

PCTEST

18855 Adams Court, Morgan Hill, CA 95037 USA Tel. 410.290.6652 / Fax 410.290.6654 http://www.pctest.com



MEASUREMENT REPORT FCC PART 15.247 / ISED RSS-247 Bluetooth (Low Energy)

Applicant Name:

Apple Inc. One Apple Park Way Cupertino, CA 95014 United States

Date of Testing: 12/10/2019 - 02/21/2020 Test Site/Location: PCTEST Morgan Hill, CA, USA Test Report Serial No.: 1C1912170050-05.BCG

| FCC ID: | BCGA2228 |
|------------|------------|
| IC: | 579C-A2228 |
| APPLICANT: | Apple Inc. |

Application Type: Model/HVIN: EUT Type: Max. RF Output Power: Frequency Range: FCC Classification: FCC Rule Part(s): ISED Specification: Test Procedure(s): Certification A2228 Tablet Device 97.724 mW (19.90 dBm) Peak Conducted 2402 – 2480MHz Digital Transmission System (DTS) Part 15 Subpart C (15.247) RSS-247 Issue 2 ANSI C63.10-2013, KDB 558074 D01 v05r02

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013 and KDB 558074 D01 v05r02. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez President



| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dana 4 of 404 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 1 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



TABLE OF CONTENTS

| 1.0 | INTR | ODUCTION | 3 |
|-----|-------|---|----|
| | 1.1 | Scope | 3 |
| | 1.2 | PCTEST Test Location | 3 |
| | 1.3 | Test Facility / Accreditations | 3 |
| 2.0 | PRO | DUCT INFORMATION | 4 |
| | 2.1 | Equipment Description | 4 |
| | 2.2 | Device Capabilities | 4 |
| | 2.3 | Antenna Description | 5 |
| | 2.4 | Test Support Equipment | 5 |
| | 2.5 | Test Configuration | 5 |
| | 2.6 | Software and Firmware | 6 |
| | 2.7 | EMI Suppression Device(s)/Modifications | 6 |
| 3.0 | DES | CRIPTION OF TESTS | 7 |
| | 3.1 | Evaluation Procedure | 7 |
| | 3.2 | AC Line Conducted Emissions | 7 |
| | 3.3 | Radiated Emissions | 8 |
| | 3.4 | Environmental Conditions | 8 |
| 4.0 | ANT | ENNA REQUIREMENTS | 9 |
| 5.0 | MEA | SUREMENT UNCERTAINTY | 10 |
| 6.0 | TES | F EQUIPMENT CALIBRATION DATA | 11 |
| 7.0 | TES | r Results | 12 |
| | 7.1 | Summary | 12 |
| | 7.2 | 6dB Bandwidth Measurement – Bluetooth (LE) | 13 |
| | 7.3 | Output Power Measurement – Bluetooth (LE) | 22 |
| | 7.3.1 | Peak Output Power Measurement - Bluetooth (LE) | 23 |
| | 7.3.2 | Average Output Power Measurement - Bluetooth (LE) | 25 |
| | 7.4 | Power Spectral Density – Bluetooth (LE) | 27 |
| | 7.5 | Conducted Emissions at the Band Edge | 55 |
| | 7.6 | Conducted Spurious Emissions | 60 |
| | 7.7 | Radiated Spurious Emission Measurements | 68 |
| | 7.8 | Radiated Restricted Band Edge Measurements | 81 |
| | 7.9 | Radiated Spurious Emissions Measurements – Below 1GHz | 93 |
| | 7.10 | AC Line-Conducted Test Data | 97 |
| 8.0 | CON | CLUSION | 01 |

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 2 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 2 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

1.3 Test Facility / Accreditations Measurements were performed at PCTEST located in Morgan Hill, CA 95037, U.S.A.

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (22831) test laboratory with the site description on file with ISED.

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 2 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 3 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Tablet Device FCC ID: BCGA2228**. The data found in this test report was taken with the EUT operating in Bluetooth low energy mode. While in low energy mode, the Bluetooth transmitter hops pseudo-randomly between 40 channels, three of which are "advertising channels". When the transmitter is hopping only between the three advertising channels, the EUT does not fall under the category of a "hopper" as defined in 15.247(a)(iii) which states that a "frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels." As operation on only the advertising channels does not qualify the EUT as a hopper, the EUT is certified as a DTS device in this mode. The data found in this report is representative of the device when it transmits on its advertising channels. Typical Bluetooth operation is covered under the DSS report found with this application.

Test Device Serial No.: DLXZR006P7FJ, DLXZR034P7FJ

2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE, HDR4, HDR8)

| Ch. | Frequency (MHz) |
|-----|-----------------|
| 0 | 2402 |
| : | : |
| 19 | 2440 |
| : | : |
| 39 | 2480 |

Table 2-1. Frequency / Channel Operations

| Measured Duty Cycles | | | | |
|----------------------|--------------------------------|-------|-------|-------|
| Duty Cycle (%) | | | |) |
| | BTLE Mode Ant WF8 Ant WF7 TxBF | | | |
| 1Mbps | ePA | 100.0 | 100.0 | 100.0 |
| TIMPS | iPA | 100.0 | 100.0 | 100.0 |
| 2Mbps | ePA | 100.0 | 100.0 | 100.0 |
| | iPA | 100.0 | 100.0 | 100.0 |

Table 2-2. Measured Duty Cycles

- 1. This device supports Bluetooth LE operations with 1Mbps and 2Mbps.
- 2. This device supports BT Beamforming

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 4 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 4 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |



2.3 Antenna Description

Following antennas were used for the testing.

| | Antenna Gain (dBi) | |
|-----------------|--------------------|---------|
| Frequency [GHz] | Ant WF8 | Ant WF7 |
| 2.4 | 0.3 | -3.2 |

Table 2-3. Highest Antenna Gain

Note: This device is capable of operating in hopping and non-hopping mode. The EUT can hop between 40 different channels in the 2400 – 2483.5MHz band.

2.4 Test Support Equipment

| F288BG |
|--------|
| |
| |
| |
| YLHDAE |
| 14140 |
| KM9 |
| |
| |

Table 2-4. Test Support Equipment Used

2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2013 and KDB 558074 D01 v05r02. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, 7.4, 7.5, and 7.6 for antenna port conducted emissions test setups.

There are two vendors of the WiFi/Bluetooth radio modules, variant 1 and variant 2. Both radio modules have the same mechanical outline, same on-board antenna matching circuit, identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances. The worst case configuration was found between the two variants. The EUT was also investigated with and without charger.

For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration. The emissions below 1GHz and above 18GHz were tested with the highest transmitting power channel and the worst case configuration.

The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape), and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

For AC line conducted and radiated test below 1GHz, following configuration were investigated and worst case was reported.

- EUT powered by AC/DC adaptor via USB-C cable with wire charger
- EUT powered by host PC via USB-C cable with wire charger

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege E of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 5 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |



2.6 Software and Firmware

The test was conducted with firmware version 17E228 installed on the EUT.

2.7 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 6 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 6 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 558074 D01 v05r02 were used in the measurement of the EUT.

Deviation from measurement procedure.....None

3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 7m x $3.66m \times 2.7m$ shielded enclosure. The shielded enclosure is manufactured by AP Americas. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-6. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, $50\Omega/50\mu$ H Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is EPCOS 2X60A Power Line Filter (100dB Attenuation, 14kHz-18GHz) and the two EPCOS 2X48A filters (100dB Minimum Insertion Loss, 14kHz - 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 7.10. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 10.35.04.

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 7 of 404 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 7 of 101 |
| © 2020 PCTEST | - | | V 9.0 02/01/2019 |



3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

Per KDB 414788, radiated emission test sites other than open-field test sites (e.g., shielded anechoic chambers), may be employed for emission measurements below 30MHz if characterized so that the measurements correspond to those obtained at an open-field test site. To determine test site equivalency, a reference sample transmitting at 149kHz was measured on an open field test site (asphalt with no ground plane) and then measured in the 3m semi-anechoic chamber. A calibrated 60cm loop antenna was used while the reference device was rotated through the X, Y and Z axis in order to capture the worst case level. A maximum deviation of 2.77dB at 149kHz was measured when comparing the 3 meter semi-anechoic chamber to the open field site.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33 depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

3.4 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege 9 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 8 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 antenna(s) of the EUT are **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The EUT complies with the requirement of §15.203.

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege 0 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 9 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |



5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

| Contribution | Expanded Uncertainty (±dB) |
|-------------------------------------|----------------------------|
| Conducted Bench Top Measurements | 1.29 |
| Conducted Disturbance | 2.48 |
| Radiated Disturbance (<1GHz) | 4.15 |
| Radiated Disturbance (>1GHz) | 4.70 |
| Radiated Disturbance (>18GHz) | 5.01 |

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 10 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 10 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

| Manufacturer | Model | Description | Cal Date | Cal Interval | Cal Due | Serial Number |
|----------------------|-------------|--|------------|--------------|------------|---------------|
| Agilent Technologies | N9030A | 3Hz-44GHz PXA Signal Analyzer | 3/13/2019 | Annual | 3/13/2020 | MY49430244 |
| Anritsu | ML2496A | Power Meter | 10/29/2019 | Annual | 10/29/2020 | 184005 |
| Anritsu | MA2411B | Pulse Power Sensor | 10/29/2019 | Annual | 10/29/2020 | 1726261 |
| Anritsu | MA2411B | Pulse Power Sensor | 10/29/2019 | Annual | 10/29/2020 | 1726262 |
| ATM | 180-442A-KF | 20dB Nominal Gain Horn Antenna | 10/29/2019 | Annual | 10/29/2020 | T058701-02 |
| COM-POWER | LIN-120A | LISN | 3/13/2019 | Annual | 3/13/2020 | 241297 |
| ETS-Lindgren | 3142E-PA | Pre-Amplifier (30MHz - 6GHz) | 9/19/2019 | Annual | 9/19/2020 | 213236 |
| ETS-Lindgren | 3142E | BiConiLog Antenna (30MHz - 6GHz) | 8/14/2019 | Annual | 8/14/2020 | 224569 |
| ETS-Lindgren | 3117 | Double Ridged Guide Antenna (1-18 GHz) | 3/12/2019 | Annual | 3/12/2020 | 205956 |
| Rohde & Schwarz | ESW26 | EMI Test Receiver | 5/21/2019 | Annual | 5/21/2020 | 101299 |
| Rohde & Schwarz | ESW44 | EMI Test Receiver | 7/27/2019 | Annual | 7/27/2020 | 101668 |
| Rohde & Schwarz | TS-PR1840 | Pre-Amplifier (18GHz - 40GHz) | 9/19/2019 | Annual | 9/19/2020 | 100051 |
| Rohde & Schwarz | TC-TA18 | Cross Polarized Vivaldi Antenna (400MHz-18GHz) | 11/14/2019 | Annual | 11/14/2020 | 101057 |
| Rohde & Schwarz | HFH2-Z2 | Loop Antenna | 3/21/2019 | Annual | 3/21/2020 | 100519 |

Table 6-1. Annual Test Equipment Calibration Schedule

Note:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Demo 11 - 6101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 11 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



7.0 TEST RESULTS

7.1 Summary

| Company Name: | Apple Inc. |
|---------------------|-----------------------------------|
| FCC ID: | BCGA2228 |
| FCC Classification: | Digital Transmission System (DTS) |
| Number of Channels: | <u>40</u> |

| FCC Part Section(s) | RSS Section(s) | Test Description | Test Limit | Test Condition | Test Result | Reference |
|------------------------|------------------|--|---|-------------------|----------------|----------------------|
| 15.247(a)(2) | RSS-247 [5.2] | 6dB Bandwidth > 500kHz | | | PASS | Section 7.2 |
| 15.247(b)(3) | RSS-247 [5.4(d)] | Transmitter Output Power | < 1 Watt | | PASS | Sections 7.3 |
| 15.247(e) | RSS-247 [5.2] | Transmitter Power Spectral Density | < 8dBm / 3kHz Band | CONDUCTED | PASS | Section 7.4 |
| 15.247(d) | RSS-247 [5.5] | Band Edge / Out-of-Band Emissions | ≥ 20dBc | | PASS | Sections 7.5, 7.6 |
| 15.205 15.209 | RSS-Gen [8.9] | General Field Strength Limits (Restricted Bands and Radiated Emission Limits) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9]) | RADIATED | PASS | Sections 7.7, 7.8 |
| 15.207 | RSS-Gen [8.8] | AC Conducted Emissions 150kHz – 30MHz | < FCC 15.207 limits (RSS-Gen[8.8]) | LINE CONDUCTED | PASS | Section 7.9 |

Table 7-1. Summary of Test Results

Notes:

- 1. All modes of operation were investigated. The test results shown in the following sections represent the worst case emissions.
- 2. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3. All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4. For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "Bluetooth LE Automation," Version 3.
- 5. For radiated band edge, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "Chamber Automation," Version 1.3.1.

| FCC ID: BCGA2228 | PCTEST | PCTEST MEASUREMENT REPORT (CERTIFICATION) | |
|---------------------|-------------------------|--|------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 12 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 12 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



7.2 6dB Bandwidth Measurement – Bluetooth (LE) §15.247(a.2); RSS-247 [5.2]

Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the transmitter antenna terminal of the EUT while the EUT is operating at maximum power and at the appropriate frequencies. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible 6dB bandwidth is 500 kHz.

Test Procedure Used

ANSI C63.10-2013 – Section 11.8.2 Option 2 KDB 558074 D01 v05r02 – Section 8.2

Test Settings

- The signal analyzers' automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 100kHz
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.





Test Notes

Both power schemes were investigated, and only the worst case is reported

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 12 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 13 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| Frequency [MHz] | Data Rate [Mbps] | Power Scheme | Channel No. | Measured Bandwidth [kHz] | Minimum Bandwidth [kHz] | Pass / Fail |
|--------------------|---------------------|-----------------|----------------|--------------------------------|-------------------------------|-------------|
| 2402 | 1.0 | ePA | 0 | 718.0 | 500 | Pass |
| 2440 | 1.0 | ePA | 19 | 718.3 | 500 | Pass |
| 2480 | 1.0 | ePA | 39 | 718.0 | 500 | Pass |
| 2404 | 2.0 | ePA | 1 | 1325.0 | 500 | Pass |
| 2440 | 2.0 | ePA | 19 | 1325.0 | 500 | Pass |
| 2478 | 2.0 | ePA | 38 | 1325.0 | 500 | Pass |

Table 7-2. Conducted Bandwidth Measurements Ant WF8

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 14 of 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 14 of 101 | |
| © 2020 PCTEST | - | | V 9.0 02/01/2019 | |



| dB/div Ref 35.00 dE | | | | Radio Devid | e: BTS | |
|---------------------------------------|-------------------------|-------------------|------|----------------|--------------------|------------------------|
| 5.0 | <u>:m</u> | | | | | ClearWrit |
| | | | | | | Averac |
| 5.0 | | | | | | Max Ho |
| enter 2.402 GHz Res BW 100 kHz | | #VBW 300 kHz | | | n 2 MHz ep 1 ms | Min Ho |
| Occupied Bandwic | .0627 MHz | Total Power | 27.7 | dBm | | Detect |
| Transmit Freq Error x dB Bandwidth | 18.072 kHz 718.0 kHz | OBW Power x dB | | .00 % 00 dB | A | Peał uto <u>M</u> a |

Plot 7-1. 6dB Bandwidth Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 0)

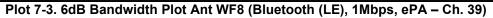


Plot 7-2. 6dB Bandwidth Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|--------------------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 45 af 404 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 15 of 101 | |
| © 2020 PCTEST V 9.0 02/01/2019 | | | | |



| XIRL RF 50Ω DC | 🛻 Trig | SENSE:INT ter Freq: 2.480000000 GHz : Free Run Avg Hol en: 40 dB | ALIGN AUTO | 08:42:19 PM Jan 20, 3 Radio Std: None Radio Device: BTS | Trace/Detector |
|------------------------------------|--------------------------|---|------------|---|----------------------------|
| 10 dB/div Ref 35.00 dBn | | | | | |
| 25.0 15.0 5.00 | | | | | Clear Writ |
| -5.00 | | | | | Averag |
| -45.0 | | | | | Max Hol |
| Center 2.48 GHz #Res BW 100 kHz | | #VBW 300 kHz | | Span 2 N Sweep 1 | |
| Occupied Bandwidt | ^h 0617 MHz | Total Power | 27.8 | dBm | |
| | 21.208 kHz | OBW Power | 99 | .00 % | Detecto Peak Auto Ma |
| x dB Bandwidth | 718.0 kHz | x dB | | 00 dB | |
| SG | | | STATUS | | |





Plot 7-4. 6dB Bandwidth Plot Ant WF8 (Bluetooth (LE), 2Mbps, ePA - Ch. 1)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 16 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 16 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



| 20 RL RF 50 Ω DC | Tr | sense:INT enter Freq: 2.44000 ig: Free Run utten: 40 dB | ALIGN AUTO 0000 GHz Avg Hold: 100/100 | 10:33:18 PM Jan 20, 2020 Radio Std: None Radio Device: BTS | Trace/Detector |
|-----------------------------------|------------|--|---|--|----------------|
| 0 dB/div Ref 35.00 dBn | 1 | | | | |
| 25.0 15.0 5.00 | | ~~~~~ | | | Clear Wri |
| 5.00 | | | | · | Avera |
| 45.0 | | | | | Max Ho |
| Center 2.44 GHz Res BW 100 kHz | | #VBW 300 k | Hz | Span 5 MHz Sweep 2.533 ms | Min Ho |
| Occupied Bandwidt | | Total Po | ower 28.0 | 0 dBm | |
| 2. | 0299 MHz | | | | Detect |
| Transmit Freq Error | 26.644 kHz | OBW P | ower 9 | 9.00 % | Auto <u>M</u> |
| x dB Bandwidth | 1.325 MHz | x dB | -6 | .00 dB | |
| G | | | STATU | IS | |

Plot 7-5. 6dB Bandwidth Plot Ant WF8 (Bluetooth (LE), 2Mbps, ePA – Ch. 19)



Plot 7-6. 6dB Bandwidth Plot Ant WF8 (Bluetooth (LE), 2Mbps, ePA - Ch. 38)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|--------------------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | D 17 -f 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 17 of 101 | |
| © 2020 PCTEST V 9.0 02/01/2019 | | | | |



| Frequency [MHz] | Data Rate [Mbps] | Power Scheme | Channel No. | Bandwidth | | Pass / Fail |
|--------------------|---------------------|-----------------|----------------|-----------|-----|-------------|
| 2402 | 1.0 | ePA | 0 | 718.0 | 500 | Pass |
| 2440 | 1.0 | ePA | 19 | 719.4 | 500 | Pass |
| 2480 | 1.0 | ePA | 39 | 719.2 | 500 | Pass |
| 2404 | 2.0 | ePA | 1 | 1329.0 | 500 | Pass |
| 2440 | 2.0 | ePA | 19 | 1329.0 | 500 | Pass |
| 2478 | 2.0 | ePA | 38 | 1328.0 | 500 | Pass |

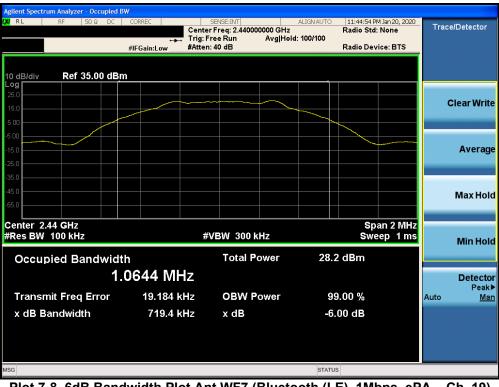
Table 7-3. Conducted Bandwidth Measurements Ant WF7

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 10 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 18 of 101 |
| © 2020 PCTEST | • | · | V 9.0 02/01/2019 |



| Trig: F | | d: 100/100 | Radio Std: None Radio Device: BTS | Trace | Detector |
|-------------------------|----------------------------------|--|--|--|---|
| 1 | | | | с | lear Writ |
| | | | | | Averag |
| | | | | | Max Hol |
| | | | Span 2 MHz Sweep 1 ms | | Min Ho |
| | Total Power | 28.1 | dBm | | Detecto |
| 17.658 kHz 718.0 kHz | OBW Power x dB | | | Auto | Peak <u>Ma</u> |
| | n # 0644 MHz 17.658 kHz | n #VBW 300 kHz #VBW 300 kHz h Total Power 0644 MHz 17.658 kHz OBW Power | n #VBW 300 kHz #VBW 300 kHz h Total Power 28.1 0644 MHz 17.658 kHz OBW Power 99 | h Total Power 28.1 dBm 0644 MHz 17.658 kHz OBW Power 99.00 % | n n 1 1 1 1 1 1 1 1 1 1 1 1 1 |

Plot 7-7. 6dB Bandwidth Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA – Ch. 0)

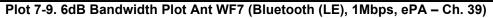


Plot 7-8. 6dB Bandwidth Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|--------------------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 10 af 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 19 of 101 | |
| © 2020 PCTEST V 9.0 02/01/2019 | | | | |



| Agilent Spectrum Analyzer - Occupied B Ø RL RF 50Ω DC | CORREC Ce | SENSE:INT enter Freq: 2.480000 rig: Free Run Atten: 40 dB | ALIGNAUTO 000 GHz Avg Hold: 100/100 | 11:49:21 PM Jan 20, 20 Radio Std: None Radio Device: BTS | 20 Trace/Detector |
|--|--------------------------|--|---|--|-------------------------------|
| 10 dB/div Ref 35.00 dBn | 1 | | | | |
| 25.0 15.0 5.00 | | | | | Clear Write |
| -5.00 -15.0 -25.0 | | | | | Average |
| -95.0 | | | | | Max Hold |
| Center 2.48 GHz #Res BW 100 kHz | | #VBW 300 kH | z | Span 2 MI Sweep 1 n | lz IS Min Hold |
| Occupied Bandwidt | ^h 0642 MHz | Total Po | wer 28. | 2 dBm | |
| | 21.205 kHz | | wer 9 | 9.00 % | Detector Peak≯ Auto Mar |
| x dB Bandwidth | 719.2 kHz | | | 5.00 dB | |
| MSG | | | STAT | US | |





Plot 7-10. 6dB Bandwidth Plot Ant WF7 (Bluetooth (LE), 2Mbps, ePA - Ch. 0)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 20 of 101 | | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 20 of 101 | | |
| © 2020 PCTEST | | | V 9.0 02/01/2019 | | |



| gilent Spectrum Analyzer - Occupied B d RL RF 50 Ω DC | CORREC Ce | sense:int enter Freq: 2.440000000 G ig: Free Run Avg tten: 40 dB | ALIGNAUTO Hz Hold: 100/100 | 12:01:12 AM Jan 21, 2020 Radio Std: None Radio Device: BTS | Trace/Detector |
|--|------------|---|----------------------------------|--|----------------|
| 10 dB/div Ref 35.00 dBn -og | 1 | | | | |
| 25.0 | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | ~ | | Clear Writ |
| 5.00 | | | | | Averag |
| 15.0 | | | | | Max Hol |
| enter 2.44 GHz Res BW 100 kHz | | #VBW 300 kHz | | Span 5 MHz Sweep 2.533 ms | Min Ho |
| Occupied Bandwidt | | Total Power | 28.4 | l dBm | |
| 2. | 0401 MHz | | | | Detect |
| Transmit Freq Error | 26.557 kHz | OBW Power | 99 | 9.00 % | Auto <u>Ma</u> |
| x dB Bandwidth | 1.329 MHz | x dB | -6. | 00 dB | |
| G | | | STATU | S | |

Plot 7-11. 6dB Bandwidth Plot Ant WF7 (Bluetooth (LE), 2Mbps, ePA – Ch. 19)



Plot 7-12. 6dB Bandwidth Plot Ant WF7 (Bluetooth (LE), 2Mbps, ePA – Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 01 -6404 | | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 21 of 101 | | |
| © 2020 PCTEST | | · | V 9.0 02/01/2019 | | |



7.3 Output Power Measurement – Bluetooth (LE) §15.247(b.3); RSS-247 [5.4(d)]

Test Overview and Limits

The transmitter antenna terminal of the EUT is connected to the input of a spectrum analyzer. Measurements are made while the EUT is operating at maximum power and at the appropriate frequencies.

The maximum permissible conducted output power is 1 Watt.

Test Procedure Used

ANSI C63.10-2013 – Section 11.9.1.3 ANSI C63.10-2013 – Section 11.9.2.3.2 KDB 558074 D01 v05r02 – Section 8.3.1.3 ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique KDB 662911 D01 v02r01 – Section E)1) Measure-and-Sum Technique

Test Settings

Method PKPM1 (Peak Power Measurement)

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

Method AVGPM-G (Average Power Measurement)

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-2. Test Instrument & Measurement Setup for Peak and Average Power Measurement

Test Notes

None

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Demo 00 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 22 of 101 |
| © 2020 PCTEST | • | · | V 9.0 02/01/2019 |



7.3.1 Peak Output Power Measurement - Bluetooth (LE)

| Frequency | Data Rate | Power | | | Ant. Gain | EIRP | Limit | Margin | |
|-----------|-----------|--------|-----|-------|-----------|-------|-------|--------|--------|
| [MHz] | [Mbps] | Scheme | No. | [dBm] | [mW] | [dBi] | [dBm] | [dBm] | [dB] |
| 2402 | 1.0 | ePA | 0 | 17.88 | 61.376 | 0.30 | 18.18 | 36.02 | -17.84 |
| 2440 | 1.0 | ePA | 19 | 17.72 | 59.156 | 0.30 | 18.02 | 36.02 | -18.00 |
| 2480 | 1.0 | ePA | 39 | 17.48 | 55.976 | 0.30 | 17.78 | 36.02 | -18.24 |
| 2402 | 1.0 | iPA | 0 | 13.81 | 24.044 | 0.30 | 14.11 | 36.02 | -21.91 |
| 2440 | 1.0 | iPA | 19 | 13.84 | 24.210 | 0.30 | 14.14 | 36.02 | -21.88 |
| 2480 | 1.0 | iPA | 39 | 13.64 | 23.121 | 0.30 | 13.94 | 36.02 | -22.08 |
| 2404 | 2.0 | ePA | 1 | 17.96 | 62.517 | 0.30 | 18.26 | 36.02 | -17.76 |
| 2440 | 2.0 | ePA | 19 | 18.00 | 63.096 | 0.30 | 18.30 | 36.02 | -17.72 |
| 2478 | 2.0 | ePA | 38 | 18.15 | 65.313 | 0.30 | 18.45 | 36.02 | -17.57 |
| 2404 | 2.0 | iPA | 1 | 13.83 | 24.155 | 0.30 | 14.13 | 36.02 | -21.89 |
| 2440 | 2.0 | iPA | 19 | 13.86 | 24.322 | 0.30 | 14.16 | 36.02 | -21.86 |
| 2478 | 2.0 | iPA | 38 | 13.67 | 23.281 | 0.30 | 13.97 | 36.02 | -22.05 |

Table 7-4. Ant WF8 Peak Conducted Output Power Measurements (Bluetooth (LE)

| Frequency | Data Rate | Power | Channel | Peak Conducted Power | | Ant. Gain | EIRP | Limit | Margin |
|-----------|-----------|--------|---------|----------------------|--------|-----------|-------|-------|--------|
| [MHz] | [Mbps] | Scheme | No. | [dBm] | [mW] | [dBi] | [dBm] | [dBm] | [dB] |
| 2402 | 1.0 | ePA | 0 | 18.20 | 66.069 | -3.20 | 15.00 | 36.02 | -21.02 |
| 2440 | 1.0 | ePA | 19 | 18.27 | 67.143 | -3.20 | 15.07 | 36.02 | -20.95 |
| 2480 | 1.0 | ePA | 39 | 17.94 | 62.230 | -3.20 | 14.74 | 36.02 | -21.28 |
| 2402 | 1.0 | iPA | 0 | 13.84 | 24.210 | -3.20 | 10.64 | 36.02 | -25.38 |
| 2440 | 1.0 | iPA | 19 | 13.88 | 24.434 | -3.20 | 10.68 | 36.02 | -25.34 |
| 2480 | 1.0 | iPA | 39 | 13.75 | 23.714 | -3.20 | 10.55 | 36.02 | -25.47 |
| 2404 | 2.0 | ePA | 1 | 18.29 | 67.453 | -3.20 | 15.09 | 36.02 | -20.93 |
| 2440 | 2.0 | ePA | 19 | 18.37 | 68.707 | -3.20 | 15.17 | 36.02 | -20.85 |
| 2478 | 2.0 | ePA | 38 | 18.72 | 74.473 | -3.20 | 15.52 | 36.02 | -20.50 |
| 2404 | 2.0 | iPA | 1 | 13.89 | 24.491 | -3.20 | 10.69 | 36.02 | -25.33 |
| 2440 | 2.0 | iPA | 19 | 13.90 | 24.547 | -3.20 | 10.70 | 36.02 | -25.32 |
| 2478 | 2.0 | iPA | 38 | 13.77 | 23.823 | -3.20 | 10.57 | 36.02 | -25.45 |

Table 7-5. Ant WF7 Peak Conducted Output Power Measurements (Bluetooth (LE)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 22 of 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 23 of 101 | |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 | |



| _ | | _ | . . | | | Peak Condu | ucted Power | | | Directional | FIRP | | Morgin |
|--------------------|---------------------|-----------------|----------------|-------|--------|------------|-------------|-------|--------|--------------------|-------|----------------|----------------|
| Frequency [MHz] | Data Rate [Mbps] | Power Scheme | Channel No. | Ant | WF8 | Ant | WF8 | Sum | med | Ant. Gain [dBi] | | Limit [dBm] | Margin [dB] |
| | | | | [dBm] | [mW] | [dBm] | [mW] | [dBm] | [mW] | Lapi | | | |
| 2402 | 1.0 | ePA | 0 | 16.77 | 47.534 | 16.54 | 45.082 | 19.67 | 92.683 | 1.74 | 18.51 | 36.02 | -17.52 |
| 2440 | 1.0 | ePA | 19 | 16.68 | 46.559 | 16.65 | 46.238 | 19.68 | 92.897 | 1.74 | 18.42 | 36.02 | -17.61 |
| 2480 | 1.0 | ePA | 39 | 16.30 | 42.658 | 16.83 | 48.195 | 19.58 | 90.782 | 1.74 | 18.04 | 36.02 | -17.99 |
| 2402 | 1.0 | iPA | 0 | 14.29 | 26.853 | 13.66 | 23.227 | 17.00 | 50.119 | 1.74 | 16.03 | 36.02 | -20.00 |
| 2440 | 1.0 | iPA | 19 | 14.98 | 31.477 | 13.83 | 24.155 | 17.45 | 55.590 | 1.74 | 16.72 | 36.02 | -19.31 |
| 2480 | 1.0 | iPA | 39 | 14.83 | 30.409 | 13.90 | 24.547 | 17.40 | 54.954 | 1.74 | 16.57 | 36.02 | -19.46 |
| 2404 | 2.0 | ePA | 1 | 16.97 | 49.774 | 16.81 | 47.973 | 19.90 | 97.724 | 1.74 | 18.71 | 36.02 | -17.32 |
| 2440 | 2.0 | ePA | 19 | 16.56 | 45.290 | 16.74 | 47.206 | 19.66 | 92.470 | 1.74 | 18.30 | 36.02 | -17.73 |
| 2478 | 2.0 | ePA | 38 | 16.28 | 42.462 | 16.83 | 48.195 | 19.57 | 90.573 | 1.74 | 18.02 | 36.02 | -18.01 |
| 2404 | 2.0 | iPA | 1 | 14.61 | 28.907 | 14.00 | 25.119 | 17.33 | 54.075 | 1.74 | 16.35 | 36.02 | -19.68 |
| 2440 | 2.0 | iPA | 19 | 14.96 | 31.333 | 13.80 | 23.988 | 17.43 | 55.335 | 1.74 | 16.70 | 36.02 | -19.33 |
| 2478 | 2.0 | iPA | 38 | 14.65 | 29.174 | 13.86 | 24.322 | 17.28 | 53.456 | 1.74 | 16.39 | 36.02 | -19.64 |

Table 7-6. TXBF Peak Conducted Output Power Measurements (Bluetooth (LE)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 24 of 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 24 of 101 | |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 | |



7.3.2 Average Output Power Measurement - Bluetooth (LE)

| Frequency | Data Rate | Power | Channel | Average C Pov | Conducted wer | Ant. Gain | EIRP | Limit | Margin |
|-----------|-----------|--------|---------|------------------|------------------|-----------|-------|-------|--------|
| [MHz] | [Mbps] | Scheme | No. | [dBm] | [mW] | [dBi] | [dBm] | [dBm] | [dB] |
| 2402 | 1.0 | ePA | 0 | 17.50 | 56.234 | 0.30 | 17.80 | 36.02 | -18.22 |
| 2440 | 1.0 | ePA | 19 | 17.47 | 55.847 | 0.30 | 17.77 | 36.02 | -18.25 |
| 2480 | 1.0 | ePA | 39 | 17.28 | 53.456 | 0.30 | 17.58 | 36.02 | -18.44 |
| 2402 | 1.0 | iPA | 0 | 13.70 | 23.442 | 0.30 | 14.00 | 36.02 | -22.02 |
| 2440 | 1.0 | iPA | 19 | 13.75 | 23.714 | 0.30 | 14.05 | 36.02 | -21.97 |
| 2480 | 1.0 | iPA | 39 | 13.54 | 22.594 | 0.30 | 13.84 | 36.02 | -22.18 |
| 2404 | 2.0 | ePA | 1 | 17.42 | 55.208 | 0.30 | 17.72 | 36.02 | -18.30 |
| 2440 | 2.0 | ePA | 19 | 17.48 | 55.976 | 0.30 | 17.78 | 36.02 | -18.24 |
| 2478 | 2.0 | ePA | 38 | 17.50 | 56.234 | 0.30 | 17.80 | 36.02 | -18.22 |
| 2404 | 2.0 | iPA | 1 | 13.67 | 23.281 | 0.30 | 13.97 | 36.02 | -22.05 |
| 2440 | 2.0 | iPA | 19 | 13.71 | 23.496 | 0.30 | 14.01 | 36.02 | -22.01 |
| 2478 | 2.0 | iPA | 38 | 13.52 | 22.491 | 0.30 | 13.82 | 36.02 | -22.20 |

Table 7-7. Ant WF8 Average Conducted Output Power Measurements (Bluetooth (LE)

| Frequency | Data Rate | Power | Channel | U | Average Conducted Power | | EIRP | Limit | Margin |
|-----------|-----------|--------|---------|-------|----------------------------|-------|-------|-------|--------|
| [MHz] | [Mbps] | Scheme | No. | [dBm] | [mW] | [dBi] | [dBm] | [dBm] | [dB] |
| 2402 | 1.0 | ePA | 0 | 17.97 | 62.661 | -3.20 | 14.77 | 36.02 | -21.25 |
| 2440 | 1.0 | ePA | 19 | 18.00 | 63.096 | -3.20 | 14.80 | 36.02 | -21.22 |
| 2480 | 1.0 | ePA | 39 | 17.73 | 59.293 | -3.20 | 14.53 | 36.02 | -21.49 |
| 2402 | 1.0 | iPA | 0 | 13.72 | 23.550 | -3.20 | 10.52 | 36.02 | -25.50 |
| 2440 | 1.0 | iPA | 19 | 13.78 | 23.878 | -3.20 | 10.58 | 36.02 | -25.44 |
| 2480 | 1.0 | iPA | 39 | 13.67 | 23.281 | -3.20 | 10.47 | 36.02 | -25.55 |
| 2404 | 2.0 | ePA | 1 | 17.73 | 59.293 | -3.20 | 14.53 | 36.02 | -21.49 |
| 2440 | 2.0 | ePA | 19 | 17.81 | 60.395 | -3.20 | 14.61 | 36.02 | -21.41 |
| 2478 | 2.0 | ePA | 38 | 18.00 | 63.096 | -3.20 | 14.80 | 36.02 | -21.22 |
| 2404 | 2.0 | iPA | 1 | 13.71 | 23.496 | -3.20 | 10.51 | 36.02 | -25.51 |
| 2440 | 2.0 | iPA | 19 | 13.75 | 23.714 | -3.20 | 10.55 | 36.02 | -25.47 |
| 2478 | 2.0 | iPA | 38 | 13.62 | 23.014 | -3.20 | 10.42 | 36.02 | -25.60 |

Table 7-8. Ant WF7 Average Conducted Output Power Measurements (Bluetooth (LE)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 25 of 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 25 of 101 | |
| © 2020 PCTEST | | | V 9.0 02/01/2019 | |



| Frequency | Data Rate | Power | Channel | Average Conducted Power | | | | | | Directional Ant. Gain | EIRP | Limit | Margin |
|-----------|-----------|--------|---------|-------------------------|--------|-------|--------|-------|--------|--------------------------|-------|-------|--------|
| [MHz] | [Mbps] | Scheme | No. | [dBm] | [mW] | [dBm] | [mW] | [dBm] | [mW] | [dBi] | [dBm] | [dBm] | [dB] |
| 2402 | 1.0 | ePA | 0 | 16.50 | 44.668 | 16.30 | 42.658 | 19.41 | 87.297 | 1.74 | 18.24 | 36.02 | -17.79 |
| 2440 | 1.0 | ePA | 19 | 16.49 | 44.566 | 16.47 | 44.361 | 19.49 | 88.920 | 1.74 | 18.23 | 36.02 | -17.80 |
| 2480 | 1.0 | ePA | 39 | 16.24 | 42.073 | 16.50 | 44.668 | 19.38 | 86.696 | 1.74 | 17.98 | 36.02 | -18.05 |
| 2402 | 1.0 | iPA | 0 | 13.98 | 25.003 | 13.64 | 23.121 | 16.82 | 48.084 | 1.74 | 15.72 | 36.02 | -20.31 |
| 2440 | 1.0 | iPA | 19 | 14.00 | 25.119 | 13.82 | 24.099 | 16.92 | 49.204 | 1.74 | 15.74 | 36.02 | -20.29 |
| 2480 | 1.0 | iPA | 39 | 13.99 | 25.061 | 13.88 | 24.434 | 16.95 | 49.545 | 1.74 | 15.73 | 36.02 | -20.30 |
| 2404 | 2.0 | ePA | 1 | 16.35 | 43.152 | 16.22 | 41.879 | 19.30 | 85.114 | 1.74 | 18.09 | 36.02 | -17.94 |
| 2440 | 2.0 | ePA | 19 | 16.49 | 44.566 | 16.50 | 44.668 | 19.51 | 89.331 | 1.74 | 18.23 | 36.02 | -17.80 |
| 2478 | 2.0 | ePA | 38 | 16.23 | 41.976 | 16.49 | 44.566 | 19.37 | 86.497 | 1.74 | 17.97 | 36.02 | -18.06 |
| 2404 | 2.0 | iPA | 1 | 14.00 | 25.119 | 13.94 | 24.774 | 16.98 | 49.888 | 1.74 | 15.74 | 36.02 | -20.29 |
| 2440 | 2.0 | iPA | 19 | 13.99 | 25.061 | 13.77 | 23.823 | 16.89 | 48.865 | 1.74 | 15.73 | 36.02 | -20.30 |
| 2478 | 2.0 | iPA | 38 | 13.97 | 24.946 | 13.81 | 24.044 | 16.90 | 48.978 | 1.74 | 15.71 | 36.02 | -20.32 |

Table 7-9. TXBF Average Conducted Output Power Measurements (Bluetooth (LE)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 26 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 26 of 101 |
| © 2020 PCTEST | • | • | V 9.0 02/01/2019 |



7.4 Power Spectral Density – Bluetooth (LE) §15.247(e); RSS-247 [5.2]

Test Overview and Limit

The peak power density is measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power and at the appropriate frequencies.

The maximum permissible power spectral density is 8 dBm in any 3 kHz band.

Test Procedure Used

ANSI C63.10-2013 – Section 11.10.2 Method PKPSD KDB 558074 D01 v05r02 – Section 8.4 DTS Maximum Power Spectral Density level in the fundamental emission ANSI C63.10-2013 – Section 14.3.2.2 Measure-and-Sum Technique KDB 662911 D01 v02r01 – Section E)2) Measure-and-Sum Technique

Test Settings

- 1. Analyzer was set to the center frequency of the DTS channel under investigation
- 2. Span = 1.5 times the DTS channel bandwidth
- 3. RBW = 3kHz
- 4. VBW = 1MHz
- 5. Detector = peak
- 6. Sweep time = auto couple
- 7. Trace mode = max hold
- 8. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.





Test Notes

None

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 07 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 27 of 101 |
| © 2020 PCTEST | | · | V 9.0 02/01/2019 |



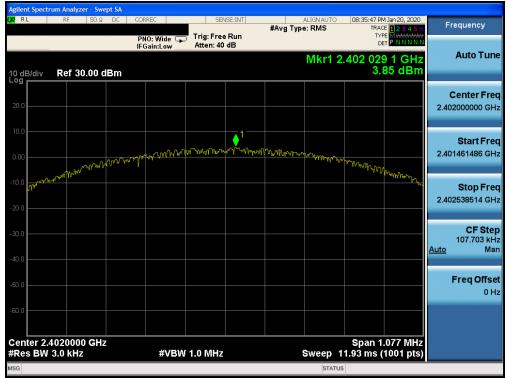
Antenna WF8

| Frequency [MHz] | Data Rate [Mbps] | Power Scheme | Channel No. | Measured Power Spectral Density [dBm/3kHz] | Maximum Permissible Power Density [dBm / 3kHz] | Margin [dB] |
|--------------------|---------------------|-----------------|----------------|---|---|----------------|
| 2402 | 1.0 | ePA | 0 | 3.85 | 8.0 | -4.15 |
| 2440 | 1.0 | ePA | 19 | 3.95 | 8.0 | -4.05 |
| 2480 | 1.0 | ePA | 39 | 3.96 | 8.0 | -4.04 |
| 2402 | 1.0 | iPA | 0 | -6.09 | 8.0 | -14.09 |
| 2440 | 1.0 | iPA | 19 | -5.89 | 8.0 | -13.89 |
| 2480 | 1.0 | iPA | 39 | -5.90 | 8.0 | -13.90 |
| 2404 | 2.0 | ePA | 1 | -1.60 | 8.0 | -9.60 |
| 2440 | 2.0 | ePA | 19 | -1.55 | 8.0 | -9.55 |
| 2478 | 2.0 | ePA | 38 | -1.52 | 8.0 | -9.52 |
| 2404 | 2.0 | iPA | 1 | -11.10 | 8.0 | -19.10 |
| 2440 | 2.0 | iPA | 19 | -11.14 | 8.0 | -19.14 |
| 2478 | 2.0 | iPA | 38 | -11.05 | 8.0 | -19.05 |

Table 7-10. Conducted Power Density Measurements Ant WF8

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 28 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 28 of 101 |
| © 2020 PCTEST | - | • | V 9.0 02/01/2019 |





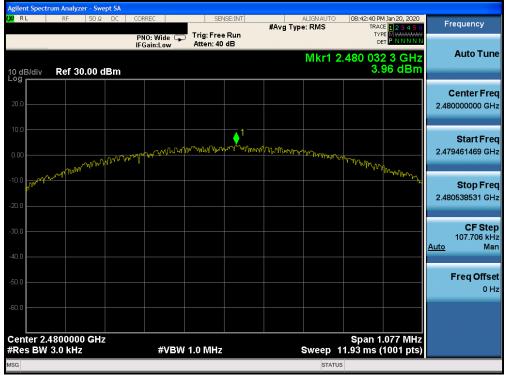
Plot 7-13. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 0)



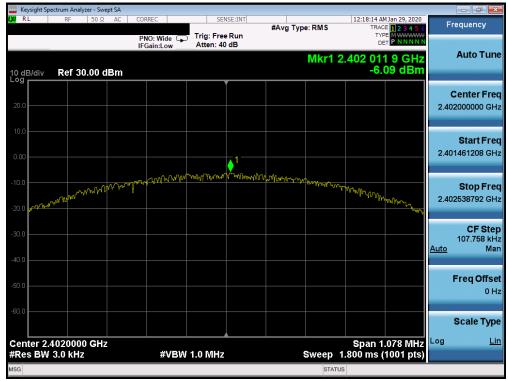
Plot 7-14. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA - Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 20 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 29 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |





Plot 7-15. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 39)



Plot 7-16. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 1Mbps, iPA - Ch. 0)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 20 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 30 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| | ectrum Analyz | | | | | | | | | | |
|-----------|--------------------|-----------|---------------|-------------------------|----------------|-------------------|------------|--|--|-------------|--------------------------------|
| X/RL | RF | 50 Ω AC | CORREC | | NSE:INT | #Avg Typ | e: RMS | TRAC | M Jan 29, 2020 DE 1 2 3 4 5 6 PE M WWWWW | Fr | equency |
| 10 dB/div | Ref 30 | .00 dBm | PNO: Wide G | Atten: 40 | | | Mkr1 | 2.440 01 | | | Auto Tune |
| 20.0 | | | | | | | | | | | Center Fre |
| 0.00 | | | | | ↓ ¹ | | | | | 2.43 | Start Fre 9460503 G⊦ |
| 10.0 | north halwyr on yb | ᠬ᠕ᠰᡗᡟᠮᡗ᠉ᢇ | wprogrammer w | ſ [~] ₩ſ₩ſ₩₩₩₩ | Y~rYyperyll1 | hr Murry yr ywyny | North Tort | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | 47h Marry horry | 2.44 | Stop Fre 0539497 GH |
| 30.0 | | | | | | | | | | <u>Auto</u> | CF Ste 107.899 kH Ma |
| 50.0 | | | | | | | | | | | F req Offs 0 F |
| -60.0 | | | | | | | | | | | Scale Typ |
| | 4400000 3.0 kHz | GHz | #VBW | / 1.0 MHz | | | Sweep | Span 1 1.800 ms (| .079 MHz (1001 pts) | Log | Li |
| ISG | | | | | | | STAT | TUS | | | |

Plot 7-17. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 1Mbps, iPA - Ch. 19)



Plot 7-18. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 1Mbps, iPA – Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 21 af 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 31 of 101 |
| © 2020 PCTEST | | · | V 9.0 02/01/2019 |





Plot 7-19. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 2Mbps, ePA - Ch. 1)



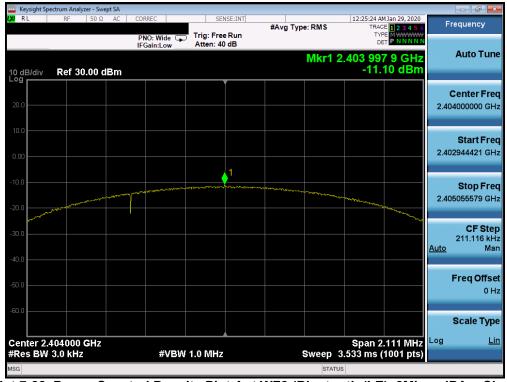
Plot 7-20. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 2Mbps, ePA - Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 22 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 32 of 101 |
| © 2020 PCTEST | - | · | V 9.0 02/01/2019 |



| (<mark> </mark> RL | RF | 50Ω DC | CORREC | SENSE:INT | ALIGN AUTO #Avg Type: RMS | 10:37:27 PM Jan 20, 2020 TRACE 1 2 3 4 5 6 TYPE M MARAAN | Frequency |
|---------------------|------------------------|--------|---------------------------|--------------|------------------------------|--|---|
| | | | PNO: Wide 🕞 IFGain:Low | Atten: 40 dB | | DET P N N N N | |
| 0 dB/div | Ref 30. | 00 dBm | | | Mkr1 2 | .478 047 7 GHz -1.52 dBm | Auto Tur |
| 20.0 | | | | | | | Center Fre 2.478000000 GF |
| 0.00 | | | J | 1 | magness and the second | | Start Fre 2.477006335 GH |
| 10.0 ~~~ 20.0 | John Martin Martin | | | | | and the second s | Stop Fre 2.478993665 GH |
| 30.0 | | | | | | | CF Ste 198.733 kl <u>Auto</u> M: |
| 50.0 | | | | | | | Freq Offs 0 |
| 60.0 | | | | | | | |
| | 2.4780000 N 3.0 kHz | GHZ | #VBV | V 1.0 MHz | Sweep 2 | Span 1.987 MHz 2.00 ms (1001 pts) | |
| ISG | | | | | STATUS | | |

Plot 7-21. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 2Mbps, ePA – Ch. 38)



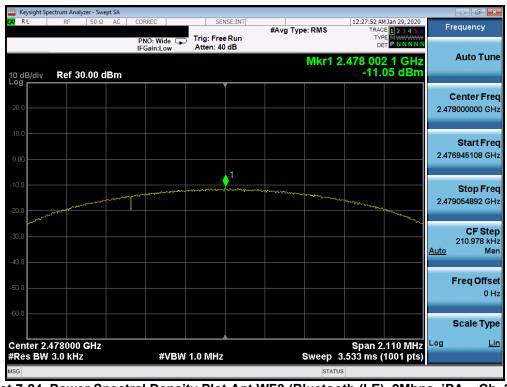
Plot 7-22. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 2Mbps, iPA – Ch. 1)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 22 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 33 of 101 |
| © 2020 PCTEST | - | | V 9.0 02/01/2019 |



| | pectrum Analyze | | | | | | | | | | | |
|------------------------------|--|---------|-------------------|--|--|----------------|----------------|--------|--|--|-------------|--------------------------------|
| KU RL | RF | 50 Ω A | PN | REC | | | #Avg Typ | e: RMS | TRA | M Jan 29, 2020 CE 1 2 3 4 5 6 PE M WWWWW ET P N N N N N | Fr | equency |
| 0 dB/div | Ref 30. | 00 dBn | | ain:Low | Atten: 4 | | | Mkr1 | 2.440 00 | | | Auto Tun |
| 20.0 | | | | | | • • | | | | | | Center Fre |
| 0.00 | | | | | | 1 | | | | | 2.438 | Start Fre 3944454 G⊦ |
| 20.0 | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | -ere-~w | not we prove that | an a | an a | I Naukanana | and the second | | and the state of t | | 2.44 | Stop Fre 1055546 G⊦ |
| 30.0 40.0 | | | · | | | | | | | | <u>Auto</u> | CF Ste 211.109 kH Ma |
| i0.0 | | | | | | | | | | | ' | F req Offs 0 F |
| | .440000 G | iHz | | | | | | | Spa <u>n 2</u> | 2.111 MHz | Log | Scale Typ <u>Li</u> |
| Res BV | / 3.0 kHz | | | #VB | N 1.0 MHz | | | Sweep | 3.533 ms | (1001 pts) | | |

Plot 7-23. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 2Mbps, iPA - Ch. 19)



Plot 7-24. Power Spectral Density Plot Ant WF8 (Bluetooth (LE), 2Mbps, iPA - Ch. 38)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 24 af 404 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 34 of 101 | |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 | |



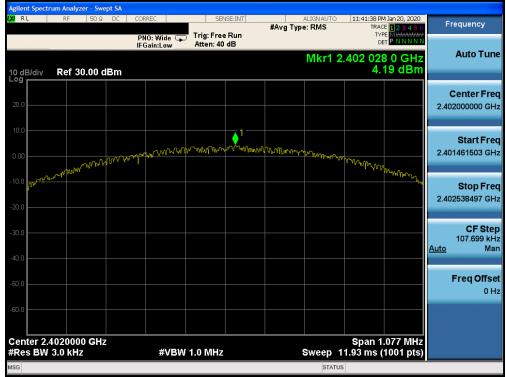
Antenna WF7

| Frequency [MHz] | Data Rate [Mbps] | Power Scheme | Channel No. | Measured Power Spectral Density [dBm/3kHz] | Maximum Permissible Power Density [dBm / 3kHz] | Margin [dB] |
|--------------------|---------------------|-----------------|----------------|---|---|----------------|
| 2402 | 1.0 | ePA | 0 | 4.19 | 8.0 | -3.81 |
| 2440 | 1.0 | ePA | 19 | 4.25 | 8.0 | -3.75 |
| 2480 | 1.0 | ePA | 39 | 4.27 | 8.0 | -3.73 |
| 2402 | 1.0 | iPA | 0 | -5.85 | 8.0 | -13.85 |
| 2440 | 1.0 | iPA | 19 | -5.72 | 8.0 | -13.72 |
| 2480 | 1.0 | iPA | 39 | -6.06 | 8.0 | -14.06 |
| 2404 | 2.0 | ePA | 1 | -1.23 | 8.0 | -9.23 |
| 2440 | 2.0 | ePA | 19 | -1.17 | 8.0 | -9.17 |
| 2478 | 2.0 | ePA | 38 | -1.21 | 8.0 | -9.21 |
| 2404 | 2.0 | iPA | 1 | -11.18 | 8.0 | -19.18 |
| 2440 | 2.0 | iPA | 19 | -11.33 | 8.0 | -19.33 |
| 2478 | 2.0 | iPA | 38 | -11.36 | 8.0 | -19.36 |

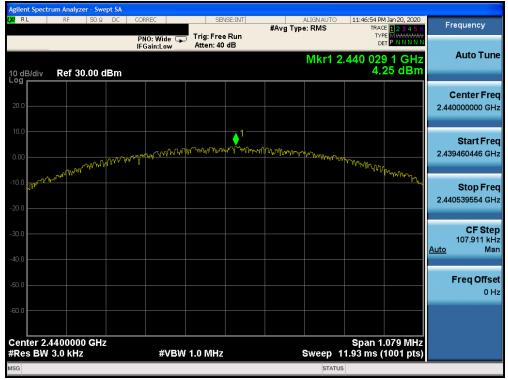
Table 7-11. Conducted Power Density Measurements Ant WF7

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 25 of 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 35 of 101 | |
| © 2020 PCTEST | • | • | V 9.0 02/01/2019 | |





Plot 7-25. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA – Ch. 0)



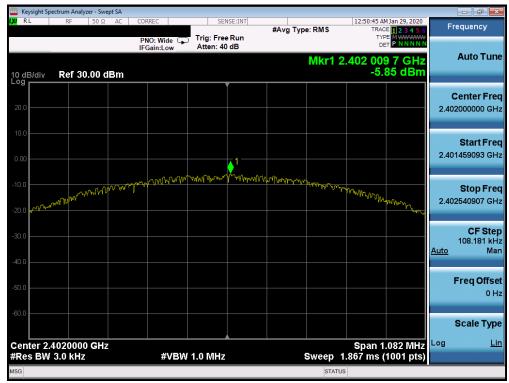
Plot 7-26. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA - Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 26 of 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 36 of 101 | |
| © 2020 PCTEST | | | V 9.0 02/01/2019 | |





Plot 7-27. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA – Ch. 39)



Plot 7-28. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 1Mbps, iPA - Ch. 0)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 27 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 37 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| Keysight Spectrum Analyze | | | | | | |
|------------------------------------|-------------|------------|-------------------|-------------------------------------|---|--|
| XV RL RF | 50 Ω AC COR | Q: Wide | g: Free Run | #Avg Type: RMS | 12:52:12 AM Jan 29, 2020 TRACE 1 2 3 4 5 6 TYPE M | Frequency |
| 10 dB/div Ref 30. | IFG | Gain:Low A | tten: 40 dB | Mkr1 | 2.440 011 8 GHz -5.72 dBm | Auto Tun |
| 20.0 | | | | | | Center Free 2.440000000 GH |
| 0.00 | | | 1 | | | Start Fre 2.439462279 GH |
| 10.0 | WMM WMPAG | | (ปการกรุง)โมระหญ่ | Alphillustoling and the appropriate | WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW | Stop Fre 2.440537721 GH |
| 40.0 | | | | | | CF Ste 107.544 kH <u>Auto</u> Ma |
| 50.0 | | | | | | Freq Offso 0 H |
| 60.0 | | | | | | Scale Typ |
| Center 2.4400000 Res BW 3.0 kHz | GHZ | #VBW 1.0 | MUZ | Swoon | Span 1.075 MHz 1.800 ms (1001 pts) | |

Plot 7-29. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 1Mbps, iPA - Ch. 19)



Plot 7-30. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 1Mbps, iPA - Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 20 of 404 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 38 of 101 |
| © 2020 PCTEST | | · | V 9.0 02/01/2019 |



| RL | r <mark>um Analyzer - Sv</mark> RF 50 S | | CORREC | SEN | ISE:INT | #Avg Typ | ALIGN AUTO e: RMS | TRAC | 4 Jan 20, 2020 E <mark>1 2 3 4 5 6</mark> | Fr | equency |
|-------------------------|--|-----|---------------------------|-----------------------------|---------|--------------------------------------|----------------------|------------------|--|-------------|---------------------------------|
| | | | PNO: Wide G | Trig: Free Atten: 40 | | 5 // | | TYF De | | | Auto Tun |
| 0 dB/div | Ref 30.00 | dBm | | | | | Mkr1 2 | .404 04: -1.: | 3 9 GHz 23 dBm | | Auto Tuli |
| 20.0 | | | | | | | | | | | Center Fre 4000000 GH |
| 10.0 0.00 | | | nor and the second second | an and the second strangers | 1 | and the second control of the second | | | | 2.40 | Start Fre |
| 10.0 ••••••• 20.0 | norman and an and a second and a | | | | | | | | | 2.40 | Stop Fre 4996784 GH |
| 10.0 | | | | | | | | | | <u>Auto</u> | CF Ste 199.357 kH Ma |
| 50.0 | | | | | | | | | | 1 | Freq Offs 0 H |
| | 4040000 GH | Iz | | | | | | Span 1 | .994 MHz | | |
| Res BW | 3.0 KHZ | | #VBV | V 1.0 MHz | | | Sweep 2 | 2.07 ms (| 1001 pts) | | |

Plot 7-31. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 2Mbps, ePA – Ch. 1)



Plot 7-32. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 2Mbps, ePA - Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 20 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 39 of 101 |
| © 2020 PCTEST | | · | V 9.0 02/01/2019 |



| U RL | RF | 50 Ω | DC | CORREC | SE | NSE:INT | | ALIGN AUTO | | M Jan 21, 2020 | Fraguaner |
|------------------------------|---|---------|----|--------------|-----------------------|---------|----------------------------------|-------------|----------------|--|--|
| | | | | PNO: Wide G | Trig: Fre Atten: 4 | | #Avg Typ | e: RMS | TY | 2 3 4 5 6 Pe Mwwww T P N N N N N | Frequency |
| 0 dB/di | Ref | 30.00 d | Bm | | | | | Mkr1 2 | .478 04 -1. | 7 8 GHz 21 dBm | Auto Tur |
| . og | | | | | | | | | | | Center Fre 2.478000000 GH |
| 0.00 | | | | -Toral Wards | an when you and | 1 | Darder Delay Sector Delay Sector | anon proson | | | Start Fre 2.477004324 GH |
| 10.0 | - and a state of the | | | | | | | | A NUMBER OF | and and a | Stop Fre 2.478995676 GH |
| 30.0 40.0 | | | | | | | | | | | CF St e 199.135 ki <u>Auto</u> Mi |
| 50.0 | | | | | | | | | | | Freq Offs |
| enter | 2.47800 | 00 GHz | | | | | | | Span 1 | .991 MHz | |
| | W 3.0 kl | | | #VB | N 1.0 MHz | : | | Sweep 2 | 2.00 ms (| 1001 pts) | |

Plot 7-33. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 2Mbps, ePA – Ch. 38)



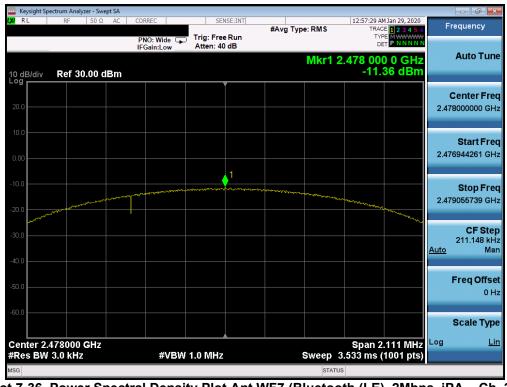
Plot 7-34. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 2Mbps, iPA – Ch. 1)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 40 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 40 of 101 |
| © 2020 PCTEST | - | | V 9.0 02/01/2019 |



| Image: Non-State Image: Non-State <th< th=""><th></th><th>ectrum Analyzer - S</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<> | | ectrum Analyzer - S | | | | | | | | | | |
|---|-------------------|---------------------|---------|------|---------|---|-------------------------------|--------|---------------------|---------------------|-------------|--------------------------------|
| Atten: 40 dB Mkr1 2.440 000 0 GHz -11.33 dBm Center 2.44000000 Center 2.44000000 Center 2.44000000 Center 2.44000000 Center 2.4400610 Center 2.440000 Center 2.4400610 Center 2.440000 Center | <mark>u</mark> RL | RF 50 : | ΩAC | | | | #Avg Typ | e: RMS | TRA | CE 1 2 3 4 5 6 | F | requency |
| Center 200 200 100 00 100 100 100 100 100 100 | 0 dB/div | Ref 30.00 | dBm | | | | | Mkr1 | D 2.440 00 | O O GHz | | Auto Tun |
| Start 2.438943894 2.441056104 2.441056104 CF 2.1122 Auto Freq O Scale Center 2.440000 GHz Span 2.112 MHz | | | | | | | | | | | | Center Fre 10000000 G⊦ |
| Stop 2.441056100 2.441056100 2.441056100 CF 211.22 Auto Freq C Scale Log | | | | | | 1 | | | | | 2.43 | Start Fre 8943894 GF |
| 211.22 Auto 211.22 Freq C 500 500 500 500 500 500 500 500 500 50 | | man | er warm | | a | 1 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | Joh Brandsonger Andreas and a | | men and the case of | Conner and a conner | 2.44 | Stop Fre 1056106 GH |
| enter 2.440000 GHz Span 2.112 MHz | | | | | | | | | | 2 | <u>Auto</u> | CF Ste 211.221 kF Ma |
| enter 2.440000 GHz Span 2.112 MHz | | | | | | | | | | | | Freq Offs 0 I |
| | | | | | | | | | | | Log | Scale Typ |
| | | | | #VBW | 1.0 MHz | | | Sweep | Span 2 3.533 ms | | | L |

Plot 7-35. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 2Mbps, iPA - Ch. 19)



Plot 7-36. Power Spectral Density Plot Ant WF7 (Bluetooth (LE), 2Mbps, iPA - Ch. 38)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 44 af 404 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 41 of 101 |
| © 2020 PCTEST | - | · | V 9.0 02/01/2019 |

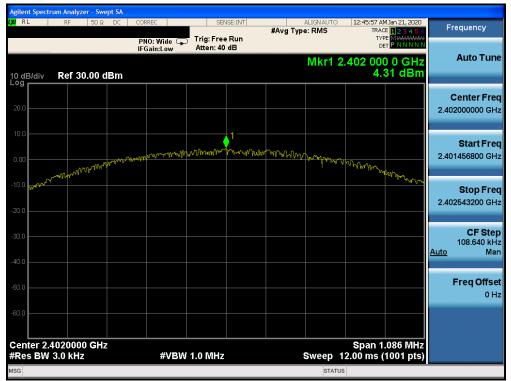


Maximum Measured Power Spectral Density Frequency Data Rate Power Channel Permissible Margin [dBm/3kHz] **Power Density** [MHz] [Mbps] Scheme No. [dB] Ant WF8 Ant WF7 Summed [dBm / 3kHz] 2402 1.0 0 4.31 3.95 7.14 8.0 -0.86 ePA 2440 1.0 ePA 19 4.15 4.13 7.15 8.0 -0.85 1.0 ePA 39 4.09 4.04 7.08 8.0 -0.92 2480 2402 1.0 iPA 0 2.03 2.01 5.03 8.0 -2.97 2440 1.0 iPA 1.63 1.96 4.81 8.0 19 -3.19 2480 1.0 iPA 39 1.18 2.21 4.74 8.0 -3.26 2404 2.0 ePA 1 -1.16 -1.59 1.64 8.0 -6.36 2.0 -1.36 -1.27 -6.30 2440 ePA 19 1.70 8.0 2.0 38 -1.35 8.0 2478 ePA -1.46 1.61 -6.39 2404 2.0 iPA 1 -5.02 -3.14 -0.97 8.0 -8.97 2440 2.0 iPA 19 -5.53 -3.68 -1.50 8.0 -9.50 2478 2.0 iPA -5.43 38 -3.19 -1.16 8.0 -9.16

Table 7-12. Conducted Power Density Measurements TxBF

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 42 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 42 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |





Plot 7-37. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 1Mbps, ePA - Ch. 0)



Plot 7-38. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 1Mbps, ePA - Ch. 0)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | D 12 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 43 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |





Plot 7-39. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)



Plot 7-40. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 44 of 404 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 44 of 101 |
| © 2020 PCTEST | • | • | V 9.0 02/01/2019 |





Plot 7-41. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 1Mbps, ePA - Ch. 39)



Plot 7-42. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 1Mbps, ePA – Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dego 45 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 45 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |





Plot 7-43. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 1Mbps, iPA – Ch. 0)



Plot 7-44. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 1Mbps, iPA - Ch. 0)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 46 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 46 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |





Plot 7-45. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 1Mbps, iPA – Ch. 19)



Plot 7-46. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 1Mbps, iPA – Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 47 of 404 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 47 of 101 |
| © 2020 PCTEST | | · | V 9.0 02/01/2019 |





Plot 7-47. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 1Mbps, iPA – Ch. 39)



Plot 7-48. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 1Mbps, iPA - Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 49 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 48 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| RL RF 50Ω | DC CORREC | SENSE:INT | ALIGN AUTO | 12:59:51 AM Jan 21, 2020 | |
|--------------------------------------|------------------------------|--------------------------------|--|--|--|
| | PNO: Wide 🖵 IFGain:Low | Trig: Free Run Atten: 40 dB | #Avg Type: RMS | TRACE 123456 TYPE MWWWW DET PNNNNN | Frequency |
| 0 dB/div Ref 30.00 d | lBm | | Mkr1 2 | .404 041 9 GHz -1.16 dBm | Auto Tur |
| 20.0 | | | | | Center Fre 2.404000000 GH |
| 0.00 | - marine and a second second | | and the stand of t | | Start Fr 2.402951265 G |
| 0.0 | | | | | Stop Fr 2.405048735 G |
| 0.0 | | | | | CF St e 209.747 k <u>Auto</u> M |
| 50.0 | | | | | Freq Offs 0 |
| enter 2.404000 GHz Res BW 3.0 kHz | #\/D\ | 1.0 MHz | Swoon-2 | Span 2.097 MHz 3.20 ms (1001 pts) | |

Plot 7-49. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 2Mbps, ePA - Ch. 1)

| RL RF 50Ω DC | CORREC PNO: Wide Trig | SENSE:INT | ALIGNAUTO #Avg Type: RMS | 01:10:09 AM Jan 21, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWWW | Frequency |
|---------------------------------------|--|-----------|-----------------------------|--|--|
| 0 dB/div Ref 30.00 dBm | IFGain:Low Att | en: 40 dB | Mkr1 2 | 404 041 9 GHz -1.59 dBm | Auto Tun |
| og | | | | | Center Fre 2.404000000 GH |
| 0.00 | and the second s | 1 | | | Start Fre 2.403003227 G⊦ |
| 20.0 | | | | and the second s | Stop Fre 2.404996773 G⊦ |
| 0.0 | | | | | CF Ste 199.355 kH <u>Auto</u> Ma |
| .0.0 | | | | | Freq Offs 0 F |
| enter 2.4040000 GHz Res BW 3.0 kHz | #VBW 1.0 | | | Span 1.994 MHz 2.07 ms (1001 pts) | |

Plot 7-50. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 2Mbps, ePA – Ch. 1)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 40 of 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 49 of 101 | |
| © 2020 PCTEST | | | V 9.0 02/01/2019 | |





Plot 7-51. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 2Mbps, ePA - Ch. 19)



Plot 7-52. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 2Mbps, ePA – Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 50 af 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 50 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| RL | RF | 50 Ω | DC | CORREC | | SEI | NSE:INT | | ALIGN AUTO | | 4 Jan 21, 2020 | Ex | equency |
|----------|---------|-------|-------------|------------------|------------------|-------------------------|---------|----------------------------|----------------------|------------------|---|-------------|--------------------------------|
| | | | | PNO: V IFGain | Vide 🖵 Low | Trig: Fre Atten: 40 | | #Avg Typ | e: RMS | TYF | E 1 2 3 4 5 6 E M WWWWW T P N N N N N | F1 | |
| 0 dB/div | Ref 30 | .00 d | Bm | | | | | | Mkr1 2 | .478 044 -1.3 | 4 2 GHz 35 dBm | | Auto Tur |
| 20.0 | | | | | | | | | | | | | Center Fre B000000 GH |
|).00 | | | n and and a | | مورمتهم (مرارسات | - to Warden Wester also | 1 | with the state of the same | har war and a second | | | 2.47 | Start Fre 6946996 Gi |
| 20.0 | | | | | | | | | | and a second | Belly March Malak | 2.47 | Stop Fre 9053004 Gi |
| 0.0 | | | | | | | | | | | | <u>Auto</u> | CF Ste 210.601 kl M |
| 0.0 | | | | | | | | | | | | | Freq Offs 0 |
| io.o | | | | | | | | | | Span 2 | .106 MHz | | |
| Res BW | 3.0 kHz | | | | #VBW | 1.0 MHz | | | Sweep 2 | 3.27 ms (| 1001 pts) | | |

Plot 7-53. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 2Mbps, ePA – Ch. 38)



Plot 7-54. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 2Mbps, ePA – Ch. 38)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege 51 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 51 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| Mkr1 2.401 993 7 GHz Auto Tr 10 dB/div Ref 20.00 dBm Center F 100 1 1 1 100 1 1 1 100 1 1 1 100 1 1 1 1 100 1 1 1 1 1 100 1 1 1 1 1 1 100 1 | X/RL | RF 50: | ΩDC | CORREC PNO: Wide C IFGain:Low | Trig: Free Run Atten: 30 dB | ALIGNAUTO #Avg Type: RMS | 06:29:41 PMFeb 08, 2020 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N | Frequency |
|--|-----------|--|-----|--|--------------------------------|--|--|---|
| 100 1 Center F 100 1 Start F 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 100 1 1 1 100 1 1 1 1 100 1 1 1 1 100 1 1 1 1 100 1 1 1 1 100 1 1 1 1 100 1 1 1 | 10 dB/div | Ref 20.00 | dBm | IFGam:Low_ | Atten. oo dB | Mkr1 2 | .401 993 7 GHz | Auto Tun |
| 100 1 | | | | | | | | Center Fre 2.402000000 GH |
| 30.0 30.0 30.0 2.403054502 (40.0 2.403054502 (2.403054502 (50.0 2.403054502 (2.403054502 (60.0 2.403054502 (2.403054502 (60.0 2.403054502 (2.403054502 (60.0 2.403054502 (2.403054502 (60.0 2.403054502 (4.400 (60.0 2.403054502 (4.400 (| | property of the second se | | and when the state of the state | 1 | an and a start and a start and a start | and the second second | Start Fre 2.400945498 GF |
| 50.0 | | | | | | | | Stop Fre 2.403054502 GH |
| | | | | | | | | CF Ste 210.900 kł <u>Auto</u> Ma |
| | 60.0 | | | | | | | Freq Offs 0 H |
| Center 2.402000 GHz Span 2.109 MHz #Res BW 3.0 kHz #VBW 1.0 MHz Sweep 23.33 ms (1001 pts) | Center 2. | | 2 | | | | Span 2.109 MHz | |

Plot 7-55. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 2Mbps, iPA - Ch. 1)



Plot 7-56. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 2Mbps, iPA - Ch. 1)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 52 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 52 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |





Plot 7-57. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 2Mbps, iPA – Ch. 19)



Plot 7-58. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 2Mbps, iPA – Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 52 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 53 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |





Plot 7-59. Power Spectral Density Plot TxBF Ant WF8 (Bluetooth (LE), 2Mbps, iPA – Ch. 38)



Plot 7-60. Power Spectral Density Plot TxBF Ant WF7 (Bluetooth (LE), 2Mbps, iPA - Ch. 38)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege 54 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 54 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



7.5 Conducted Emissions at the Band Edge §15.247(d); RSS-247 [5.5]

Test Overview and Limit

For the following out of band conducted spurious emissions plots at the band edge, the EUT was set to transmit at maximum power with the largest packet size available. These settings produced the worst-case emissions.

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth.

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3 KDB 558074 D01 v05r02 – Section 8.7.2

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW = 100kHz
- 4. VBW = 300kHz
- 5. Detector = Peak
- 6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = max hold
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-4. Test Instrument & Measurement Setup

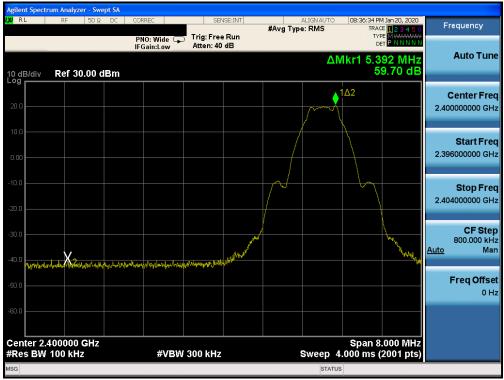
Test Notes

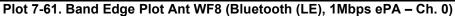
Both power schemes were investigated, and only the worst case is reported.

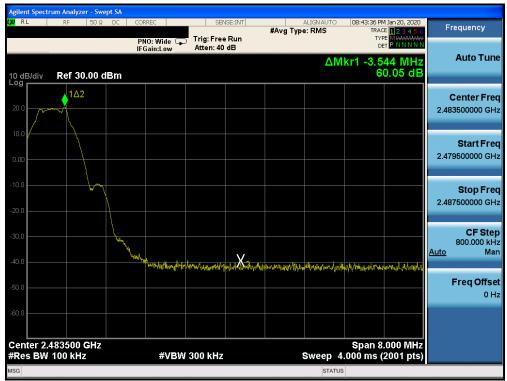
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 55 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 55 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



Antenna WF8







Plot 7-62. Band Edge Plot Ant WF8 (Bluetooth (LE), 1Mbps ePA – Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 56 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| RL RF 50Ω DC | CORREC | SENSE:INT | | ALIGN AUTO | 10:30:50 PN | 4 Jan 20, 2020 | |
|--|---------------------------|-------------------|-----------|------------|---------------------|-----------------------------------|---|
| | | ree Run | #Avg Type | | TRAC | E 123456 MWWWWW P N N N N N | Frequency |
| dB/div Ref 30.00 dBm | IFGain:Low Atten. | 40 00 | | ΔN | 1kr1 4.8 5 | 36 MHz 8.53 dB | Auto Tun |
| 20.0 | | | | | 1∆2 | | Center Fre 2.400000000 G⊦ |
| 0.00 | | | | | | | Start Fre 2.394000000 GH |
| 0.0 | | | | | | | Stop Fre 2.406000000 GH |
| | | | w | | | | CF Ste 1.200000 Mi <u>Auto</u> Mi |
| 0.0 1442-4464 1444 1444 1444 1444 1444 1444 1444 | Mahan Manaharahar Azilian | ren dreater and a | | | | | Freq Offs 0 I |
| 0.0 | | | | | | | |
| enter 2.400000 GHz Res BW 100 kHz | #VBW 300 kH | z | | Sweep 1 | Span 1 .067 ms (| 2.00 MHz 2001 pts) | |
| G | | | | STATUS | | | |

Plot 7-63. Band Edge Plot Ant WF8 (Bluetooth (LE), 2Mbps ePA – Ch. 1)



Plot 7-64. Band Edge Plot Ant WF8 (Bluetooth (LE), 2Mbps ePA - Ch. 38)

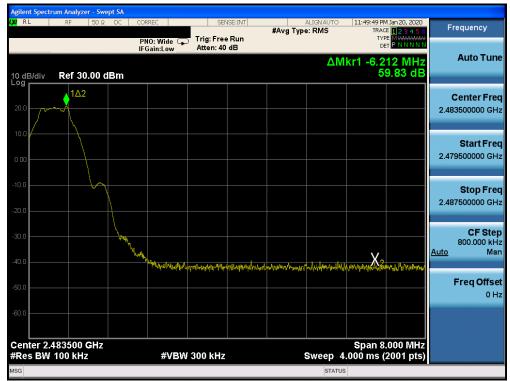
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege 57 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 57 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



Antenna WF7

lent Spectrum Analyzer - Swept SA JTO 11:42:02 PM Jan 20, 2020 TRACE 123456 U RL 50 Ω SENSE:INT Frequency #Avg Type: RMS Trig: Free Run Atten: 40 dB TYPE DET PNO: Wide 🖵 IFGain:Low Auto Tune ΔMkr1 4.400 MHz 60.52 dB Ref 30.00 dBm 10 dB/div **Center Freq** 2.400000000 GHz Start Freq 2.396000000 GHz Stop Freq 2.404000000 GHz CF Step 800.000 kHz North Man <u>Auto</u> Manman harmon Anna Maria ميناناه وتساديها **Freq Offset** 0 Hz Span 8.000 MHz Sweep 4.000 ms (2001 pts) Center 2.400000 GHz #Res BW 100 kHz #VBW 300 kHz

Plot 7-65. Band Edge Plot Ant WF7 (Bluetooth (LE), 1Mbps ePA - Ch. 0)



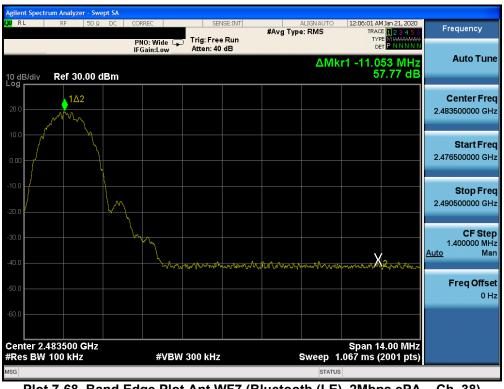
Plot 7-66. Band Edge Plot Ant WF7 (Bluetooth (LE), 1Mbps ePA – Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | D |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 58 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| gilent Spectrun RL | | JΩ [| | ORREC | | SEN | VSE:INT | | ALIGN AUTO | | 1 Jan 20, 2020 | - |
|-------------------------|--------------|----------|--------------|-------------------|-------|-------------------------|---------|----------|------------|----------------------|--|---|
| | | | | PNO: W FGain:L | ide 🖵 | Trig: Free Atten: 40 | | #Avg Typ | e: RMS | TRAC | E 1 2 3 4 5 6 E MWWWWW T P N N N N N | Frequency |
| 0 dB/div | Ref 30.0 | 0 dB | | | | | | | ΔΙ | Mkr1 5.9 5 | 64 MHz 8.56 dB | Auto Tun |
| 20.0 | | | | | | | | | | 1 <u>Δ2</u> | | Center Fre 2.400000000 GH |
| 0.00 | | | | | | | | | | | | Start Fre 2.394000000 GH |
| 0.0 | | | | | | | | | | | | Stop Fre 2.406000000 GH |
| 0.0 | | | | | | | | | | | | CF Ste 1.200000 MH <u>Auto</u> Ma |
| 0.0 <mark>www.~~</mark> | nfhMull-Afra | γ•n, −n, | ᡧ᠕ᢛᢪᢏᡗᢧᠷᢆᡟᡫᠬ | ~~^ | 2 www | Mythillon when | | | | | | Freq Offs 0 H |
| | | | | | | | | | | | | |
| enter 2.40 Res BW 10 | | IZ | | \$ | ≠vbw | 300 kHz | | | Sweep | Span 1 1.067 ms (| 2.00 MHz 2001 pts) | |

Plot 7-67. Band Edge Plot Ant WF7 (Bluetooth (LE), 2Mbps ePA – Ch. 1)



Plot 7-68. Band Edge Plot Ant WF7 (Bluetooth (LE), 2Mbps ePA - Ch. 38)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dave 50 of 404 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 59 of 101 |
| © 2020 PCTEST | • | · | V 9.0 02/01/2019 |



7.6 Conducted Spurious Emissions §15.247(d); RSS-247 [5.5]

Test Overview and Limit

For the following out of band conducted spurious emissions plots, the EUT was set to transmit at maximum power with the largest packet size available. The worst case spurious emissions were found in this configuration.

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the procedure in Section 8.5 of KDB 558074 D01 v05r02 and Section 11.11 of ANSI C63.10-2013.

Test Procedure Used

ANSI C63.10-2013 – Section 11.11.3 KDB 558074 D01 v05r02 – Section 8.5

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 25GHz (separated into two plots per channel)
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 7-5. Test Instrument & Measurement Setup

| FCC ID: BCGA2228 | MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Quality Manager |
|---------------------|---------------------------------------|---------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 60 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 60 of 101 |
| © 2020 PCTEST | | · | V 9.0 02/01/2019 |



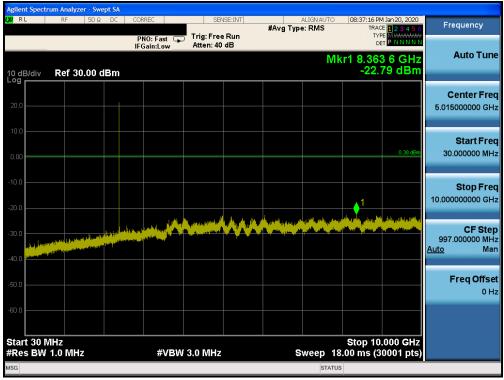
Test Notes

- 1. RBW was set to 1MHz rather than 100kHz in order to increase the measurement speed.
- 2. The display line shown in the following plots denotes the limit at 20dB below the fundamental emission level measured in a 100kHz bandwidth. However, since the traces in the following plots are measured with a 1MHz RBW, the display line may not necessarily appear to be 20dB below the level of the fundamental in a 1MHz bandwidth.
- 3. For plots showing conducted spurious emissions near the limit, the frequencies were investigated with a reduced RBW to ensure that no emissions were present.
- 4. The unit was tested with all possible mode and power schemes and only the highest emission is reported.

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 61 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 61 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |



Antenna WF8



Plot 7-69. Conducted Spurious Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA - Ch. 0)



Plot 7-70. Conducted Spurious Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA - Ch. 0)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|--|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | | Dama 60 af 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | | Page 62 of 101 |
| © 2020 PCTEST | * | | | V 9 0 02/01/2019 |



| | L | RF | 50 Ω | DC | CORRE | | | ENSE:INT | #Avg Ty | ALIGNAUTO pe: RMS | 108.40.17 Pr | M Jan 20, 2020 ^{DE} <mark>1 2 3 4 5 6</mark> | Frequency |
|-------------------|------------------|---------------|------------|----|-------------|--------------------|-----------------------|----------|---------|----------------------|---------------------|--|------------------------------------|
| | | | | | PNC IFGa | l:Fast G in:Low | Trig: Fre Atten: 4 | | | | TYI Di | E 123456 E MWWWW ET P NNNNN | |
| | 3/div | Ref 3 | 0.00 d | Bm | | | | | | Mk | (r1 9.84 -21. | 1 8 GHz 08 dBm | Auto Tui |
| og 20.0 | | | | | | | | | | | | | Center Fr 5.015000000 Gi |
| 0.0 | | | | | | | | | | | | 0.49 dBm | Start Fr 30.000000 M |
| 0.0 | | | | | | | | | | | | 4 | Stop Fr 10.000000000 G |
| 0.0 0.0 | | AND ALL PARTY | - | | | | | | | | | a an | CF Sto 997.000000 M |
| D.O | | | un antesta | | | | | | | | | | <u>Auto</u> M |
| 0.0 | | | | | | | | | | | | | Freq Offs 01 |
| 0.0 | | | | | | | | | | | | | |
| | t 30 M s BW 1 | | z | | | #VB۱ | V 3.0 MH: | z | | Sweep 18 | Stop 10 00 ms (3 | .000 GHz 0001 pts) | |

Plot 7-71. Conducted Spurious Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

| RL | RF | 50Ω [| DC COF | REC | SEN | ISE:INT | | ALIGN AUTO | | 4 Jan 20, 2020 | Frequency |
|---------|---|---|--------|---|-------------------------|---|----------|--|---------------------------|--------------------------------------|-----------------------------|
| | | | | NO: Fast G Gain:Low | Trig: Free Atten: 16 | | #Avg Typ | e: RMS | TYI | CE 123456 PE MWWWWW ET P NNNNN | |
|) dB/di | v Ref 5 | .00 dBn | า | | | | | Mkr | 1 23.80 -36. | 0 0 GHz 94 dBm | Auto Tur |
| | | | | | | | | | | 0.49 dBm | Center Fre |
| 5.0 | | | | | | | | | | | 17.500000000 GH |
| 5.0 | | | | | | | | | | | Start Fre 10.000000000 G |
| 5.0 | | | | | | | | na | ر بالاردانيون رومانيون | 1 Physiolectrop | Stop Fro |
| 5.0 | langal (ping a la fara Ananin Sina Anatia | andre and | | and the second secon | | a di Serai da Mandala da Katalan d | | and a state of the | والمكأسط والأصطلوع | يماد الألبط بالكانية. | CF Ste |
| 5.0 | | | | | | | | | | | 1.500000000 GI Auto M |
| 5.0 | | | | | | | | | | | Freq Offs |
| 5.0 | | | | | | | | | | | 01 |
| | | | | | | | | | | | |
| | 0.000 GH: W 1.0 MF | | | #VB | V 3.0 MHz | | s | weep 26 | 25 Stop 0.00 ms (3 | .000 GHz 0001 pts) | |

Plot 7-72. Conducted Spurious Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege 62 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 63 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| W RL | r <mark>um Analyzer</mark> RF | - Swept 50 Ω E | ORREC | CEN | JSE:INT | | ALIGN AUTO | 09:44:20 0 | M Jan 20, 2020 | |
|-------------------------|----------------------------------|-------------------|-------------------------|-------------|---------|----------|------------|------------------|--|---|
| | 10 | 30 % L | PNO: Fast C Gain:Low | . | Run | #Avg Typ | | TRA | CE 1 2 3 4 5 6 PE M WWWWWW DET P N N N N N | Frequency |
| 10 dB/div | Ref 30. | 00 dBi | -Gain:Low | Atten. 40 | | | Μ | lkr1 8.95 -22 | 3 5 GHz 87 dBm | Auto Tuno |
| 20.0 | | | | | | | | | | Center Free 5.015000000 GH |
| 0.00 | | | | | | | | | 0.56 dBm | Start Fre 30.000000 MH |
| 20.0 | | | | | | | | | 1 | Stop Fre 10.000000000 GH |
| 10.0 Contraction | | ant pire at a | | | ~~~ | | | | | CF Ste 997.000000 MH <u>Auto</u> Ma |
| 50.0 | | | | | | | | | | Freq Offse 0 H |
| 60.0 Start 30 F | /IHz 1.0 MHz | | #\/P | N 3.0 MHz | | | ween 1 | Stop 10 |).000 GHz 30001 pts) | |
| | 1.0 MHZ | | #VB | /V 3.0 WIHZ | | | stati | | 30001 pts) | |

Plot 7-73. Conducted Spurious Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA - Ch. 39)



Plot 7-74. Conducted Spurious Plot Ant WF8 (Bluetooth (LE), 1Mbps, ePA - Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 04 af 404 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 64 of 101 |
| © 2020 PCTEST | • | • | V 9.0 02/01/2019 |



Antenna WF7



Plot 7-75. Conducted Spurious Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA – Ch. 0)



Plot 7-76. Conducted Spurious Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA - Ch. 0)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege 65 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 65 of 101 |
| © 2020 PCTEST | - | · | V 9.0 02/01/2019 |



| | | RF | 50Ω E | | REC | | NSE:INT | #Avg Typ | ALIGN AUTO pe: RMS | | 4 Jan 20, 2020 26 1 2 3 4 5 6 26 M WWWWWW T P N N N N N | Frequency |
|-----------------|-------|--------------|-------------------------------|-------------------------|----------|-----------|---------|----------|-----------------------|-----------|--|---|
| 0 dB | /div | Ref 30. | 00 dBi | IF | Gain:Low | Atten: 40 | | | Mk | (r1 9.23) | 0 0 GHz 62 dBm | Auto Tur |
| og 20.0 | | | | | | | | | | | | Center Fre 5.015000000 GF |
| 10.0).00 | | | | | | | | | | | 0.86 dBm | Start Fr 30.000000 Mi |
| 10.0 20.0 - | | | | | | | | | | | ↓1 | Stop Fro 10.000000000 GI |
| 0.0 1 0.0 | | | angar tanja _{tang} a | n analima na analima | | | | | | | | CF St e 997.000000 M <u>Auto</u> M |
| 0.0 | | | | | | | | | | | | Freq Offs 0 |
| | 30 MI | Hz .0 MHz | | | #\/B\A | / 3.0 MHz | | | Sweep 18 | Stop 10 | .000 GHz | |

Plot 7-77. Conducted Spurious Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

| RL | RF 50 Ω DC | CORREC | SEN | SE:INT | | IN AUTO | 11:46:32 PM | | Frequency |
|--|--|--------------------------------------|--|------------------------------|-------------------------|---|---------------------------------|---|---|
| | | PNO: Fast C IFGain:Low | Trig: Free Atten: 16 | Run | Avg Type: R | IM 5 | TYPE | 123456 M WAAAAA PNNNNN | |
| dB/div | tef 5.00 dBm | | | | | Mkr1 | 23.935 -37.3 | 5 GHz 8 dBm | Auto Tur |
| ^{,g} | | | | | | | | 0.86 dBm | Center Fre |
| .00 | | | | | | | | | 17.500000000 GI |
| 5.0 | | | | | | | | | Start Fro |
| 5.0 | | | | | | | | | 10.00000000 Gł |
| 5.0 | | | | التغاط المخاطبات وروا والراو | and the sector | and a state of | and the state of the | | Stop Fre |
| 19 C C C C C C C C C C C C C C C C C C C | and the property of the proper | n pering in grane print in the start | an al ^{an} an | | يتحقق والمطلبين وريتاني | Contraction of the second s | anti-statutine, Miller av " o e | | |
| 5.0 | a sector an above t | | | | | | | | CF Ste 1.500000000 GI <u>Auto</u> M |
| | | | | | | | | | Freq Offs |
| 5.0 | | | | | | | | | 01 |
| 5.0 | | | | | | | | | |
| tart 10.000 Res BW 1.0 | | #VB | W 3.0 MHz | | Swe | ep 26. | Stop 25. 00 ms (30 | 000 GHz | |

Plot 7-78. Conducted Spurious Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA – Ch. 19)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Demo 66 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 66 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



| K/RL | r <mark>um Analyzer</mark> - RF 5 | 50Ω D0 | | REC | SEN | VSE:INT | | ALIGN AUTO | 11:51:52 P | M Jan 20, 2020 | |
|-------------------------------|--------------------------------------|--------|---|------------------------|----------|---------|----------|------------|-------------------|--|---|
| | | | P | NO: Fast 🕞 Gain:Low | . | Run | #Avg Typ | | TRA | CE 123456 PE M VIIII 0 0 0 ET P N N N N N | Frequency |
| 10 dB/div | Ref 30.0 | 0 dBn | | Jain.Low | | | | N | lkr1 9.81 -22. | 9 2 GHz 84 dBm | Auto Tun |
| 20.0 | | | | | | | | | | | Center Fre 5.015000000 GH |
| 0.00 | | | | | | | | | | 0.91 dBm | Start Fre 30.000000 MH |
| 20.0 | | | | | | | | | | | Stop Fre 10.000000000 GH |
| 30.0 | | | | | | **** | | | | e the second | CF Ste 997.000000 M⊢ <u>Auto</u> Ma |
| 50.0 | | | | | | | | | | | Freq Offse 0 ⊢ |
| 60.0 Start 30 M #Res BW | | | | #\/B\A | 3.0 MHz | | | ween | Stop 10 | 0.000 GHz | |
| SG | 1.0 10112 | | | # V D V | 5.0 MHZ | | C | STAT | | ooor pis) | |

Plot 7-79. Conducted Spurious Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA - Ch. 39)



Plot 7-80. Conducted Spurious Plot Ant WF7 (Bluetooth (LE), 1Mbps, ePA - Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dave 07 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 67 of 101 |
| © 2020 PCTEST | | · | V 9.0 02/01/2019 |



7.7 Radiated Spurious Emission Measurements §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 7 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-13 per Section 15.209 and RSS-Gen (8.9).

| Frequency | Field Strength [μV/m] | Measured Distance [Meters] | | | | | | |
|----------------------------|--------------------------|-------------------------------|--|--|--|--|--|--|
| Above 960.0 MHz | 500 | 3 | | | | | | |
| Table 7-13 Padiated Limits | | | | | | | | |

Table 7-13. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 - Section 6.6.4.3

KDB 558074 D01 v05r02 - Section 8.6, 8.7

Test Settings

Average Field Strength Measurements

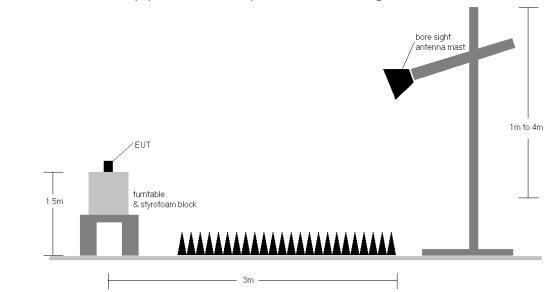
- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = power average (RMS)
- 5. Number of measurement points = 1001 (Number of points must be \geq 2 x span/RBW)
- 6. Sweep time = auto
- 7. Trace (RMS) averaging was performed over at least 100 traces

Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege 69 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 68 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |





The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-6. Radiated Test Setup >1GHz

Test Notes

- The optional test procedures for antenna port conducted measurements of unwanted emissions per the guidance of KDB 558074 D01 v05r02 were not used to evaluate this device for compliance to radiated limits. All radiated spurious emissions levels were measured in a radiated test setup.
- 2. All emissions lying in restricted bands specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-13.
- 3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- 4. This unit was tested with its standard battery.
- 5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 6. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 7. The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 8. The unit was tested with all possible mode and power schemes and only the highest emission is reported.

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 00 af 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 69 of 101 |
| © 2020 PCTEST | • | • | V 9.0 02/01/2019 |

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



Determining Spurious Emissions Levels

- ο Field Strength Level [dBμV/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- ο Margin [dB] = Field Strength Level [dBµV/m] Limit [dBµV/m]

Radiated Band Edge Measurement Offset

• The amplitude offset shown in the radiated restricted band edge plots in Section 7.8 was calculated using the formula:

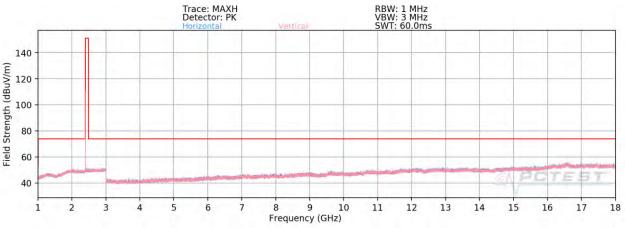
Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) - Preamplifier Gain

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 70 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 70 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |

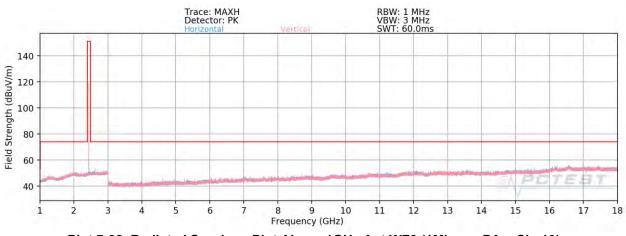


Radiated Spurious Emission Measurements §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

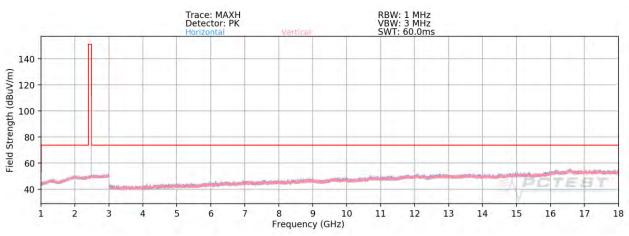
Antenna WF8











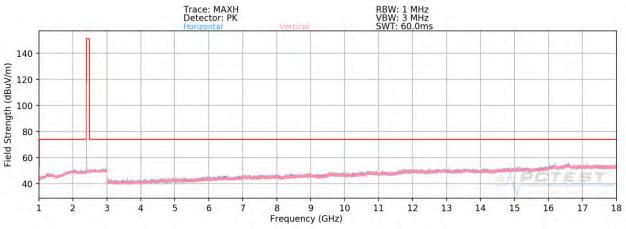
Plot 7-83. Radiated Spurious Plot Above 1GHz Ant WF8 (1Mbps, ePA - Ch. 39)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 71 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 71 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |

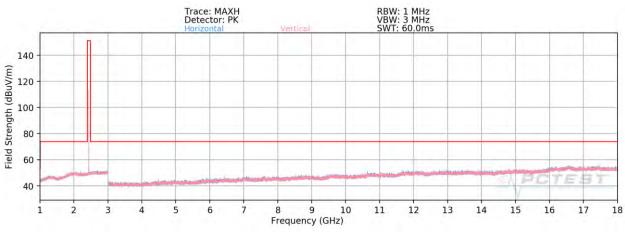


Radiated Spurious Emission Measurements §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

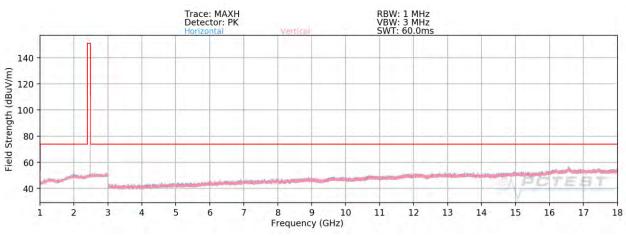
Antenna WF7











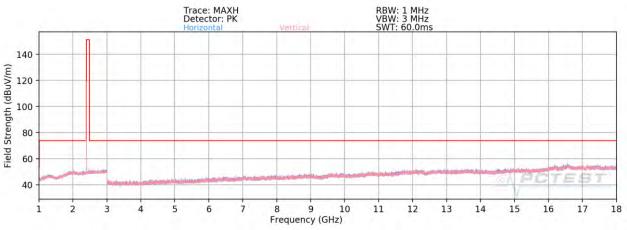
Plot 7-86. Radiated Spurious Plot Above 1GHz Ant WF7 (1Mbps, ePA – Ch. 39)

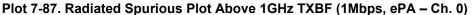
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 72 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 72 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |

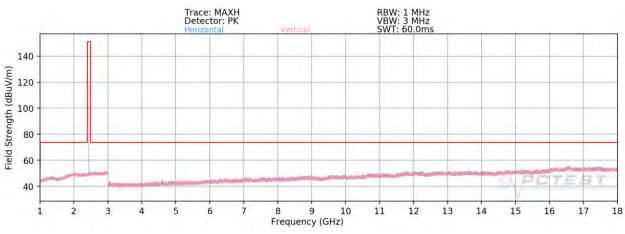


Radiated Spurious Emission Measurements §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

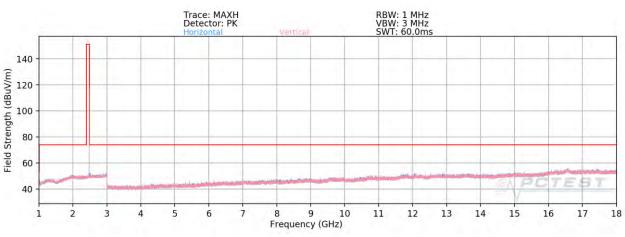
TxBF









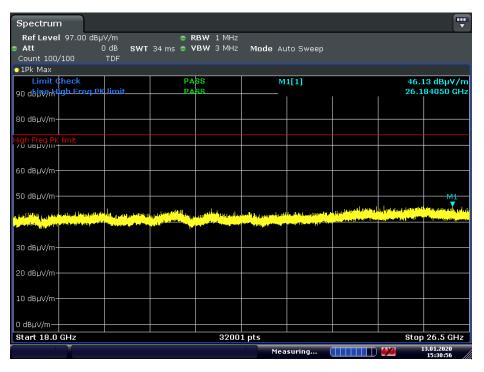


Plot 7-89. Radiated Spurious Plot Above 1GHz TXBF (1Mbps, ePA – Ch. 39)

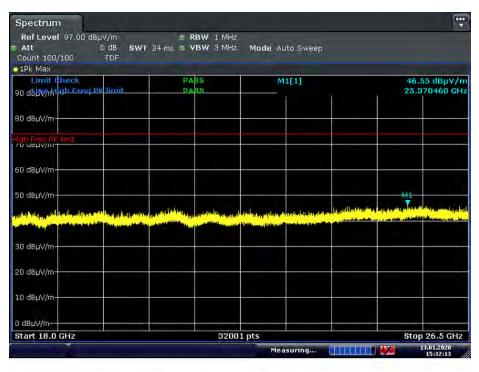
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 72 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 73 of 101 |
| © 2020 PCTEST | • | · | V 9.0 02/01/2019 |



Radiated Spurious Emission Measurements (Above 18GHz) §15.205 §15.209 §15.247(d); RSS-Gen [8.9]



Plot 7-90. Radiated Spurious Plot Above 18GHz TxBF (1Mbps, ePA, Ant. Pol. H)



Plot 7-91. Radiated Spurious Plot Above 18GHz TxBF (1Mbps, ePA, Ant. Pol. V)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dawa 74 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 74 of 101 |
| © 2020 PCTEST | - | · | V 9.0 02/01/2019 |



Radiated Spurious Emission Measurements §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Antenna WF8

| LE |
|----------|
| 3 Meters |
| 2402MHz |
| 0 |
| |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 4804.00 | Avg | Н | - | - | -79.76 | 5.39 | 32.63 | 53.98 | -21.35 |
| 4804.00 | Peak | H | - | - | -68.03 | 5.39 | 44.36 | 73.98 | -29.62 |
| 12010.00 | Avg | Н | - | - | -82.85 | 14.50 | 38.65 | 53.98 | -15.33 |
| 12010.00 | Peak | Н | - | - | -70.93 | 14.50 | 50.57 | 73.98 | -23.41 |

| Table 7-14. Radiated Measurement |
|----------------------------------|
|----------------------------------|

| Bluetooth Mode: | LE |
|---------------------------|----------|
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2440MHz |
| Channel: | 19 |
| | |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 4880.00 | Avg | Н | - | - | -79.74 | 5.46 | 32.72 | 53.98 | -21.26 |
| 4880.00 | Peak | Н | - | - | -68.68 | 5.46 | 43.78 | 73.98 | -30.20 |
| 7320.00 | Avg | H | - | - | -81.10 | 9.01 | 34.91 | 53.98 | -19.07 |
| 7320.00 | Peak | Н | - | - | -69.61 | 9.01 | 46.40 | 73.98 | -27.58 |
| 12200.00 | Avg | Н | - | - | -82.55 | 14.91 | 39.36 | 53.98 | -14.62 |
| 12200.00 | Peak | Н | - | - | -70.76 | 14.91 | 51.15 | 73.98 | -22.83 |

Table 7-15. Radiated Measurements

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 75 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 75 of 101 |
| © 2020 PCTEST | • | • | V 9.0 02/01/2019 |



| Bluetooth Mode: | LE |
|---------------------------|----------|
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2480MHz |
| Channel: | 39 |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 4960.00 | Avg | H | - | - | -80.06 | 6.16 | 33.10 | 53.98 | -20.88 |
| 4960.00 | Peak | Н | - | - | -68.07 | 6.16 | 45.09 | 73.98 | -28.89 |
| 7440.00 | Avg | Н | - | - | -81.65 | 9.86 | 35.21 | 53.98 | -18.77 |
| 7440.00 | Peak | Н | - | - | -70.00 | 9.86 | 46.86 | 73.98 | -27.12 |
| 12400.00 | Avg | Н | - | - | -83.47 | 14.54 | 38.07 | 53.98 | -15.91 |
| 12400.00 | Peak | Н | - | - | -71.99 | 14.54 | 49.55 | 73.98 | -24.43 |

Table 7-16. Radiated Measurements

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 76 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 76 of 101 |
| © 2020 PCTEST | - | • | V 9.0 02/01/2019 |



Radiated Spurious Emission Measurements §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

Antenna WF7

| Bluetooth Mode: | LE |
|---------------------------|----------|
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2402MHz |
| Channel: | 0 |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 4804.00 | Avg | V | - | - | -79.71 | 5.39 | 32.68 | 53.98 | -21.30 |
| 4804.00 | Peak | V | - | - | -68.44 | 5.39 | 43.95 | 73.98 | -30.03 |
| 12010.00 | Avg | V | - | - | -82.82 | 14.50 | 38.68 | 53.98 | -15.30 |
| 12010.00 | Peak | V | - | - | -71.68 | 14.50 | 49.82 | 73.98 | -24.16 |

| Table 7-17. Radiated Measurement | s |
|----------------------------------|---|
|----------------------------------|---|

| Bluetooth Mode: | LE |
|---------------------------|----------|
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2440MHz |
| Channel: | 19 |
| | |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 4880.00 | Avg | V | - | - | -79.74 | 5.46 | 32.72 | 53.98 | -21.26 |
| 4880.00 | Peak | V | - | - | -68.11 | 5.46 | 44.35 | 73.98 | -29.63 |
| 7320.00 | Avg | V | - | - | -81.22 | 9.01 | 34.79 | 53.98 | -19.19 |
| 7320.00 | Peak | V | - | - | -69.84 | 9.01 | 46.17 | 73.98 | -27.81 |
| 12200.00 | Avg | V | - | - | -82.63 | 14.91 | 39.28 | 53.98 | -14.70 |
| 12200.00 | Peak | V | - | - | -70.92 | 14.91 | 50.99 | 73.98 | -22.99 |

Table 7-18. Radiated Measurements

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 77 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 77 of 101 |
| © 2020 PCTEST | • | • | V 9.0 02/01/2019 |



| Bluetooth Mode: | LE |
|---------------------------|----------|
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2480MHz |
| Channel: | 39 |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 4960.00 | Avg | V | - | - | -80.15 | 6.16 | 33.01 | 53.98 | -20.97 |
| 4960.00 | Peak | V | - | - | -68.65 | 6.16 | 44.51 | 73.98 | -29.47 |
| 7440.00 | Avg | V | - | - | -81.79 | 9.86 | 35.07 | 53.98 | -18.91 |
| 7440.00 | Peak | V | - | - | -70.37 | 9.86 | 46.49 | 73.98 | -27.49 |
| 12400.00 | Avg | V | - | - | -83.43 | 14.54 | 38.11 | 53.98 | -15.87 |
| 12400.00 | Peak | V | - | - | -71.52 | 14.54 | 50.02 | 73.98 | -23.96 |

Table 7-19. Radiated Measurements

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 79 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 78 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



Radiated Spurious Emission Measurements §15.205 §15.209 §15.247(d); RSS-Gen [8.9]

TxBF

| Bluetooth Mode: | LE |
|---------------------------|----------|
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2402MHz |
| Channel: | 0 |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 4804.00 | Avg | V | - | - | -79.60 | 5.39 | 32.79 | 53.98 | -21.19 |
| 4804.00 | Peak | V | - | - | -67.83 | 5.39 | 44.56 | 73.98 | -29.42 |
| 12010.00 | Avg | V | - | - | -82.81 | 14.50 | 38.69 | 53.98 | -15.29 |
| 12010.00 | Peak | V | - | - | -71.25 | 14.50 | 50.25 | 73.98 | -23.73 |

| Table 7-20. Radiated | Measurements |
|----------------------|--------------|
|----------------------|--------------|

| Bluetooth Mode: | LE |
|---------------------------|----------|
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2440MHz |
| Channel: | 19 |
| | |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 4880.00 | Avg | V | - | - | -79.92 | 5.46 | 32.54 | 53.98 | -21.44 |
| 4880.00 | Peak | V | - | - | -68.02 | 5.46 | 44.44 | 73.98 | -29.54 |
| 7320.00 | Avg | V | - | - | -81.21 | 9.01 | 34.80 | 53.98 | -19.18 |
| 7320.00 | Peak | V | - | - | -69.55 | 9.01 | 46.46 | 73.98 | -27.52 |
| 12200.00 | Avg | V | - | - | -82.58 | 14.91 | 39.33 | 53.98 | -14.65 |
| 12200.00 | Peak | V | - | - | -71.50 | 14.91 | 50.41 | 73.98 | -23.57 |

Table 7-21. Radiated Measurements

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 70 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 79 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |



| Bluetooth Mode: | LE |
|---------------------------|----------|
| Distance of Measurements: | 3 Meters |
| Operating Frequency: | 2480MHz |
| Channel: | 39 |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 4960.00 | Avg | V | - | - | -80.11 | 6.16 | 33.05 | 53.98 | -20.93 |
| 4960.00 | Peak | V | - | - | -69.03 | 6.16 | 44.13 | 73.98 | -29.85 |
| 7440.00 | Avg | V | - | - | -81.78 | 9.86 | 35.08 | 53.98 | -18.90 |
| 7440.00 | Peak | V | - | - | -70.44 | 9.86 | 46.42 | 73.98 | -27.56 |
| 12400.00 | Avg | V | - | - | -83.55 | 14.54 | 37.99 | 53.98 | -15.99 |
| 12400.00 | Peak | V | - | - | -71.99 | 14.54 | 49.55 | 73.98 | -24.43 |

Table 7-22. Radiated Measurements

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 90 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 80 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |

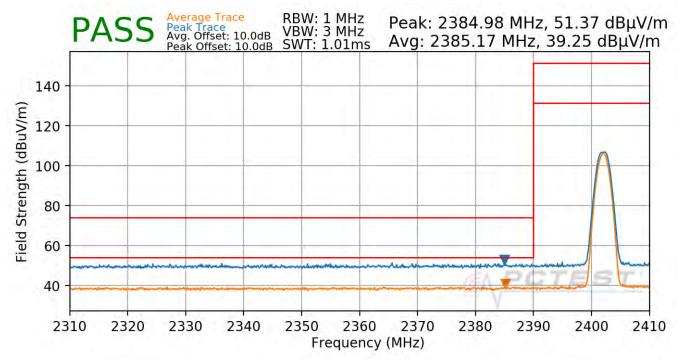


The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting.

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 1 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2402MHz |
| Channel: | 0 |



Plot 7-92. Radiated Restricted Lower Band Edge Measurement Ant WF8 (Average & Peak)

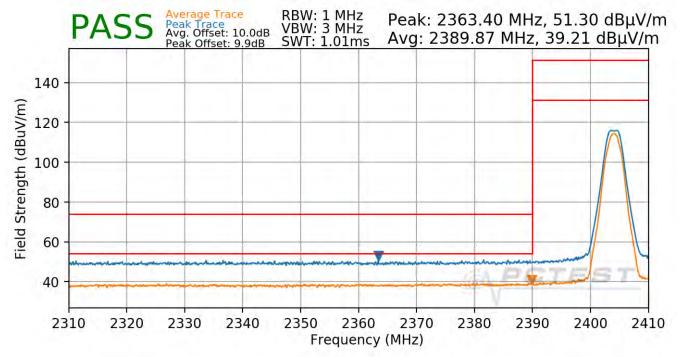
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 91 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 81 of 101 |
| © 2020 PCTEST | • | • | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 2 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2404MHz |
| Channel: | 1 |



Plot 7-93. Radiated Restricted Lower Band Edge Measurement Ant WF8 (Average & Peak)

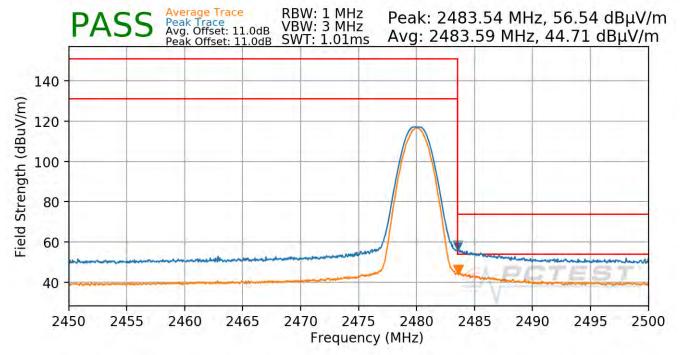
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 92 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 82 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 1 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2480MHz |
| Channel: | 39 |



Plot 7-94. Radiated Restricted Upper Band Edge Measurement Ant WF8 (Average & Peak)

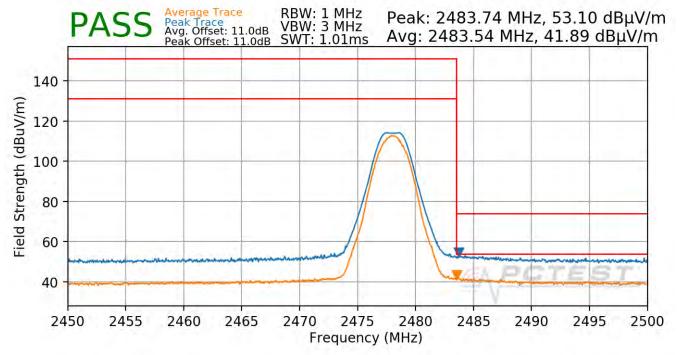
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 92 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 83 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 2 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2478MHz |
| Channel: | 38 |



Plot 7-95. Radiated Restricted Upper Band Edge Measurement Ant WF8 (Average & Peak)

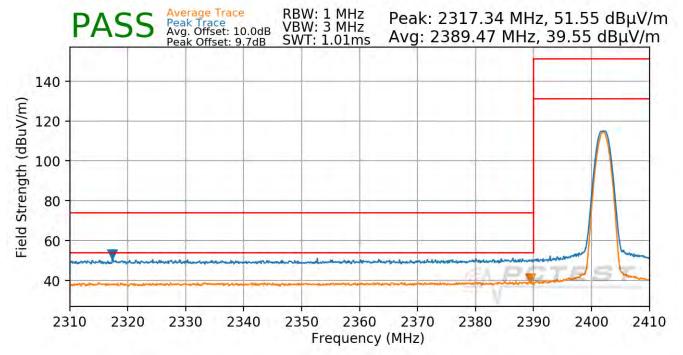
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 04 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 84 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) - Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 1 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2402MHz |
| Channel: | 0 |



Plot 7-96. Radiated Restricted Lower Band Edge Measurement Ant WF7 (Average & Peak)

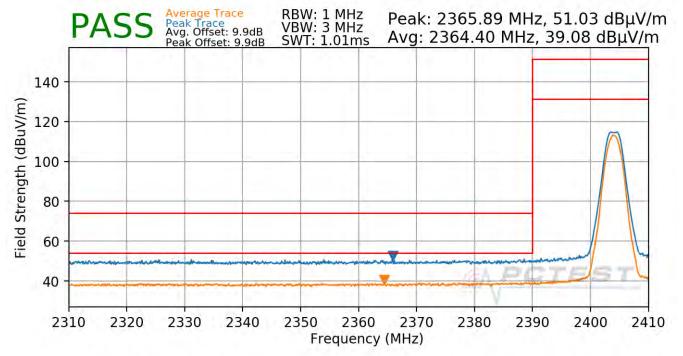
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 95 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 85 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 2 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | _2404MHz |
| Channel: | 1 |



Plot 7-97. Radiated Restricted Lower Band Edge Measurement Ant WF7 (Average & Peak)

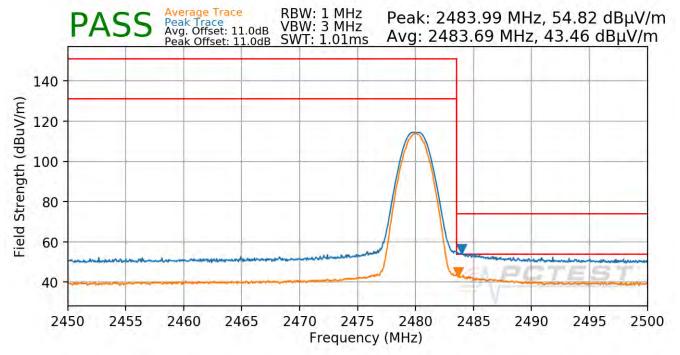
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Demo 96 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 86 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 1 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2480MHz |
| Channel: | 39 |



Plot 7-98. Radiated Restricted Upper Band Edge Measurement Ant WF7 (Average & Peak)

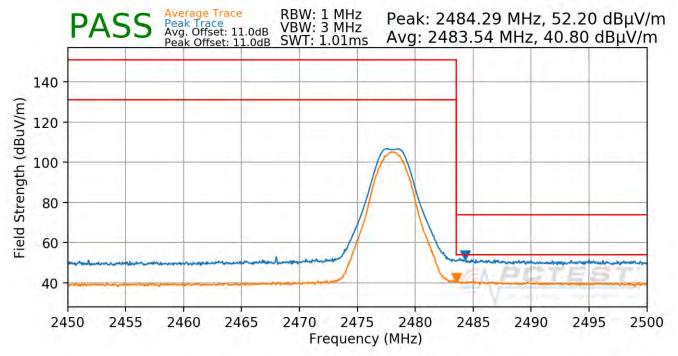
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 97 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 87 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 2 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2478MHz |
| Channel: | 38 |



Plot 7-99. Radiated Restricted Upper Band Edge Measurement Ant WF7 (Average & Peak)

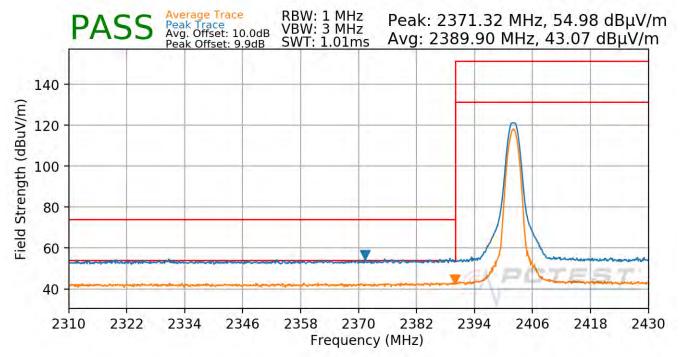
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 99 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 88 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) - Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 1 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2402MHz |
| Channel: | 0 |



Plot 7-100. Radiated Restricted Lower Band Edge Measurement TXBF (Average & Peak)

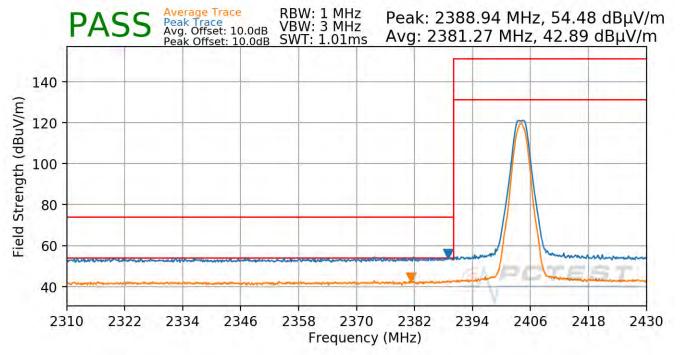
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 90 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 89 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 2 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2404MHz |
| Channel: | 1 |



Plot 7-101. Radiated Restricted Lower Band Edge Measurement TXBF (Average & Peak)

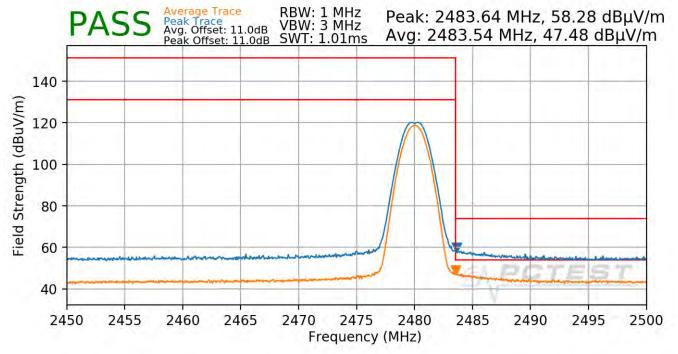
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 00 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 90 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 1 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2480MHz |
| Channel: | 39 |



Plot 7-102. Radiated Restricted Upper Band Edge Measurement TXBF (Average & Peak)

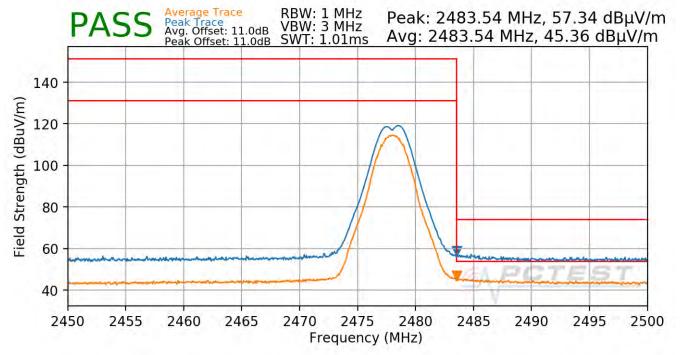
| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 01 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 91 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

| Bluetooth Mode: | LE |
|-----------------------|----------|
| Modulation: | GFSK |
| Data Rate: | 2 Mbps |
| Measurement Distance: | 3 Meters |
| Operating Frequency: | 2478MHz |
| Channel: | 38 |



Plot 7-103. Radiated Restricted Upper Band Edge Measurement TXBF (Average & Peak)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 02 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 92 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |



7.9 Radiated Spurious Emissions Measurements – Below 1GHz §15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 7 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-10 per Section 15.209 and RSS-Gen (8.9).

| Frequency | Field Strength [µV/m] | Measured Distance [Meters] |
|-------------------|--------------------------|-------------------------------|
| 0.009 – 0.490 MHz | 2400/F (kHz) | 300 |
| 0.490 – 1.705 MHz | 24000/F (kHz) | 30 |
| 1.705 – 30.00 MHz | 30 | 30 |
| 30.00 – 88.00 MHz | 100 | 3 |
| 88.00 – 216.0 MHz | 150 | 3 |
| 216.0 – 960.0 MHz | 200 | 3 |
| Above 960.0 MHz | 500 | 3 |

Table 7-23. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 120kHz (for emissions from 30MHz 1GHz)
- 3. Detector = quasi-peak
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

Quasi-Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 120kHz (for emissions from 30MHz 1GHz)
- 3. VBW = 300kHz
- 4. Detector = quasi-peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold

7. Trace was allowed to stabilize

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 02 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 93 of 101 |
| © 2020 PCTEST | • | | V 9 0 02/01/2019 |



Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.

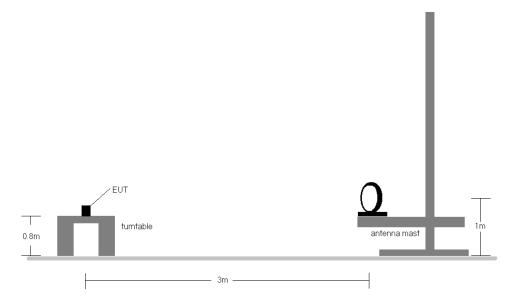
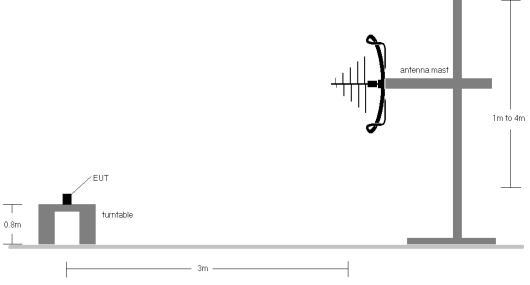
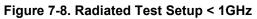


Figure 7-7. Radiated Test Setup < 30MHz





| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dega 04 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 94 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |

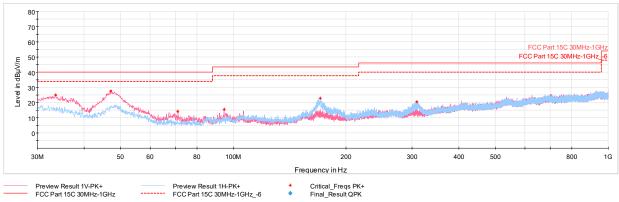


- 1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-23.
- 2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
- 3. This unit was tested with its standard battery.
- 4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector on emissions within 6dB of the limit. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 5. Emissions were measured at a 3 meter test distance.
- 6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
- 7. No spurious emissions were detected within 20dB of the limit below 30MHz.
- 8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
- The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.
- 10. The unit was tested with all possible mode and power schemes and only the highest emission is reported.

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 05 af 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 95 of 101 |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 |



Radiated Spurious Emissions Measurements (Below 1GHz) §15.209; RSS-Gen [8.9]



Plot 7-104. Radiated Spurious Plot below 1GHz (1Mbps, ePA Ch.19 with AC/DC Adapter)

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|--------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 33.59 | Max Peak | V | 100 | 237 | -68.09 | -13.79 | 25.12 | 40.00 | -14.88 |
| 47.22 | Max Peak | V | 100 | 305 | -58.51 | -20.76 | 27.73 | 40.00 | -12.27 |
| 71.18 | Max Peak | V | 100 | 102 | -72.00 | -20.85 | 14.15 | 40.00 | -25.85 |
| 94.51 | Max Peak | V | 100 | 68 | -71.16 | -20.40 | 15.44 | 43.52 | -28.08 |
| 170.55 | Max Peak | Н | 100 | 93 | -66.59 | -17.54 | 22.87 | 43.52 | -20.65 |
| 308.83 | Max Peak | Н | 100 | 243 | -73.21 | -13.31 | 20.48 | 46.02 | -25.54 |

Table 7-24. Radiated Spurious Emissions Below 1GHz (1Mbps, ePA Ch.19 with AC/DC Adapter)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Page 96 of 101 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 96 01 101 | |
| © 2020 PCTEST | | | V 9.0 02/01/2019 | |



7.10 AC Line-Conducted Test Data §15.207; RSS-Gen [8.8]

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

| Frequency of emission | Conducted Limit (dBµV) | | | |
|-----------------------|------------------------|-----------|--|--|
| (MHz) | Quasi-peak | Average | | |
| 0.15 – 0.5 | 66 to 56* | 56 to 46* | | |
| 0.5 – 5 | 56 | 46 | | |
| 5 – 30 | 60 | 50 | | |

Table 7-25. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

- 8. Analyzer center frequency was set to the frequency of the spurious emission of interest
- 9. RBW = 9kHz (for emissions from 150kHz 30MHz)
- 10. Detector = quasi-peak
- 11. Sweep time = auto couple
- 12. Trace mode = max hold
- 13. Trace was allowed to stabilize

Average Field Strength Measurements

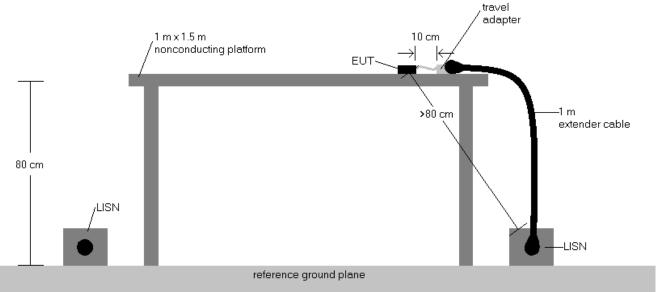
- 1. Analyzer center frequency was set to the frequency of the spurious emission of interest
- 2. RBW = 9kHz (for emissions from 150kHz 30MHz)
- 3. Detector = RMS
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dego 07 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 97 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |



Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



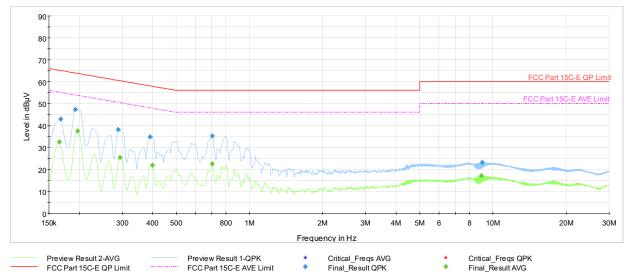


Test Notes

- All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
- 2. The limit for an intentional radiator from 150kHz to 30MHz are specified in Part 15.207 and RSS-Gen (8.8).
- 3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- 4. QP/AV Level (dB μ V) = QP/AV Analyzer/Receiver Level (dB μ V) + Corr. (dB)
- 5. Margin (dB) = QP/AV Limit (dB μ V) QP/AV Level (dB μ V)
- 6. Traces shown in plot are made using a quasi-peak and average detector.
- 7. Deviations to the Specifications: None.

| FCC ID: BCGA2228 | MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Quality Manager |
|---------------------|---------------------------------------|---------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 09 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 98 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |





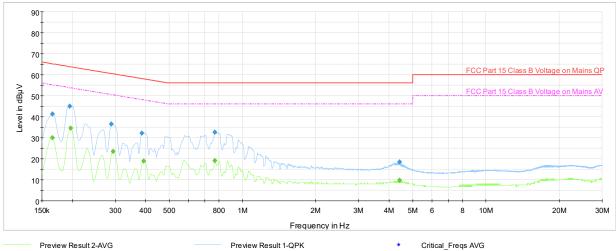
Plot 7-105. Line Conducted Plot with Bluetooth LE (L1 – 1Mbps, ePA, Ch.19, with AC/DC Adapter)

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Averaqe [dBµV] | Limit [dBµV] | Marqin [dB] | Line | PE |
|--------------------|------------------|---------------------|-------------------|-----------------|----------------|------|-----|
| 0.166 | FINAL | — | 32.40 | 55.17 | -22.77 | L1 | GND |
| 0.168 | FINAL | 42.94 | - | 65.06 | -22.12 | L1 | GND |
| 0.193 | FINAL | 47.35 | _ | 63.92 | -16.57 | L1 | GND |
| 0.197 | FINAL | — | 37.41 | 53.73 | -16.31 | L1 | GND |
| 0.290 | FINAL | 38.17 | - | 60.54 | -22.37 | L1 | GND |
| 0.294 | FINAL | _ | 25.41 | 50.41 | -25.00 | L1 | GND |
| 0.391 | FINAL | 34.71 | _ | 58.05 | -23.34 | L1 | GND |
| 0.400 | FINAL | — | 21.80 | 47.86 | -26.06 | L1 | GND |
| 0.704 | FINAL | — | 22.55 | 46.00 | -23.45 | L1 | GND |
| 0.704 | FINAL | 35.23 | | 56.00 | -20.77 | L1 | GND |
| 8.970 | FINAL | — | 17.12 | 50.00 | -32.88 | L1 | GND |
| 9.038 | FINAL | 23.14 | | 60.00 | -36.86 | L1 | GND |

Table 7-26. Line Conducted Measurements with Bluetooth LE (L1 – 1Mbps, ePA, Ch.19, with AC/DC Adapter)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager | |
|---------------------|-------------------------|---------------------------------------|---------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dama 00 af 404 | |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 99 of 101 | |
| © 2020 PCTEST | • | | V 9.0 02/01/2019 | |







Plot 7-106. Line Conducted Plot with Bluetooth LE (N – 1Mbps, ePA, Ch.19 with AC/DC Adapter)

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Averaqe [dBµV] | Limit [dBµV] | Marqin [dB] | Line | PE |
|--------------------|------------------|---------------------|-------------------|-----------------|----------------|------|-----|
| 0.166 | FINAL | 41.20 | — | 65.17 | -23.97 | N | GND |
| 0.166 | FINAL | — | 30.03 | 55.17 | -25.15 | N | GND |
| 0.195 | FINAL | 45.02 | _ | 63.82 | -18.80 | N | GND |
| 0.197 | FINAL | — | 34.57 | 53.73 | -19.15 | N | GND |
| 0.290 | FINAL | 36.42 | _ | 60.54 | -24.12 | N | GND |
| 0.294 | FINAL | — | 23.56 | 50.41 | -26.85 | N | GND |
| 0.386 | FINAL | 32.14 | _ | 58.14 | -26.00 | N | GND |
| 0.393 | FINAL | — | 18.84 | 48.00 | -29.16 | N | GND |
| 0.769 | FINAL | — | 19.22 | 46.00 | -26.78 | N | GND |
| 0.769 | FINAL | 32.68 | | 56.00 | -23.32 | N | GND |
| 4.416 | FINAL | 18.39 | | 56.00 | -37.61 | N | GND |
| 4.418 | FINAL | | 9.86 | 46.00 | -36.14 | N | GND |

Table 7-27. Line Conducted Measurements with Bluetooth LE (N – 1Mbps, ePA, Ch.19, with AC/DC Adapter)

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Degs 100 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 100 of 101 |
| © 2020 PCTEST | | | V 9.0 02/01/2019 |



8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Apple Tablet Device FCC ID: BCGA2228** is in compliance with Part 15 Subpart C (15.247) of the FCC Rules and RSS-247 of the Innovation, Science and Economic Development Canada Rules.

| FCC ID: BCGA2228 | PCTEST | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Quality Manager |
|---------------------|-------------------------|---------------------------------------|---------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Degs 101 of 101 |
| 1C1912170050-05.BCG | 12/10/2019 - 02/21/2020 | Tablet Device | Page 101 of 101 |
| © 2020 PCTEST | | • | V 9.0 02/01/2019 |