dB -29.25 -31.78 -35.35 -35.11 -31.87 -26.91 -34.81 -30.40 -44.91 | QP AVG QP AVG QP AVG QP AVG | | | |

Emission Level= Read Level+ Correct Factor



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Attachment B-- Radiated Emission Test Data

9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB

Below the permissible value has no need to be reported.

30MHz~1GHz

| Temperatu | re: | 25℃ | | | | | Relative Humidity: 55% | | | | | | | | | | | | |
|--------------|---------|----------|------|-------|----------|------|---|----------|-------------------|---------|-----|---------|---------|------|---------|------------------|----|------|----------|
| Test Voltag | je: | DC: | 3.7\ | / | | | | | M. | | | | | Į. | | | | | |
| Ant. Pol. | | Hori | zon | tal | | | | | 62 | | d | ĸ | | ١ | 7 | | * | ď | N |
| Test Mode: | | BLE | TX | 24 | 02 N | 1ode | е | | | | 1 | | | | d | 1 | | | |
| Remark: | | Only | / WC | rse | cas | e is | reporte | ed | 113 | 3 | | | | | | | | | |
| 80.0 dBuV/m | | | | | | | | | | | | | | | | | | | 7 |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | (R | F)FCC | 150 | | ladiat largin | | , | + |
| | | | | | | | | | | | | | | | | | | - | 1 |
| | | | | ╏ | | | | | | | 6 | | | | | | | ᅷ | |
| 30 | | | | | | | | | 5 X | k. | Ň | . برميا | | | | | | | |
| X X | | | | | 2 | | 3 X .w ^M / | 4 X | | ₩W | " - | W. V. | MANA AN | Mary | and the | yn dr | ww | ~/^/ | 7 |
| W W | M | | | ۸ | NΜ | Now | 3 // ^{**} ///////////////////////////////// | ringping | י אר זיין ייוואאי | 101 [1] | | - | | | _ | | _ | | - |
| | | War | w/w | , WW. | <u> </u> | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| -20 | | | | | | | | | | | | | | | | | | | |
| 30.000 40 | 50 | 60 | 70 | 80 | | | (MH: | z) | | 30 |)0 | 40 | 00 | 500 | 60 | 0 70 | 0 | 1000 | 0.00 |
| No. Mi | Г- | | F | | ding | g | Corre | | Meas | | | Lin | oit | | 0 | /er | | | |
| No. Mk. | | eq. | | | vel | | Facto | or | me | | | | | | | | | | |
| | M | | | | Bu∨ | | dB/m | | dBu\ | | | | ıV/r | | | В | | Dete | |
| 1 | 32.4 | 059 | | 34 | .99 | | -14.8 | 1 | 20. | 18 | | 40 | .00 |) | -19 | 9.82 | 2 | QF |) |
| 2 | 103.8 | 3055 | | 35 | .97 | | -22.23 | 3 | 13. | 74 | | 43 | .50 |) | -29 | 9.7 | 6 | QF |) |
| 3 | 143.3 | 3261 | | 41 | .53 | | -22.14 | 4 | 19. | 39 | | 43 | .50 |) | -24 | 1.1 | 1 | QF |) |
| 4 | 184.4 | 1898 | | 38 | .40 | | -20.02 | 2 | 18. | 38 | | 43 | .50 |) | -25 | 5.12 | 2 | QF | <u> </u> |
| 5 | 235.8 | 3164 | | 42 | .67 | | -17.97 | 7 | 24. | 70 | | 46 | .00 |) | -2′ | 1.3 | 0 | QF |) |
| 6 * | 332.5 | 187 | | 45 | .39 | | -15.14 | 4 | 30. | 25 | | 46 | .00 |) | -15 | 5.7 | 5 | QF | <u> </u> |
| *:Movi | | Over !! | -i+ | Lieu | or 11-2 | | | | | | | | | | | | | | |
| *:Maximum da | ııa x:0 | Over lir | IIII | !:OV | er mar | gin | | | | | | | | | | | | | |
| Emission L | evel= | Rea | d L | eve | ıl+ C | orr | ect Fac | tor | | | | | | | | | | | |



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| Temperature: | 25℃ | The same of | R | elative Humi | dity: | 55% | |
|--|----------------|----------------|-------------------|--------------|----------|-------------------------------|--------|
| Test Voltage: | DC 3.7 | 7V | 30 | - OHI | | | |
| Ant. Pol. | Vertica | al | 100 | 11 | GU | 1130 | |
| Test Mode: | BLE T | X 2402 Mod | 10 | and the same | 19 | | |
| Remark: | Only w | orse case i | s reported | MILLER | | 2 M | |
| 80.0 dBuV/m | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | (RF)FCC | 15C 3M Radiation Margin -5 | |
| | | | | | | in digit o | |
| | | | | | | | |
| 30 1 2 | | | | | 5 4 X | 6 | |
| | W | | э ү | MANAMANANA N | | han Marin | Lumber |
| \ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | war war | www.cm/Allylli | Malland Aller | WHANKANAA 17 | 1 100 | | |
| | V _V | ANT MINING | HIAIM- | | | | |
| | | | | | | | |
| | | | | | | | |
| 20 20 30.000 40 5 | 0 60 70 | | (MHz) | 300 | 400 ! | 500 600 700 | 1000.0 |
| 55.500 | | | (2) | | | 303 303 100 | 1000.0 |
| | _ | Reading | Correct | Measure- | Limit | 0 | |
| No. Mk. | Freq. | Level | Factor | ment | Limit | Over | |
| | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detect |
| 1 * 32 | .4059 | 42.29 | -14.81 | 27.48 | 40.00 | -12.52 | QP |
| 2 47 | .9940 | 46.80 | -22.57 | 24.23 | 40.00 | -15.77 | QP |
| 3 169 | 9.5990 | 40.14 | -20.54 | 19.60 | 43.50 | -23.90 | QP |
| 4 361 | 1.7139 | 34.84 | -14.04 | 20.80 | 46.00 | -25.20 | QP |
| | 7.1199 | 37.67 | -12.06 | 25.61 | 46.00 | | QP |
| | 5.7073 | 37.42 | -9.55 | 27.87 | 46.00 | | QP |
| 0 000 | | 01.72 | -0.00 | 21.01 | 40.00 | -10.13 | Q(I |
| *:Maximum data | x:Over limit | !:over margin | _ | | | | |
| | | | | | | | |
| Emission Leve | el= Read | Level+ Cor | rect Factor | r | | | |



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Above 1GHz

| Temperature: | 25℃ | Relative Humidity: | 55% | | |
|---------------|--|--------------------|-----|--|--|
| Test Voltage: | DC 3.7V | | | | |
| Ant. Pol. | Horizontal | | | | |
| Test Mode: | BLE Mode TX 2402 MHz | | | | |
| Remark: | No report for the emission which more than 10 dB below the | | | | |
| | prescribed limit. | | | | |

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Over | |
|-----|-----|----------|------------------|-------------------|------------------|--------|--------|----------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 4804.252 | 47.30 | 14.43 | 61.73 | 74.00 | -12.27 | peak |
| 2 | * | 4804.984 | 34.00 | 14.44 | 48.44 | 54.00 | -5.56 | AVG |



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| Temperature: | 25℃ | Relative Humidity: | 55% | | | |
|---------------|--|----------------------|-----|--|--|--|
| Test Voltage: | DC 3.7V | | | | | |
| Ant. Pol. | Vertical | | | | | |
| Test Mode: | BLE Mode TX 2402 MHz | BLE Mode TX 2402 MHz | | | | |
| Remark: | No report for the emission which more than 10 dB below the | | | | | |
| | prescribed limit. | | | | | |

| ı | No. | Mk. | Freq. | _ | Correct Factor | Measure- ment | Limit | Over | |
|---|-----|-----|----------|-------|-------------------|------------------|--------|--------|----------|
| | | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | * | 4803.256 | 34.05 | 14.42 | 48.47 | 54.00 | -5.53 | AVG |
| 2 | | | 4804.306 | 48.01 | 14.43 | 62.44 | 74.00 | -11.56 | peak |



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| Temperature: | 25℃ | Relative Humidity: | 55% | | | |
|---------------|--|----------------------|-----|--|--|--|
| Test Voltage: | DC 3.7V | | | | | |
| Ant. Pol. | Horizontal | | | | | |
| Test Mode: | BLE Mode TX 2442 MHz | BLE Mode TX 2442 MHz | | | | |
| Remark: | No report for the emission which more than 10 dB below the | | | | | |
| | prescribed limit. | | | | | |

| No. | Mk. | . Freq. | _ | Correct Factor | Measure- ment | Limit | Over | |
|-----|-----|----------|-------|-------------------|------------------|--------|--------|----------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | * | 4883.972 | 29.85 | 14.92 | 44.77 | 54.00 | -9.23 | AVG |
| 2 | | 4884.160 | 44.32 | 14.92 | 59.24 | 74.00 | -14.76 | peak |



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| Temperature: | 25℃ | Relative Humidity: | 55% | | | |
|---------------|--|--------------------|-----|--|--|--|
| Test Voltage: | DC 3.7V | | | | | |
| Ant. Pol. | Vertical | | | | | |
| Test Mode: | BLE Mode TX 2442 MHz | 0 | | | | |
| Remark: | No report for the emission which more than 10 dB below the | | | | | |
| | prescribed limit. | | | | | |

| No | . Mk. | Freq. | Reading Level | | Measure- ment | Limit | Over | |
|----|-------|----------|------------------|-------|------------------|--------|--------|----------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | * | 4883.952 | 37.25 | 14.92 | 52.17 | 54.00 | -1.83 | AVG |
| 2 | | 4884.232 | 48.89 | 14.92 | 63.81 | 74.00 | -10.19 | peak |



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| Temperature: | 25℃ | Relative Humidity: | 55% | | | |
|---------------|--|--------------------|-----|--|--|--|
| Test Voltage: | DC 3.7V | | | | | |
| Ant. Pol. | Horizontal | | | | | |
| Test Mode: | BLE Mode TX 2480 MHz | 0 | | | | |
| Remark: | No report for the emission which more than 10 dB below the | | | | | |
| | prescribed limit. | | | | | |

| N | o. Mk | . Freq. | | Correct Factor | Measure- ment | Limit | Over | |
|---|-------|----------|-------|-------------------|------------------|--------|-------|----------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | * | 4960.150 | 36.40 | 15.39 | 51.79 | 54.00 | -2.21 | AVG |
| 2 | | 4960.618 | 49.92 | 15.40 | 65.32 | 74.00 | -8.68 | peak |



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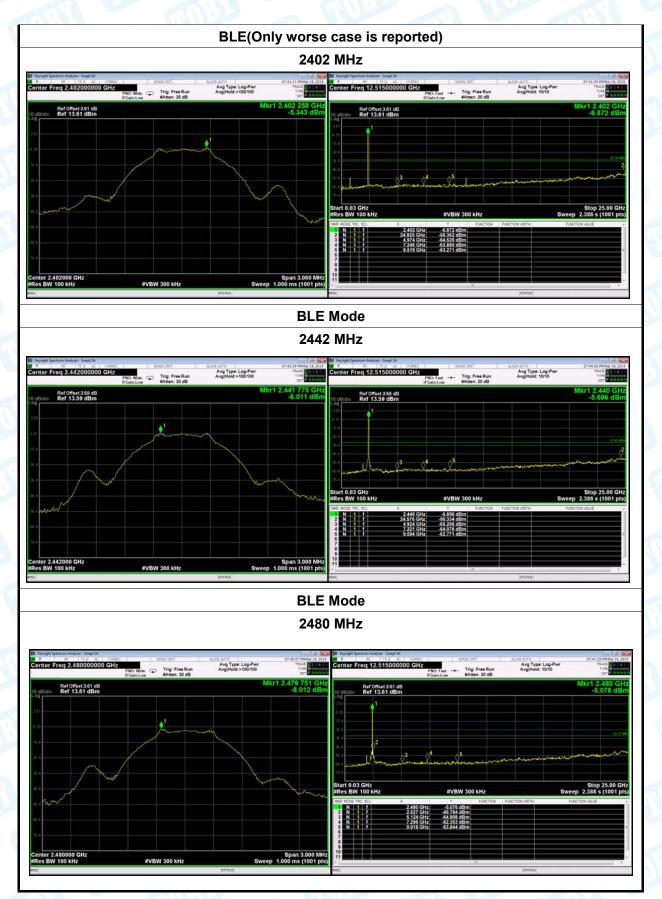
| Temperature: | 25℃ | Relative Humidity: | 55% | | | |
|---------------|--|--------------------|-----|--|--|--|
| Test Voltage: | DC 3.7V | | | | | |
| Ant. Pol. | Vertical | | | | | |
| Test Mode: | BLE Mode TX 2480 MHz | 0 | | | | |
| Remark: | No report for the emission which more than 10 dB below the | | | | | |
| | prescribed limit. | | | | | |

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Over | |
|-----|-----|----------|------------------|-------------------|------------------|--------|-------|----------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | * | 4960.228 | 34.66 | 15.39 | 50.05 | 54.00 | -3.95 | AVG |
| 2 | | 4960.666 | 49.45 | 15.40 | 64.85 | 74.00 | -9.15 | peak |



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Conducted Emission Test Data

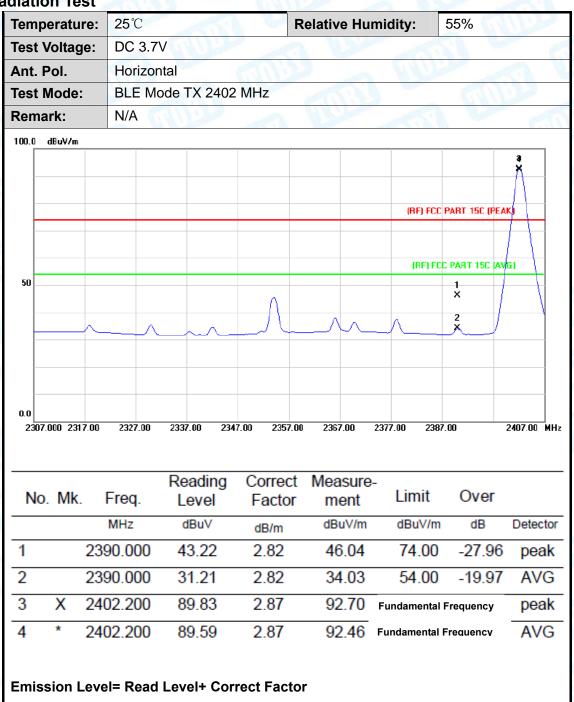




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Attachment C-- Restricted Bands Requirement and Band-edge Test Data

(1) Radiation Test



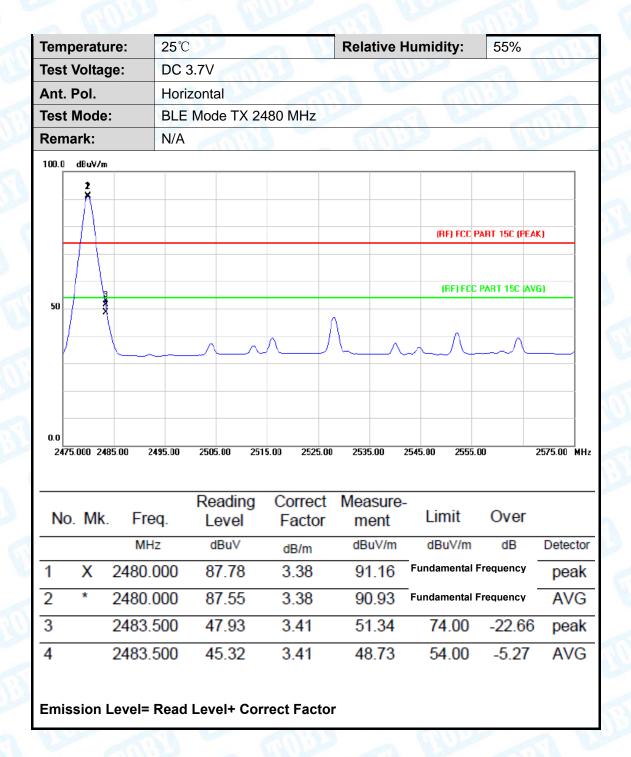


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| No. Mk. Freq. Reading Level Correct Factor Measurement Measurement Limit Over MHz dBuV dBuV dBuV/m dBuV/m< | Reading Correct Measure- Level Factor ment Limit Over Buv Buv | Temperature: | 25℃ | Relative Hu | umidity: 55% | |
|---|--|---------------|-------------------------|-----------------|----------------------------|------------|
| REP FCC PART 15C (PEAK) REP FCC PART 15C | RED FCC PART 15C (PEAK) RED FCC PART 15C (PEAK) RED FCC PART 15C (PEAK) RED FCC PART 15C (AVG) | Test Voltage: | DC 3.7V | | | ABIN |
| No. Mk. Freq. Reading Correct Measure Limit Over MHz dBuV dB/m dBuV/m dBuV/m | REJ FCC PART 15C (PEAK)X REJ FCC PART 15C (P | Ant. Pol. | Vertical | | | |
| 100.0 dBuV/m IRF) FCC PART 15C (PEAK) IRF) FCC PART 15C (PEAK) | Reading Correct Measure-Limit Over | Test Mode: | BLE Mode TX 2402 | ЛHz | | W. |
| No. Mk. Freq. Reading Correct Measure— Level Factor ment Limit Over MHz dBuV dB/m dBuV/m dBuV/m dB Det 1 2390.000 42.93 2.82 45.75 74.00 -28.25 p 2 2390.000 29.20 29.20 2.82 32.02 54.00 -21.98 A 3 X 2402.200 74.43 2.87 77.30 Fundamental Frequency p | Reading Correct Measure-Limit Over | Remark: | N/A | | | |
| No. Mk. Freq. Reading Correct Measure-Limit Over MHz | Correct Measure-Limit Over | 100.0 dBuV/m | | | | |
| No. Mk. Freq. Reading Correct Measure-Limit Over MHz | Reading Correct Measure- Limit Over | | | | | |
| No. Mk. Freq. Reading Correct Measure-Limit Over MHz | Correct Measure-Limit Over | | | | (RF) FCC PART 15C (PE | 3 AKIX |
| No. Mk. Freq. Reading Correct Measure-Limit Over MHz | Reading Correct Measure Limit Over | | | | | |
| No. Mk. Freq. Reading Correct Measure- Level Factor ment Limit Over MHz dBuV dB/m dBuV/m dBuV/m dB Det 1 2390.000 42.93 2.82 45.75 74.00 -28.25 pt 2 2390.000 29.20 2.82 32.02 54.00 -21.98 A 3 X 2402.200 74.43 2.87 77.30 Fundamental Frequency pt | X 2 2 2 2 2 2 2 2 2 | | | | (RF) FCC PART 15C (A | (VG) |
| No. Mk. Freq. Reading Correct Measure- Level Factor ment Limit Over MHz dBuV dB/m dBuV/m dBuV/m dB Det 1 2390.000 42.93 2.82 45.75 74.00 -28.25 p 2 2390.000 29.20 2.82 32.02 54.00 -21.98 A 3 X 2402.200 74.43 2.87 77.30 Fundamental Frequency p | Reading Correct Measure- Limit Over | 50 | | | 1 | + |
| No. Mk. Freq. Reading Correct Measure- Level Factor ment Limit Over MHz dBuV dB/m dBuV/m dBuV/m dB Det 1 2390.000 42.93 2.82 45.75 74.00 -28.25 pc 2 2390.000 29.20 2.82 32.02 54.00 -21.98 Action in the content of | Reading Correct Measure- Limit Over | | | | | \bot |
| No. Mk. Freq. Level Level Level Factor Measure Factor Measure Measure Factor Measure | Reading Level Correct Factor Measurement Limit Over dBuV dB/m dBuV/m dBuV/m dBuV/m dB Detector 42.93 2.82 45.75 74.00 -28.25 peak 29.20 2.82 32.02 54.00 -21.98 AVG 74.43 2.87 77.30 Fundamental Frequency peak | | | | 2 X | / 4 |
| No. Mk. Freq. Level Level Level Factor Measure Factor Measure Measure Factor Measure | Reading Level Correct Factor Measurement Limit Over dBuV dB/m dBuV/m dBuV/m dBuV/m dB Detector 42.93 2.82 45.75 74.00 -28.25 peak 29.20 2.82 32.02 54.00 -21.98 AVG 74.43 2.87 77.30 Fundamental Frequency peak | | | | | |
| No. Mk. Freq. Level Level Level Factor Measure Factor Measure Measure Factor Measure | Reading Level Correct Factor Measurement Limit Over dBuV dB/m dBuV/m dBuV/m dB uV/m | | | | | |
| No. Mk. Freq. Level Level Level Factor Measure Factor Measure Measure Factor Measure | Reading Level Correct Factor Measurement Limit Over dBuV dB/m dBuV/m dBuV/m dB uV/m | 0.0 | | | | |
| No. Mk. Freq. Level Factor ment Limit Over MHz dBuV dBuV dBuV/m dBuV/m dBuV/m dBuV/m dBuV/m dB Det 1 2390.000 42.93 2.82 45.75 74.00 -28.25 p 2 2390.000 29.20 2.82 32.02 54.00 -21.98 A 3 X 2402.200 74.43 2.87 77.30 Fundamental Frequency p | Level Factor ment Limit Over dBuV dBl/m dBuV/m dBuV/m dBl/m dBl/m Detector 42.93 2.82 45.75 74.00 -28.25 peak 29.20 2.82 32.02 54.00 -21.98 AVG 74.43 2.87 77.30 Fundamental Frequency peak | | 2327.00 2337.00 2347.00 | 2357.00 2367.00 | 2377.00 2387.00 | 2407.00 MI |
| No. Mk. Freq. Level Factor ment Limit Over MHz dBuV dBuV dBuV/m dBuV/m dBuV/m dB uV/m dB uV | Level Factor ment Limit Over dBuV dBl/m dBuV/m dBuV/m dBl/m dBl/m Detector 42.93 2.82 45.75 74.00 -28.25 peak 29.20 2.82 32.02 54.00 -21.98 AVG 74.43 2.87 77.30 Fundamental Frequency peak | | | | | |
| 1 2390.000 42.93 2.82 45.75 74.00 -28.25 p 2 2390.000 29.20 2.82 32.02 54.00 -21.98 A 3 X 2402.200 74.43 2.87 77.30 Fundamental Frequency | 42.93 2.82 45.75 74.00 -28.25 peak 29.20 2.82 32.02 54.00 -21.98 AVG 74.43 2.87 77.30 Fundamental Frequency peak | No. Mk. Fr | • | | | |
| 2 2390.000 29.20 2.82 32.02 54.00 -21.98 A 3 X 2402.200 74.43 2.87 77.30 Fundamental Frequency p | 29.20 2.82 32.02 54.00 -21.98 AVG 74.43 2.87 77.30 Fundamental Frequency peak | M | Hz dBuV | iB/m dBuV/m | dBuV/m dB | Detecto |
| 3 X 2402.200 74.43 2.87 77.30 Fundamental Frequency p | 74.43 2.87 77.30 Fundamental Frequency peak | | 0.000 42.93 | 2.82 45.75 | 74.00 -28.25 | peak |
| | | 2 2390 | 0.000 29.20 | .82 32.02 | 54.00 -21.98 | AVG |
| 1 * 2402.200 74.18 2.87 77.05 Fundamental Frequency Δ | 74.18 2.87 77.05 Fundamental Frequency AVG | 3 X 2402 | 2.200 74.43 | .87 77.30 | — Fundamental Frequency | peak |
| 7 2-102.200 1-10 2.01 11.00 I discussional Frequency | | 4 * 2402 | 2.200 74.18 | 97 77.05 | Fundamental Frequency | AVG |

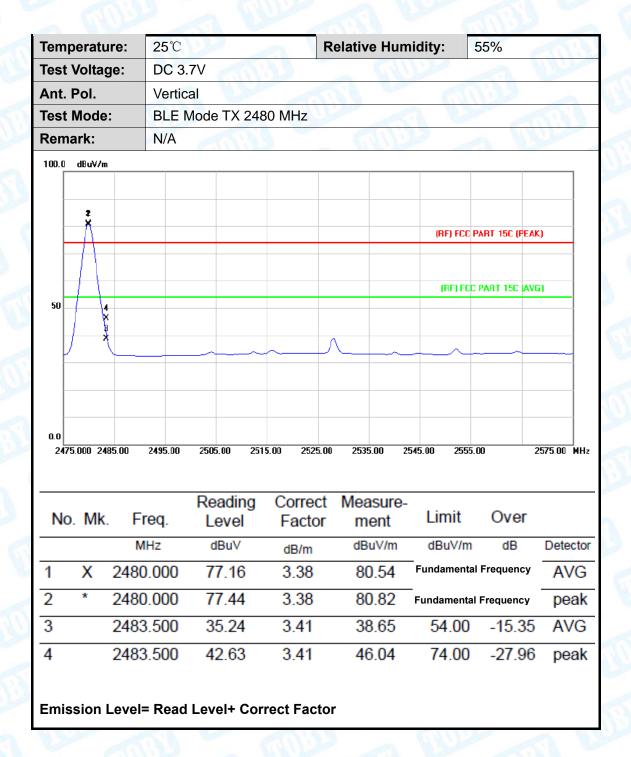


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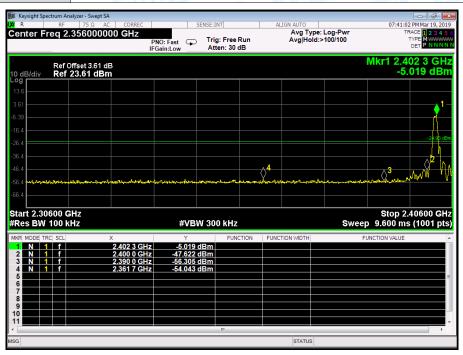


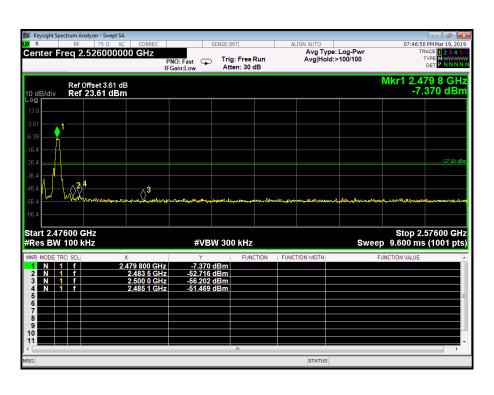


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(2) Conducted Test









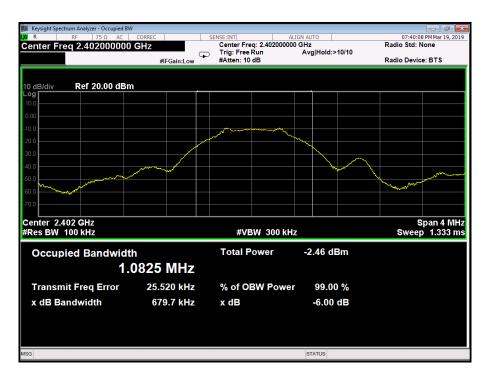
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Attachment D-- Bandwidth Test Data

| | Temperature: | 25℃ | | Relative Humidity: | 55% | |
|---|-------------------|------|---------------|--------------------|-------|--|
| | Test Voltage: | DC 3 | .7V | | | |
| | Test Mode: | BLE | TX Mode | | | |
| | Channel frequency | | 6dB Bandwidth | 99% Bandwidth | Limit | |
| | (MHz) | | (kHz) | (kHz) | (kHz) | |
| | 2402 | | 679.7 1082.5 | | | |
| | 2442 | | 671.3 | 1075.5 | >=500 | |
| | 2480 | | 681.1 | 1081.0 | | |
| 4 | | | | | | |

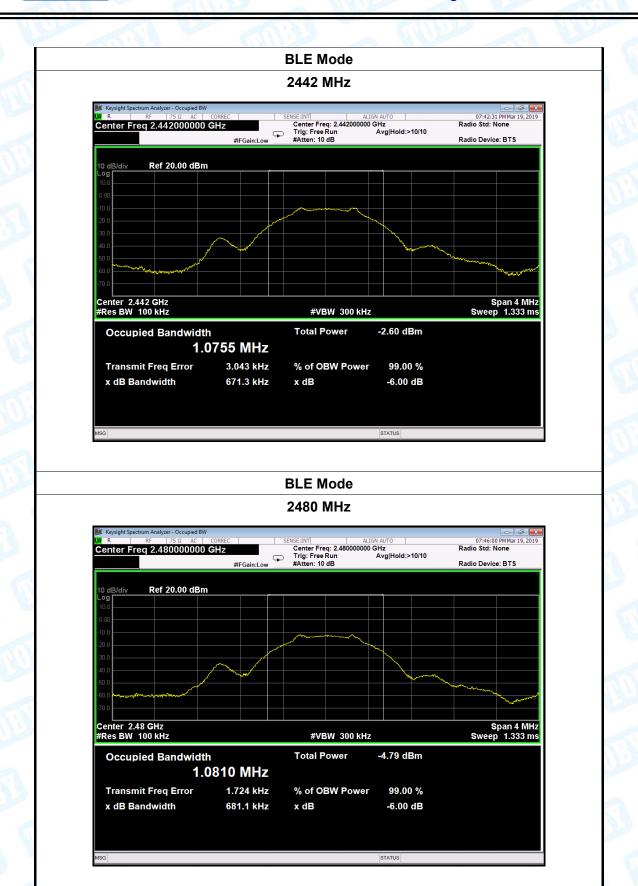
BLE Mode

2402 MHz





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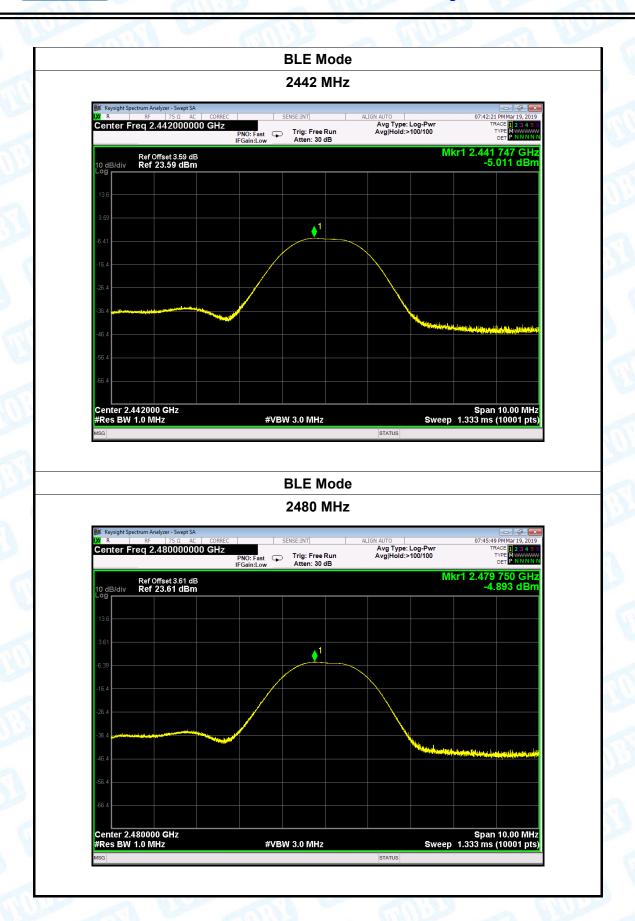
Attachment E-- Peak Output Power Test Data

| Temperature: | 25℃ | | Relative H | umidity: | 55% | |
|--|---|----------------------------|---------------------------------------|------------------------------|--|--|
| Test Voltage: | DC 3.7V | N. W. | THE PERSON | 45 | THE PARTY OF THE P | |
| Test Mode: | BLE TX M | lode | Hilliam | | | |
| Channel freque | ncy (MHz) | Test Re | esult (dBm) | | Limit (dBm | |
| 2402 | | -4 | 4.753 | | | |
| 2442 | | | 5.011 | | 30 | |
| 2480 | | -4 | 4.893 | | | |
| | | BLI | E Mode | | | |
| | | 240 | 20 MIII- | | | |
| | | 240 | 02 MHz | | | |
| | | 240 | J2 IVIMZ | | | |
| | n Analyzer - Swept SA RF 75 Ω AC CORR | | | | 07:39:40 PM Mar 19, 2019 | |
| LXI R | | EC SENSE:IN PNO: Fast Trig | IT ALIGN AUTO Avg T | ype: Log-Pwr old:>100/100 | | |
| Center Freq | 75 Ω AC CORR 2.402000000 GHz of Offset 3.61 dB | EC SENSE:IN | IT ALIGN AUTO AVg T : Free Run Avg IH | old:>100/100 | 07:39:40 PMMar 19, 2019 TRACE 12 3 4 5 6 TYPE MWWWWW DET PNNNNN | |
| Center Freq | RF 75 Ω AC CORR 2.402000000 GH z | EC SENSE:IN PNO: Fast Trig | IT ALIGN AUTO AVg T : Free Run Avg IH | old:>100/100 | 07:39:40 PM Mar 19, 2019 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P NNNNN | |
| Center Freq | 75 Ω AC CORR 2.402000000 GHz of Offset 3.61 dB | EC SENSE:IN PNO: Fast Trig | IT ALIGN AUTO AVg T : Free Run Avg IH | old:>100/100 | 07:39:40 PMMar 19, 2019 TRACE 12 3 4 5 6 TYPE MWWWWW DET PNNNNN | |
| Center Freq | 75 Ω AC CORR 2.402000000 GHz of Offset 3.61 dB | EC SENSE:IN PNO: Fast Trig | IT ALIGN AUTO Avg T Avg IH Avg IH | old:>100/100 | 07:39:40 PMMar 19, 2019 TRACE 12 3 4 5 6 TYPE MWWWWW DET PNNNNN | |
| Center Freq | 75 Ω AC CORR 2.402000000 GHz of Offset 3.61 dB | EC SENSE:IN PNO: Fast Trig | IT ALIGN AUTO AVg T : Free Run Avg IH | old:>100/100 | 07:39:40 PMMar 19, 2019 TRACE 12 3 4 5 6 TYPE MWWWWW DET PNNNNN | |
| Center Freq | 75 Ω AC CORR 2.402000000 GHz of Offset 3.61 dB | EC SENSE:IN PNO: Fast Trig | IT ALIGN AUTO Avg T Avg IH Avg IH | old:>100/100 | 07:39:40 PMMar 19, 2019 TRACE 12 3 4 5 6 TYPE MWWWWW DET PNNNNN | |
| Center Freq | 75 Ω AC CORR 2.402000000 GHz of Offset 3.61 dB | EC SENSE:IN PNO: Fast Trig | IT ALIGN AUTO Avg T Avg IH Avg IH | old:>100/100 | 07:39:40 PMMar 19, 2019 TRACE 12 3 4 5 6 TYPE MWWWWW DET PNNNNN | |
| Center Frequency Relationship R | 75 Ω AC CORR 2.402000000 GHz | EC SENSE:IN PNO: Fast Trig | IT ALIGN AUTO Avg T Avg IH Avg IH | old:>100/100 | 07:39:40 PMMar 19, 2019 TRACE 12 3 4 5 6 TYPE MWWWWW DET PNNNNN | |
| Center Freq 10 dB/div R 10 dB/div R 13.6 3.61 | 75 Ω AC CORR 2.402000000 GHz | EC SENSE:IN PNO: Fast Trig | IT ALIGN AUTO Avg T Avg IH Avg IH | old:>100/100 | 07:39:40 PMMar 19, 2019 TRACE 12 3 4 5 6 TYPE MWWWWW DET PNNNNN | |

#VBW 3.0 MHz



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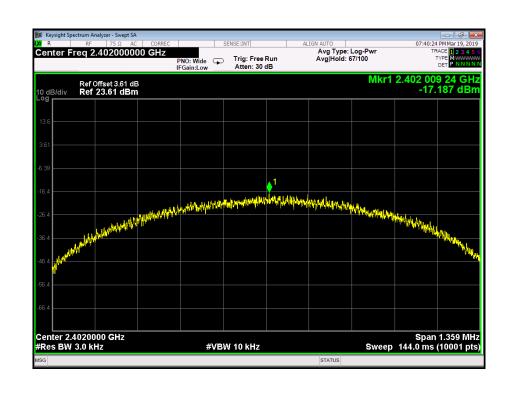
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Attachment F-- Power Spectral Density Test Data

| Temperature: 25°C | | Relative Hu | umidity: | 55% | MAG |
|-------------------|----------|---------------|-----------|-----|--------|
| Test Voltage: | DC 3.7V | The same of | 631 | | |
| Test Mode: | BLE TX N | Mode | a W | | |
| Channel Fred | quency | Power Density | Lim | it | Result |
| (MHz) | | (dBm) | (dBm) (dB | | Result |
| 2402 | | -17.187 | | | |
| 2442 | | -16.711 | 8 | | PASS |
| 2480 | | -19.743 | | | |
| | | RI E Mode | - 1 | | |

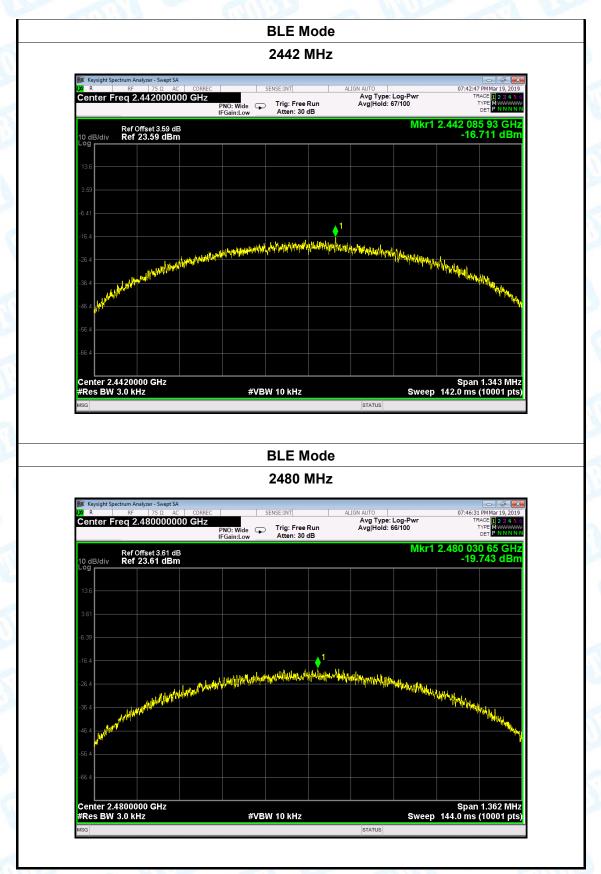
BLE Mode

2402 MHz





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----END OF REPORT-----