

May 17, 2023

VIAVI SOLUTIONS INC.  
Jaryk Kuzel  
1445 South Spectrum Boulevard, Suite 102  
Chandler, AZ 85286  
United States

Dear Jaryk Kuzel,

Enclosed is the EMC Wireless test report for compliance testing of the VIAVI SOLUTIONS INC., XEdge as tested to the requirements of the FCC Part 15.247, 15.407, 22, 24, 27, 90, 96.

Thank you for using the services of Eurofins Electrical and Electronic Testing NA, Inc. Please contact me if you have any questions regarding these results or if Eurofins E&E can be of further service to you.

Sincerely yours,

*Michelle Farming*

Documentation Department  
Eurofins Electrical and Electronic Testing NA, Inc.

Reference: (\\VIAVI SOLUTIONS INC.\\WIR125010-FCC RSS BLE Rev. 2)



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## **FCC Test Report**

for the

**VIAVI SOLUTIONS INC.  
XEdge**

### **Standard**

**47 CFR FCC Part 15, Subpart C (Section 15.247)**

**47 CFR FCC Part 15, Subpart E (Section 15.407)**

**47 CFR FCC Part 22 Subpart H**

**47 CFR FCC Part 24 Subpart E**

**47 CFR FCC Part 27 Subpart L**

**47 CFR FCC Part 90**

**47 CFR FCC Part 96**

**Report: WIR125010-FCC RSS BLE Rev. 2**

### **Prepared For:**

**VIAVI SOLUTIONS INC.  
1445 South Spectrum Boulevard, Suite 102  
Chandler, AZ 85286  
United States**

### **Prepared By:**

**Eurofins Electrical and Electronic Testing NA, Inc.  
914 W. Patapsco Avenue  
Baltimore, MD 21230**

## FCC Test Report

for the

**VIAVI SOLUTIONS INC.**  
**XEdge**

### Standard

**47 CFR FCC Part 15, Subpart C (Section 15.247)**

**47 CFR FCC Part 15, Subpart E (Section 15.407)**

**47 CFR FCC Part 22 Subpart H**

**47 CFR FCC Part 24 Subpart E**

**47 CFR FCC Part 27 Subpart L**

**47 CFR FCC Part 90**

**47 CFR FCC Part 96**



Donald Salguero  
Wireless Lab

**Engineering Statement:** The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of 15.247, 15.407, Part 22 Subpart H and Part 24 Subpart E, Part 27 Subpart L, Part 90 and Part 96 of the FCC Rules under normal use and maintenance.



Michael Griffiths  
Manager, Wireless Lab

## Report Status Sheet

Revision	Report Date	Reason for Revision
∅	March 6, 2023	Initial Issue.
1	May 12, 2023	Updated customer address; Updated standards tested to; Added configuration information and block diagram; Updated test procedure for Radiated Emissions;
2	May 17, 2023	Updated customer address.

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**I. Executive Summary**

**A. Purpose of Test**

An EMC evaluation was performed to determine compliance of the VIAVI SOLUTIONS INC., XEdge, with the requirements of FCC Part 15.247, 15.407, 22, 24, 27, 90, 96. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with PVG-04 technical requirements, the following data is presented in support of the Certification of the XEdge. VIAVI SOLUTIONS INC. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the XEdge, has been **permanently** discontinued.

**B. Executive Summary**

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15.247, 15.407, 22, 24, 27, 90, 96, in accordance with VIAVI SOLUTIONS INC., purchase order number 2941010096. All tests were conducted using measurement procedure.

FCC Reference	Description	Compliance
15.247, 15.407, Part 22, Part 24, Part 27, Part 90, Part 96	Spurious Radiated Emissions	Compliant

**Rationale:**

Per KDB 996369 D04 “Modular Transmitter Integration Guide – Guidance for Host Product Manufacturers” only spot checks are reported in this filing

## II. Equipment Information

### A. Overview

Eurofins Electrical and Electronic Testing NA, Inc. was contracted by VIAVI SOLUTIONS INC. to perform testing on the XEdge, under purchase order number 2941010096.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of VIAVI SOLUTIONS INC., XEdge.

The results obtained relate only to the item(s) tested.

### B. References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

- ANSI C63.10:2013
- ANSI C63.26:2015
- KDB 996369 D04 Module Integration Guide V02
- RSS-130 Issue 2
- RSS-132 Issue 4
- RSS-133 Issue 6
- RSS-139 Issue 4
- RSS-140 Issue 1
- RSS-192, Issue 4
- RSS-195 Issue 2
- RSS-197 Issue 1
- RSS-199 Issue 3

### C. Test Site

All testing was performed at Eurofins Electrical and Electronic Testing NA, Inc., 914 W. Patapsco Avenue, Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Eurofins Electrical and Electronic Testing NA, Inc. has been accredited by the American Association for Laboratory Accreditation (A2LA) (Certificate #: 0591.01) in accordance with ISO/IEC 17025:2017.

Eurofins Electrical and Electronic Testing NA, Inc. is part of the Eurofins Electrical & Electronics (E&E) global compliance network.

CAB ID for IC: US0109



**D. Measurement Uncertainty**

Test Method	Typical Expanded Uncertainty	K	Confidence Level
RF Frequencies	±4.52 Hz	2	95%
RF Power Conducted Emissions	±2.32 dB	2	95%
RF Power Conducted Spurious Emissions	±2.25 dB	2	95%
RF Power Radiated Emissions	±3.01 dB	2	95%

**Table 1. Uncertainty Calculations Summary**
**E. Equipment Configuration**

<b>Name of EUT/Model:</b>	XEdge
<b>Description of EUT and Intended Use:</b>	Cellular modem with Wi-Fi and BLE capabilities
<b>Selected Operation Mode(s):</b>	Continuous transmitter, and normal operation.
<b>Rational for the selection of the Operation Mode(s):</b>	Continuous transmitter for radiated emissions exploration of colocated radios. Normal operation for immunity testing.
<b>Susceptibility Criteria:</b>	>10% lost packets on ping command. Call dropped status on CMW500. Total loss of lock of GPS link, significant deviation from latitude, longitude, and elevation numbers
<b>Monitoring Method(s):</b>	Ping command, CMW500 call status, and output from pythom script.
<b>Emissions Class Declaration:</b>	Class A
<b>Configurations:</b>	See 'Setup Instructions 2023-02-09.docx'
<b>Rated Power Input</b>	
<b>Input Voltage Range:</b>	100-240V
<b>AC or DC:</b>	AC
<b>Voltage Frequency:</b>	50-60
<b>Number of Phases:</b>	1
<b>Current:</b>	1.2
<b>Uses an external AC/DC Adapter:</b>	True
<b>Manufacturer:</b>	FSP
<b>Model #:</b>	FSP045-D3MR3
<b>Part #:</b>	9NA0453006
<b>Serial #:</b>	H2151001012
<b>The EUT can be battery powered:</b>	False
<b>Power Input Under Test</b>	
<b>Input Voltage:</b>	120V
<b>Frequency:</b>	60Hz
<b>Physical Description</b>	
<b>EUT Arrangement:</b>	Table Top
<b>System with Multiple Chassis?</b>	False

<b>Size (HxWxD) inches:</b>	9 x 5 x 2.5
<b>Weight (lbs):</b>	1
<b>Highest Internal Frequency (MHz):</b>	5.8GHz
<b>Other Info</b>	
<b>EUT Software (Internal to EUT):</b>	xedge_lite_fmt.py
<b>Support Software (used by support PC to exercise EUT):</b>	Putty.exe; SimmCon
<b>Firmware:</b>	
<b>Transmitter Parameters</b>	
<b>Description of your unit:</b>	5G, LTE, Wi-Fi
<b>Modulation Type:</b>	QPSK, QAM, BPSK
<b>Number of Channels:</b>	0
<b>Frequency Range (Mhz):</b>	various
<b>Antenna Type:</b>	integrated + whip an
<b>Antenna Gain (db):</b>	various
<b>PMN:</b>	5G Sub-6 GHz M.2 Module
<b>HVIN:</b>	RM502QAE
<b>FVIN:</b>	RM502QAEAAR11A03M4G
<b>HMN:</b>	N/A
<b>Data Rates:</b>	
<b>Expected Power Level:</b>	
<b>Number of Antenna:</b>	5
<b>Number of Intentional Transmitters:</b>	2
<b>Number of Certified Intentional Transmitter Modules:</b>	0
<b>FCC ID:</b>	WUW-RM502QAE
<b>IC ID:</b>	9613A-RM502QAE

**Table 2. Equipment Details**

<b>Name/Description</b>	<b>Model Number</b>	<b>Part Number</b>	<b>Serial Number</b>	<b>Rev. #</b>
EUT (Xedge)	NXE-DEVICE	N/A	303	N.A.

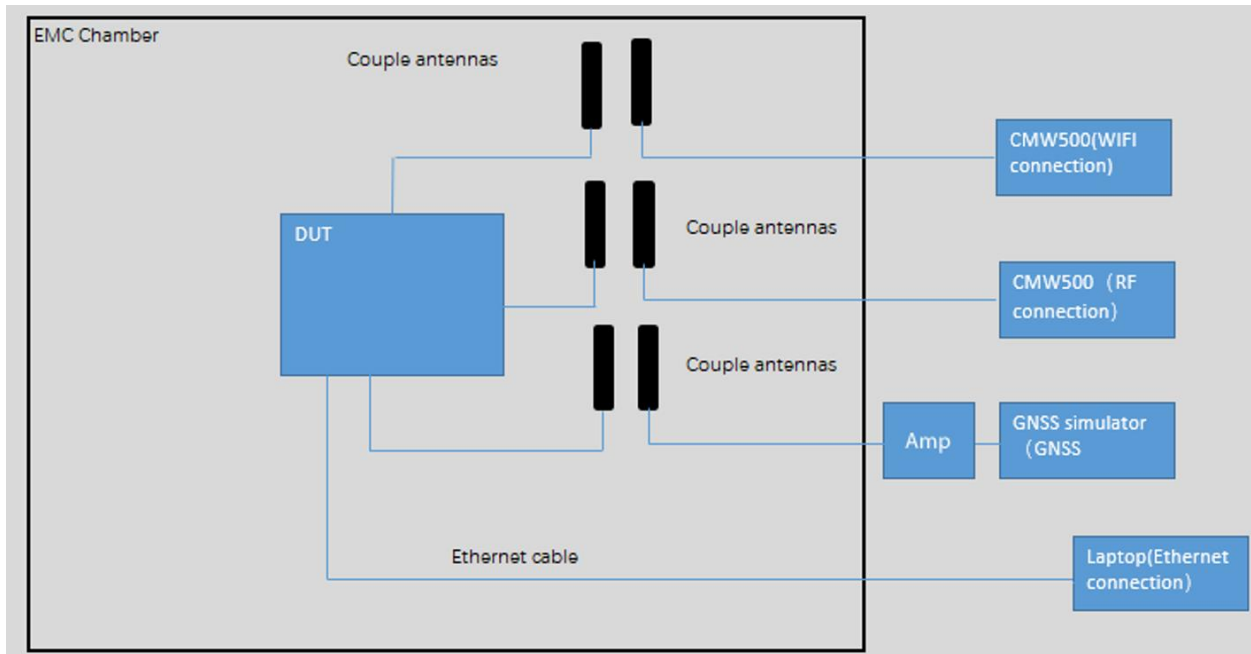
**Table 3. EUT List**

Port Name on EUT	Cable Desc. or reason for none	3 Meters or Longer	Length as tested (m)	Max Length (m)	Shielded?	Termination Box ID & Port Name
Output Power Module 1		No	1		No	
Output Power Module 2		No	1		No	
LAN Port		Yes	10		No	

**Table 4. Ports and Cabling**

Name/Description	Manufacturer	Model Number	Serial Number	*Customer Supplied Calibration Data
Laptop	Dell	Latitude XT2	2MMFTP1	N.A.

**Table 5. Support Equipment**



**Figure 1. Block Diagram**

**F. Modifications****a) Modifications to EUT**

No modifications were made to the EUT.

**b) Modifications to Test Standard**

No modifications were made to the test standard.

**G. Disposition of EUT**

The test sample including all support equipment (if any), submitted to the Electromagnetic Compatibility Lab for testing was returned to VIAVI SOLUTIONS INC. upon completion of testing.

### III. Electromagnetic Compatibility Criteria for Intentional Radiators

#### Radiated Emission

**Test Requirement:** KDB 996369 D04 Module Integration Guide V02

2.0 e) Perform testing on the product with the transmitter or transmitters operating to confirm that the host product meets the FCC requirements. This investigation of the final product can be done by spot checking emissions from the device while operating the host as a composite system (with all the transmitters operating simultaneously). This testing is performed with the host product configured in typical operational modes to check the fundamental-frequency and spurious emissions for compliance with all the applicable rules.

3.0 b) The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure).

3.2 The frequency spectrum to be investigated for this composite investigation testing at a minimum is based on the 15.33 (b) table. The highest frequency generated or used in the device or on which the device operates, or tunes (MHz) shall include the frequencies of the transmitters and comply with the limits of 15.109 or the highest level permitted for an individual component.

**Test Procedure:**

The transmitters were turned on and operated simultaneously. Measurements were performed at different combinations of active bands. On the Raspberry Pi transmitter, the tested channels were: 802.11b channel 6, 802.11a channels 40, 60, 120, and 157. On the Quectel RM502Q-AE transmitter the tested channels were the 10MHz wide middle channels of the 3G Bands 2, 4, 5, and LTE Bands 2, 4, 5, 12, 13, 30, 41, 66, 71.

The receive antenna was located 3m from the EUT for emission measurement between 30MHz to 1GHz. The receive antenna was located 1m from the EUT for measurements between 1GHz to 18GHz.

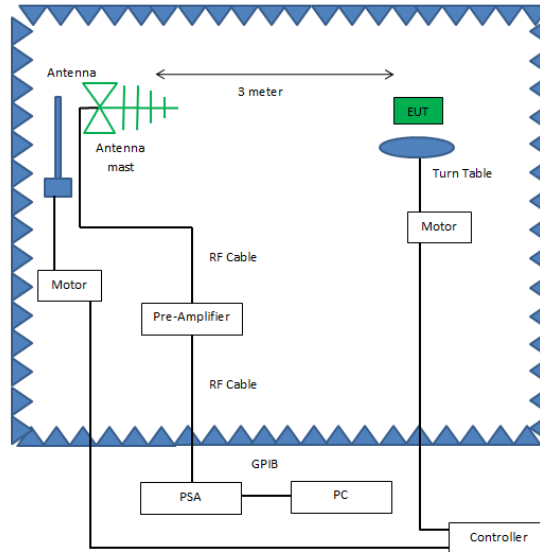
The EUT was rotated orthogonally through all three axes. Plots shown are corrected for both antenna correction factor.

Exploratory band selection rationale:

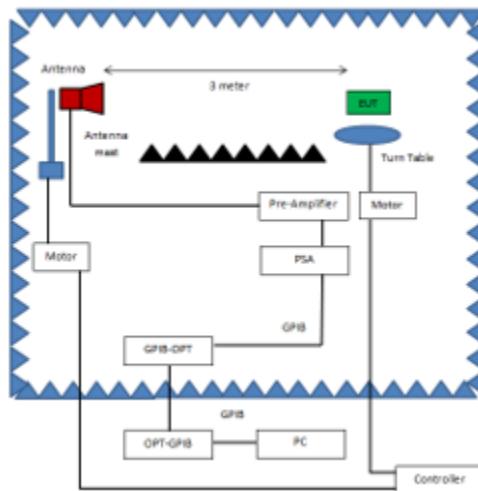
A few of the bands were either fully or partially contained by a wider span band. i.e Band 7 was not investigated because it is contained within Band 41; additionally, Band 41 carried higher output power.

WCDMA bands were investigated because its modulation could have generated different intermodulation emissions products when compared to LTE Bands.

5G bands were considered covered by LTE investigation since frequency, modulation, and power are essentially equivalent to each other.



**Radiated Emissions, Below 1GHz, Test Setup**



**Radiated Emissions, Above 1GHz, Test Setup**

**Test Results:** EUT does not exhibit intermodulation products from the simultaneous operation of its transmitters.

**Test Engineer:** Donald Salguero

**Test Date(s):** February 16 - 22, 2023

## Test Equipment List

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Radiated Emissions Equipment List						
Asset Number	Description	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due Date
1T4751	Antenna - Blog	Sunol Sciences	JB6	A101910	6/1/2022	12/1/2023
1T4483	Antenna; Horn	ETS-Lindgren	3117	56658	1/31/2022	7/31/2023
1T8743	Preamplifier	A.H. Systems, Inc.	PAM-0118P	419	Func Verify	Func Verify
1T4300	SEMI-ANECHOIC CHAMBER (NSA)	EMC TEST SYSTEMS	NONE	NONE	8/19/2021	8/31/2023
1T4300B	Semi-Anechoic 3m Chamber sVSWR	EMC TEST SYSTEMS	NONE	NONE	9/30/2021	9/30/2023
1T4681	Spectrum Analyzer (PSA)	Agilent Technologies	E4448A	MY46180897	10/15/2021	4/15/2023
1T9990	Thermometer/Hygrometer	Fisher Scientific	06-662-4, 11725843	210843372	10/1/2021	10/1/2023
1T8371	Double Ridge Guide Horn Antenna	A.H. Systems, Inc.	SAS-571	2176	Func Verify	Func Verify
N/A	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	168144	1/9/2022	N/A

**Table 6. REE Equipment List**

Note: Functionally verified test equipment is verified using calibrated instrumentation at time of testing.

**END OF REPORT**