

Element Washington DC LLC 18855 Adams Court, Morgan Hill, CA 95037 USA

Tel. 410.290.6652 / Fax 410.290.6654 http://www.element.com



MEASUREMENT REPORT FCC PART 15.519 / ISED RSS-220 Ultra-Wideband

| Applicant Name: Apple Inc. One Apple Park Way Cupertino, CA 95014 United States | Date of Testing: 6/7/2022 - 8/5/2022 Test Site/Location: Element Washington DC LLC Morgan Hill, CA, USA Test Report Serial No.: | | | |
|---|---|--|--|--|
| | 1C2205090037-08.BCG | | | |
| FCC ID: | BCG-A2771 | | | |
| IC: | 579C-A2771 | | | |
| APPLICANT: | Apple Inc. | | | |
| Application Type: | Certification | | | |
| Model/HVIN: | A2771 | | | |
| EUT Type: | Watch | | | |
| Operational Frequency: | 6489.6MHz (Ch 5) and 7987.2MHz (Ch 9) | | | |
| FCC Classification: | Ultra-Wideband Transmitter (UWB) | | | |
| FCC Rule Part(s): | Part 15 Subpart F (15.519) | | | |

ISED Specification: **RSS-220 Subclass: Test Procedure(s):**

Part 15 Subpart F (15.519) RSS-Gen Issue 5, RSS-220 Issue 1 Hand-held Communication Devices ANSI C63.10-2013, KDB 393764 D01 v02r01

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 393764 D01 v02r01. 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.

R Ortanez **Executive Vice President**



| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager |
|-------------------------------------|---|-----------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 1 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 1 of 63 |
| | - | · | V 10.5 12/15/2021 |



TABLE OF CONTENTS

| 1.0 | INTI | RODUCTION | 3 |
|-----|-------|---|-----|
| | 1.1 | Scope | 3 |
| | 1.2 | Element Washington DC LLC Test Location | 3 |
| | 1.3 | Test Facility / Accreditations | 3 |
| 2.0 | PRC | DUCT INFORMATION | 4 |
| | 2.1 | Equipment Description | 4 |
| | 2.2 | Device Capabilities | 4 |
| | 2.3 | Antenna Description | 5 |
| | 2.4 | Test Support Equipment | 6 |
| | 2.5 | Test Configuration | 6 |
| | 2.6 | Software and Firmware | 7 |
| | 2.7 | EMI Suppression Device(s)/Modifications | 7 |
| 3.0 | DES | CRIPTION OF TESTS | 8 |
| | 3.1 | Evaluation Procedure | 8 |
| | 3.2 | AC Line Conducted Emissions | 8 |
| | 3.3 | Radiated Emissions | 9 |
| | 3.4 | Environmental Conditions | 9 |
| 4.0 | ANT | ENNA REQUIREMENTS | 10 |
| 5.0 | MEA | ASUREMENT UNCERTAINTY | 11 |
| 6.0 | TES | T EQUIPMENT CALIBRATION DATA | 12 |
| 7.0 | TES | T RESULTS | 13 |
| | 7.1 | Summary | .13 |
| | 7.2 | 10dBc Bandwidth Measurement | .14 |
| | 7.3 | Bandwidth Measurement | .18 |
| | 7.4 | Maximum Peak and Average Radiated Power (EIRP) | .22 |
| | 7.4.1 | Peak Radiated Power Measurement | .24 |
| | 7.4.2 | Average Radiated Power Measurement | .26 |
| | 7.5 | Cease Transmission Time | .28 |
| | 7.6 | Radiated Spurious Emission Measurements | .33 |
| | 7.7 | Radiated Spurious Emissions Measurements – Below 960MHz | .51 |
| | 7.8 | AC Line-Conducted Emission Measurement | .56 |
| 8.0 | CON | ICLUSION | 62 |
| 9.0 | APF | ENDIX A | 63 |
| | | | |

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | Test Dates: EUT Type: | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 2 of 63 |
| | | | V 10.5 12/15/2021 |



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 Element Washington DC LLC Test Location

These measurement tests were conducted at the Element 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 Element located in Morgan Hill, CA 95037, U.S.A.

- Element Washington DC LLC is an ISO 17025-2017 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.
- Element Washington DC LLC 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).
- Element Washington DC LLC facility is a registered (22831) test laboratory with the site description on file with ISED.

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | Approved by: Technical Manager | |
|-------------------------------------|---------------------|-----------------------------------|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 3 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 3 01 63 |
| | | | V 10 5 12/15/2021 |



2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Watch FCC ID: BCG-A2771** and **IC: 579C-A2771**. The test data contained in this report pertains only to the emissions due to the EUT's Ultra-Wideband (UWB) transmitter.

Test Device Serial No.: D2WW61TXY9, KWK1Q59DDY, MF7HW34X15

2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n WLAN, 802.11a/n UNII, Bluetooth (1x, EDR, HDR4, HDR8, LE1M, LE2M), NFC, UWB, 60.5GHz Transmitter

For ISED, this device is under subclass 5.3 Hand-held Communication Devices of RSS-220

Data Port UWB Radio Terminal Access: No

| Ch. | Frequency [MHz] | Config | Payload |
|-----|--------------------|--------|---------|
| | | | 25 |
| | | 0 | 65 |
| | | | 125 |
| 5 | 6500 | | 45 |
| 5 | 0500 | 1 | 85 |
| | | | 125 |
| | | 4 | 0 |
| | | 5 | 0 |
| | 8000 | 0 | 25 |
| | | | 65 |
| | | | 125 |
| 9 | | | 45 |
| 9 | | 1 | 85 |
| | | | 125 |
| | | 4 | 0 |
| | | 5 | 0 |

Table 2-1. UWB Frequency / Channel Operations

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 4 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 4 of 63 |
| | | · | V 10.5 12/15/2021 |



Notes:

1. This device supports simultaneous multi radio transmission feature, which allows multiple radios to transmit simultaneously at the same antenna. The table below shows all the possible multi radio TX combinations:

| | | Anton | - FCM | | |
|---|--------------|-------------------------|-----------|------------|--|
| | Antenna FCM | | | | |
| o: " | WLAN | Bluetooth | UNII | UWB | |
| Simultaneous Tx Config | 802.11b/g/n | BDR, EDR, HDR4/8, LE | 802.11a/n | Ch.5, Ch.9 | |
| Config 1 | \checkmark | × | × | ~ | |
| Config 2 | × | ✓ | × | ✓ | |
| Config 3 | × | ✓ | ✓ | × | |
| Table 2.2. Simultaneous Transmission Configurations | | | | | |

 Table 2-2. Simultaneous Transmission Configurations

 \checkmark = Support; * = NOT Support

2. All above simultaneous transmission configurations have been tested and the worst case configuration was found to be configuration 3 (BT and UNII). These results can be found in the RF Bluetooth and RF UNII reports.

2.3 Antenna Description

Following antenna gain provided by manufacturer was used for the testing.

| Frequency [MHz] | Antenna Gain (dBi) | | | |
|---------------------------------|--------------------|--|--|--|
| 6250-6750 | -8.6 | | | |
| 7750-8250 | -5.4 | | | |
| Table 2-3. Highest Antenna Gain | | | | |

Note: Antenna Specifications has been attached to Appendix A

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | Test Dates: EUT Type: | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 5 of 63 |
| | | | V 10.5 12/15/2021 |



2.4 Test Support Equipment

| 1 | Apple Macbook | Model: | A1398 | S/N: | C2QKP008F6F3 |
|---|------------------------|-------------|--------------------|----------|-----------------------|
| | w/AC/DC Adapter | Model: | A1435 | S/N: | N/A |
| | Apple iPhone | Model: | 993-89846LL/A | S/N: | QHLHY57CJ9 |
| | | | | | |
| 2 | Apple USB-C cable | Model: | N/A | S/N: | N/A |
| | w/ Charging Dock | Model: | N/A | S/N: | DQ812910CU008V22F |
| | w/ Cradle | Model: | LA2-BD-LG-EVT | S/N: | CYV115300H1A2LE03MEVC |
| | | | | | |
| 3 | Apple Magnetic Charger | Model: | A2515 | S/N: | DLC035200UJMFR0AJ |
| | Apple Magnetic Charger | Model: | A2515 | S/N: | DLC035202KRMFR0A2 |
| | | | | | |
| 4 | Pathfinder Falcon | Model: | 920-098626-01 | S/N: | DLC03770065Q6PM1W |
| | SiP Socket | Model: | N/A | S/N: | P1 X2538B PF166 |
| | | | _ | | |
| 5 | DC Power Supply | Model: | KPS3010D | S/N: | N/A |
| | | | | | |
| 6 | Store Sample Wristband | Model: | N/A | S/N: | DLC219400361YDQ2W |
| | Т | able 2-4 To | est Support Fauipm | ent Used | |

 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 393764 D01 v02r01. 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.

The worst case configuration was investigated with various types of wristbands, metal and non-metal wristbands. The EUT was also investigated with and without wireless charger. The worst case configuration found was used for all testing.

For emissions from 960MHz – 18GHz, channel 5 and channel 9 were tested with highest power and worst case configuration. The emissions below 960MHz and above 18GHz were tested with the highest transmitting power 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 emission and radiated test below 960MHz, following configuration were investigated and the worst case was reported.

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

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 6 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 6 of 63 |
| | • | · | V 10 5 12/15/2021 |



2.6 Software and Firmware

The test was conducted with firmware version watchOS 9.0 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: BCG-A2771 IC: 579C-A2771 | element | Approved by: Technical Manager | | |
|-------------------------------------|---------------------|-----------------------------------|-------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Page 7 of 63 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | | |
| | | | V 10 5 12/15/2021 | |



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 393764 D01 v02r01 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 x 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 65-5. 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 groundplane. 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 7.8. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 10.50.40.

| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager |
|-------------------------------------|---|-----------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 9 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 8 of 63 |



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 rotated about its vertical axis 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: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 9 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye y ul us |
| | | | V 10 5 12/15/2021 |



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: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager | |
|-------------------------------------|---|-----------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Page 10 of 63 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 10 01 63 | |
| | | | V 10 5 12/15/2021 | |



5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. 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 | 1.77 |
| Line Conducted Disturbance | 2.70 |
| Radiated Disturbance (<30MHz) | 4.38 |
| Radiated Disturbance (<1GHz) | 4.75 |
| Radiated Disturbance (>1GHz) | 5.20 |
| Radiated Disturbance (>18GHz) | 4.72 |

| Parameter | Expanded Uncertainty | |
|-----------|----------------------|--|
| Time | \pm 0.2% | |

| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager | |
|-------------------------------------|---|-----------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Page 11 of 63 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 11 01 63 | |
| | | | V 10 5 12/15/2021 | |



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 | 6/10/2022 | Annual | 6/10/2023 | MY49430244 |
| ATM | 180-442A-KF | 20dB Nominal Gain Horn Antenna | 8/13/2021 | Annual | 8/13/2022 | T058701-01 |
| ETS-Lindgren | 3142E | BiConiLog Antenna (30MHz - 6GHz) | 10/21/2021 | Annual | 10/21/2022 | 208204 |
| ETS-Lindgren | 3117 | Double Ridged Guide Antenna (1-18 GHz) | 5/11/2022 | Annual | 5/11/2023 | 205956 |
| Keysight Technology | N9040B | UXA Signal Analyzer | 2/8/2022 | Annual | 2/8/2023 | MY57212015 |
| Rohde & Schwarz | TS-PR18 | Pre-Amplifier (1GHz - 18GHz) | 1/6/2022 | Annual | 1/6/2023 | 101639 |
| Rohde & Schwarz | FSV40 | Signal Analyzer (10Hz-40GHz) | 3/4/2022 | Annual | 3/4/2023 | 101619 |
| Rohde & Schwarz | ESW26 | EMI Test Receiver | 5/19/2022 | Annual | 5/19/2023 | 101299 |
| Rohde & Schwarz | TS-PR8 | Pre-Amplifier (30MHz - 8GHz) | 1/6/2022 | Annual | 1/6/2023 | 102327 |
| Rohde & Schwarz | ESW44 | EMI Test Receiver | 12/2/2021 | Annual | 12/2/2022 | 101570 |
| Rohde & Schwarz | ENV216 | Two-Line V-Network | 1/14/2022 | Annual | 1/14/2023 | 101364 |
| Rohde & Schwarz | TS-PR1840 | Pre-Amplifier (18GHz - 40GHz) | 4/18/2022 | Annual | 4/18/2023 | 100050 |
| Rohde & Schwarz | TC-TA18 | Cross Polarized Vivaldi Antenna (400MHz-18GHz) | 1/25/2022 | Annual | 1/25/2023 | 101063 |
| Rohde & Schwarz | HFH2-Z2 | Loop Antenna | 4/3/2022 | Annual | 4/3/2023 | 100546 |

Table 6-1. Test Equipment List

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: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | | |
|-------------------------------------|---------------------|---|-------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 12 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 12 of 63 | |
| | | | V 10.5 12/15/2021 | |



7.0 TEST RESULTS

7.1 Summary

| Company Name: | Apple Inc. |
|--------------------|-------------------|
| FCC ID: | BCG-A2771 |
| IC: | <u>579C-A2771</u> |
| FCC Classification | Liltra Widebond T |

FCC Classification: <u>Ultra-Wideband Transmitter</u>

| FCC Part Section(s) | RSS Section(s) | Test Description | Test Limit | Test Condition | Test Result | Reference |
|-------------------------|--------------------------------|--|--|----------------------|----------------|------------------|
| §15.503, §15.519 (b) | RSS-220 [2] | 10dBc Bandwidth | ≥ 500MHz | | PASS | Section 7.2, 7.3 |
| § 2.1049 | RSS-Gen [6.7] | Occupied Bandwidth | N/A | | N/A | Section 7.3 |
| §15.519 (e) | RSS-220 [5.3.1(g)] | Maximum Peak Power Spectral Density (Peak EIRP) | < 0 dBm/50MHz EIRP | | PASS | Sections 7.4.1 |
| §15.519 (c) | RSS-220 [5.3.1(d)] | Maximum Average Emission (Average EIRP) | < -41.3 dBm/MHz EIRP | | PASS | Section 7.4.2 |
| §15.519 (a)(1) | RSS-220 [5.3.1(b)] | Cease Transmission Time | See §15.519 (a)(1) and RSS-220 [5.3.1(b)] for details | RADIATED | PASS | Section 7.5 |
| §15.519 (c) | RSS-220 [5.3.1(d)] | Radiated Emissions Above 960MHz | See table in §15.519 (c) and RSS-220[5.3.1(d)] for details | | PASS | Sections 7.6 |
| §15.519 (d) | RSS-220 [5.3.1(e)] | Radiated Emissions in the 1164 – 1240Mhz and 1559 – 1610MHz GPS Bands | See §15.519 (d) and RSS- 220 [5.3.1 (e)] for details | | PASS | Sections 7.6 |
| §15.519 (c), §15.209 | RSS-220 [3.4] RSS-Gen [8.9] | Radiate Emissions Below 960MHz | Emissions in restricted bands must meet the radiated limits detailed in §15.209 (RSS-Gen [8.9]) | | PASS | Section 7.7 |
| §15.207 | RSS-Gen [8.8] | AC Line Conducted Emissions 150kHz – 30MHz | < FCC 15.207 limits (RSS-Gen [8.8]) | AC LINE CONDUCTED | PASS | Section 7.8 |

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.

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 12 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 13 of 63 |
| | - | | V 10.5 12/15/2021 |



7.2 10dBc Bandwidth Measurement §15.503 §15.519 (b)

Test Overview and Limit

The UWB bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna. The upper boundary is designated F_H and the lower boundary is designated F_L . The frequency at which the highest radiated emission occurs is designated F_M .

- The center frequency, F_c , equals $(F_H + F_L)/2$
- The fractional bandwidth equals $2(F_{H} F_{L}) / (F_{H} + F_{L})$

The UWB bandwidth of a device operating under the provisions of this section must be contained between 3100MHz and 10,600MHz.

- a) The minimum permissible 10dBc Bandwidth is 500 MHz
- b) Fractional bandwidth is equal or greater than 0.20

Test Procedure Used

ANSI C63.10-2013 – Section 10.1 KDB 393764 D01 v02r01

Test Settings

- 1. RBW = 1MHz
- 2. VBW = 3MHz
- 3. Detector = Peak
- 4. Trace mode = max hold
- 5. Sweep = auto couple
- 6. The trace was allowed to stabilize

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 14 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye 14 01 03 |
| | | | V 10 5 12/15/2021 |



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

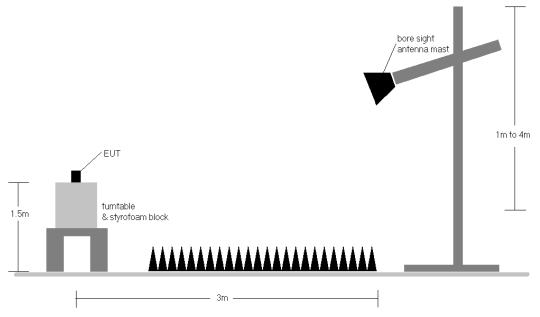


Figure 7-1. Test Setup

Test Notes

- 1. In those cases where the measured emission spectrum contains multiple (more than two) –10dBc points, the outermost points define the UWB bandwidth (i.e., the widest bandwidth is reported).
- 2. All modes of operation were investigated and the worst-case emissions are reported.

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 15 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 15 01 63 |
| | | | V 10.5 12/15/2021 |



| Frequency [GHz] | Channel | Config | Payload | Fм [GHz] | F∟ [GHz] | Fн [GHz] | Fc [GHz] | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|--------------------|---------|--------|---------|-------------|-------------|-------------|-------------|--------------------------------|-------------------------------|-------------|
| 6.5 | 5 | 0 | 125 | 6.250 | 6.226 | 6.753 | 6.489 | 527.00 | 500 | Pass |
| | | | | Sec. 1 | | | | | | |

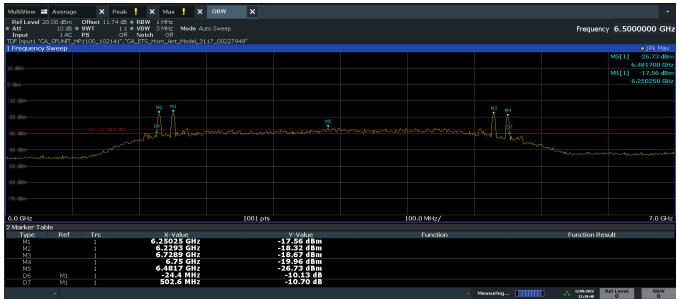
Table 7-2. 10dBc Bandwidth Measurements (UWB, Ch.5, 6.5GHz)

| Frequency [GHz] | Channel | Config | Payload | Fм [GHz] | F∟ [GHz] | Fн [GHz] | Fc [GHz] | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|--------------------|---------|--------|---------|-------------|-------------|-------------|-------------|--------------------------------|-------------------------------|-------------|
| 8.0 | 9 | 0 | 125 | 8.227 | 7.724 | 8.251 | 7.988 | 526.90 | 500 | Pass |

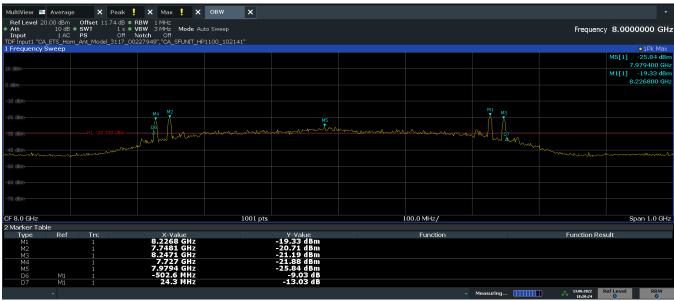
Table 7-3. 10dBc Bandwidth Measurements (UWB, Ch.9, 8GHz)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 16 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 10 01 03 |
| | | | V 10.5 12/15/2021 |





Plot 7-1. 10dBc Bandwidth (Ch. 5, Config 0/Payload 125)



Plot 7-2. 10dBc Bandwidth (Ch. 9, Config 0/Payload 125)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager | |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 17 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 17 of 63 | |
| | | | V 10.5 12/15/2021 | |



7.3 Bandwidth Measurement

RSS-220 [2], RSS-Gen [6.7]

Test Overview and Limit

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

ANSI C63.10-2013 – Section 6.9 RSS-Gen [6.7]

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 10dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.

- 2. RBW = 1 5% of the expected OBW
- 3. VBW \ge 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize

8. If necessary, steps 2 - 7 were repeated after changing the RBW such that it would be within 1 - 5% of the 99% occupied bandwidth observed in Step 7

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 18 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye 10 01 03 |
| | | | V 10.5 12/15/2021 |



Test Setup

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

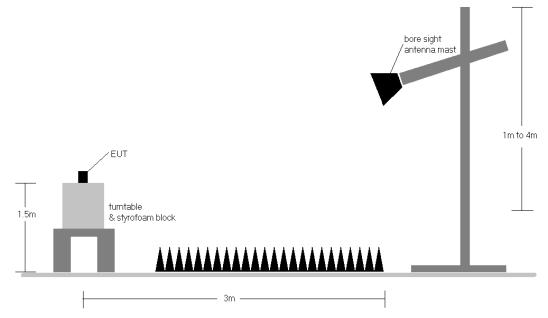


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported.

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager | |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 10 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 19 of 63 | |
| | | | V 10.5 12/15/2021 | |



| Frequency [GHz] | Channel | Config | Payload | Measured OBW [MHz] | Measured 10dBc Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|--------------------|---------|--------|---------|--------------------------|---|-------------------------------|-------------|
| 6.5 | 5 | 0 | 125 | 677.570 | 534.00 | 500 | Pass |

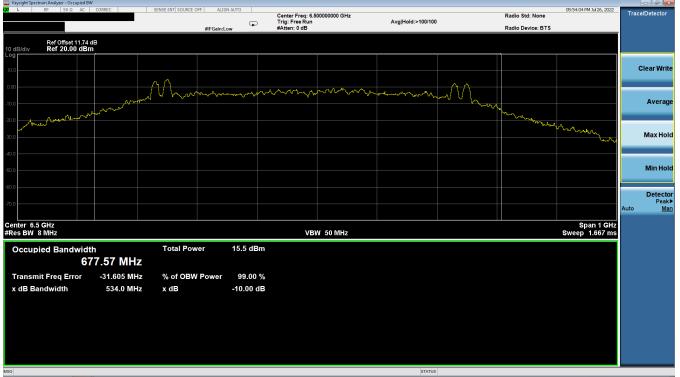
Table 7-4. ISED 10dBc Bandwidth & 99% OBW Measurements (UWB, Ch.5, 6.5GHz)

| Frequency [GHz] | Channel | Config | Payload | Measured OBW [MHz] | Measured 10dBc Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|--------------------|---------|--------|---------|--------------------------|---|-------------------------------|-------------|
| 8.0 | 9 | 0 | 125 | 604.920 | 541.10 | 500 | Pass |

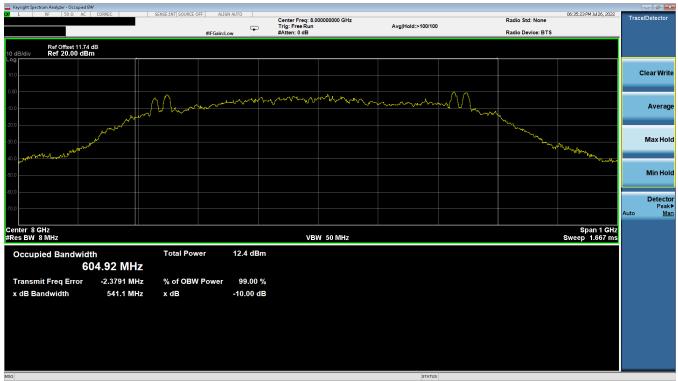
Table 7-5. ISED 10dBc Bandwidth & 99% OBW Measurements (UWB, Ch.9, 8GHz)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | | |
|-------------------------------------|---------------------|---|-------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 20 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 20 of 63 | |
| | | | V 10.5 12/15/2021 | |





Plot 7-3. ISED 10dBc Occupied Bandwidth & 99% (Ch. 5, Config 0/Payload 125)



Plot 7-4. ISED 10dBc Occupied Bandwidth & 99 (Ch. 9, Config 0/Payload125)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 21 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 21 of 63 |
| | | | V 10.5 12/15/2021 |



7.4 Maximum Peak and Average Radiated Power (EIRP) §15.519 (c) §15.519 (e); RSS-220 [5.3.1(d)] RSS-220 [5.3.1(g)]

Test Overview and Limits

15.519 (e) There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, F_M. That limit is 0 dBm for Peak EIRP.

15.519 (c) The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

| Frequency [MHz] | EIRP [dBm] |
|-----------------|------------|
| 3100-10600 | -41.3 |

Table 7-6. FCC 15.519 Average EIRP limit

| dBm] |
|------|
| 1.3 |
| 1.3 |

Table 7-7. RSS-220 Average EIRP limit

Test Procedure Used

ANSI C63.10-2013 – Section 10.3.5 and 10.3.7 KDB 393764 D01 v02r01

Test Settings

Average EIRP Measurements

- 1. RBW = 1MHz
- 2. VBW = 3MHz
- 3. Detector = Average (RMS)
- 4. Sweep time = No more than a 1 ms integration period over each measurement bin
- 5. Trace mode = Max hold
- 6. Trace was allowed to stabilize

Peak EIRP Measurements

- 1. RBW = 50MHz
- 2. VBW = 50MHz
- 3. Detector = Peak
- 4. Sweep time = auto couple
- 5. Trace mode = Max hold
- 6. Trace was allowed to stabilize

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: Test Dates: | | EUT Type: | Page 22 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 22 01 05 |
| | | | V/ 10 5 12/15/2021 |



EUT turntable 8. styrofoam block mining and mining a

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

Figure 7-3. Test Instrument & Measurement Setup

Test Notes

- 1. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- 2. All modes of operation were investigated and the worst-case emissions are reported.

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: Test Dates: | | EUT Type: | Page 23 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 23 01 03 |
| | | | V 10 5 12/15/2021 |



7.4.1 Peak Radiated Power Measurement §15.519(e)); RSS-220 [5.3.1(g)]

| Frequency [GHz] | Channel | Config | Payload | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Fм [GHz] | Peak EIRP [dBm/50MHz] | Peak EIRP Limit [dBm/50MHz] | Margin [dB] |
|--------------------|---------|--------|---------|------------------------------|---------------------------|----------------------------------|-------------|--------------------------|-----------------------------------|----------------|
| 6.5 | 5 | 0 | 125 | V | 246 | 101 | 6.487 | -3.88 | 0.00 | -3.88 |

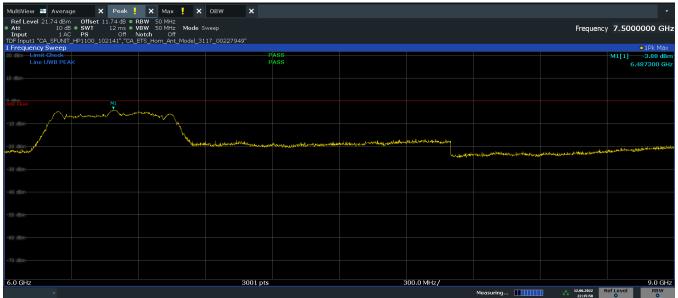
Table 7-8. Peak EIRP Measurements (Channel 5)

| Frequency [GHz] | Channel | Config | Payload | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Fм [GHz] | Peak EIRP [dBm/50MHz] | Peak EIRP Limit [dBm/50MHz] | Margin [dB] |
|--------------------|---------|--------|---------|------------------------------|---------------------------|----------------------------------|-------------|--------------------------|-----------------------------------|----------------|
| 8.0 | 9 | 0 | 125 | Н | 108 | 298 | 7.9938 | -2.63 | 0.00 | -2.63 |

Table 7-9. Peak EIRP Measurements (Channel 9)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: Test Dates: | | EUT Type: | Page 24 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 24 01 03 |
| | | | V 10.5 12/15/2021 |





Plot 7-5. Peak Radiated Power (Ch. 5, Config 0/Payload 125)



Plot 7-6. Peak Radiated Power (Ch. 9, Config 0/Payload 125)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 25 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 25 01 63 |
| | | | V 10.5 12/15/2021 |



7.4.2 Average Radiated Power Measurement

<u>§15.519(c)); RSS-220 [5.3.1(d)]</u>

| Frequency [GHz] | Channel | Config | Payload | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Fм [GHz] | Average EIRP [dBm/MHz] | Average EIRP Limit [dBm/MHz] | Margin [dB] |
|--------------------|---------|--------|---------|------------------------------|---------------------------|----------------------------------|-------------|------------------------------|------------------------------------|----------------|
| 6.5 | 5 | 0 | 125 | V | 246 | 101 | 6.6553 | -42.15 | -41.30 | -0.85 |

Table 7-10. Average EIRP Measurements (Channel 5)

| Frequency [GHz] | Channel | Config | Payload | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Fм [GHz] | Average EIRP [dBm/MHz] | Average EIRP Limit [dBm/MHz] | Margin [dB] |
|--------------------|---------|--------|---------|------------------------------|---------------------------|----------------------------------|-------------|------------------------------|------------------------------------|----------------|
| 8.0 | 9 | 0 | 125 | Н | 108 | 298 | 7.9788 | -42.47 | -41.30 | -1.17 |

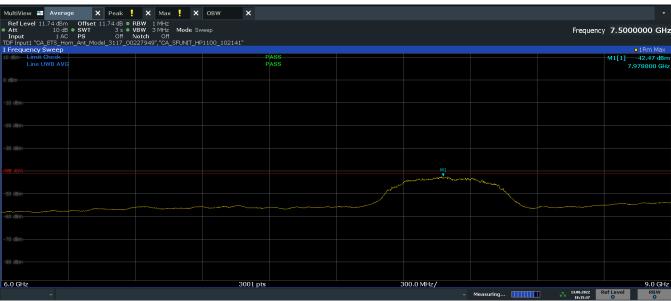
Table 7-11. Average EIRP Measurements (Channel 9)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------|---------------------------------------|-----------------------------------|
| • | | EUT Type: | Dogo 26 of 62 |
| | | Watch | Page 26 of 63 |
| | | | V 10.5 12/15/2021 |



| | Peak 🚦 🗙 Max 🚦 🗙 | овш 🗙 | | | | • |
|--|---|---------------------|------------|-----------|------------|-------------------------------|
| TDF Input1 "CA_SFUNIT_HP1100_10214 | 3 s ● VBW 3 MHz Mode Swi Off Notch Off | зер 17_00227949" | | | Frequency | 7.5000000 GHz |
| 1 Frequency Sweep 10 dBm Limit Check | | PASS | | | | • 1Rm Max M1[1] -42.15 dBm |
| Line UWB AVG | | PASS | | | | 6.655300 GHz |
| | | | | | | |
|) dBm- | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | M1 | | | | | |
| factures and a start and a start and a start a | manner by | | | | | |
| | | | | | | |
| 60 dBm | | | | | | |
| | | | | | | |
| 70 dBm | | | | | | |
| | | | | | | |
| 80 dBm- | | | | | | |
| eu-upm | | | | | | |
| | | | | | | |
| 5.0 GHz | | 3001 pts | 300.0 MHz/ | | 12.06.2022 | 9.0 GHz Ref Level RBW |
| | | | | Measuring | 12.06.2022 | o O |

Plot 7-7. Average Radiated Power (Ch. 5, Config 0/Payload 125)



Plot 7-8. Average Radiated Power (Ch. 9, Config 0/Payload 125)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 27 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 27 01 63 |
| | | | V 10.5 12/15/2021 |



7.5 Cease Transmission Time §15.519(a)(1); RSS-220 [5.3.1(b)]

Test Overview and Limit

A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

Test Procedures Used

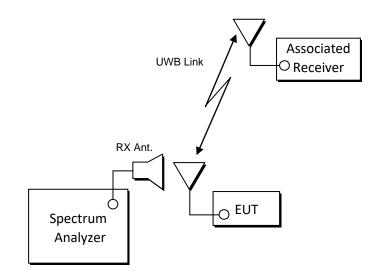
KDB 393764 D01 v02r01

Test Settings

- 1. RBW = 1MHz
- 2. VBW = 3MHz
- 3. Span = Zero Span Mode
- 4. Sweep time shall be sufficient to demonstrate EUTs compliance with the rule part.

Test Setup

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





| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Daga 20 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 28 of 63 |
| | | | V 10.5 12/15/2021 |



Test Configurations

The EUT was monitored in 2 different test configurations:

- Mode 1: EUT initiates the UWB link to the associated receiver (phone),
 - Associated receiver ends the link, and EUT ceases transmission of any information other than periodic signals (polling) for use in the establishment or re-establishment of a communications link with an associated receiver
- Mode 2: The associated receiver (phone) initiates the UWB link to the EUT
 - EUT ends the link, and stops sending acknowledgements to associated receiver

<u>Result</u>

| Parameter | Limit | Result |
|------------------------|---|--------|
| Cessation Time - Mode1 | The UWB intentional radiator shall cease transmission within 10 seconds An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting. | Pass |
| Cessation Time - Mode2 | The UWB intentional radiator shall cease transmission within 10 seconds An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting. | Pass |

Plots Description

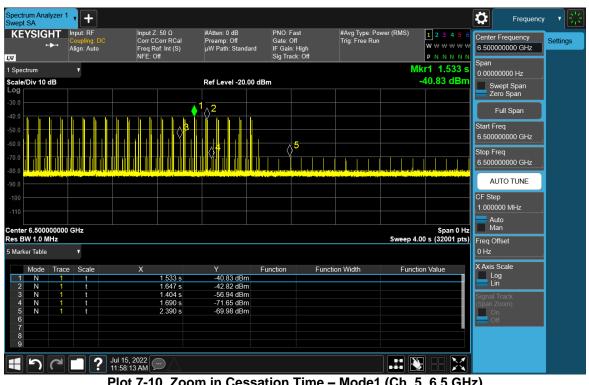
- Cessation Time Mode1 (Mode2) plot:
 - Marker 1 shows start time of initiating UWB link
 - Marker 2 shows stop time of sending acknowledgement
- Zoom in Cessation Time Mode1 plot:
 - Marker 1 shows EUT traffic level
 - o Marker 2 shows Associated receiver (Phone) traffic level
 - Marker 3 shows Associated receiver (Phone) Acknowledgement signal
 - Marker 4 shows EUT Polling signal (Before ceasing transmission)
 - Marker 5 shows EUT Polling signal (After ceasing transmission)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager |
|-------------------------------------|---|-----------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 29 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 29 01 03 |
| | | | V 10.5 12/15/2021 |





Plot 7-9. Cessation Time - Mode1 (Ch. 5, 6.5 GHz)



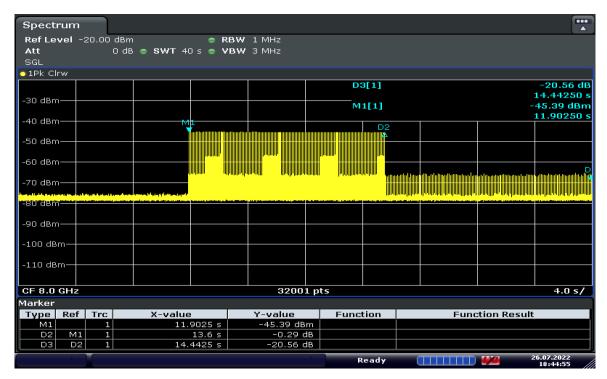
Plot 7-10. Zoom in Cessation Time – Mode1 (Ch. 5, 6.5 GHz)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 20 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 30 of 63 |
| | | | V 10.5 12/15/2021 |





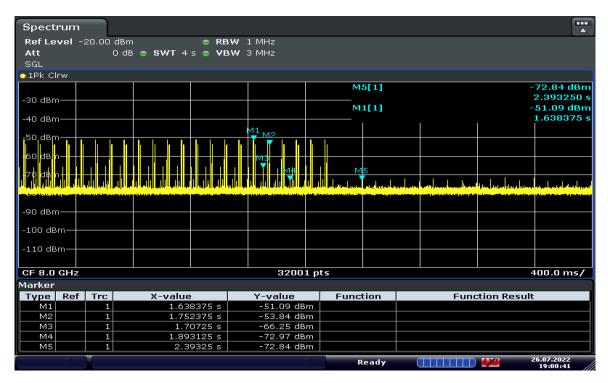
Plot 7-11. Cessation Time – Mode2 (Ch. 5, 6.5 GHz)



Plot 7-12. Cessation Time – Mode1 (Ch. 9, 8 GHz)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager |
|-------------------------------------|---|-----------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 31 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage ST 01 03 |
| | | | V 10 5 12/15/2021 |





Plot 7-13. Zoom in Cessation Time - Mode1 (Ch. 9, 8 GHz)



Plot 7-14. Cessation Time – Mode2 (Ch. 9, 8 GHz)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 22 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 32 of 63 |
| | | • | V 10.5 12/15/2021 |



7.6 Radiated Spurious Emission Measurements §15.519 (c) §15.519 (d); RSS-220 [5.3.1(d)] RSS-220 [5.3.1(e)]

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 must not exceed the average limits shown in Table 7-12 and Table 7-13 per Section 15.519 (C) and RSS-220[5.3.1(d)] when measured using a resolution bandwidth of 1 MHz:

| Frequency [MHz] | EIRP [dBm] |
|-----------------|---------------|
| 960-1610 | -75.3 |
| 1610-1990 | -63.3 |
| 1990-3100 | -61.3 |
| 3100-10600 | -41.3 |
| Above 10600 | -61.3 |

Table 7-12. FCC 15.519 Radiated Spurious Emissions Limits

| Frequency [MHz] | EIRP [dBm] |
|-----------------|---------------|
| 960-1610 | -75.3 |
| 1610-4750 | -70.0 |
| 4750-10600 | -41.3 |
| Above 10600 | -61.3 |

Table 7-13. RSS-220 Radiated Spurious Emissions Limits

All out of band emissions must not exceed the average limits shown in Table 7-14 per Section 15.519 (d) and RSS-220(5.3.1)(e) when measured using a resolution bandwidth greater than or equal to 1 kHz. The measurements shall demonstrate compliance with the stated limits at whatever resolution bandwidth is used.

| Frequency [MHz] | EIRP [dBm] |
|-----------------|---------------|
| 1164-1240 | -85.3 |
| 1559-1610 | -85.3 |

Table 7-14. FCC 15.519/RSS-220 Radiated Spurious Emissions Limits for GPS frequency bands

Test Procedures Used

ANSI C63.10-2013 – Section 10.3 KDB 393764 D01 v02r01

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 33 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 33 01 03 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | V 10 5 12/15/2021 |



Test Settings

Average RSE Measurements

- 1. RBW = 1MHz (30kHz for emissions in the GPS band)
- 2. VBW = 3MHz (100kHz for emissions in the GPS band)
- 3. Detector = Average (RMS)
- 4. Sweep time = No more than a 1 ms integration period over each measurement bin
- 5. Trace mode = Max hold
- 6. Trace was allowed to stabilize

Test Setup

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

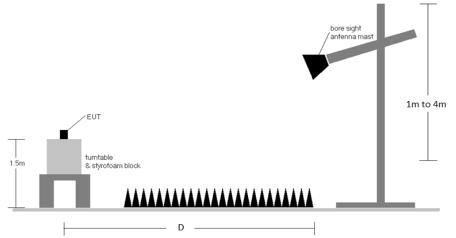


Figure 7-5. Radiated Test Setup - Above 960MHz

Test Notes

- 1. All modes of operation were investigated and the worst-case emissions are reported.
- 2. This unit was tested with its standard battery.
- 3. The RBW for measurements in the GPS Bands were reduced to 30kHz in order to show compliance.
- 4. D is the measurement test distance and emissions from 960MHz 18GHz were measured at 0.6 meter test distance while emissions above 18GHz were measured at 0.5 meter test distance with the application of a distance correction factor.
- 5. The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 6. 6GHz 9GHz RSE is covered in EIRP section (Section 7.4).

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 24 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 34 of 63 |
| | | | V 10 5 12/15/2021 |



Determining Spurious Emissions Levels

- \circ E [dBµV/m] = Analyzer level [dBm] + 107 + AFCL [dB/m]
- Spurious Emission Level $[dBm] = E [dB\mu V/m] + 20 \log (D_{Meas}) 104.8$
- Spurious Emission Level [dBm] = Analyzer Level [dBm] + AFCL [dB/m] + Conversion Factor [dB]
- AFCL [dB/m] = (Antenna Factor [dB/m] + Cable Loss [dB] + Attenuator [dB]) Preamplifier Gain [dB]
- Conversion Factor [dB] = 107 104.8 + 20 log (D Meas)
- Margin [dB] = Spurious Emission Level [dBm] Limit [dBm]

| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager | |
|-------------------------------------|---|-----------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 25 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 35 of 63 | |
| | | | V 10.5 12/15/2021 | |



Radiated Spurious Emission Measurements (960MHz – 18GHz) §15.519(c); RSS-220 [5.3.1(d)]

| MultiView 📰 Spectrum 🗙 Spectrum | | | • | | ini 🎦 Panel | |
|--|------------------------|------------|----------------------------------|---------------------------|-------------------|--|
| Ref Level -10.00 dBm Offset -2.24 dB RBW 1 M Att 0 dB SWT 5.04 s VBW 3 M Input 1 AC PS Off Notch | rlHz Mode Sweep Off | | Frequency 3.4800000 GHz | Freq. | Span | |
| TDF input1 "3M1_SFU_102132_HP1100_UWB","CA_ETS_F 1 Frequency Sweep | | | ●1Rm Max | Ampt. / Scale | Auto Set | |
| Limit Check Line UWB HANDHELD LIMIT | PASS PASS | | M1[1] -82.21 dBm 1.252500 GHz | вw | Sweep | |
| | | | | Trace | Trigger | |
| | | | | Meas | Meas Config | |
| | | | | Lines | Input / Output | |
| | | | | Marker | Peak | |
| | | | | Marker | Search | |
| | | | | Function | - | |
| | | | | Undo | Redo | |
| | | | | Run Single | Run Cont. | |
| | | | | Setup | Print | |
| | | | | File | Mode | |
| -80 dBm | | | | 8-0 | | |
| -80 dBm | | | | | MHz ms dBm m¥ | |
| | | | | -dBm ¥ kHz µs dB µ¥ | | |
| -100 d8m | | | | | | |
| | | | | Pre | eset | |
| 960.0 MHz | 5041 pts | 504.0 MHz/ | 6.0 GHz | | | |
| Messuring 16,07,3022 Ref avel 0 RIV | | | | | | |

19:51:05 16.07.2022

Plot 7-15. FCC Radiated Spurious Emission 960-6000MHz (Ch. 5, Config 0, Payload 125 Ant. Pol. H)



19:42:47 16.07.2022

Plot 7-16. FCC Radiated Spurious Emissions 960-6000MHz (Ch. 5, Config 0, Payload 125 Ant. Pol. V)

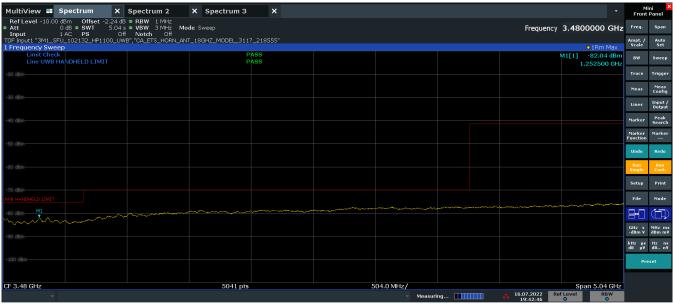
| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager | |
|-------------------------------------|---|-----------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Page 36 of 63 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | | |
| | | | V 10.5 12/15/2021 | |



| MultiView Spectrum X Spectrum 2 X Spectrum 3 X | • | Mi Front | |
|--|-----|--------------------|-------------------|
| RefLevel 10.00 dBm Offset -2.24 dB RBW 1MHz ● Att 0 dB SWT 5.04 s VBW 3 MHz Mode Sweep Frequency 3.4800000 Input 1 AC PS 0 ff Off 5 0 ff 5 | GHz | Freq. | Span |
| Input 1AC PS Off Notch Off TDF inputt "SML_SFU_102132_HP1100_UWB","CA_ETS_HORN_ANT_18GHZ_MODEL_3117_218555" •1Rm •1Rm I Frequency Sweep •1Rm •1Rm •1Rm •1Rm | | Ampt. / Scale | Auto Set |
| M1[1] = 2250 | dBm | BW | Sweep |
| -20 dBm- | | Trace | Trigger |
| | | Meas | Meas Config |
| | | Lines | Input / Output |
| | | Marker | Peak Search |
| -50 dtm | | Marker Function | Marker |
| | | Undo | Redo |
| | | Run Single | Run Cont. |
| | | Setup | Print |
| SED UWB HANCHELD LIMIT | | | Mode |
| | | | (\Box) |
| -90 dim | | GHz s -dBm ¥ | MHz ms dBm m¥ |
| | | kHz µs dB µ¥ | Hz ns dB n¥ |
| | | Pre | set |
| | | | |
| 960.0 MHz 5041 pts 504.0 MHz/ 6.0 | GHz | | |

19:51:58 16.07.2022

Plot 7-17. ISED Radiated Spurious Emission 960-6000MHz (Ch. 5, Config 0, Payload 125 Ant. Pol. H)





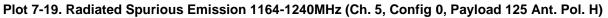
Plot 7-18. ISED Radiated Spurious Emission 960-6000MHz (Ch. 5, Config 0, Payload 125 Ant. Pol. V)

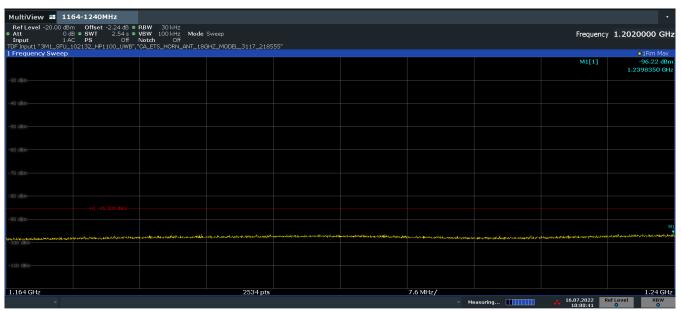
| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 37 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye 3/ 01 03 |
| | | | V 10.5 12/15/2021 |



| MultiView 📰 116 | | DDW Solu | | | | | | | • |
|---|----------------------|---|--|-----|---|----------------------------------|--|--|--|
| Att 0 dE | C PS Off | VBW 100 kHz Mode Notch Off | | 55" | | | | Frequency | 1.2020000 GHz |
| 1 Frequency Sweep | 02102_) # 1100_040 , | 0.5510510101010115101 | 5/12_/10022_011/ _2100 | | | | | | o1Rm Max |
| | | | | | | | | M1[1] | -95.89 dBm 1.2000060 GHz |
| -30 dBm- | | | | | | | | | |
| -40 dBm- | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| -60 dBm | | | | | | | | | |
| -70 dBm | | | | | | | | | |
| -80 dBm | | | | | | | | | |
| | | | | | | | | | |
| -90 dBm | | den som at holle det tan måde ble kolmednen | ander som en sense ander an der sense der stander der stande der stande so | M1 | ner, harten fraken et stan afnaren der staden s | more dat sala sura a constructor | ub sites to debug souther | مىرى بىلىرى بىلى بىل | a ala akia gipata nakia ta anala da patamina distrika. |
| kan alan sahala kana saharan saharan 100 dBm | | | | | | | a ta nama tanggi pana si nama na | | |
| -110 dBm | | | | | | | | | |
| | | | 0504 | | | 7.6 1411. (| | | |
| 1.164 GHz | | | 2534 pts | | | 7.6 MHz/ → ме | easuring | 16.07.2022 10:04:47 | ef Level RBW O |

10:04:48 16.07.2022





10:00:41 16.07.2022

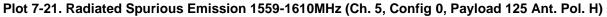


| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 29 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 38 of 63 |
| | - | | V 10.5 12/15/2021 |



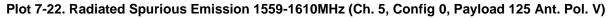
| MultiView 🖬 15 | 559-1610MHz | | | | | | | | • |
|-----------------------|--|-------------------------------|---|---|---|--|--|--|---|
| Att 0 c Input 1 A | m Offset -2.24 dB ● dB ● SWT 1.7 s ● AC PS Off 102132_HP1100_UWB",' | VBW 100 kHz Mode Notch Off | | | | | | Frequency | 1.5845000 GHz |
| 1 Frequency Sweep | | | | | | | | | 1Rm Max |
| -30 dBm | | | | | | | | M1[1] | -96.83 dBm 1.5741610 GHz |
| -30 dBm- | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| -60 dBm | | | | | | | | | |
| -70 d8m | | | | | | | | | |
| -80 dBm | | | | | | | | | |
| | | | | | | | | | |
| -90 dBm- | al market of the state of the s | M | | | | | | | |
| -100 dBm- | an mart an gold the optimized and a star of the star | | an an an Anna an Anna an Anna an Anna Ann | ann faithe a shaffer tagan tallon faithe a dha sa dha sha dha gan tallon faithe | and the agence of the spectra decount of the states | and a fear that a second and a fear that a fear of the | and a superior of the second | ta yaya di kuma ya sa sa kuta ma ya kuta da ya mata kuta da kuta da sa | a antiga ana anti-antiga dala ang panahadan fatika. |
| -110 dBm | | | | | | | | | |
| | | | | | | | | | |
| 1.559 GHz | | | 1701 pts | | | 5.1 MHz/ | | 16.07.2022 | 1.61 GHz tef Level RBW |
| ~ | | | | | | | easuring | 16.07.2022 | ef Level RBW |

15:19:15 16.07.2022



| MultiView 📰 15 | | | | | | | | | • |
|---|--|--|------------------------------|---|-------------------------------|----------|--|-------------------------------|---|
| ■ Att 0 d Input 1 A | m Offset -2.24 dB ● dB ● SWT 1.7 s ● AC PS Off 102132_HP1100_UWB"," | VBW 100 kHz Mode Notch Off | Sweep 3HZ MODEL 3117 2185 | 55" | | | | Frequency | 1.5845000 GHz |
| 1 Frequency Sweep | | | | | | | | | 1Rm Max |
| | | | | | | | | M1[1] | -96.90 dBm 1.5753100 GHz |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 90 dBm | | | | | | | | | |
| an fan te staar yn de staar de staar de staar de staar wegen wegen wegen de staar de staar de staar de staar de | alaran ana ang ang ang ang ang ang ang ang a | and the second | M1 | haddarhagandraamaqayada,ayaaqayaqahadaaqa | ahthagan at a balanca dagatar | | and the second second second second | alaasteense windowed to state | national and an |
| 100 d8m- | | | | | | | | | |
| | | | | | | | | | |
| 1.559 GHz | | | 1701 pts | | | 5.1 MHz/ | | | 1.61 GHz |
| * | | | 1701 pts | | | | easuring | 16.07.2022 15:19:41 | ef Level RBW |

15:19:42 16.07.2022



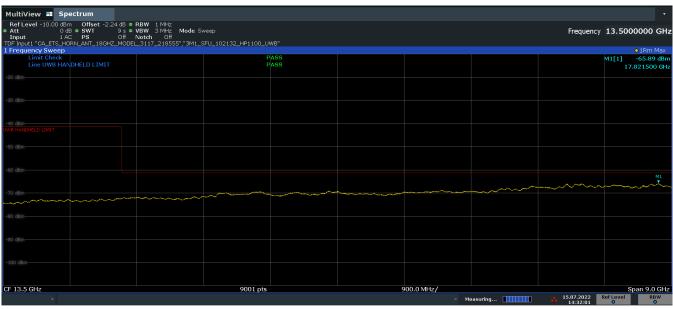
| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 20 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 39 of 63 |
| | • | • | V 10.5 12/15/2021 |



| MultiView 🖬 Spectrum | | | | • |
|--|--|------------|---------------------|-----------------------------------|
| Ref Level -10.00 dBm Offset -2.24 dB RBW 1 • Att 0 dB • SWT 9 s • VBW 31 Input 1 AC PS Off Notch TDF inputi * CA_ETS_HORN_ANT_18GHZ_MODEL_3117_2 317_2 | MHz MHz Mode Sweep Off 196555" "2004 SEL 100120 HB1100 LBNB" | | Frequency | 13.5000000 GHz |
| 1 Frequency Sweep | 218333, 301_8 0_102132_00100_000 | | | •1Rm Max |
| Limit Check Line UWB HANDHELD LIMIT | PASS PASS | | | M1[1] -65.86 dBm 17.821500 GHz |
| -20 dBm- | | | | |
| -30 dBm- | | | | |
| -40 dBm- UWB HANDHELD LIMIT | | | | |
| -S0 dBm- | | | | |
| -60 dBm- | | | | |
| -70 dBm- | | | | M1 ••••• |
| | | | | |
| -80 dBm- | | | | |
| -90 dBm- | | | | |
| -100 dBm- | | | | |
| CF 13.5 GHz | 9001 pts | 900.0 MHz/ | | Span 9.0 GHz |
| - | | | easuring 15.07.2022 | Ref Level RBW |

14:21:16 15.07.2022









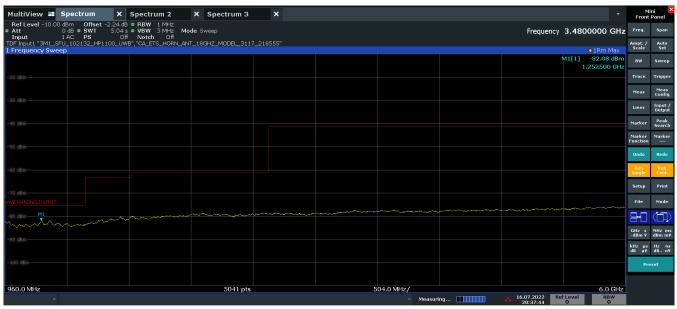
| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 40 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 40 of 63 |
| | | • | V 10.5 12/15/2021 |



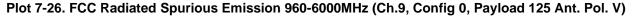
| AultiView = Spectrum 2 X Spectrum 3 X | Mi Front | |
|---|--------------------|-------------------|
| RefLevel -10.00 dBm Offset -2.24 dB © RBW I MHz Att 0 dB © SWT 5.04 s © VBW 3 MHz Input 1 AC PS Off | Freq. | Span |
| | Ampt. / Scale | Auto Set |
| M1[1] -82.18 dBm 1.252500 GHz | BW | Sweep |
| 20 dBm- | Trace | Trigger |
| 30 dBm | Meas | Meas Config |
| | Lines | Input / Output |
| | Marker | Peak Search |
| 50 dBrg | Marker Function | Marker |
| | Undo | Redo |
| | Run Single | Run Cont. |
| 70 dBrs- | Setup | Print |
| V8 HANGHELD LIMIT | File | Mode |
| | | (\Box) |
| | GHz s -dBm ¥ | MHz ms dBm m¥ |
| | kHz µs dB µ¥ | Hz ns dBn¥ |
| | Pre | set |
| | | |
| 60.0 MHz 5041 pts 504.0 MHz 6.0 GHz | | |

20:29:48 16.07.2022

Plot 7-25. FCC Radiated Spurious Emission 960-6000MHz (Ch. 9, Config 0, Payload 125 Ant. Pol. H)







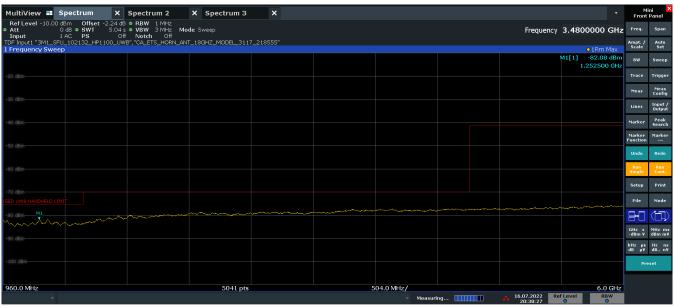
| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 41 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 41 of 63 |
| | • | • | V 10.5 12/15/2021 |



| MultiView 🖬 Spectrum 2 X Spectrum 3 X | Min Front P | |
|---|--------------------|-------------------|
| RefLevel -10.00 dBm Offset -2.24 dB © RBW 1 MHz Att 0 dB © SW1 5.04.5 © VBW 3 MHz Frequency 3.4800000 GHz Input 1 AC PS Off Frequency 3.4800000 GHz | Freq. | Span |
| TDF Input1 "3M1 SFU 102132 HP1100 UWB"."CA ETS HORN ANT 18GHZ MODEL 3117 218555" | Ampt. / Scale | Auto Set |
| | вw | Sweep |
| | Trace | Trigger |
| | Meas | Meas Config |
| 30 d8m | Lines | Input / Output |
| 40.d8m | Marker | Peak Search |
| | Marker Junction | Marker |
| 50 d8m | Undo | Redo |
| | Run Single | Run Cont. |
| 70 d8m | Setup | Print |
| | File | Mode |
| | | |
| | GHz s ∣ -dBm ¥ | MHz ms dBm m¥ |
| | kHz µs dB µ¥ | Hz ns dB n¥ |
| 100 dBm | Pres | set |
| | | |
| 960.0 MHz 5041 pts 504.0 MHz/ 6.0 GHz 6.0 GHz 6.0 GHz | | |

20:29:48 16.07.2022

Plot 7-27. ISED Radiated Spurious Emission 960-6000MHz (Ch. 9, Config 0, Payload 125 Ant. Pol. H)





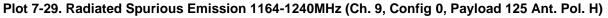
Plot 7-28. ISED Radiated Spurious Emission 960-6000MHz (Ch.9, Config 0, Payload 125 Ant. Pol. V)

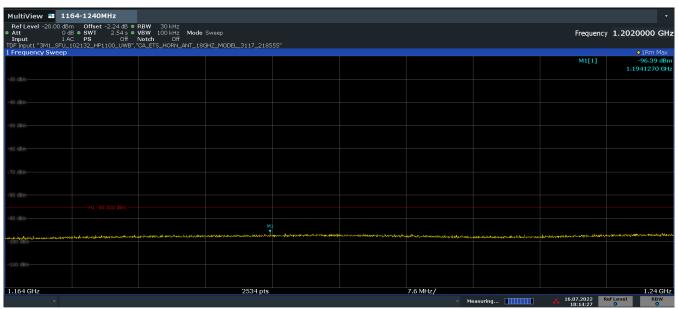
| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager | |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 42 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 42 of 63 | |
| | | | V 10.5 12/15/2021 | |



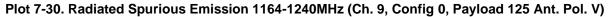
| MultiView 📰 110 | 54-1240MHz | | | | | | | | • |
|------------------------|----------------------------|--|----------|--|-------------------------------------|----------|---|---|-----------------------------|
| Att 0 di Input 1 At | C PS Off | VBW 100 kHz Mode | | 55" | | | | Frequency | 1.2020000 GHz |
| 1 Frequency Sweep | | | | | | | | | ●1Rm Max |
| | | | | | | | | M1[1] | -96.14 dBm 1.2380960 GHz |
| -30 dBm | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| -60 dBm | | | | | | | | | |
| -70 dBm | | | | | | | | | |
| -80 dBm- | | | | | | | | | |
| | | | | | | | | | |
| -90 dBm | te dans en de beskelen det | Level des Rockstonsburger A. 118-148. 10 | | frant served an advanced as the served and an advanced and | Materian and Material Advantages, a | - Maria | n Automoustic and provide a sub-tracket and | n a ta a a sa sa kalindaran wijaranak dingan ^{ang} | M1 |
| -100 dBm | | | | | | | | | |
| -110 dBm | | | | | | | | | |
| | | | | | | | | | |
| 1.164 GHz | | | 2534 pts | | | 7.6 MHz/ | | | 1.24 GHz |
| ~ | | | | | | | easuring | 16.07.2022 R 10:10:34 | o RBW |

10:10:35 16.07.2022







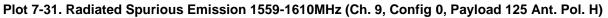


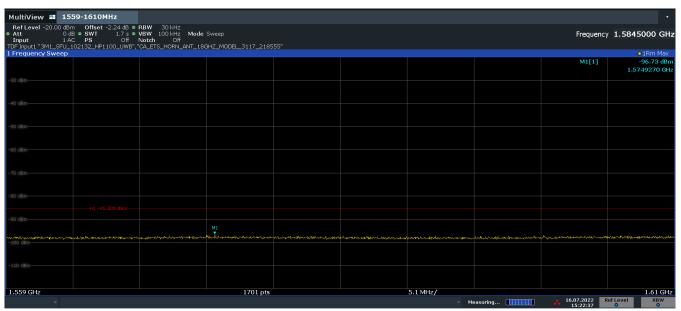
| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager | |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 42 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 43 of 63 | |
| | - | • | V 10.5 12/15/2021 | |



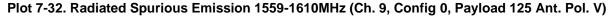
| MultiView 📰 155 | | | | | | | | | • |
|------------------------------|------------------------------------|--|--|---|--------------------------------------|----------|-------------------------------|---|---|
| Att 0 dE | C PS Off | VBW 100 kHz Mode Notch Off | | | | | | Frequency | 1.5845000 GHz |
| 1 Frequency Sweep | .02132_AP1100_OWB , | CA_ETS_MORN_ANT_18 | 302_MODEL_3117_2183 | 000 | | | | | •1Rm Max |
| | | | | | | | | M1[1] | -97.05 dBm 1.5917550 GHz |
| -30 dBm | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| -60 dBm | | | | | | | | | |
| -70 dBm | | | | | | | | | |
| -80 dBm | | | | | | | | | |
| | | | | | | | | | |
| -90 dBm | ud Assa - a us a collection school | a - an and dow to a model Actual match | l hand beitet sociale. Mit wet of the second | and the state of the | a and a complete to the state of the | MI | ti karda da adashi sa satawan | An and the second section about the order and the | and the field of the strengt second box |
| -100 dBm | | | | | | | | | |
| -110 dBm | | | | | | | | | |
| | | | 1701 | | | | | | |
| 1.559 GHz | | | 1701 pts | | | 5.1 MHz/ | easuring | 16.07.2022 15:22:05 | ef Level RBW O O |

15:22:06 16.07.2022





15:22:37 16.07.2022



| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager | |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 14 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 44 of 63 | |
| | - | | V 10.5 12/15/2021 | |



| MultiView Spectrum | | | | • |
|---|---|-----------|-------------|---|
| Ref Level -10.00 dBm Offset -2.24 dB RBW 1 • Att 0 dB • SWT 9 s • VBW 3 Input 1 AC PS Off Notch TDF input1 * CA_ETS_HORN_ANT_18GHZ_MODEL_3117_2 * * | MHz MHz Mode Sweep Off JISEES" "2M1 SEL 100120 H01100 HWP" | | | Frequency 13.5000000 GHz |
| 1 Frequency Sweep | 218333, 301_30_102132_00100_000 | | | •1Rm Max |
| Limit Check Line UWB HANDHELD LIMIT | PASS PASS | | | M1[1] -65.91 dBm 16.707600 GHz |
| -20 dBm- | | | | |
| -30 dBm- | | | | |
| -40 dBm | | | | |
| -50 dBm- | | | | |
| -60 dBm- | | | | |
| -70 dBm- | | | | M1 •••••••••••••••••••••••••••••••••••• |
| -80 dBm | | | | |
| -80 gBtu- | | | | |
| -90 dBm- | | | | |
| -100 d8m- | | | | |
| CF 13.5 GHz | 9001 pts | 900.0 MH: | | Span 9.0 GHz |
| √ | 9001 prs | 900.0 MH. | → Measuring | 15.07.2022 Ref Level RBW 14:55:05 0 0 |

14:55:06 15.07.2022



| ef Level -10.00 dBm Offset -2.24 dB • RBW 11 | 1Hz | | | | |
|---|------------------------|-----|------------|-----------|----------------|
| tt 0 dB ● SWT 9 s ● VBW 3 l nout 1 AC PS Off Notch | rlHz Mode Sweep Off | | | Frequency | 13.5000000 G |
| input1 "CA_ETS_HORN_ANT_18GHZ_MODEL_3117_2 requency Sweep | | | | | ●1Rm Ma |
| Limit Check Line UWB HANDHELD LIMIT | PAS | s s | | | M1[1] -65.88 d |
| d8m- | | | | | 17.825500 0 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| iBm | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 3.5 GHz | 9001 pts | | 900.0 MHz/ | | Span 9.0 |

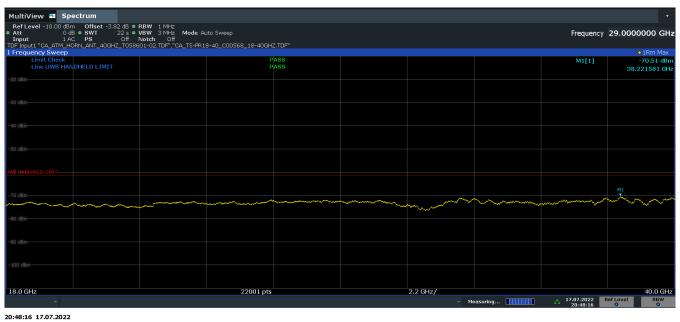




| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | | |
|-------------------------------------|---------------------|---|-------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 45 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 45 of 63 | |
| | | • | V 10.5 12/15/2021 | |



Radiated Spurious Emissions (Above 18GHz) §15.519 (c); RSS-220 [5.3.1(d)]



Plot 7-35. Radiated Spurious Emission 18-40GHz (Ch. 5, Config 0, Payload 125 Ant. Pol. H)

| MultiView 📰 Spectrum | | | | | | |
|--|------------------------|--------|------------|--|------------------------|---|
| RefLevel -10.00 dBm Offset -3.82 dB • RBW 1 MHz | | | | | | · · · |
| Att 0 dB • SWT 22 s • VBW 3 MHz Mo Input 1 AC PS Off Notch Off | ode Auto Sweep | | | | Frequency | 29.0000000 GHz |
| TDF Input1 "CA_ATM_HORN_ANT_40GHZ_T058601-02","CA_TS-PR 1 Frequency Sweep | 18-40_C00568_18-40GHZ" | | | | | o 1Rm Max |
| Limit Check | PASS | | | | M1[1] | -70.49 dBm |
| Line UWB HANDHELD LIMIT | PASS | | | | | 38.218581 GHz |
| -20 dBm- | | | | | | |
| | | | | | | |
| -30 dBm- | | | | | | |
| | | | | | | |
| | | | | | | |
| -40 dBm | | | | | | |
| | | | | | | |
| -S0 dBm | | | | | | |
| | | | | | | |
| UWB HANDHELD LIMIT | | | | | | |
| | | | | | | |
| -70 dBm- | | | | | | M1 |
| | | mannen | me and the | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | mann | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |
| | | | munit | | | |
| -80 dBm- | | | | | | |
| | | | | | | |
| -90 dBm- | | | | | | |
| | | | | | | |
| -100 dBm | | | | | | |
| | | | | | | |
| | | | | | | |
| 18.0 GHz | 22001 pts | ; | 2.2 GHz/ | | | 40.0 GHz |
| * | | | | easuring | 17.07.2022 20:33:49 | o RBW |

20:33:49 17.07.2022



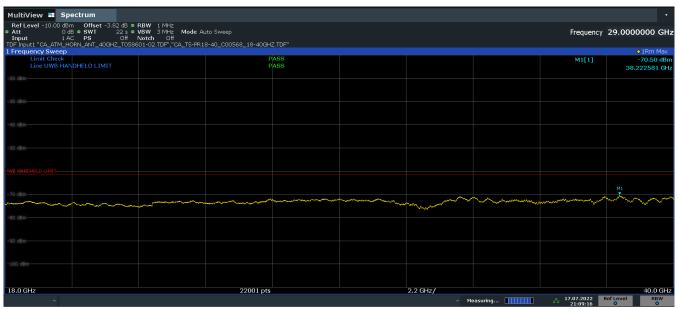
| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager | |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 46 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 46 of 63 | |
| | | | V 10.5 12/15/2021 | |



| MultiView 📰 Spectrum | | | | | | | • |
|--|---------------------------------------|-----------|------------|-----------|----------|----------------------------|-----------------------------|
| Ref Level -10.00 dBm Offset -3.82 dB • Att 0 dB SWT 22 s Input 1 AC PS Off TDF Input1 CA_ATM_HORN_ANT_40GHZ_T053 | ■ VBW 3 MHz Mode Au Notch Off | | 7.TDF" | | | Frequency | 29.0000000 GHz |
| 1 Frequency Sweep | · · · · · · · · · · · · · · · · · · · | | | | | | o1Rm Max |
| Limit Check Line UWB HANDHELD LIMIT | | | ASS ASS | | | M1[1] | -70.52 dBm 38.229580 GHz |
| -20 dBm- | | | | | | | |
| -30 dBm | | | | | | | |
| -40 d8m- | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| -70 dBm- | | | | | | ward and the second second | |
| -80 dBm- | | | | man t | | | |
| -90 d8m- | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 18.0 GHz | | 22001 pts | | 2.2 GHz/ | | | 40.0 GHz |
| ▼ ▼ | | 22001 pts | | | easuring | 17.07.2022 21:01:38 | ef Level RBW |

21:01:39 17.07.2022









| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 47 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye 41 01 03 |
| | • | · | V 10.5 12/15/2021 |



Radiated Spurious Emission Measurements (960MHz-18GHz) §15.519(c); RSS-220 [5.3.1(d)]

| Distance of Measurements: | 0.6 Meters |
|---------------------------|------------|
| Operating Frequency: | 6500 MHz |
| Channel: | 5 |
| Config | 0 |
| Payload | 125 |

| Frequency [MHz] | Detector | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dBm] | Conversion Factor [dB] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|--------------------|----------|------------------------------|---------------------------|----------------------------------|----------------------------|---------------|---------------------------|-------------------------------------|----------------|----------------|
| 1252 | Avg | V | - | - | -75.05 | -4.75 | -2.24 | -82.04 | -75.30 | -6.74 |
| 1654 | Avg | V | - | - | -73.93 | -5.15 | -2.24 | -81.32 | -63.30 | -18.02 |
| 2283 | Avg | V | - | - | -76.24 | -1.46 | -2.24 | -79.94 | -61.30 | -18.64 |
| 10950 | Avg | V | - | - | -77.12 | 7.01 | -2.24 | -72.34 | -61.30 | -11.04 |
| 14570 | Avg | V | - | - | -76.48 | 8.75 | -2.24 | -69.97 | -61.30 | -8.67 |
| 16900 | Avg | V | - | - | -75.64 | 10.99 | -2.24 | -66.89 | -61.30 | -5.59 |

 Table 7-15. Radiated Spurious Emission Measurements 960MHz-18GHz (FCC)

| Distance of Measurements: | 0.6 Meters |
|---------------------------|------------|
| Operating Frequency: | 6500 MHz |
| Channel: | 5 |
| Config | 0 |
| Payload | 125 |

| Frequency [MHz] | Detector | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dBm] | Conversion Factor [dB] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|--------------------|----------|------------------------------|---------------------------|----------------------------------|----------------------------|---------------|---------------------------|-------------------------------------|----------------|----------------|
| 1252 | Avg | V | - | - | -75.05 | -4.75 | -2.24 | -82.04 | -75.30 | -6.74 |
| 1637 | Avg | V | - | - | -75.54 | -5.35 | -2.24 | -83.13 | -70.00 | -13.13 |
| 2260 | Avg | V | - | - | -76.39 | -1.54 | -2.24 | -80.17 | -70.00 | -10.17 |
| 10950 | Avg | V | - | - | -77.12 | 7.01 | -2.24 | -72.34 | -61.30 | -11.04 |
| 14570 | Avg | V | - | - | -76.48 | 8.75 | -2.24 | -69.97 | -61.30 | -8.67 |
| 16900 | Avg | V | - | - | -75.64 | 10.99 | -2.24 | -66.89 | -61.30 | -5.59 |

 Table 7-16. Radiated Spurious Emission Measurements 960MHz-18GHz (ISED)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 48 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 48 01 03 |
| | | | V 10.5 12/15/2021 |



Radiated Spurious Emission Measurements (960MHz-18GHz) §15.519 (c); RSS-220 [5.3.1(d)]

| Distance of Measurements: | 0.6 Meters |
|---------------------------|------------|
| Operating Frequency: | 8000 MHz |
| Channel: | 9 |
| Config | 0 |
| Payload | 125 |

| Frequency [MHz] | Detector | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dBm] | Conversion Factor [dB] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|--------------------|----------|------------------------------|---------------------------|----------------------------------|----------------------------|---------------|---------------------------|-------------------------------------|----------------|----------------|
| 1252 | Avg | V | - | - | -75.09 | -4.75 | -2.24 | -82.08 | -75.30 | -6.78 |
| 1830 | Avg | V | - | - | -75.77 | -3.29 | -2.24 | -81.30 | -63.30 | -18.00 |
| 2250 | Avg | V | - | - | -76.46 | -1.54 | -2.24 | -80.24 | -61.30 | -18.94 |
| 9950 | Avg | V | - | - | -77.50 | 6.31 | -2.24 | -73.43 | -41.30 | -32.13 |
| 15000 | Avg | V | - | - | -76.22 | 9.10 | -2.24 | -69.36 | -61.30 | -8.06 |
| 17500 | Avg | V | - | - | -75.57 | 10.44 | -2.24 | -67.37 | -61.30 | -6.07 |

Table 7-17. Radiated Spurious Emission Measurements 960MHz-18GHz (FCC)

| Distance of Measurements: | 0.6 Meters |
|---------------------------|------------|
| Operating Frequency: | 8000 MHz |
| Channel: | 9 |
| Config | 0 |
| Payload | 125 |

| Frequency [MHz] | Detector | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dBm] | Conversion Factor [dB] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|--------------------|----------|------------------------------|---------------------------|----------------------------------|----------------------------|---------------|---------------------------|-------------------------------------|----------------|----------------|
| 1252 | Avg | V | - | - | -75.09 | -4.75 | -2.24 | -82.08 | -75.30 | -6.78 |
| 2250 | Avg | V | - | - | -76.46 | -1.54 | -2.24 | -80.24 | -70.00 | -10.24 |
| 4510 | Avg | V | - | - | -77.07 | 1.42 | -2.24 | -77.89 | -70.00 | -7.89 |
| 9950 | Avg | V | - | - | -77.50 | 6.31 | -2.24 | -73.43 | -41.30 | -32.13 |
| 15000 | Avg | V | - | - | -76.22 | 9.10 | -2.24 | -69.36 | -61.30 | -8.06 |
| 17500 | Avg | V | - | - | -75.57 | 10.44 | -2.24 | -67.37 | -61.30 | -6.07 |

 Table 7-18. Radiated Spurious Emission Measurements 960MHz-18GHz (ISED)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager | |
|---|-------------|---------------------------------------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dogo 40 of 62 | |
| 1C2205090037-08.BCG 6/7/2022 - 8/5/2022 | | Watch | Page 49 of 63 | |
| | | • | V 10.5 12/15/2021 | |



Radiated Spurious Emission Measurements (Above 18GHz) §15.519 (c); RSS-220 [5.3.1(d)]

| Distance of Measurements: | 0.5 Meters |
|---------------------------|------------|
| Operating Frequency: | 6500 MHz |
| Channel: | 5 |
| Config | 0 |
| Payload | 125 |

| Frequency [MHz] | Detector | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dBm] | Conversion Factor [dB] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|--------------------|----------|------------------------------|---------------------------|----------------------------------|----------------------------|---------------|---------------------------|-------------------------------------|----------------|----------------|
| 19500 | Avg | V | - | - | -65.92 | -5.02 | -3.82 | -74.76 | -61.30 | -13.46 |
| 22000 | Avg | V | - | - | -63.95 | -7.54 | -3.82 | -75.31 | -61.30 | -14.01 |
| 26000 | Avg | V | - | - | -64.31 | -5.68 | -3.82 | -73.81 | -61.30 | -12.51 |
| 32000 | Avg | V | - | - | -66.90 | -4.06 | -3.82 | -74.78 | -61.30 | -13.48 |
| 38219 | Avg | V | - | - | -62.75 | -3.92 | -3.82 | -70.49 | -61.30 | -9.19 |

Table 7-19. Radiated Spurious Emission Measurements 18-40GHz

| Distance of Measurements: | 0.5 Meters |
|---------------------------|------------|
| Operating Frequency: | 8000 MHz |
| Channel: | 9 |
| Config | 0 |
| Payload | 125 |
| | |

| Frequency [MHz] | Detector | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dBm] | Conversion Factor [dB] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|--------------------|----------|------------------------------|---------------------------|----------------------------------|----------------------------|---------------|---------------------------|-------------------------------------|----------------|----------------|
| 18200 | Avg | Н | - | - | -64.01 | -6.04 | -3.82 | -73.87 | -61.30 | -12.57 |
| 24000 | Avg | Н | - | - | -63.15 | -6.45 | -3.82 | -73.42 | -61.30 | -12.12 |
| 28085 | Avg | Н | - | - | -64.12 | -4.40 | -3.82 | -72.34 | -61.30 | -11.04 |
| 32000 | Avg | Н | - | - | -67.05 | -4.06 | -3.82 | -74.93 | -61.30 | -13.63 |
| 38223 | Avg | Н | - | - | -61.68 | -5.00 | -3.82 | -70.50 | -61.30 | -9.20 |

Table 7-20. Radiated Spurious Emission Measurements 18-40GHz

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 50 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | rage 50 01 03 |
| | | | V 10 5 12/15/2021 |



7.7 Radiated Spurious Emissions Measurements – Below 960MHz §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 7-21 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 7-21. 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

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 = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 51 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 51 01 63 |
| | | | V 10.5 12/15/2021 |



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

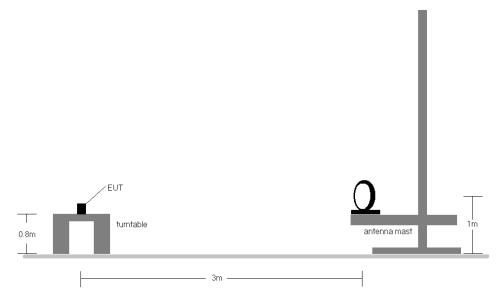
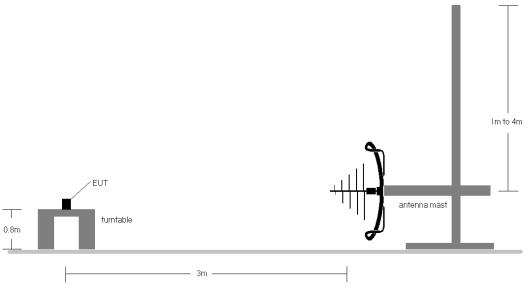
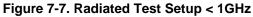


Figure 7-6. Radiated Test Setup < 30Mhz





| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege 52 of 62 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 52 of 63 |
| | | | V 10.5 12/15/2021 |



Test Notes

- 1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen(8.10) are below the limit shown in Table 7-21.
- The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes. For below 30MHz the loop antenna was positioned in 3 orthogonal planes (X front, Y side, Z top) to determine the orientation resulting in the worst case emissions.
- 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 for emissions within 6dB of the limit.
- 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.
- 9. Both configurations below were investigated, and the worst case has been reported.
 - a. EUT powered by AC/DC adaptor via USB-C cable with magnetic charger
 - b. EUT powered by host PC via USB-C cable with magnetic charger
- 10. All modes of operation were investigated and the worst-case emissions are reported.

Sample Calculations

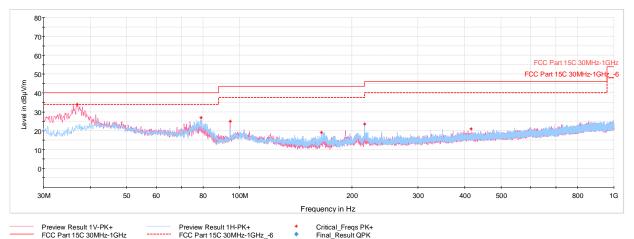
Determining Spurious Emissions Levels

- Field Strength Level $[dB\mu V/m]$ = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = (Antenna Factor [dB/m] + Cable Loss [dB] + Attenuator [dB]) Preamplifier Gain [dB]
- Margin [dB] = Field Strength Level $[dB\mu V/m]$ Limit $[dB\mu V/m]$

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 53 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye 55 01 03 |
| | | | V 10 5 12/15/2021 |



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



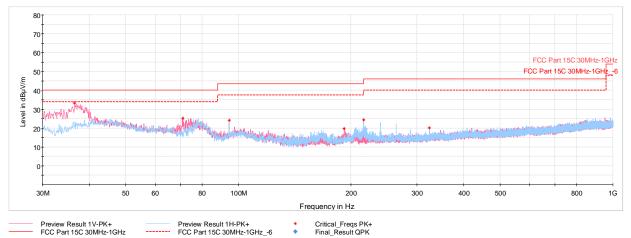
Plot 7-39. Radiated Spurious Emission 30-960MHz (Ch. 5, Config 0, Payload 125 with AC/DC Adapter + Magnetic Charger)

| Frequency [MHz] | Detector | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|--------------------|----------|------------------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 36.887 | Max-Peak | V | 100 | 331 | -54.87 | -18.24 | 33.89 | 40.00 | -6.11 |
| 78.985 | Max-Peak | Н | 200 | 305 | -57.31 | -22.86 | 26.83 | 40.00 | -13.17 |
| 94.505 | Max-Peak | V | 200 | 182 | -62.94 | -19.05 | 25.01 | 43.52 | -18.51 |
| 165.509 | Max-Peak | Н | 200 | 234 | -67.65 | -20.18 | 19.17 | 43.52 | -24.36 |
| 215.852 | Max-Peak | Н | 100 | 255 | -65.73 | -17.76 | 23.51 | 43.52 | -20.01 |
| 415.430 | Max-Peak | Н | 100 | 0 | -73.80 | -12.20 | 21.00 | 46.02 | -25.02 |

| Table 7-22. Radiated Spurious Emission 30-960MHz (Ch. 5, Config 0, Payload 125 with AC/DC Adapter + Magnetic |
|--|
| Charger) |

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | MEASUREMENT REPORT (CERTIFICATION) | Approved by: Technical Manager |
|-------------------------------------|---------------------|---------------------------------------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 54 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 54 01 05 |
| | | | V 10.5 12/15/2021 |





FCC Part 15C 30MHz-1GHz FCC Part 15C 30MHz-1GHz_6 FCC Part 15C 30MHz-1GHz_6 Final_Result QPK Plot 7-40. Radiated Spurious Emission 30-960MHz (Ch. 9, Config 0, Payload 125 with AC/DC Adapter + Magnetic Charger)

| Frequency [MHz] | Detector | Antenna Polarity [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|--------------------|----------|------------------------------|---------------------------|----------------------------------|----------------------------|----------------|-------------------------------|-------------------|----------------|
| 36.548 | Max-Peak | V | 100 | 188 | -55.45 | -18.32 | 33.23 | 40.00 | -6.77 |
| 71.128 | Max-Peak | V | 100 | 31 | -61.20 | -20.64 | 25.16 | 40.00 | -14.84 |
| 94.505 | Max-Peak | V | 200 | 185 | -63.79 | -19.05 | 24.16 | 43.52 | -19.36 |
| 191.796 | Max-Peak | V | 100 | 297 | -69.06 | -18.17 | 19.77 | 43.52 | -23.75 |
| 215.901 | Max-Peak | Н | 100 | 242 | -64.79 | -17.75 | 24.46 | 43.52 | -19.06 |
| 323.716 | Max-Peak | Н | 100 | 259 | -72.32 | -14.52 | 20.16 | 46.02 | -25.87 |

| Table 7-23. Radiated Spurious Emission 30-960MHz (Ch. 9, Config 0, Payload 125 with AC/DC Adapter + Magnetic |
|--|
| Charger) |

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Dege EE of C2 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 55 of 63 |
| | | | V 10.5 12/15/2021 |



7.8 AC Line-Conducted Emission Measurement §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 AC Line 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 (MHz) | Conducted Limit (dBµV) | | | | |
|--------------------------------|------------------------|-----------|--|--|--|
| | Quasi-peak | Average | | | |
| 0.15 – 0.5 | 66 to 56* | 56 to 46* | | | |
| 0.5 - 5 | 56 | 46 | | | |
| 5 - 30 | 60 | 50 | | | |

Table 7-24. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak 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 = quasi-peak
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

Average Measurements

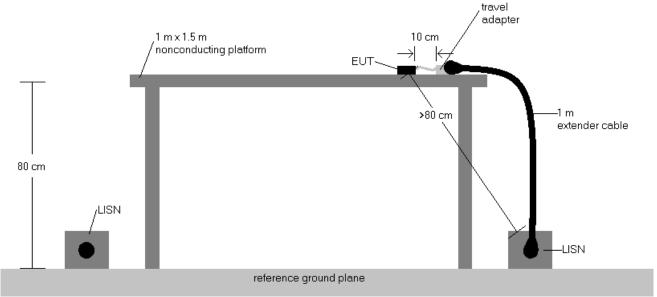
- 1. Analyzer center frequency was set to the frequency of the spurious emission of interest
- 2. RBW = 9kHz (for emissions from 150kHz 30MHz)
- 3. Detector = RMS
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager |
|-------------------------------------|---|-----------|-----------------------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 56 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 50 01 03 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | V 10 5 12/15/2021 |



Test Setup

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



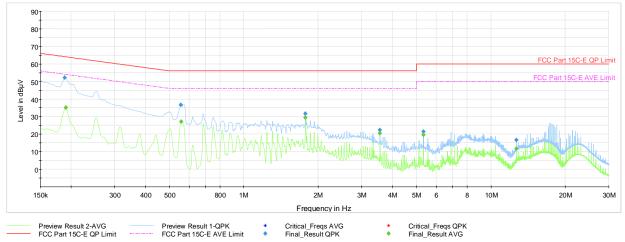


Test Notes

- 1. All modes of operation were investigated and the worst-case emissions are reported. 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 detectors
- 7. Deviations to the Specifications: None.
- 8. Both configurations below were investigated, and the worst case has been reported.
 - a. EUT powered by AC/DC adapter via USB-C cable with magnetic charger
 - b. EUT powered by host PC via USB-C cable with magnetic charger

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 57 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 57 01 63 |
| | | | V 10 5 12/15/2021 |





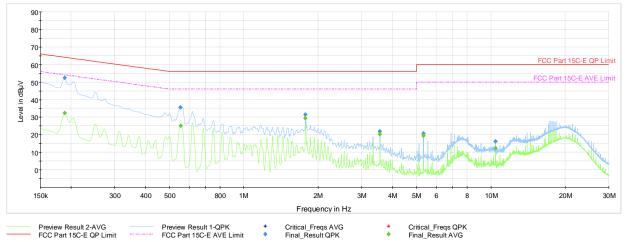
Plot 7-41. AC Line Conducted (Ch. 5, Config 0, Payload 125 L1, with PC via USB-C cable with magnetic charger)

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|--------------------|------------------|---------------------|-------------------|--------------|-------------|------|----|
| 0.188 | FINAL | 52.2 | | 64.11 | -11.89 | L1 | ON |
| 0.191 | FINAL | | 35.02 | 54.02 | -19.00 | L1 | ON |
| 0.555 | FINAL | 36.6 | | 56.00 | -19.40 | L1 | ON |
| 0.557 | FINAL | | 27.22 | 46.00 | -18.78 | L1 | ON |
| 1.777 | FINAL | | 29.46 | 46.00 | -16.54 | L1 | ON |
| 1.777 | FINAL | 31.6 | | 56.00 | -24.38 | L1 | ON |
| 3.557 | FINAL | 22.3 | | 56.00 | -33.73 | L1 | ON |
| 3.557 | FINAL | | 20.41 | 46.00 | -25.59 | L1 | ON |
| 5.334 | FINAL | 21.5 | | 60.00 | -38.48 | L1 | ON |
| 5.334 | FINAL | | 19.60 | 50.00 | -30.40 | L1 | ON |
| 12.667 | FINAL | | 11.55 | 50.00 | -38.45 | L1 | ON |
| 12.667 | FINAL | 16.7 | | 60.00 | -43.33 | L1 | ON |

Table 7-25. AC Line Conducted Data (Ch. 5, Config 0, Payload 125 L1, with PC via USB-C cable with magnetic charger)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 58 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye so ul 03 |
| | | | V 10 5 12/15/2021 |





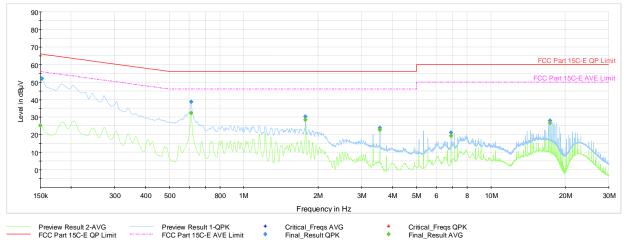
Plot 7-42. AC Line Conducted (Ch. 5, Config 0, Payload 125 N, with PC via USB-C cable with magnetic charger)

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|--------------------|------------------|---------------------|-------------------|--------------|-------------|------|----|
| 0.188 | FINAL | | 32.32 | 54.11 | -21.79 | Ν | ON |
| 0.188 | FINAL | 52.4 | | 64.11 | -11.72 | Ν | ON |
| 0.553 | FINAL | 35.6 | | 56.00 | -20.40 | Ν | ON |
| 0.555 | FINAL | | 25.07 | 46.00 | -20.93 | N | ON |
| 1.777 | FINAL | | 29.39 | 46.00 | -16.61 | Ν | ON |
| 1.777 | FINAL | 31.5 | | 56.00 | -24.54 | Ν | ON |
| 3.557 | FINAL | 22.0 | | 56.00 | -34.03 | Ν | ON |
| 3.557 | FINAL | | 20.40 | 46.00 | -25.60 | Ν | ON |
| 5.334 | FINAL | 20.9 | | 60.00 | -39.15 | Ν | ON |
| 5.334 | FINAL | | 19.39 | 50.00 | -30.61 | N | ON |
| 10.444 | FINAL | | 12.43 | 50.00 | -37.57 | N | ON |
| 10.444 | FINAL | 16.3 | | 60.00 | -43.75 | Ν | ON |

Table 7-26. AC Line Conducted Data (Ch. 5, Config 0, Payload 125 N, with PC via USB-C cable with magnetic charger)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 59 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye 59 01 03 |
| | | | V 10 5 12/15/2021 |





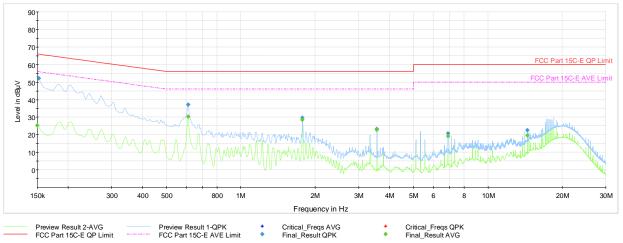
Plot 7-43. AC Line Conducted (Ch. 9, Config 0, Payload 125 L1, with PC via USB-C cable with magnetic charger)

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|--------------------|------------------|---------------------|-------------------|--------------|-------------|------|----|
| 0.150 | FINAL | | 25.31 | 56.00 | -30.69 | L1 | ON |
| 0.152 | FINAL | 51.9 | | 65.88 | -13.99 | L1 | ON |
| 0.611 | FINAL | | 32.41 | 46.00 | -13.59 | L1 | ON |
| 0.611 | FINAL | 38.6 | | 56.00 | -17.36 | L1 | ON |
| 1.777 | FINAL | | 28.45 | 46.00 | -17.55 | L1 | ON |
| 1.777 | FINAL | 30.4 | | 56.00 | -25.58 | L1 | ON |
| 3.557 | FINAL | 23.9 | | 56.00 | -32.08 | L1 | ON |
| 3.557 | FINAL | | 22.72 | 46.00 | -23.28 | L1 | ON |
| 6.889 | FINAL | 21.2 | | 60.00 | -38.81 | L1 | ON |
| 6.889 | FINAL | | 19.32 | 50.00 | -30.68 | L1 | ON |
| 17.333 | FINAL | | 26.75 | 50.00 | -23.25 | L1 | ON |
| 17.333 | FINAL | 28.1 | | 60.00 | -31.90 | L1 | ON |

 Table 7-27. AC Line Conducted Data (Ch. 9, Config 0, Payload 125 L1, with PC via USB-C cable with magnetic charger)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 60 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye ou ul 03 |
| | | · | V 10 5 12/15/2021 |





Plot 7-44. AC Line Conducted Plot (Ch. 9, Config 0, Payload 125 N, with PC via USB-C cable with magnetic charger)

| Frequency [MHz] | Process State | QuasiPeak [dBµV] | Average [dBµV] | Limit [dBµV] | Margin [dB] | Line | PE |
|--------------------|------------------|---------------------|-------------------|--------------|-------------|------|----|
| 0.150 | FINAL | | 25.31 | 56.00 | -30.69 | Ν | ON |
| 0.152 | FINAL | 52.2 | | 65.88 | -13.68 | Ν | ON |
| 0.611 | FINAL | | 30.29 | 46.00 | -15.71 | Ν | ON |
| 0.611 | FINAL | 37.2 | | 56.00 | -18.76 | Ν | ON |
| 1.777 | FINAL | | 28.40 | 46.00 | -17.60 | Ν | ON |
| 1.777 | FINAL | 29.7 | | 56.00 | -26.30 | Ν | ON |
| 3.557 | FINAL | 23.3 | | 56.00 | -32.74 | Ν | ON |
| 3.557 | FINAL | | 22.69 | 46.00 | -23.31 | Ν | ON |
| 6.889 | FINAL | 20.8 | | 60.00 | -39.22 | Ν | ON |
| 6.889 | FINAL | | 19.24 | 50.00 | -30.76 | Ν | ON |
| 14.444 | FINAL | | 19.61 | 50.00 | -30.39 | Ν | ON |
| 14.444 | FINAL | 22.5 | | 60.00 | -37.49 | Ν | ON |

Table 7-28. AC Line Conducted Data (Ch. 9, Config 0, Payload 125 N, with PC via USB-C cable with magnetic charger)

| FCC ID: BCG-A2771 IC: 579C-A2771 | element | element MEASUREMENT REPORT (CERTIFICATION) | |
|-------------------------------------|---------------------|---|-------------------|
| Test Report S/N: | Test Dates: | EUT Type: | Page 61 of 63 |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Fage 01 01 03 |
| | | | V 10 5 12/15/2021 |



8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the Apple Watch FCC ID: BCG-A2771 and IC: 579C-A2771 is in compliance with Part 15 Subpart F (15.519) of the FCC Rules and RSS-220 of the Innovation, Science and Economic Development Canada Rules.

| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager | |
|-------------------------------------|---|-----------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Page 62 of 63 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | raye oz ul 03 | |
| | | | V 10.5 12/15/2021 | |



9.0 APPENDIX A

Antenna gains provided by manufacturer:

| WIFI/BT 2.4GHz, W | /iFi 5GHz, UWB Antenna Gain | (FCIVI), Type: IFA |
|-------------------|-----------------------------|--------------------|
| Frequency (MHz) | Horizontal (dBi) | Vertical (dBi) |
| 2412 | -6.6 | -6.6 |
| 2442 | -6.4 | -6.2 |
| 2472 | -6.2 | -6.2 |
| 5180 | -10.7 | -8.1 |
| 5260 | -9.9 | -7.2 |
| 5320 | -8.6 | -6.2 |
| 5500 | -6.9 | -4.4 |
| 5600 | -7.0 | -4.2 |
| 5700 | -6.4 | -3.4 |
| 5745 | -5.8 | -2.8 |
| 5785 | -6.0 | -3.0 |
| 5825 | -6.1 | -3.0 |
| 6250 | -11.4 | -8.6 |
| 6375 | -14.3 | -11.0 |
| 6500 | -13.8 | -10.8 |
| 6625 | -13.1 | -9.8 |
| 6750 | -14.4 | -10.6 |
| 7750 | -12.5 | -7.0 |
| 7875 | -12.5 | -6.1 |
| 8000 | -12.6 | -5.4 |
| 8125 | -12.7 | -6.1 |
| 8250 | -12.3 | -6.1 |

| FCC ID: BCG-A2771 IC: 579C-A2771 | element MEASUREMENT REPORT (CERTIFICATION) | | Approved by: Technical Manager | |
|-------------------------------------|---|-----------|-----------------------------------|--|
| Test Report S/N: | Test Dates: | EUT Type: | Dage 62 of 62 | |
| 1C2205090037-08.BCG | 6/7/2022 - 8/5/2022 | Watch | Page 63 of 63 | |
| | | | V 10.5 12/15/2021 | |