



REGULATORY COMPLIANCE TEST REPORT

FCC CFR 47 Part 15 Subpart C 15.250 (WBT)

Report No.: CATA18-U26 Rev A

Company: Catapult Sports Pty Ltd

Model Name: RE-V8-SR-V1



REGULATORY COMPLIANCE TEST REPORT

Company: Catapult Sports Pty Ltd

Model Name: RE-V8-SR-V1

To: FCC CFR 47 Part 15 Subpart C 15.250 (WBT)

Test Report Serial No.: CATA18-U26 Rev A

This report supersedes: NONE

Applicant: Catapult Sports Pty Ltd Company
10 Post Office Square, Floor 9
Boston, Massachusetts 02109
USA

Issue Date: 11th April 2025

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
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www.micomlabs.com



MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

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1. ACCREDITATION, LISTINGS & RECOGNITION

1.1. TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2017. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-01.pdf>



1.2. RECOGNITION

MiCOM Labs, Inc is widely recognized for its wireless testing and certification capabilities. In addition to being recognized for Testing and Certification under Phase 2 Mutual Recognition Agreements (MRA) with Canada, Europe, United Kingdom and Japan, our international recognition includes Conformity Assessment Body (CAB) designation status under agreements with Asia Pacific (APEC) MRA Phase 1 countries giving acceptance of MiCOM Labs test reports. MiCOM Labs test reports are accepted globally.

| Country | Recognition Body | Status | MRA Phase | Identification No. |
|----------------|--------------------------------------------------------------------------------------------------|--------|--------------|---------------------------------------------|
| USA | Federal Communications Commission (FCC) | TCB | - | US0159 Test Firm Designation#: US1084 |
| Canada | Industry Canada (ISED) | FCB | APEC MRA 2 | US0159 ISED#: 4143A |
| Japan | MIC (Ministry of Internal Affairs and Communication) | CAB | Japan MRA 2 | RCB 210 |
| | Japan Approvals Institute for Telecommunication Equipment (JATE) | | | |
| | VCCI | -- | -- | A-0012 |
| Europe | European Commission | NB | EU MRA 2 | NB 2280 |
| United Kingdom | Department for Business, Energy & Industrial Strategy (BEIS) | AB | UK MRA 2 | AB 2280 |
| Mexico | Instituto Federal de Telecomunicaciones (IFT) | CAB | Mexico MRA 1 | US0159 |
| Australia | Australian Communications and Media Authority (ACMA) | CAB | APEC MRA 1 | US0159 |
| Hong Kong | Office of the Telecommunication Authority (OFTA) | | | |
| Korea | Ministry of Information and Communication Radio Research Laboratory (RRL) | | | |
| Singapore | Infocomm Development Authority (IDA) | | | |
| Taiwan | National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI) | | | |
| Vietnam | Ministry of Communication (MIC) | | | |

TCB – Telecommunications Certification Bodies (TCB)

FCB – Foreign Certification Body

CAB – Conformity Assessment Body

NB – Notified Body

AB – Approved Body

MRA – Mutual Recognition Agreement

MRA Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

1.3. PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org/testlaboratorynumber/2381.02) test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-02.pdf>



United States of America – Telecommunication Certification Body (TCB)
Industry Canada – Certification Body, CAB Identifier – US0159
Europe – Notified Body (NB), NB Identifier - 2280
UK – Approved Body (AB), AB Identifier - 2280
Japan – Recognized Certification Body (RCB), RCB Identifier - 210

2. DOCUMENT HISTORY

| Document History | | |
|------------------|-------------------------------|---------------------------------|
| Revision | Date | Comments |
| Draft | 7 th February 2025 | Draft report for client review. |
| Rev A | 1 st April 2025 | Initial Release |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

In the above table the latest report revision will replace all earlier versions.

3. TEST RESULT CERTIFICATE

Manufacturer: Catapult Sports Pty Ltd
10 Post Office Square, Floor 9
Boston, Massachusetts 02109
USA

Model: RE-V8-SR-V1

Equipment Type: Indoor Device

S/N's: 19

Test Date(s): 30th-31st January & 3rd February 2025

Tested By: MiCOM Labs, Inc.
575 Boulder Court
Pleasanton California 94566
USA

Telephone: +1 925 462 0304

Fax: +1 925 462 0306

Website: www.micomlabs.com

STANDARD(S)

FCC CFR 47 Part 15 Subpart F 15.250 (WBT)

TEST RESULTS

EQUIPMENT COMPLIES

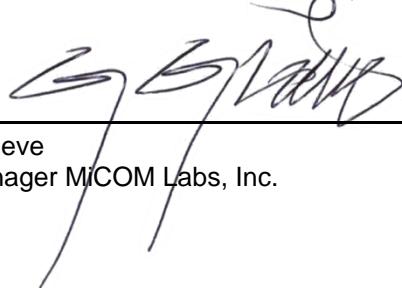
MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

Approved & Released for MiCOM Labs, Inc. by:

Graeme Grieve
Quality Manager MiCOM Labs, Inc.



Gordon Hurst
President & CEO MiCOM Labs, Inc.



4. REFERENCES AND MEASUREMENT UNCERTAINTY

4.1. Normative References

| REF. | PUBLICATION | YEAR | TITLE |
|------|--------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I | 15.250 | Feb 2005 | Operation of wideband systems within the band 5925-7250 MHz. |
| II | A2LA | 16 th April 2024 | R105 - Requirements When Making Reference to A2LA Accreditation Status |
| III | ANSI C63.10 | 2020 | American National Standard for Testing Unlicensed Wireless Devices |
| IV | ANSI C63.4 | 2014 + 2017 Amendment | American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| V | ETSI TR 100 028 | 2001-12 | Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics |
| VI | M 3003 | Edition 4 Oct.2019 | Expression of Uncertainty and Confidence in Measurements |
| VII | FCC 47 CFR Part 2.1033 | Feb 2023 | FCC requirements and rules regarding photographs and test setup diagrams. |
| VIII | KDB 393764 D01 WBFAQ v02 | January 29, 2018 | Ultra-Wideband (UWB) Devices frequently asked questions |
| IX | KDB 789033 | 20 th July 2021 | Unlicensed Service Rules and Procedures |

4.2. Test and Uncertainty Procedure

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.

5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

| Details | Description |
|--------------------------------------|----------------------------------------------------------------------------------------------|
| Purpose: | Test of the Catapult Sports Pty Ltd RE-V8-SR-V1 to FCC CFR 47 Part 15 Subpart F 15.250 (WBT) |
| Applicant: | Catapult Sports Pty Ltd 10 Post Office Square, Floor 9 Boston, Massachusetts 02109 USA |
| Manufacturer: | As applicant |
| Laboratory performing the tests: | MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA |
| Test report reference number: | CATA18-U26 |
| Date EUT received: | 30 th January 2025 |
| Standard(s) applied: | FCC CFR 47 Part 15 Subpart C 15.250 |
| Dates of test (from - to): | 30 th – 31 st January & 3 rd February 2025 |
| No of Units Tested: | 1 |
| Product Family Name: | Vector 8 Stadium Relay |
| Model(s): | RE-V8-SR-V1 |
| Location for use: | Indoors |
| Declared Frequency Range(s): | 6489.60 MHz; |
| Type of Modulation: | BPM/BPSK |
| EUT Modes of Operation: | WBT |
| Declared Nominal Output Power (dBm): | -41.3 dBm |
| Rated Input Voltage and Current: | 48.0 VDC 0.35 A |
| Operating Temperature Range: | -20C to + 85C |
| Equipment Dimensions: | 130mm(W)x59.5mm(H)x175mm(L) |
| Weight: | 520 Kg |
| Hardware Rev: | B2 |
| Software Rev: | 8.8.0 |
| Product Application: | Indoor Device |

5.2. Scope Of Test Program

Catapult Sports Pty Ltd Company

The scope of the test program was to test the Catapult Sports Pty Ltd Company RE-V8-SR-V1 for compliance against the following specifications:

FCC CFR 47 Part 15 Subpart C 15.250

Operation of wideband systems within the band 5925 -7250 MHz

5.3. Equipment Model(s) and Serial Number(s)

| Type (EUT/ Support) | Equipment Description | Manufacturer | Model No. | Serial No. |
|---------------------|---------------------------------|-------------------------|-------------|------------|
| EUT | Mobile & Portable Client Device | Catapult Sports Pty Ltd | RE-V8-SR-V1 | 19 |

5.4. Antenna Details

| Type | Manufacturer | Model | Family | Gain (dBi) | BF Gain | Dir BW | X-Pol (dB) | Frequency Band (MHz) |
|----------|--------------|-------|--------|------------|---------|----------------------------------------|------------|----------------------|
| Integral | Catapult | NA | Patch | 4.28 | 0 | HPBW: 108° (Azimuth), 102° (Elevation) | -1 | 6250 – 6750 |

BF Gain - Beamforming Gain
 Dir BW - Directional BeamWidth
 X-Pol - Cross Polarization

5.5. Cabling and I/O Ports

| Port Type | Max Cable Length | # of Ports | Screened | Connector Type | Data Type | Data Rate(s) |
|-----------|------------------|------------|----------|----------------|-----------|--------------|
| POE | 5m | 1 | Yes | Data/Power | Digital | Unknown |

5.6. Test Configurations

Results for the following configurations are provided in this report:

| Operational Mode(s) | Data Rate with Highest Power MBit/s | Channel Frequency (MHz) | | | |
|---------------------|-------------------------------------|-------------------------|-----|--------|--|
| | | Low | Mid | High | |
| | | 5925 - 7250 MHz | | | |
| WB | -- | -- | -- | 6489.6 | |

5.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:

1. NONE

5.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:

1. NONE

6. TEST SUMMARY

List of Measurements

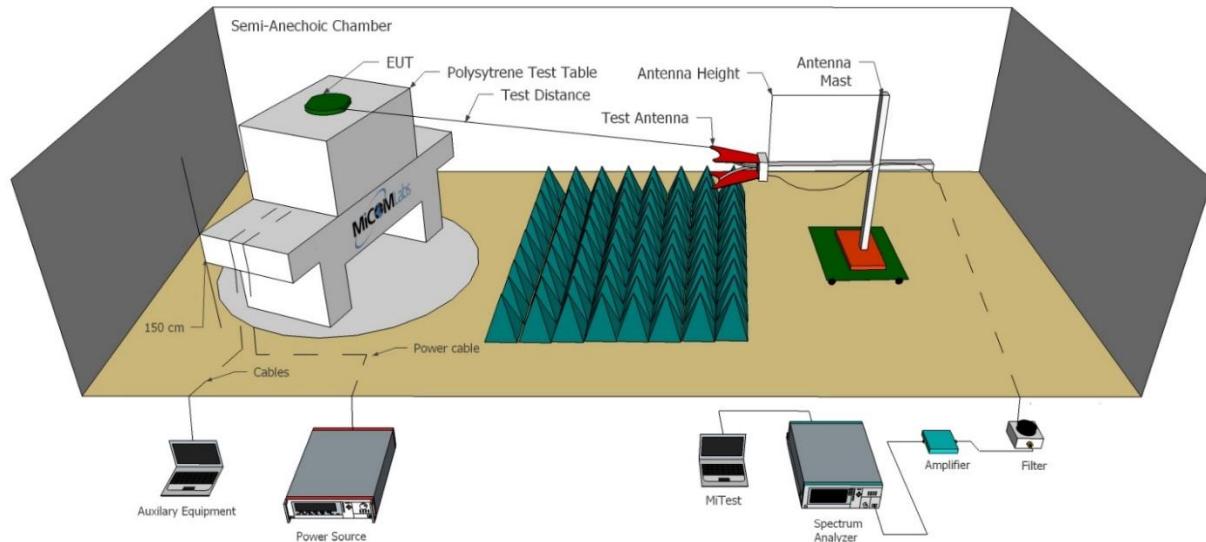
| Test Header | Result | Data Link |
|------------------------------------------|----------|---------------------------|
| WB Bandwidth | Complies | View Data |
| Average Output Power | Complies | View Data |
| Peak Power Density | Complies | View Data |
| Spurious Radiated Emissions | Complies | View Data |
| Spurious Radiated Emissions in GPS Bands | Complies | View Data |
| Comments: None | | |

7. TEST EQUIPMENT CONFIGURATION(S)

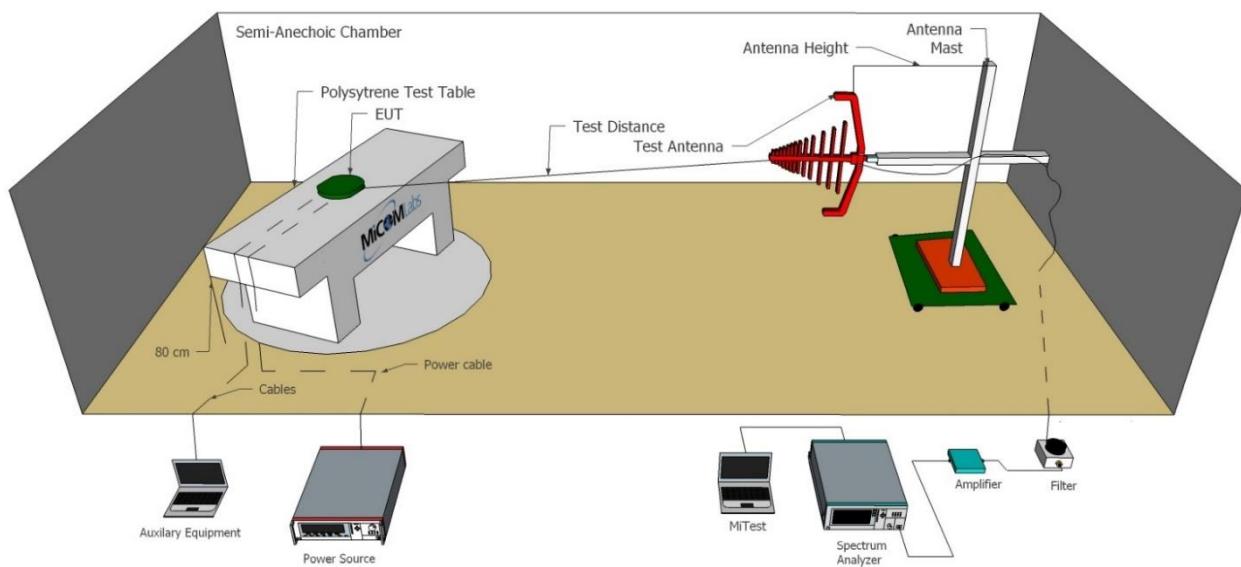
7.1. Radiated Emissions - 3m Chamber

The following tests were performed using the radiated test set-up shown in the diagram below. Radiated emissions above and below 1GHz.

Radiated Emissions Above 1GHz Test Setup



Radiated Emissions Below 1GHz Test Setup



A full system calibration was performed on the test station and any resulting system losses (or gains) were considered in the production of all final measurement data.

| Asset# | Description | Manufacturer | Model# | Serial# | Calibration Due Date |
|--------|---------------------------------------------------|-----------------------------|-----------------------------------------|-------------|----------------------|
| 170 | Video System Controller for Semi Anechoic Chamber | Panasonic | WV-CU101 | 04R08507 | Not Required |
| 266 | 10 Hz to 50GHz MXA Signal Analyzer | Keysight | N9020B | MY60110791 | 25 Jul 2025 |
| 298 | 3M Radiated Emissions Chamber Maintenance Check | MiCOM | 3M Chamber | 298 | 11 Mar 2025 |
| 330 | Variac 0-280 Vac | Staco Energy Co | 3PN1020B | 0546 | Cal when used |
| 336 | Active loop Ant 10kHz to 30 MHz | EMCO | EMCO 6502 | 00060498 | 7 Dec 2025 |
| 338 | Sunol 30 to 3000 MHz Antenna | Sunol | JB3 | A052907 | 5 Dec 2025 |
| 373 | 26III RMS Multimeter | Fluke | Fluke 26 series III | 76080720 | 29 Sep 2025 |
| 382 | Tunable Notch Filter | Wainwright Instruments GmbH | WRCT800/960-0.2/40-8EEK | 64 | Cal when used |
| 397 | Amp 10 - 2500MHz | MiCOM Labs | Amp 10 - 2500 MHz | NA | 27 Feb 2025 |
| 399 | ETS 1-18 GHz Horn Antenna | ETS | 3117 | 00154575 | 7 Dec 2025 |
| 406 | Amplifier for Radiated Emissions | MiCOM Labs | 40dB 1 to 18GHz Amp | 0406 | 2 Apr 2025 |
| 410 | Desktop Computer | Dell | Inspiron 620 | WS38 | Not Required |
| 411 | Mast/Turntable Controller | Sunol Sciences | SC98V | 060199-1D | Not Required |
| 412 | USB to GPIB Interface | National Instruments | GPIB-USB HS | 11B8DC2 | Not Required |
| 413 | Mast Controller | Sunol Science | TWR95-4 | 030801-3 | Not Required |
| 415 | Turntable Controller | Sunol Sciences | Turntable Controller | None | Not Required |
| 416 | Gigabit ethernet filter | ETS-Lingren | Gigafoil 260366 | None | Not Required |
| 447 | MiTest Rad Emissions Test Software | MiCOM | Rad Emissions Test Software Version 1.0 | 447 | Not Required |
| 462 | Schwarzbeck cable from Antenna to Amplifier. | Schwarzbeck | AK 9513 | 462 | 18 Apr 2025 |
| 463 | Schwarzbeck cable from Amplifier to Bulkhead. | Schwarzbeck | AK 9513 | 463 | 18 Apr 2025 |
| 464 | Schwarzbeck cable from Bulkhead to Receiver | Schwarzbeck | AK 9513 | 464 | 16 Apr 2025 |
| 465 | Low Pass Filter DC-1000 MHz | Mini-Circuits | NLP-1200+ | VUU01901402 | 14 Apr 2025 |

| | | | | | |
|------|-----------------------------------------------------------|--------------------|-------------------|-------------|---------------|
| 480 | Cable - Bulkhead to Amp | SRC Haverhill | 157-3050360 | 480 | 18 Apr 2025 |
| 481 | Cable - Bulkhead to Receiver | SRC Haverhill | 151-3050787 | 481 | 18 Apr 2025 |
| 510 | Barometer/Thermometer | Digi Sense | 68000-49 | 170871375 | 4 Jan 2026 |
| 554 | Precision SMA Cable | Fairview Microwave | SCE18060101-400CM | 554 | 18 Apr 2025 |
| 555 | Rhode & Schwarz Receiver (Firmware Version : 3.10 SP1) | Rhode & Schwarz | ESW 44 | 101893 | 28 Jun 2025 |
| 701 | DC Power Supply | Keysight | E36155A | MY63000671 | 6 Nov 2025 |
| 87 | Uninterruptible Power Supply | Falcon Electric | ED2000-1/2LC | F3471 02/01 | Cal when used |
| CC05 | Confidence Check | MiCOM | CC05 | None | 5 Mar 2025 |

8. MEASUREMENT AND PRESENTATION OF TEST DATA

The measurement and graphical data presented in this test report was generated automatically using state-of-the-art technology creating an easy to read report structure. Numerical measurement data is separated from supporting graphical data (plots) through hyperlinks. Numerical measurement data can be reviewed without scrolling through numerous graphical pages to arrive at the next data matrix.

Plots have been relegated into the Appendix 'Graphical Data'.

Test and report automation was performed by [MiTest](#). [MiTest](#) is an automated test system developed by MiCOM Labs. [MiTest](#) is the first cloud based modular test system enabling end-to-end automation of regulatory compliance testing for conducted RF testing.



The MiCOM Labs "[MiTest](#)" Automated Test System" (Patent Pending)

9. TEST RESULTS

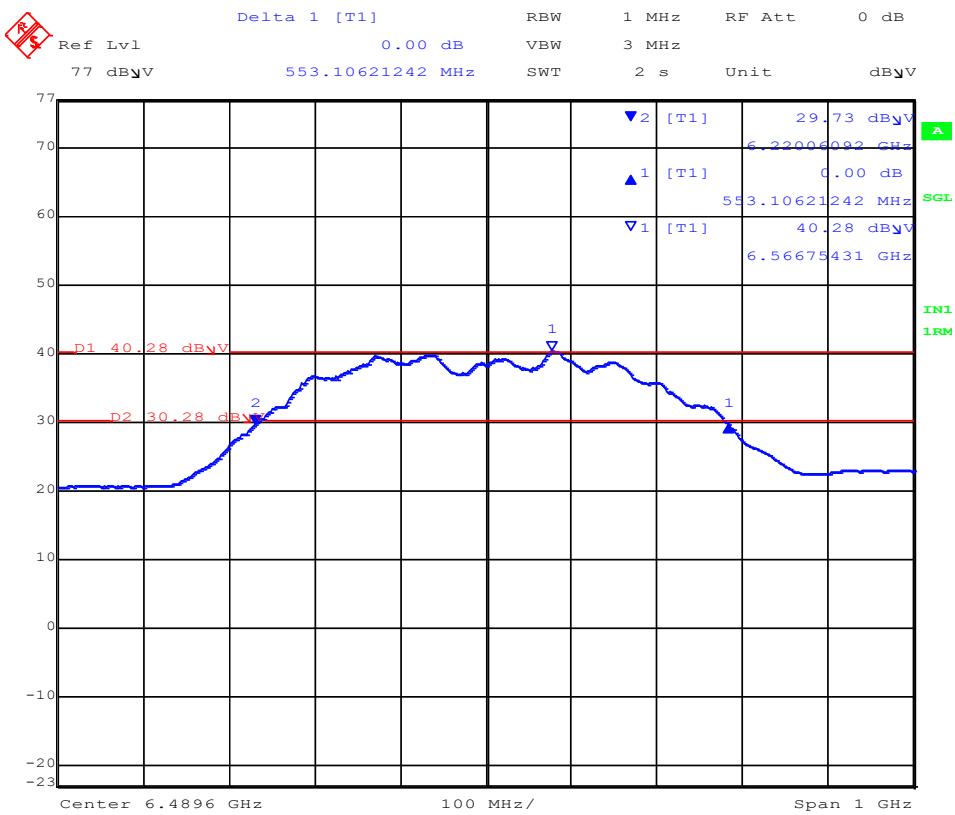
9.1. WB Bandwidth

| Conducted Test Conditions for WB Bandwidth | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------|-------------|--|--|--|
| Standard: | FCC CFR 47 Part 15 Subpart C 15.250 | Ambient Temp. (°C): | 24.0 - 27.5 | | | |
| Test Heading: | WB Bandwidth | Rel. Humidity (%): | 32 - 45 | | | |
| Standard Section(s): | ANSI C63.10 Section 10.1; 5.1(a)(b) 15.250(a) | Pressure (mBars): | 999 - 1001 | | | |
| Reference Document(s): | See Normative References | | | | | |
| Test Procedure for WB Bandwidth Measurement The WB Bandwidth is measured radiated, at a 1-meter distance, while EUT is operating in transmission mode at the appropriate center frequency. The Resolution Bandwidth was set to 1MHz RBW IAW ANSI C63.10. Testing was performed under ambient conditions at nominal voltage. | | | | | | |
| Test configuration and setup used for the measurement was per the Radiated Test Set-up section specified in this document. | | | | | | |

Equipment Configuration for WB Bandwidth

| | | | |
|--------------------------------|----------------|-----------------------------------|----------------|
| Variant: | WB | Duty Cycle (%): | 99 |
| Data Rate: | -- | Antenna Gain (dBi): | 4.28 |
| Modulation: | -- | Beam Forming Gain (Y)(dB): | Not Applicable |
| TPC: | Not Applicable | Tested By: | SB |
| Engineering Test Notes: | | | |

| Test Frequency | Measured 10 dB Bandwidth (MHz) | 10 dB Bandwidth Frequencies (MHz) | | |
|----------------|--------------------------------|-----------------------------------|---------|--|
| | | Lowest | Highest | |
| MHz | Port A | | | |
| 6489.60 | 553.10 | 6220.06 | 6773.17 | |



Date: 4.FEB.2025 08:43:06

| Traceability to Industry Recognized Test Methodologies | | |
|--------------------------------------------------------|----------------------------------|--|
| Work Instruction: | WI-03 MEASURING RF SPECTRUM MASK | |
| Measurement Uncertainty: | ±2.81 dB | |

The above values are representative of the worst-case value between polarities and based on the power measurements.

9.2. Transmit Power

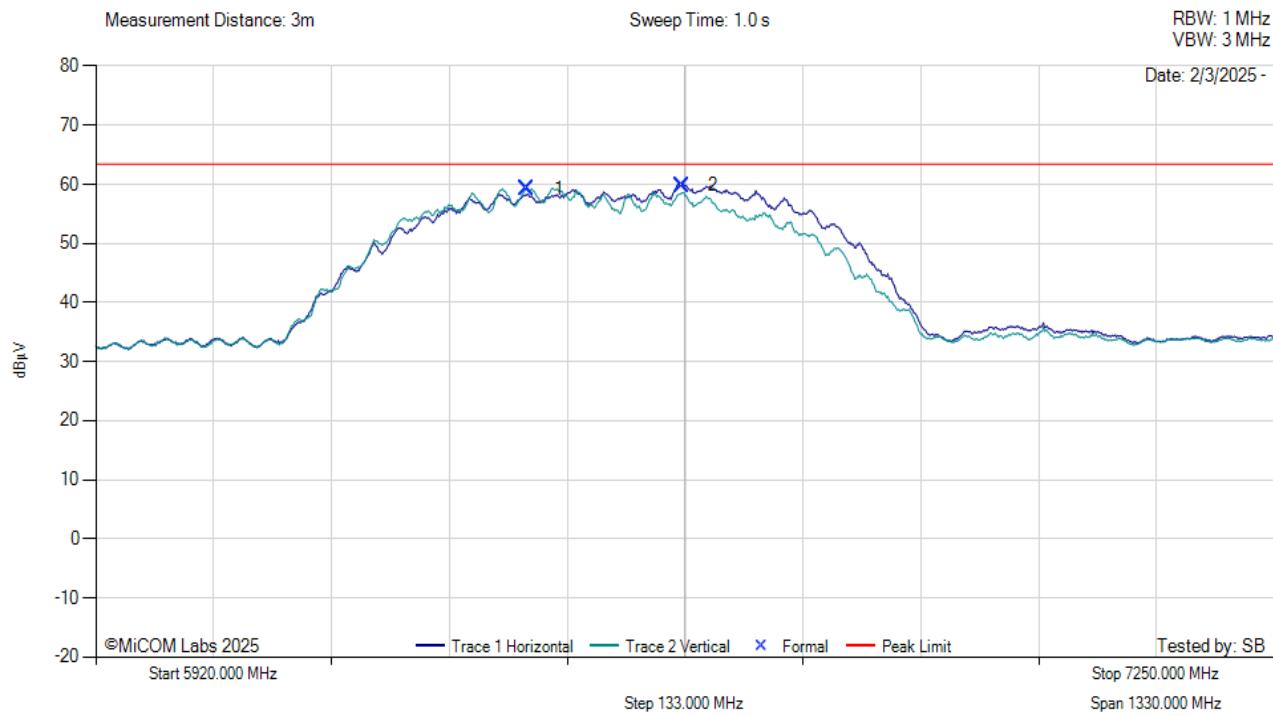
| Conducted Test Conditions for Maximum Radiated Output Power | | | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------|-------------|-----------------|------------------|--------------------------|-----------|-------|------|
| Standard: | FCC CFR 47 Part 15 Subpart C 15.250 | Ambient Temp. (°C): | 24.0 - 27.5 | | | | | | |
| Test Heading: | Radiated Emissions WB Transmission | Rel. Humidity (%): | 32 - 45 | | | | | | |
| Standard Section(s): | ANSI C63.10 Section 10.3.5; 5.3.1; Section 4 Annex 15.250 (d)(1) | Pressure (mBars): | 999 - 1001 | | | | | | |
| Reference Document(s): | None | | | | | | | | |
| Test Procedure for WB Transmission Testing was performed under ambient conditions at nominal voltage. Test configuration and setup used for the measurement was per the Radiated Test Set-up section specified in this document. Supporting KDB's referenced below. | | | | | | | | | |
| Operating Frequency Band: 5925-7250 MHz | | | | | | | | | |
| Limits Maximum EIRP (dBm) <table border="1"> <thead> <tr> <th>Frequency (MHz)</th><th>EIRP Limit (dBm)</th><th>EIRP at 1 Meter (dBuv/m)</th></tr> </thead> <tbody> <tr> <td>5925-7250</td><td>-41.3</td><td>63.4</td></tr> </tbody> </table> | | | | Frequency (MHz) | EIRP Limit (dBm) | EIRP at 1 Meter (dBuv/m) | 5925-7250 | -41.3 | 63.4 |
| Frequency (MHz) | EIRP Limit (dBm) | EIRP at 1 Meter (dBuv/m) | | | | | | | |
| 5925-7250 | -41.3 | 63.4 | | | | | | | |

Equipment Configuration for RF Output Power

| | | | |
|--------------------------------|----------------|-----------------------------------|----------------|
| Variant: | WB | Duty Cycle (%): | 99 |
| Data Rate: | -- | Antenna Gain (dBi): | 4.28 |
| Modulation: | -- | Beam Forming Gain (Y)(dB): | Not Applicable |
| TPC: | Not Applicable | Tested By: | SB |
| Engineering Test Notes: | | | |

Test Measurement Results

| Test Frequency MHz | Measured Radiated Output Power (dB μ V/m) | Limit (dB μ V/n) | Margin (dB) | EUT Power Setting |
|--------------------|-----------------------------------------------|----------------------|-------------|-------------------|
| 6489.60 | 59.85 | 63.4 | -3.55 | 19.0 |



| 5920.00 - 7250.00 MHz | | | | | | | | | | | | | |
|-----------------------|---------------|----------------|---------------|---------|--------------------|------------------|------------|--------|---------|--------------------|-----------|------------|--|
| Num | Frequency MHz | Raw dB μ V | Cable Loss dB | AF dB/m | Level dB μ V/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dB μ V/m | Margin dB | Pass /Fail | |
| 1 | 6406.78 | 64.82 | 3.37 | -8.95 | 59.24 | AVG | Vertical | 150 | 210 | 63.4 | -4.2 | Pass | |
| 2 | 6581.01 | 65.23 | 3.41 | -8.79 | 59.85 | AVG | Horizontal | 150 | 270 | 63.4 | -3.5 | Pass | |

Test Notes: PoE powered. Antenna connected to EUT, CF mode active. 6.5GHz, PS 19.0

9.3. Peak Power Density

| Test Conditions for Maximum Peak Power Density | | | |
|------------------------------------------------|------------------------------------------------------------------|----------------------------|-------------|
| Standard: | FCC CFR 47 Part 15 Subpart C 15.250 | Ambient Temp. (°C): | 24.0 - 27.5 |
| Test Heading: | Radiated Emissions WB Transmission | Rel. Humidity (%): | 32 - 45 |
| Standard Section(s): | ANSI C63.10 Section 10.3.6; 5.3.1; Section 4 Annex 15.250 (d)(3) | Pressure (mBars): | 999 - 1001 |
| Reference Document(s): | None | | |

Test Procedure for WB Transmission

Testing was performed under ambient conditions at nominal voltage.

Test configuration and setup used for the measurement was per the Radiated Test Set-up section specified in this document.

If measurements were gathered with a RBW less than 50MHz then formula below was used to convert to the correct limit. (example shown is 1MHz):

$$\text{EIRP}_{1\text{ MHz}} = \text{EIRP}_{50\text{ MHz}} + 20\log(1\text{MHz}/50\text{MHz}) = 0\text{dBm} + (-34\text{dBm}) = -34\text{dBm}$$

dBuv/m to EIRP

$\text{EIRP} = \text{E} + 20 \cdot \text{Log}(\text{d}/\text{m}) - 104.77$ (see FCC KDB 789033)

Where:

E = Field Strength

D = Distance in Meters

Operating Frequency Band:
5925-7250 MHz

Limits Maximum EIRP (dBm)

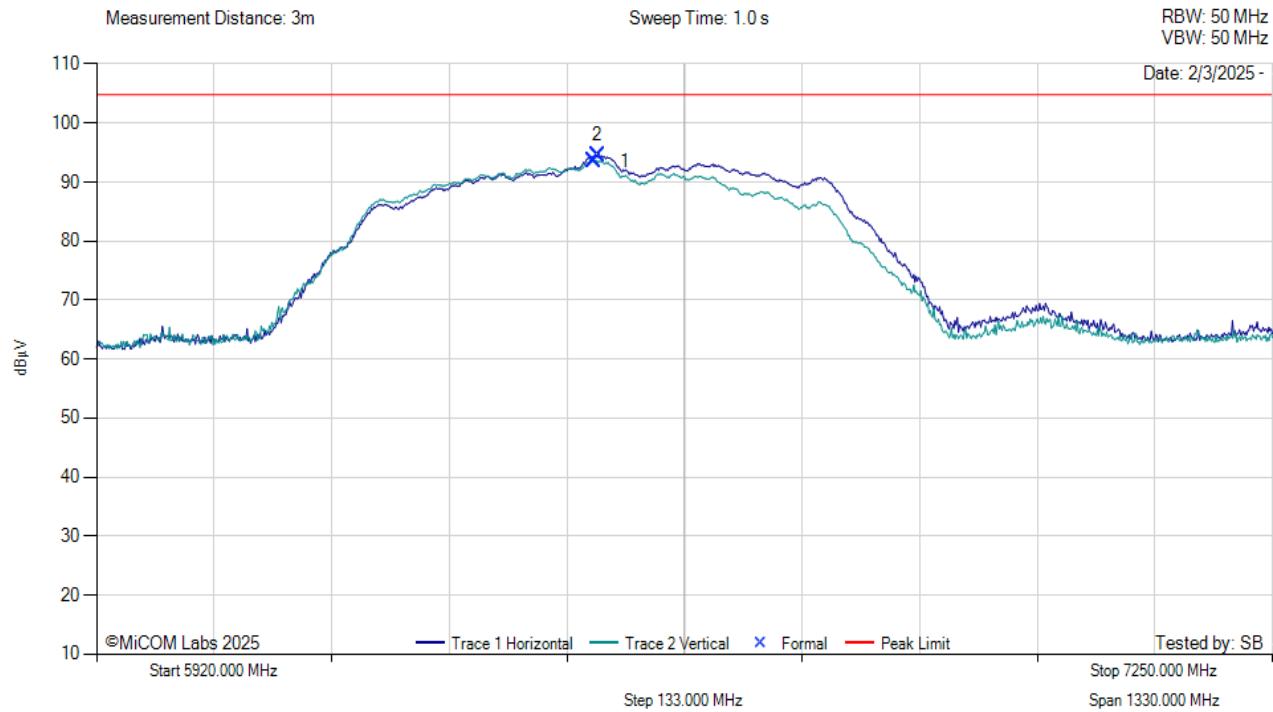
| Frequency (MHz) | EIRP Limit (dBm/50MHz) | EIRP at 1 Meters (dBuv/m) |
|-----------------|------------------------|---------------------------|
| 5925-7250 | 0 | 104.77 |

Equipment Configuration for Peak Power Density

| | | | |
|--------------------------------|----------------|-----------------------------------|----------------|
| Variant: | WB | Duty Cycle (%): | 99 |
| Data Rate: | -- | Antenna Gain (dBi): | 4.28 |
| Modulation: | -- | Beam Forming Gain (Y)(dB): | Not Applicable |
| TPC: | Not Applicable | Tested By: | SB |
| Engineering Test Notes: | | | |

Test Measurement Results

| Test Frequency MHz | Measured Radiated Output Power (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | EUT Power Setting |
|--------------------|-----------------------------------------------|----------------------|-------------|-------------------|
| 6489.60 | 94.51 | 104.8 | -10.29 | 19.0 |



5920.00 - 7250.00 MHz

| Num | Frequency MHz | Raw dB μ V | Cable Loss dB | AF dB/m | Level dB μ V/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dB μ V/m | Margin dB | Pass /Fail |
|-----|---------------|----------------|---------------|---------|--------------------|------------------|------------|--------|---------|--------------------|-----------|------------|
| 1 | 6482.59 | 99.05 | 3.38 | -8.85 | 93.59 | MaxP | Vertical | 150 | 210 | 104.8 | -11.2 | Pass |
| 2 | 6486.58 | 100.01 | 3.39 | -8.88 | 94.51 | MaxP | Horizontal | 150 | 270 | 104.8 | -10.3 | Pass |

Test Notes: PoE powered. Antenna connected to EUT, CF mode active. 6.5GHz, PS 19.0

9.4. Transmitter Spurious Band Emissions

| Radiated Test Conditions for Radiated Spurious and Band-Edge Emissions | | | |
|------------------------------------------------------------------------|------------------------------------------------------------|----------------------------|-------------|
| Standard: | FCC CFR 47 Part 15 Subpart C 15.250 | Ambient Temp. (°C): | 20.0 - 24.5 |
| Test Heading: | Radiated Spurious Emissions | Rel. Humidity (%): | 32 - 45 |
| Standard Section(s): | ANSI C63.10 Section 10.2 + 10.3; 5.3.1 15.250 (d)(1)(5) | Pressure (mBars): | 999 - 1001 |
| Reference Document(s): | See Normative References | | |

Test Procedure for Radiated Spurious and Band-Edge Emissions

Radiated emissions for restricted bands above 1 GHz are measured in the anechoic chamber at a 1-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in max hold mode. Depending on the frequency band spanned a notch filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned. Measurements on any restricted band frequency or frequencies above 1 GHz are based on the use of measurement instrumentation employing peak and average detectors. All measurements were performed using a resolution bandwidth of 1 MHz.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

where:

FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL - AG + NFL

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss

Emissions 30MHz to 1GHz (15.250 (d)(5))

Emissions from digital circuitry used to enable the operation of the transmitter may comply with the limits in § 15.209 provided it can be clearly demonstrated that those emissions are due solely to emissions from digital circuitry contained within the transmitter and the emissions are not intended to be radiated from the transmitter's antenna. Emissions from associated digital devices, as defined in § 15.3(k), e.g., emissions from digital circuitry used to control additional functions or capabilities other than the operation of the transmitter, are subject to the limits contained in subpart B of this part. Emissions from these digital circuits shall not be employed in determining the -10 dB bandwidth of the fundamental emission or the frequency at which the highest emission level occurs.

Measurements made at 1 & 3 meter to meet noise floor to limit requirements

| Frequency Range | | Average Limit | | |
|-----------------|-------|---------------|---------------------------|---------------------------|
| MHz | MHz | EIRP (dBm) | EIRP at 1 Meters (dBuV/m) | EIRP at 3 Meters (dBuV/m) |
| 960 | 1610 | -75.30 | 29.40 | 19.93 |
| 1610 | 1990 | -63.40 | 41.40 | 31.93 |
| 1990 | 3100 | -61.30 | 43.40 | 33.93 |
| 3100 | 5925 | -51.30 | 53.40 | 43.93 |
| 5925 | 7250 | -41.30 | 63.40 | 53.93 |
| 7250 | 10600 | -51.30 | 53.40 | 43.93 |
| 10600 | 18000 | -61.30 | 43.40 | 33.93 |
| 18000 | 40000 | -61.30 | 43.40 | 33.93 |

No Emissions were observed from 18GHz to 40GHz

Radiated Spurious Emissions in the GPS Bands FCC 15.250 (d)(2)

| Frequency Range | | Average Limit | |
|-----------------|------|---------------|---------------------------|
| MHz | MHz | EIRP (dBm) | EIRP at 1 Meters (dBuV/m) |
| 1164 | 1240 | -85.3 | 19.47 |
| 1559 | 1610 | -85.3 | 19.47 |

50 MHz Peak Emissions 15.250 (d)(3)

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 and this 50 MHz bandwidth must be contained within the 5925-7250 MHz band. The peak EIRP limit is $20 \log (RBW/50)$ dBm where RBW is the resolution bandwidth in megahertz that is employed by the measurement instrument. RBW shall not be lower than 1 MHz or greater than 50 MHz. The video bandwidth of the measurement instrument shall not be less than RBW. If RBW is greater than 3 MHz, the application for certification filed with the Commission shall contain a detailed description of the test procedure, calibration of the test setup, and the instrumentation employed in the testing

9.4.1. Transmitter Spurious Emissions

9.4.1.1. 6489.6 MHz

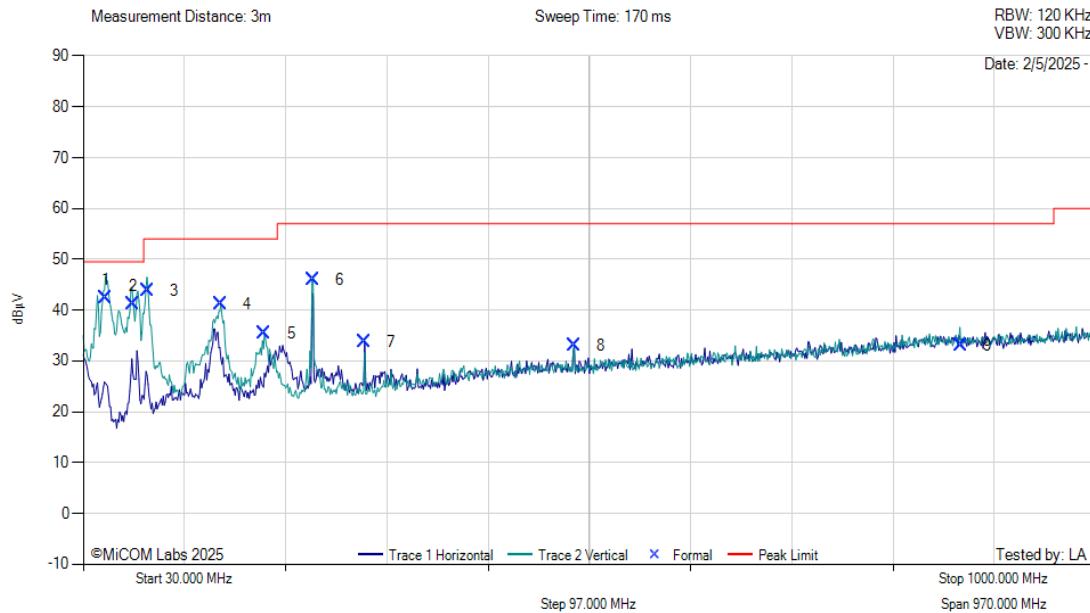
Equipment Configuration for 30 MHZ TO 1 GHZ CLASS A

| | | | |
|---------------------------------|----------------|------------------------|-----|
| Antenna: | Integral | Variant: | WBT |
| Antenna Gain (dBi): | 4.28 | Modulation: | -- |
| Beam Forming Gain (Y): | Not Applicable | Duty Cycle (%): | 99 |
| Channel Frequency (MHz): | 6489.6 | Data Rate: | -- |
| Power Setting: | 19.0 | Tested By: | LA |

Test Measurement Results



30 MHz to 1 GHz Class A



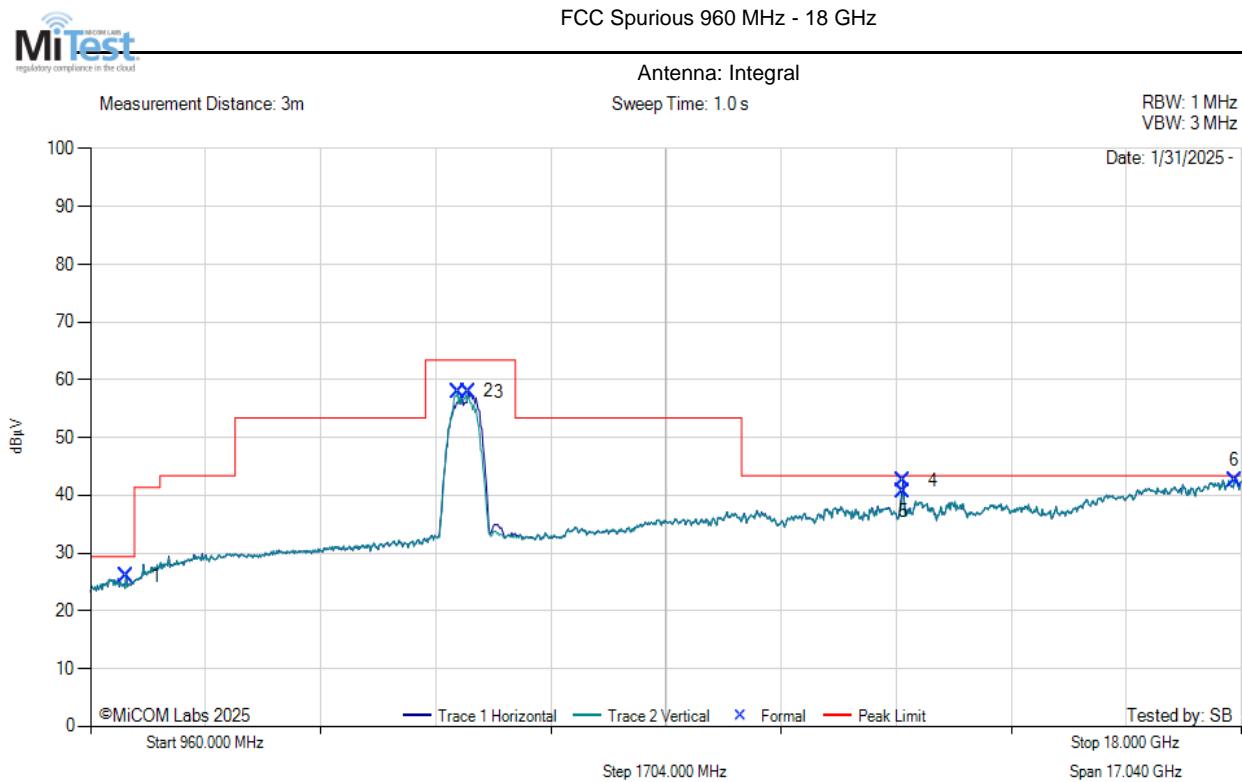
| 30.00 - 1000.00 MHz | | | | | | | | | | | | | |
|---------------------|---------------|----------|---------------|---------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|--|
| Num | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB/m | Level dBµV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail | |
| 1 | 51.66 | 55.73 | 3.73 | -17.06 | 42.40 | MaxQP | Vertical | 103 | 249 | 49.5 | -7.1 | Pass | |
| 2 | 77.35 | 54.28 | 3.94 | -16.97 | 41.25 | MaxQP | Vertical | 100 | 209 | 49.5 | -8.2 | Pass | |
| 3 | 91.74 | 56.49 | 4.05 | -16.77 | 43.77 | MaxQP | Vertical | 99 | 241 | 54.0 | -10.2 | Pass | |
| 4 | 161.92 | 49.66 | 4.41 | -12.93 | 41.14 | MaxP | Vertical | 100 | 0 | 54.0 | -12.9 | Pass | |
| 5 | 203.63 | 44.22 | 4.61 | -13.36 | 35.46 | MaxP | Vertical | 100 | 0 | 54.0 | -18.5 | Pass | |
| 6 | 250.19 | 54.21 | 4.80 | -12.98 | 46.02 | MaxP | Vertical | 100 | 0 | 57.0 | -11.0 | Pass | |
| 7 | 299.66 | 40.05 | 5.00 | -11.25 | 33.81 | MaxP | Horizontal | 100 | 90 | 57.0 | -23.2 | Pass | |
| 8 | 500.45 | 34.33 | 5.69 | -7.01 | 33.00 | MaxP | Horizontal | 199 | 268 | 57.0 | -24.0 | Pass | |
| 9 | 870.99 | 28.31 | 6.87 | -2.17 | 33.01 | MaxP | Vertical | 100 | 299 | 57.0 | -24.0 | Pass | |

Test Notes: PoE powered .6.5GHz Active. PS 19.

Equipment Configuration for FCC SPURIOUS 960 MHZ - 18 GHZ

| | | | |
|---------------------------------|----------------|------------------------|-----|
| Antenna: | Integral | Variant: | WBT |
| Antenna Gain (dBi): | 4.28 | Modulation: | -- |
| Beam Forming Gain (Y): | Not Applicable | Duty Cycle (%): | 99 |
| Channel Frequency (MHz): | 6489.6 | Data Rate: | -- |
| Power Setting: | 19.0 | Tested By: | SB |

Test Measurement Results



| 960.00 - 18000.00 MHz | | | | | | | | | | | | | |
|-----------------------|---------------|----------|---------------|---------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|--|
| Num | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB/m | Level dBµV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail | |
| 1 | 1488.24 | 41.92 | 1.56 | -16.89 | 25.99 | AVG | Vertical | 150 | 330 | 29.4 | -3.4 | Pass | |
| 2 | 6395.76 | 64.06 | 3.35 | -8.91 | 58.00 | AVG | Vertical | 150 | 210 | 63.4 | -5.4 | Pass | |
| 3 | 6549.12 | 63.82 | 3.39 | -8.82 | 57.88 | AVG | Horizontal | 150 | 270 | 63.4 | -5.5 | Pass | |
| 4 | 12990.24 | 45.42 | 5.15 | -7.47 | 42.60 | AVG | Horizontal | 150 | 330 | 43.4 | -0.8 | Pass | |
| 5 | 12990.24 | 43.58 | 5.15 | -7.47 | 40.75 | AVG | Vertical | 150 | 330 | 43.4 | -2.6 | Pass | |
| 6 | 17897.76 | 35.89 | 6.27 | 0.89 | 42.55 | AVG | Horizontal | 150 | 150 | 43.4 | -0.9 | Pass | |

Test Notes: PoE powered. Antenna connected to EUT. CF mode active. 6.5GHz, PS 19.0

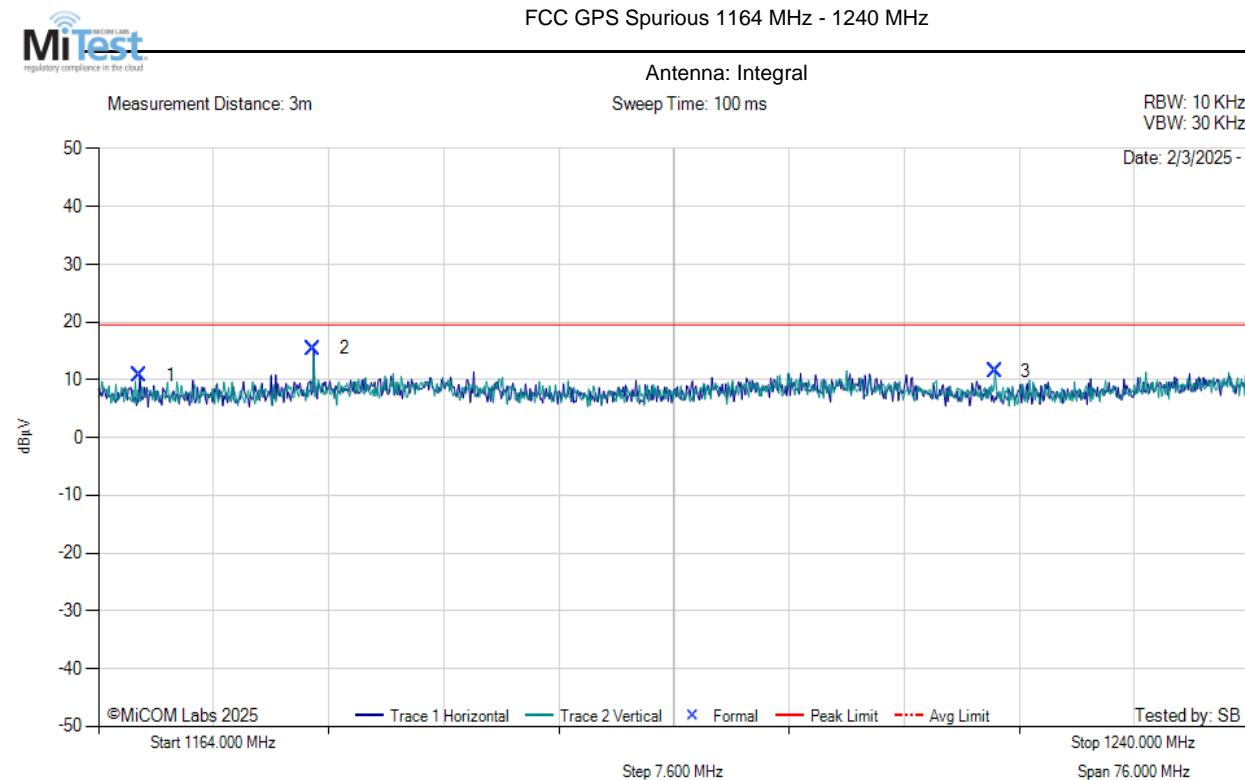
9.4.2. GPS Band Emissions

9.4.2.2. 6489.6 MHz operation

Equipment Configuration for Spurious Emissions

| | | | |
|---------------------------------|----------------|------------------------|-----|
| Antenna: | Integral | Variant: | WBT |
| Antenna Gain (dBi): | 4.28 | Modulation: | -- |
| Beam Forming Gain (Y): | Not Applicable | Duty Cycle (%): | 99 |
| Channel Frequency (MHz): | 6489.6 | Data Rate: | -- |
| Power Setting: | 19.0 | Tested By: | SB |

Test Measurement Results



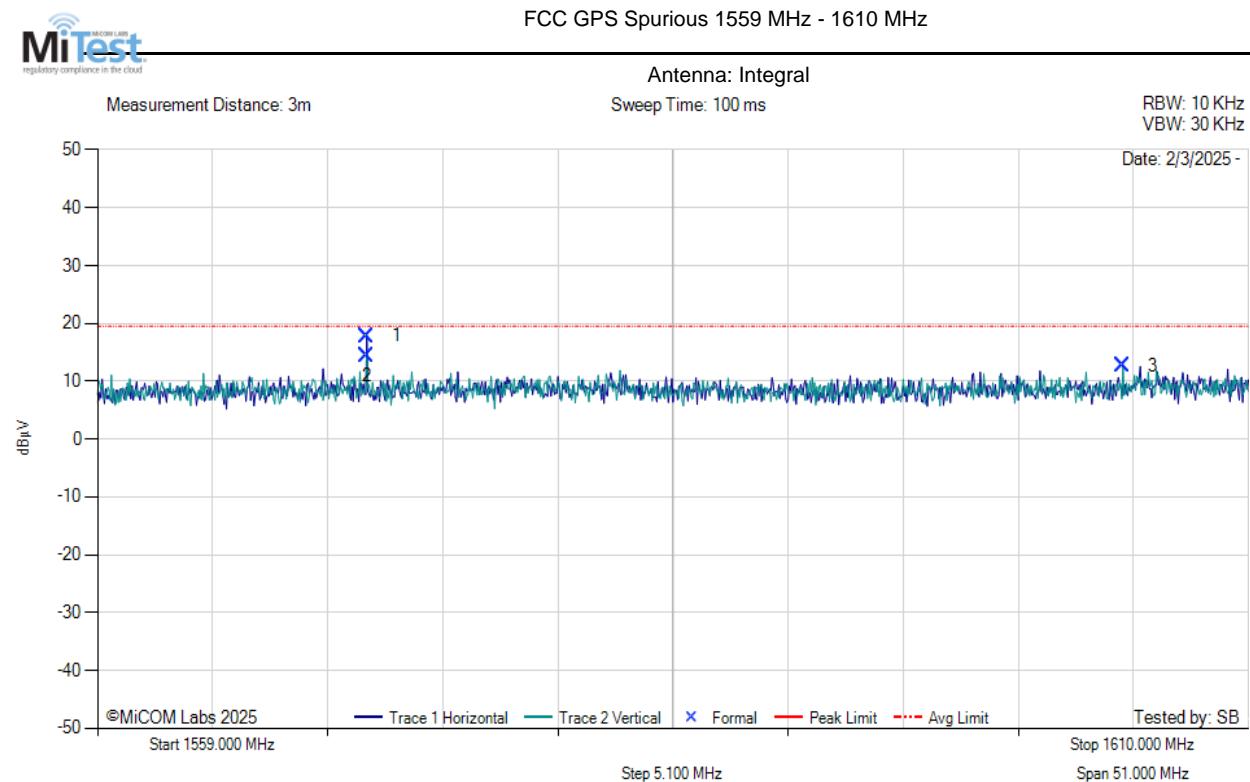
| 1164.00 - 1240.00 MHz | | | | | | | | | | | | |
|-----------------------|---------------|----------|---------------|---------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB/m | Level dBμV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1 | 1166.74 | 26.23 | 1.40 | -16.86 | 10.78 | AVG | Horizontal | 149 | 30 | 19.5 | -8.7 | Pass |
| 2 | 1178.21 | 30.77 | 1.41 | -16.76 | 15.42 | AVG | Horizontal | 149 | 30 | 19.5 | -4.1 | Pass |
| 3 | 1223.20 | 26.52 | 1.42 | -16.46 | 11.48 | AVG | Vertical | 149 | 269 | 19.5 | -8.0 | Pass |

Test Notes: PoE powered. Antenna connected to EUT. GPS Band 1164-1240, CF mode active. 6.5GHz, PS 19.0

Equipment Configuration for Spurious Emissions

| | | | |
|---------------------------------|----------------|------------------------|-----|
| Antenna: | Integral | Variant: | WBT |
| Antenna Gain (dBi): | 4.28 | Modulation: | -- |
| Beam Forming Gain (Y): | Not Applicable | Duty Cycle (%): | 99 |
| Channel Frequency (MHz): | 6489.6 | Data Rate: | -- |
| Power Setting: | 19.0 | Tested By: | SB |

Test Measurement Results



1559.00 - 1610.00 MHz

| Num | Frequency MHz | Raw dB μ V | Cable Loss dB | AF dB/m | Level dB μ V/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dB μ V/m | Margin dB | Pass /Fail |
|-----|---------------|----------------|---------------|---------|--------------------|------------------|------------|--------|---------|--------------------|-----------|------------|
| 1 | 1570.93 | 32.78 | 1.64 | -16.57 | 17.86 | AVG | Horizontal | 150 | 270 | 19.5 | -1.6 | Pass |
| 2 | 1570.93 | 29.37 | 1.64 | -16.57 | 14.45 | AVG | Vertical | 150 | 330 | 19.5 | -5.1 | Pass |
| 3 | 1604.44 | 27.33 | 1.62 | -16.28 | 12.67 | AVG | Vertical | 150 | 269 | 19.5 | -6.8 | Pass |

Test Notes: PoE powered. Antenna connected to EUT. GPS Band 1559-1610, CF mode active. 6.5GHz, PS 19.0



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