

Company: Digi International

Test of: ConnectCore i.MX6UL

To: FCC CFR 47 Pt 15.407 & ISED RSS 247

Report No.: DIGI79-U2 Rev A

**ADDENDUM TEST REPORT**



# RADIATED TEST REPORT

FROM



Test of: Digi International ConnectCore i.MX6UL

To: FCC CFR 47 Pt 15.407 & ISED RSS 247

Test Report Serial No.: DIGI79-U2 Rev A

This report supersedes: NONE

Applicant: Digi International  
11001 Bren Road E.  
Minnetonka, Minnesota 55343  
USA

Product Description Embedded ARM Module

Issue Date: 14th December 2018

## **This Test Report is Issued Under the Authority of:**

**MiCOM Labs, Inc.**  
575 Boulder Court  
Pleasanton California 94566  
USA  
Phone: +1 (925) 462-0304  
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[www.micomlabs.com](http://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 17025:2005. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://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>



### Accredited Laboratory

A2LA has accredited

**MiCOM LABS**  
Pleasanton, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 14<sup>th</sup> day of May 2018.

  
President and CEO  
For the Accreditation Council  
Certificate Number 2381.01  
Valid to November 30, 2019

*For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

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## 1.2. RECOGNITION

MiCOM Labs, Inc has widely recognized wireless testing capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA countries. MiCOM Labs test reports are accepted globally.

| Country   | Recognition Body   | Status | Phase      | Identification No.                      |
|-----------|--|--------|------------|---|
| USA       | Federal Communications Commission (FCC)  | TCB    | -          | US0159<br>Listing #: 102167             |
| Canada    | Industry Canada (IC)   | FCB    | APEC MRA 2 | US0159<br>Listing #: 4143A-2<br>4143A-3 |
| Japan     | MIC (Ministry of Internal Affairs and Communication)   | CAB    | APEC MRA 2 | RCB 210                                 |
|           | VCCI   | --     | --         | A-0012                                  |
| Europe    | European Commission  | NB     | EU MRA     | NB 2280                                 |
| Australia | Australian Communications and Media Authority (ACMA)   | CAB    | APEC MRA 1 | US0159                                  |
| Hong Kong | Office of the Telecommunication Authority (OFTA)   | CAB    | APEC MRA 1 |   |
| Korea     | Ministry of Information and Communication Radio Research Laboratory (RRL)                        | CAB    | APEC MRA 1 |   |
| Singapore | Infocomm Development Authority (IDA)   | CAB    | APEC MRA 1 |   |
| Taiwan    | National Communications Commission (NCC)<br>Bureau of Standards, Metrology and Inspection (BSMI) | CAB    | APEC MRA 1 |   |
| Vietnam   | Ministry of Communication (MIC)  | CAB    | APEC MRA 1 |   |

EU MRA – European Union Mutual Recognition Agreement.

NB – Notified Body

APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement. Recognition agreement under which test lab is accredited to regulatory standards of the APEC member countries.

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

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### 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) test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-02.pdf>



## Accredited Product Certification Body

A2LA has accredited


**MiCOM LABS**

Pleasanton, CA

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC 17065:2012 *Requirements for bodies certifying products, processes and services*. This product certification body also meets the A2LA R322 – *Specific Requirements – Notified Body Accreditation Requirements* and A2LA R308 - *Specific Requirements - ISO-IEC 17065 - Telecommunication Certification Body Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a management system.

Presented this 14<sup>th</sup> day of May 2018



  
President and CEO  
For the Accreditation Council  
Certificate Number 2381.02  
Valid to November 30, 2019

*For the product certification schemes to which this accreditation applies, please refer to the organization's Product Certification Scope of Accreditation.*

United States of America – Telecommunication Certification Body (TCB)

Industry Canada – Certification Body, CAB Identifier – US0159

Europe – Notified Body (NB), NB Identifier - 2280

Japan – Recognized Certification Body (RCB), RCB Identifier - 210

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## 2. DOCUMENT HISTORY

| Document History |                                |                                 |
|------------------|--------------------------------|---------------------------------|
| Revision         | Date                           | Comments                        |
| Draft            | 14 <sup>th</sup> November 2018 | Draft report for client review. |
| Rev A            | 14 <sup>th</sup> December 2018 | Initial release.                |
|                  |                                |                                 |
|                  |                                |                                 |

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### 3. TEST RESULT CERTIFICATE

|   |   |
|---|---|
| <b>Manufacturer:</b> Digi International<br>11001 Bren Road E.<br>Minnetonka, Minnesota 55343<br>USA | <b>Tested By:</b> MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton<br>California 94566 USA |
| <b>Model:</b> CC IMX6UL   | <b>Telephone:</b> +1 925 462 0304   |
| <b>Type Of Equipment:</b> Embedded ARM Module   | <b>Fax:</b> +1 925 462 0306   |
| <b>S/N's:</b> 4410  |   |
| <b>Test Date(s):</b> 2 <sup>nd</sup> Nov. 2018  | <b>Website:</b> www.micomlabs.com   |

| STANDARD(S)   | TEST RESULTS       |
|---|--------------------|
| FCC CFR 47 Part 15 Subpart E 15.407& ISED RSS-247<br>Radiated Emission requirements | 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.

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## 4. REFERENCES AND MEASUREMENT UNCERTAINTY

### 4.1. Normative References

| REF. | PUBLICATION            | YEAR                                 | TITLE   |
|------|------------------------|--------------------------------------|---|
| I    | KDB 662911 D01 & D02   | Oct 31 2013                          | Guidance for measurement of output emission of devices that employ single transmitter with multiple outputs or systems with multiple transmitters operating simultaneously in the same frequency band |
| II   | KDB 905462 D07 v02     | 22nd August 2016                     | Test guidance to demonstrate compliance for U-NII devices subject to DFS requirements.  |
| III  | KDB 926956 D01 v02     | 22nd August 2016                     | U-NII Device Transition Plan  |
| IV   | A2LA                   | August 2018                          | R105 - Requirement's When Making Reference to A2LA Accreditation Status   |
| V    | ANSI C63.10            | 2013                                 | American National Standard for Testing Unlicensed Wireless Devices  |
| VI   | ANSI C63.4             | 2014                                 | 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                                  |
| VII  | CISPR 32               | 2015                                 | Electromagnetic compatibility of multimedia equipment - Emission requirements   |
| VIII | 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  |
| IX   | FCC 06-96              | Jun 30 2006                          | Memorandum Opinion and Order  |
| X    | FCC 47 CFR Part 15.407 | 2016                                 | Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices  |
| XI   | ICES-003               | Issue 6 Jan 2016; Updated April 2017 | Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement.   |
| XII  | M 3003                 | Edition 3 Nov.2012                   | Expression of Uncertainty and Confidence in Measurements  |
| XIII | RSS-247 Issue 2        | Feb 2017                             | Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and License-Exempt Local Area Network (LE-LEN) Devices   |
| XIV  | RSS-Gen Issue 5        | April 2018                           | General Requirements for Compliance of Radio Apparatus  |
| XV   | FCC 47 CFR Part 2.1033 | 2016                                 | FCC requirements and rules regarding photographs and test setup diagrams.   |
| XVI  | KDB 905462 D02 v02     | April 8 2016                         | Compliance Measurement Procedures for Unlicensed National Information Infrastructure devices operating in the 5250 to 5350 MHz and 5470 to 5725 MHz bands incorporating Dynamic Frequency Selection.  |
| XVII | KDB 789033 D02 V02r01  | 14th December, 2017                  | Guidelines For Compliance Testing Of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E  |

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#### **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.

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## 5. PRODUCT DETAILS AND TEST CONFIGURATIONS

### 5.1. Technical Details

| Details                          | Description   |
|----------------------------------|---|
| Purpose:                         | Test of the Digi International ConnectCore for i.MX6UL family to FCC CFR 47 Part 15 Subpart E 15.407 & ISSED RSS-247. Compliance Measurement Procedures for Unlicensed National Information Infrastructure devices operating in the 5150 to 5250 MHz, 5250 to 5350 MHz, 5470 to 5725 and 5725 - 5850 MHz bands incorporating Dynamic Frequency Selection. |
| Applicant:                       | Digi International<br>11001 Bren Road E.<br>Minnetonka, Minnesota 55343<br>USA  |
| Manufacturer:                    | Same as applicant.  |
| Laboratory performing the tests: | MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton California 94566 USA  |
| Test report reference number:    | DIGI79-U2 Addendum Rev A  |
| Date EUT received:               | 17 <sup>th</sup> October 2018   |
| Standard(s) applied:             | FCC CFR 47 Part 15 Subpart E 15.407   |
| Dates of test (from - to):       | 2 <sup>nd</sup> November. 2018  |
| No of Units Tested:              | 1   |
| Product Family Name:             | i.MX6UL   |
| Model(s):                        | ConnectCore   |
| Location for use:                | Indoors   |
| Declared Frequency Range(s):     | 5150 - 5250 MHz; 5250 - 5350 MHz; 5470 - 5725 MHz; 5725 - 5850 MHz;   |
| Type of Modulation:              | CCK, OFDM   |
| EUT Modes of Operation:          | a, HT-20, HT-40, ac80 (802.11a/b/g/n/ac)  |
| Declared Nominal Output Power:   | Max. +18 dBm  |
| Transmit/Receive Operation:      | Duplex  |
| Rated Input Voltage and Current: | 5VDC, 2A  |
| Operating Temperature Range:     | -40°C to +85°C  |
| Equipment Dimensions:            | 2 ½ x 3 ½ x 3/4 inch  |
| Weight:                          | 40.2 gr. (1.4 oz)   |
| Hardware Rev:                    | 50001939-01   |
| Firmware Version:                | 82003996 rev B  |
| Software Rev:                    | 82003996 rev B  |

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## **5.2. Scope Of Test Program**

The scope of the test program was to test the Digi International ConnectCore for i.MX6UL family with a new antenna addition (Pulse W3334) in the frequency ranges 5150 - 5250 MHz; 5250 - 5350 MHz; 5470 - 5725 MHz; 5725 - 5850 MHz; for compliance against the radiated emission requirements of the following specifications:

**FCC CFR 47 Part 15 Subpart E 15.407**

Subpart E – Unlicensed National Information Infrastructure Devices

**ISED RSS 247**

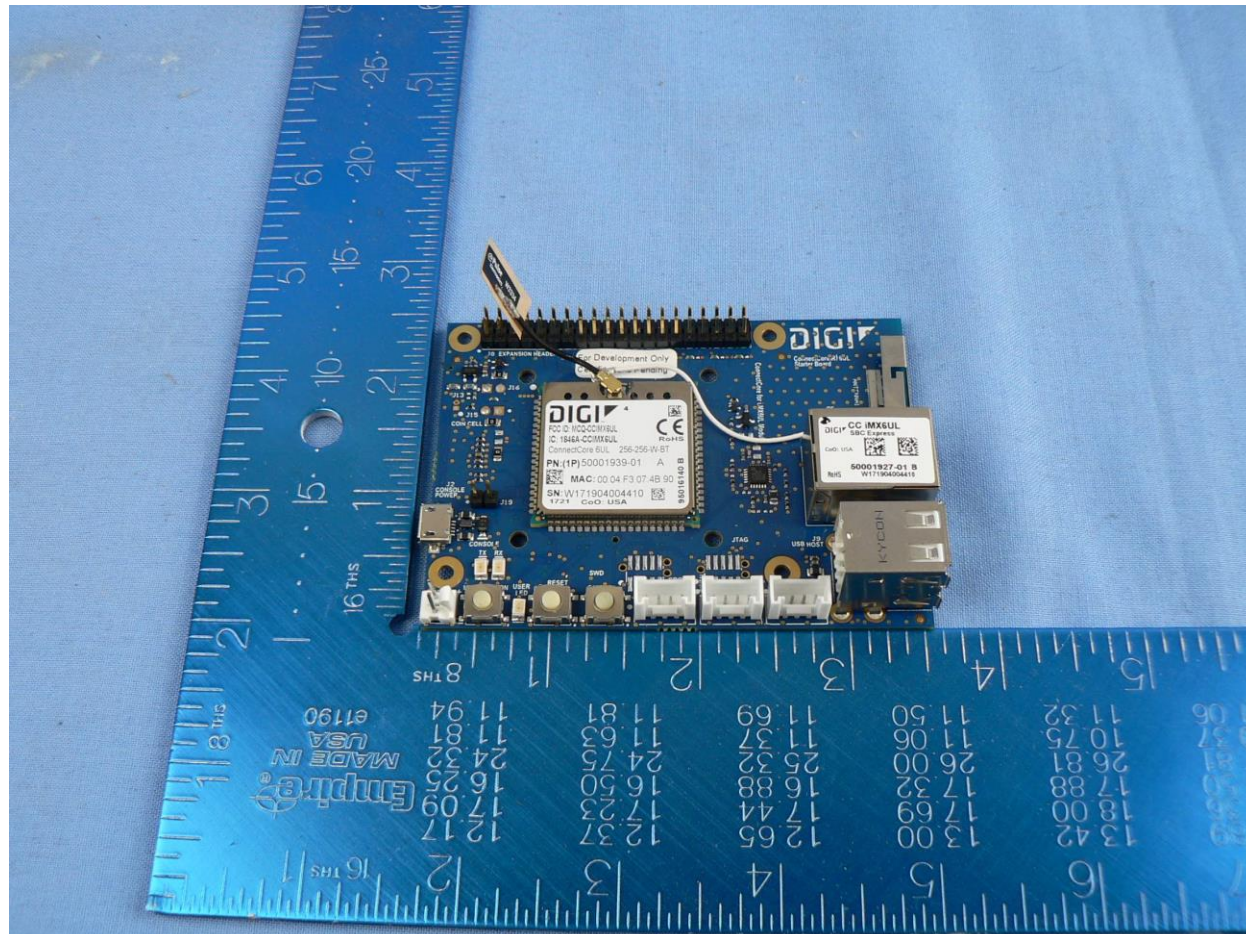
RSS-247 — Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

This is an Addendum Report to show compliance as a result of antenna addition - Radiated Transmitter Spurious and Restricted Band Edge testing was performed, for complete test report see CETECOM ICT Services Test Report 1-311616-01-20

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**CCiMX6UL**



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

| Type | Description         | Manufacturer | Model                          | Serial no. | Delivery Date              |
|------|---------------------|--------------|--------------------------------|------------|----------------------------|
| EUT  | Embedded ARM Module | Digi         | ConnectCore for i.MX6UL        | 4410       | 17 <sup>th</sup> Oct. 2018 |
| Host | Host Support Board  | Digi         | ConnectCore® 6UL Starter Board |            | 17 <sup>th</sup> Oct. 2018 |

### 5.4. Antenna Details

| Type  | Manufacturer | Model | Family | Peak Gain (dBi) | BF Gain | Dir BW | X-Pol | Frequency Band (MHz) |
|-------|--------------|-------|--------|-----------------|---------|--------|-------|----------------------|
| Patch | Pulse LARSEN | W3334 | FPC    | 5.5 dBi +/-1 dB | -       | 360    | -     | 5150 - 5850          |

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

### 5.5. Cabling and I/O Ports

#### Host Ports:

| Port Type | Max Cable Length | # of Ports | Screened   | Conn Type     | Data Type | Environment       |
|-----------|------------------|------------|------------|---------------|-----------|-------------------|
| USB       | < 3m             | 2          | Shielded   | USB           | Digital   | End-User  Indoors |
| USB       | < 3m             | 2          | Shielded   | USB-C         | Digital   | End-User  Indoors |
| SDIO      | < 3m             | 1          | Unshielded | 50 pin Header | Digital   | End-User  Indoors |
| DC        | < 3m             | 1          | Unshielded | Pins          | NA        | End-User  Indoors |
| Molex     | < 3m             | 3          | Unshielded | Pins          | Digital   | End-User  Indoors |

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## 5.6. Test Configurations

Results for the following configurations are provided in this report:

Radiated emissions testing was performed with EUT in 11a mode (mode with highest power density representing worst case for emissions) with Band Edge Measurements made for channels of operation as noted.

| Operational Mode(s)<br>(802.11a/b/g/n/ac) | Data Rate with Highest Power<br>MBit/s | Channel Frequency (MHz) |          |          |
|---|--|-------------------------|----------|----------|
|   |  | Low                     | Mid      | High     |
| <b>5150 - 5250 MHz</b>                    |  |                         |          |          |
| a   | 6                                      | 5,180.00                | 5,200.00 | 5,240.00 |
| HT-20                                     | 6.5                                    | 5,180.00                | --       | --       |
| HT-40                                     | 13.5                                   | 5,190.00                | --       | --       |
| ac-80                                     | 29.30                                  | --                      | 5,210.00 | --       |
| <b>5250 - 5350 MHz</b>                    |  |                         |          |          |
| a   | 6                                      | 5,260.00                | 5,300.00 | 5,320.00 |
| HT-20                                     | 6.5                                    | --                      | --       | 5,320.00 |
| HT-40                                     | 13.5                                   | --                      | --       | 5,310.00 |
| ac-80                                     | 29.30                                  | --                      | 5,290.00 | --       |
| <b>5470 - 5725 MHz</b>                    |  |                         |          |          |
| a   | 6                                      | 5,500.00                | 5,580.00 | 5,720.00 |
| HT-20                                     | 6.5                                    | 5,500.00                | --       | --       |
| HT-40                                     | 13.5                                   | 5,510.00                | --       | --       |
| ac-80                                     | 29.30                                  |                         | 5,530.00 |          |
| <b>5725 - 5850 MHz</b>                    |  |                         |          |          |
| a   | 6                                      | 5,745.00                | 5,785.00 | 5,825.00 |
| HT-20                                     | 6.5                                    | 5,745.00                | --       | 5,825.00 |
| HT-40                                     | 13.5                                   | 5,755.00                | --       | 5,795.00 |
| ac-80                                     | 29.30                                  |                         | 5,775.00 |          |

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### **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

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## 6. TEST SUMMARY

### List of Measurements

| Test Header                             | Result   | Data Link                 |
|---|----------|---------------------------|
| Peak Transmit Power                     | Complies | See Note                  |
| 26 dB & 99% Bandwidth                   | Complies | See Note                  |
| 6 dB & 99% Bandwidth                    | Complies | See Note                  |
| Power Spectral Density                  | Complies | See Note                  |
| Dynamic Frequency Selection (DFS)       | Complies | See Note 2                |
| Radiated                                | Complies | -                         |
| TX Spurious & Restricted Band Emissions | Complies | <a href="#">View Data</a> |
| Restricted Edge & Band-Edge Emissions   | Complies | View Data                 |
| Digital Emissions                       | Complies | See Note                  |
| AC Wireline                             | Complies | See Note                  |

Note: See CETECOM ICT Test Report 1-3116/16-01-20

Note 2: See CETECOM ICT Test Report 1-3116/16-01-21

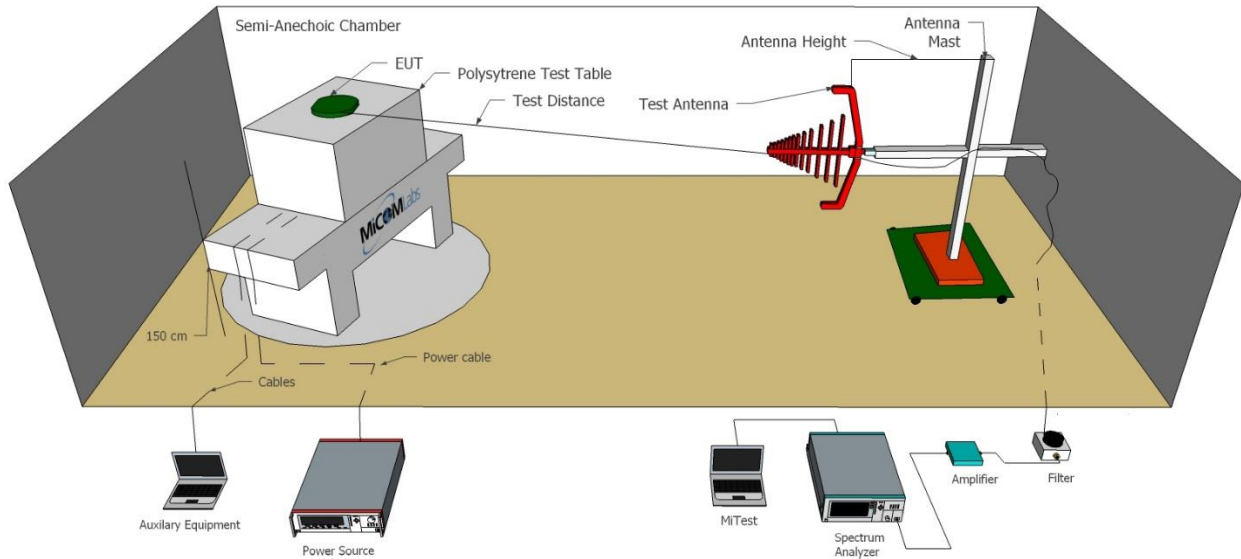
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## 7. TEST EQUIPMENT CONFIGURATION(S)

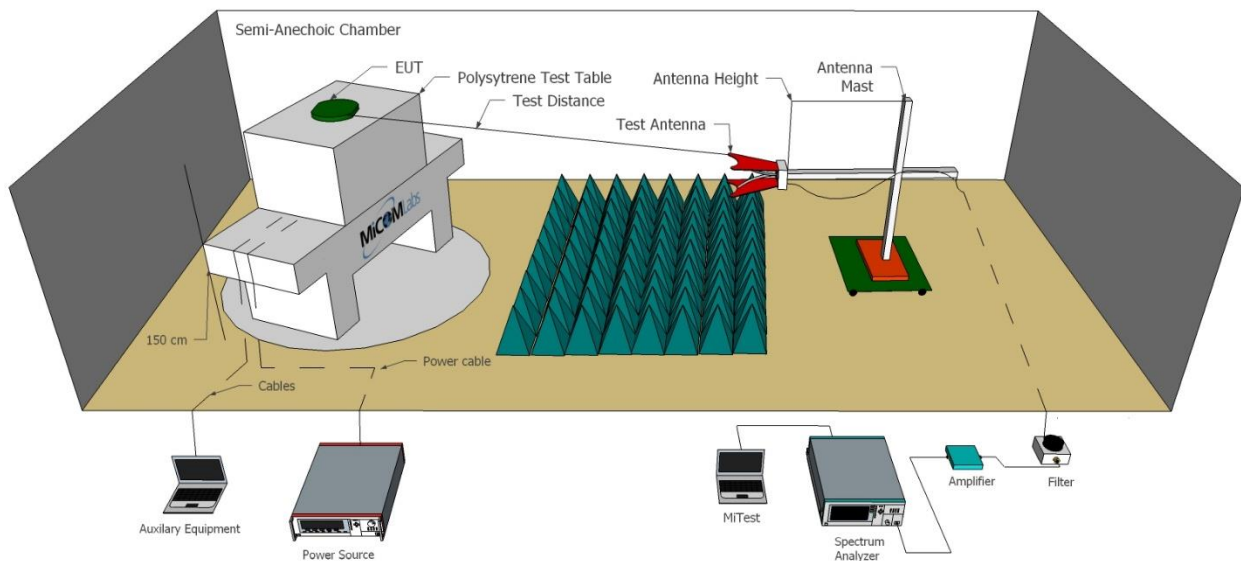
### 7.1. Radiated Emissions - 3m Chamber

The following tests were performed using the radiated test set-up shown in the diagram below.

Radiated Emissions Below 1GHz Test Setup



Radiated Emissions Above 1GHz Test Setup



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A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account 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         |
| 298    | 3M Radiated Emissions Chamber Maintenance Check   | MiCOM                | 3M Chamber                              | 298        | 21 Jan 2019          |
| 338    | Sunol 30 to 3000 MHz Antenna                      | Sunol                | JB3                                     | A052907    | 4 Apr 2019           |
| 377    | Band Rejection Filter 5150 to 5880MHz             | Microtronics         | BRM50716                                | 034        | 9 Oct 2019           |
| 378    | Rohde & Schwarz 40 GHz Receiver with Generator    | Rhode & Schwarz      | ESIB40                                  | 100107/040 | 12 Oct 2019          |
| 397    | Amp 10 - 2500MHz                                  | MiCOM Labs           | Amp 10 - 2500 MHz                       | NA         | 12 Jan 2019          |
| 399    | ETS 1-18 GHz Horn Antenna                         | ETS                  | 3117                                    | 00154575   | 12 Oct 2019          |
| 406    | Amplifier for Radiated Emissions                  | MiCOM Labs           | 40dB 1 to 18GHz Amp                     | 0406       | 12 Jan 2019          |
| 410    | Desktop Computer                                  | Dell                 | Inspiron 620                            | WS38       | Not Required         |
| 411    | Mast/Turntable Controller                         | Sunol Science        | 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 Science        | 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        | 9 Oct 2019           |
| 463    | Schwarzbeck cable from Amplifier to Bulkhead.     | Schwarzbeck          | AK 9513                                 | 463        | 9 Oct 2019           |
| 464    | Schwarzbeck cable from Bulkhead to Receiver       | Schwarzbeck          | AK 9513                                 | 464        | 9 Oct 2019           |
| 480    | Cable - Bulkhead to Amp                           | SRC Haverhill        | 157-3050360                             | 480        | 24 Aug 2019          |
| 481    | Cable - Bulkhead to Receiver                      | SRC Haverhill        | 151-3050787                             | 481        | 24 Aug 2019          |
| 510    | Barometer/Thermometer                             | Control Company      | 68000-49                                | 170871375  | 11 Dec 2019          |
| 518    | Cable - Amp to Antenna                            | SRC Haverhill        | 157-3051574                             | 518        | 24 Aug 2019          |
| CC05   | Confidence Check                                  | MiCOM                | CC05                                    | None       | 21 Jan 2019          |

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## 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)

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## 9. TEST RESULTS

### 9.1. Radiated

| Radiated Test Conditions for Radiated Spurious and Band-Edge Emissions |   |                            |             |
|--|---|----------------------------|-------------|
| <b>Standard:</b>   | FCC CFR 47:15.407                         | <b>Ambient Temp. (°C):</b> | 20.0 - 24.5 |
| <b>Test Heading:</b>   | Radiated Spurious and Band-Edge Emissions | <b>Rel. Humidity (%):</b>  | 32 - 45     |
| <b>Standard Section(s):</b>  | 15.407 (b), 15.205, 15.209                | <b>Pressure (mBars):</b>   | 999 - 1001  |
| <b>Reference Document(s):</b>  | 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 3-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 peak 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.

Test configuration and setup for Undesirable Measurement were per the Radiated Test Set-up specified in this document.

15.407 (b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

#### Limits for Restricted Bands (15.205, 15.209)

**Peak emission: 74 dBuV/m**

**Average emission: 54 dBuV/m**

#### 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**

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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

**Example:**

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength (dBµV/m);

$$E = 1000000 \times \sqrt[3]{30P} / 3 \text{ } \mu\text{V/m}$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz equates to 68.23 dBuV/m

Conversion between dBmV/m (or dBmV) and mV/m (or mV) are as follows:

$$\text{Level (dBmV/m)} = 20 * \text{Log (level (mV/m))}$$

40 dBmV/m = 100 mV/m

48 dBmV/m = 250 mV/m

**Restricted Bands of Operation (15.205)**

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| Frequency Band    |                     |               |             |
|-------------------|---------------------|---------------|-------------|
| MHz               | MHz                 | MHz           | GHz         |
| 0.090-0.110       | 16.42-16.423        | 399.9-410     | 4.5-5.15    |
| 0.495-0.505       | 16.69475-16.69525   | 608-614       | 5.35-5.46   |
| 2.1735-2.1905     | 16.80425-16.80475   | 960-1240      | 7.25-7.75   |
| 4.125-4.128       | 25.5-25.67          | 1300-1427     | 8.025-8.5   |
| 4.17725-4.17775   | 37.5-38.25          | 1435-1626.5   | 9.0-9.2     |
| 4.20725-4.20775   | 73-74.6             | 1645.5-1646.5 | 9.3-9.5     |
| 6.215-6.218       | 74.8-75.2           | 1660-1710     | 10.6-12.7   |
| 6.26775-6.26825   | 108-121.94          | 1718.8-1722.2 | 13.25-13.4  |
| 6.31175-6.31225   | 123-138             | 2200-2300     | 14.47-14.5  |
| 8.291-8.294       | 149.9-150.05        | 2310-2390     | 15.35-16.2  |
| 8.362-8.366       | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4   |
| 8.37625-8.38675   | 156.7-156.9         | 2690-2900     | 22.01-23.12 |
| 8.41425-8.41475   | 162.0125-167.17     | 3260-3267     | 23.6-24.0   |
| 12.29-12.293      | 167.72-173.2        | 3332-3339     | 31.2-31.8   |
| 12.51975-12.52025 | 240-285             | 3345.8-3358   | 36.43-36.5  |

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|                   |           |           |            |
|-------------------|-----------|-----------|------------|
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | Above 38.6 |
| 13.36-13.41       |           |           |            |

(b) Except as provided in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

(c) Except as provided in paragraphs (d) and (e) of this section, regardless of the field strength limits specified elsewhere in this subpart, the provisions of this section apply to emissions from any intentional radiator.

(d) The following devices are exempt from the requirements of this section:

- (1) Swept frequency field disturbance sensors operating between 1.705 and 37 MHz provided their emissions only sweep through the bands listed in paragraph (a) of this section, the sweep is never stopped with the fundamental emission within the bands listed in paragraph (a) of this section, and the fundamental emission is outside of the bands listed in paragraph (a) of this section more than 99% of the time the device is actively transmitting, without compensation for duty cycle.
- (2) Transmitters used to detect buried electronic markers at 101.4 kHz which are employed by telephone companies.
- (3) Cable locating equipment operated pursuant to §15.213.
- (4) Any equipment operated under the provisions of §15.253, 15.255, and 15.256 in the frequency band 75-85 GHz, or §15.257 of this part.
- (5) Biomedical telemetry devices operating under the provisions of §15.242 of this part are not subject to the restricted band 608-614 MHz but are subject to compliance within the other restricted bands.
- (6) Transmitters operating under the provisions of subparts D or F of this part.
- (7) Devices operated pursuant to §15.225 are exempt from complying with this section for the 13.36-13.41 MHz band only.
- (8) Devices operated in the 24.075-24.175 GHz band under §15.245 are exempt from complying with the requirements of this section for the 48.15-48.35 GHz and 72.225-72.525 GHz bands only, and shall not exceed the limits specified in §15.245(b).
- (9) Devices operated in the 24.0-24.25 GHz band under §15.249 are exempt from complying with the requirements of this section for the 48.0-48.5 GHz and 72.0-72.75 GHz bands only, and shall not exceed the limits specified in §15.249(a).

(e) Harmonic emissions appearing in the restricted bands above 17.7 GHz from field disturbance sensors operating under the provisions of §15.245 shall not exceed the limits specified in §15.245(b).

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## 9.1.1. TX Spurious & Restricted Band Emissions

### 9.1.1.1. Pulse W3334

#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5180.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 15             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 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                     | 5177.54       | 68.73    | -2.65         | -11.95  | 54.13        | Fundamental      | Vertical   | 151    | 232     | --           | --        |            |
| #2                     | 6906.61       | 63.74    | -3.02         | -8.05   | 52.67        | Peak (NRB)       | Horizontal | 151    | 360     | --           | --        | Pass       |
| #3                     | 10359.97      | 58.60    | -3.86         | -5.61   | 49.13        | Peak (NRB)       | Vertical   | 151    | 146     | --           | --        | Pass       |

Test Notes: EUT connected to laptop via USB, separate USB power supply

Note: click the links in the above matrix to view the graphical image (plot).

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5200.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 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 |
| <a href="#">#1</a>     | 5202.01       | 73.26    | -2.63         | -11.93  | 58.70        | Fundamental      | Vertical   | 151    | 0       | --           | --        |            |
| <a href="#">#2</a>     | 6933.33       | 62.71    | -3.00         | -7.96   | 51.75        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| <a href="#">#3</a>     | 10407.55      | 57.76    | -3.90         | -5.85   | 48.01        | Peak (NRB)       | Vertical   | 100    | 164     | --           | --        | Pass       |

Test Notes: EUT connected to laptop via USB, separate USB power supply

Note: click the links in the above matrix to view the graphical image (plot).

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5240.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 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 |
| <a href="#">#1</a>     | 5235.97       | 75.92    | -2.62         | -12.30  | 61.00        | Fundamental      | Vertical   | 151    | 0       | --           | --        |            |
| <a href="#">#2</a>     | 6986.62       | 60.53    | -3.06         | -7.74   | 49.73        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| <a href="#">#3</a>     | 10475.51      | 59.48    | -3.81         | -6.27   | 49.40        | Peak (NRB)       | Vertical   | 200    | 0       | --           | --        | Pass       |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5260.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 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 |
| <a href="#">#1</a>     | 5263.20       | 77.57    | -2.63         | -12.08  | 62.86        | Fundamental      | Vertical   | 151    | 0       | --           | --        |            |
| <a href="#">#2</a>     | 7013.39       | 59.70    | -3.04         | -7.77   | 48.89        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| <a href="#">#3</a>     | 10521.12      | 58.04    | -3.99         | -6.09   | 47.96        | Peak (NRB)       | Vertical   | 151    | 0       | --           | --        | Pass       |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5300.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 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 |
| <a href="#">#1</a>     | 5295.95       | 77.93    | -2.66         | -12.12  | 63.15        | Fundamental      | Vertical   | 100    | 0       | --           | --        |            |
| <a href="#">#2</a>     | 7066.55       | 61.26    | -3.01         | -7.52   | 50.73        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| <a href="#">#3</a>     | 10600.10      | 64.50    | -3.83         | -5.44   | 55.23        | Max Peak         | Vertical   | 131    | 240     | 68.2         | -13.0     | Pass       |
| <a href="#">#4</a>     | 10600.10      | 51.65    | -3.83         | -5.44   | 42.38        | Max Avg          | Vertical   | 131    | 240     | 54.0         | -11.6     | Pass       |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5320.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 15             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 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 |
| <a href="#">#1</a>     | 5315.80       | 74.89    | -2.67         | -12.14  | 60.08        | Fundamental      | Vertical   | 100    | 0       | --           | --        |            |
| <a href="#">#2</a>     | 7093.40       | 61.88    | -3.01         | -7.62   | 51.25        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| <a href="#">#3</a>     | 10640.12      | 66.50    | -4.21         | -5.00   | 57.29        | Max Peak         | Vertical   | 116    | 38      | 68.2         | -10.9     | Pass       |
| <a href="#">#4</a>     | 10640.12      | 53.27    | -4.21         | -5.00   | 44.06        | Max Avg          | Vertical   | 116    | 38      | 54.0         | -9.9      | Pass       |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5500.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 15             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 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 |
| <a href="#">#1</a>     | 5503.49       | 62.75    | -2.70         | -11.61  | 48.44        | Fundamental      | Vertical   | 100    | 181     | --           | --        |            |
| <a href="#">#2</a>     | 7333.32       | 65.56    | -3.00         | -7.90   | 54.66        | Max Peak         | Horizontal | 101    | 345     | 68.2         | -13.6     | Pass       |
| <a href="#">#3</a>     | 7333.32       | 59.65    | -3.00         | -7.90   | 48.75        | Max Avg          | Horizontal | 101    | 345     | 54.0         | -5.3      | Pass       |
| <a href="#">#4</a>     | 11002.02      | 68.06    | -3.92         | -6.27   | 57.87        | Max Peak         | Vertical   | 115    | 117     | 68.2         | -10.4     | Pass       |
| <a href="#">#5</a>     | 11002.02      | 53.80    | -3.92         | -6.27   | 43.61        | Max Avg          | Vertical   | 115    | 117     | 54.0         | -10.4     | Pass       |

Test Notes: EUT connected to laptop via USB, separate USB power supply

Note: click the links in the above matrix to view the graphical image (plot).

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5580.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 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 |
| <a href="#">#1</a>     | 5575.55       | 70.08    | -2.75         | -11.50  | 55.83        | Fundamental      | Vertical | 100    | 0       | --           | --        |            |
| <a href="#">#2</a>     | 11152.29      | 63.28    | -4.04         | -4.73   | 54.51        | Max Peak         | Vertical | 118    | 116     | 68.2         | -13.7     | Pass       |
| <a href="#">#3</a>     | 11152.29      | 49.11    | -4.04         | -4.73   | 40.34        | Max Avg          | Vertical | 118    | 116     | 54.0         | -13.7     | Pass       |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5720.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 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 |
| <a href="#">#1</a>     | 5716.17       | 65.76    | -2.77         | -11.01  | 51.98        | Fundamental      | Vertical | 100    | 0       | --           | --        |            |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5745.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 18000.00 MHz |               |                |               |         |                    |                  |          |        |         |                    |           |            |
|------------------------|---------------|----------------|---------------|---------|--------------------|------------------|----------|--------|---------|--------------------|-----------|------------|
| Num                    | Frequency MHz | Raw dB $\mu$ V | Cable Loss dB | AF dB/m | Level dB $\mu$ V/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dB $\mu$ V/m | Margin dB | Pass /Fail |
| <a href="#">#1</a>     | 5739.82       | 61.44          | -2.75         | -10.98  | 47.71              | Fundamental      | Vertical | 150    | 5       | --                 | --        |            |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5785.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 18000.00 MHz |               |                |               |         |                    |                  |          |        |         |                    |           |            |
|------------------------|---------------|----------------|---------------|---------|--------------------|------------------|----------|--------|---------|--------------------|-----------|------------|
| Num                    | Frequency MHz | Raw dB $\mu$ V | Cable Loss dB | AF dB/m | Level dB $\mu$ V/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dB $\mu$ V/m | Margin dB | Pass /Fail |
| <a href="#">#1</a>     | 5786.35       | 62.33          | -2.75         | -10.78  | 48.80              | Fundamental      | Vertical | 151    | 0       | --                 | --        |            |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for TX Spurious & Restricted Band Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5825.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

| 1000.00 - 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 |
| <a href="#">#1</a>     | 5824.05       | 63.06    | -2.81         | -10.77  | 49.48        | Fundamental      | Vertical | 100    | 0       | --           | --        |            |
| <a href="#">#2</a>     | 7766.61       | 56.36    | -3.00         | -7.17   | 46.19        | Peak (NRB)       | Vertical | 100    | 281     | --           | --        | Pass       |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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## 9.1.2. Restricted Edge & Band-Edge Emissions

### 9.1.2.2. Pulse W3334

#### RESULTS SUMMARY FOR RADIATED BAND-EDGE EMISSIONS

##### 5150 - 5250 MHz

| Pulse W3334      |                           | Band-Edge Freq | Limit 68.2dBµV/m | Limit 54.0dBµV/m | Power Setting |
|------------------|---------------------------|----------------|------------------|------------------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz            | dBµV/m           | dBµV/m           |               |
| 802.11a          | 5180.00                   | 5150.00        | 67.52            | 46.30            | 12            |
| 802.11ac-80      | 5210.00                   | 5150.00        | 67.75            | 52.75            | 10            |
| 802.11n HT-20    | 5180.00                   | 5150.00        | 67.35            | 46.08            | 12            |
| 802.11n HT-40    | 5190.00                   | 5150.00        | 66.35            | 49.68            | 10            |

##### 5250 - 5350 MHz

| Pulse W3334      |                           | Band-Edge Freq | Limit 68.2dBµV/m | Limit 54.0dBµV/m | Power Setting |
|------------------|---------------------------|----------------|------------------|------------------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz            | dBµV/m           | dBµV/m           |               |
| 802.11a          | 5320.00                   | 5350.00        | 67.76            | 45.72            | 13            |
| 802.11ac-80      | 5290.00                   | 5350.00        | 67.12            | 51.12            | 12            |
| 802.11n HT-20    | 5320.00                   | 5350.00        | 67.14            | 45.96            | 13            |
| 802.11n HT-40    | 5310.00                   | 5350.00        | 67.66            | 52.32            | 12            |

##### 5470 - 5725 MHz

| Pulse W3334      |                           | Restricted-Edge Freq | Limit 68.2dBµV/m | Limit 54.0dBµV/m | Power Setting |
|------------------|---------------------------|----------------------|------------------|------------------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz                  | dBµV/m           | dBµV/m           |               |
| 802.11a          | 5500.00                   | 5460.00              | 66.94            | 44.88            | 12            |
| 802.11ac-80      | 5530.00                   | 5460.00              | 67.93            | 50.76            | 8             |
| 802.11n HT-20    | 5500.00                   | 5460.00              | 67.28            | 44.88            | 12            |
| 802.11n HT-40    | 5510.00                   | 5460.00              | 67.63            | 46.76            | 9             |

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#### 5725 MHz Radiated Lower Band-Edge Emissions

| Pulse W3334      |                           | Band-Edge Freq | Level  | Level  | Power Setting |
|------------------|---------------------------|----------------|--------|--------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz            | dBµV/m | dBµV/m |               |
| 802.11a          | 5745.00                   | 5725.00        | 63.79  | 90.75  | 18            |
| 802.11ac-80      | 5775.00                   | 5725.00        | 66.19  | 77.45  | 16            |
| 802.11n HT-20    | 5745.00                   | 5725.00        | 63.88  | 89.10  | 18            |
| 802.11n HT-40    | 5755.00                   | 5725.00        | 64.25  | 86.04  | 16            |

#### 5850 MHz Radiated Higher Band-Edge Emissions

| Pulse W3334      |                           | Band-Edge Freq | Level  | Level  | Power Setting |
|------------------|---------------------------|----------------|--------|--------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz            | dBµV/m | dBµV/m |               |
| 802.11a          | 5825.00                   | 5850.00        | 62.00  | 59.77  | 18            |
| 802.11ac-80      | 5775.00                   | 5850.00        | 65.15  | 61.80  | 16            |
| 802.11n HT-20    | 5825.00                   | 5850.00        | 61.77  | 60.84  | 18            |
| 802.11n HT-40    | 5795.00                   | 5850.00        | 63.49  | 63.28  | 17            |

Click on the links to view the data.

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**Equipment Configuration for Restricted Lower Band-Edge Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.50           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5180.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 12             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

**4500.00 - 5250.00 MHz**

| Num | Frequency MHz | Raw dB $\mu$ V | Cable Loss dB | AF dB/m | Level dB $\mu$ V/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dB $\mu$ V/m | Margin dB | Pass /Fail |
|-----|---------------|----------------|---------------|---------|--------------------|------------------|----------|--------|---------|--------------------|-----------|------------|
| #1  | 5150.00       | 14.70          | -2.61         | 34.21   | 46.30              | Max Avg          | Vertical | 150    | 303     | 54.0               | -7.7      | Pass       |
| #2  | 5150.00       | 35.92          | -2.61         | 34.21   | 67.52              | Max Peak         | Vertical | 150    | 303     | 68.2               | -0.7      | Pass       |
| #3  | 5150.00       | --             | --            | --      | --                 | Restricted-Band  | --       | --     | --      | --                 | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

Note: click the links in the above matrix to view the graphical image (plot).

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**Equipment Configuration for Restricted Lower Band-Edge Emissions**

|                                 |                |                        |              |
|---------------------------------|----------------|------------------------|--------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11ac-80  |
| <b>Antenna Gain (dBi):</b>      | 5.50           | <b>Modulation:</b>     | OFDM         |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99           |
| <b>Channel Frequency (MHz):</b> | 5210.00        | <b>Data Rate:</b>      | 29.30 MBit/s |
| <b>Power Setting:</b>           | 10             | <b>Tested By:</b>      | JMH          |

**Test Measurement Results**

| 4500.00 - 5250.00 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                    | 5143.99       | 36.17    | -2.62         | 34.20   | 67.75        | Max Peak         | Vertical | 150    | 303     | 68.2         | -0.5      | Pass       |
| #2                    | 5150.00       | 21.15    | -2.61         | 34.21   | 52.75        | Max Avg          | Vertical | 150    | 303     | 54.0         | -1.3      | Pass       |
| #3                    | 5150.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for Restricted Lower Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 5.50           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5180.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 12             | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

| 4500.00 - 5250.00 MHz |               |                |               |         |                    |                  |          |        |         |                    |           |            |
|-----------------------|---------------|----------------|---------------|---------|--------------------|------------------|----------|--------|---------|--------------------|-----------|------------|
| Num                   | Frequency MHz | Raw dB $\mu$ V | Cable Loss dB | AF dB/m | Level dB $\mu$ V/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dB $\mu$ V/m | Margin dB | Pass /Fail |
| #1                    | 5148.50       | 35.75          | -2.61         | 34.21   | 67.35              | Max Peak         | Vertical | 150    | 303     | 68.2               | -0.9      | Pass       |
| #2                    | 5150.00       | 14.48          | -2.61         | 34.21   | 46.08              | Max Avg          | Vertical | 150    | 303     | 54.0               | -7.9      | Pass       |
| #3                    | 5150.00       | --             | --            | --      | --                 | Restricted-Band  | --       | --     | --      | --                 | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for Restricted Lower Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 5.50           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5190.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 10             | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

**4500.00 - 5250.00 MHz**

| Num | Frequency MHz | Raw dB $\mu$ V | Cable Loss dB | AF dB/m | Level dB $\mu$ V/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dB $\mu$ V/m | Margin dB | Pass /Fail |
|-----|---------------|----------------|---------------|---------|--------------------|------------------|----------|--------|---------|--------------------|-----------|------------|
| #1  | 5150.00       | 18.08          | -2.61         | 34.21   | 49.68              | Max Avg          | Vertical | 150    | 303     | 54.0               | -4.3      | Pass       |
| #2  | 5150.00       | 34.75          | -2.61         | 34.21   | 66.35              | Max Peak         | Vertical | 150    | 303     | 68.2               | -1.9      | Pass       |
| #3  | 5150.00       | --             | --            | --      | --                 | Restricted-Band  | --       | --     | --      | --                 | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for Restricted Lower Band-Edge Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5500.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 12             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

**5350.00 - 5500.00 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  | 5460.00       | 13.04    | -2.69         | 34.53   | 44.88        | Max Avg          | Vertical | 142    | 281     | 54.0         | -9.1      | Pass       |
| #3  | 5470.00       | 35.08    | -2.69         | 34.55   | 66.94        | Max Peak         | Vertical | 142    | 281     | 68.2         | -1.3      | Pass       |
| #2  | 5460.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| #4  | 5470.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

Note: click the links in the above matrix to view the graphical image (plot).

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**Equipment Configuration for Restricted Lower Band-Edge Emissions**

|                                 |                |                        |              |
|---------------------------------|----------------|------------------------|--------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11ac-80  |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM         |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99           |
| <b>Channel Frequency (MHz):</b> | 5530.00        | <b>Data Rate:</b>      | 29.30 MBit/s |
| <b>Power Setting:</b>           | 8              | <b>Tested By:</b>      | JMH          |

**Test Measurement Results**

| 5350.00 - 5500.00 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                    | 5460.00       | 18.92    | -2.69         | 34.53   | 50.76        | Max Avg          | Vertical | 142    | 281     | 54.0         | -3.2      | Pass       |
| #3                    | 5463.91       | 36.08    | -2.69         | 34.54   | 67.93        | Max Peak         | Vertical | 142    | 281     | 68.2         | -0.3      | Pass       |
| #2                    | 5460.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| #4                    | 5470.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for Restricted Lower Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5500.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 12             | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

| 5350.00 - 5500.00 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                    | 5460.00       | 13.04    | -2.69         | 34.53   | 44.88        | Max Avg          | Vertical | 142    | 281     | 54.0         | -9.1      | Pass       |
| #3                    | 5469.32       | 35.41    | -2.68         | 34.55   | 67.28        | Max Peak         | Vertical | 142    | 281     | 68.2         | -1.0      | Pass       |
| #2                    | 5460.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| #4                    | 5470.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for Restricted Lower Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5510.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 9              | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

**5350.00 - 5500.00 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  | 5460.00       | 14.92    | -2.69         | 34.53   | 46.76        | Max Avg          | Vertical | 142    | 281     | 54.0         | -7.2      | Pass       |
| #3  | 5470.00       | 35.77    | -2.69         | 34.55   | 67.63        | Max Peak         | Vertical | 142    | 281     | 68.2         | -0.6      | Pass       |
| #2  | 5460.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| #4  | 5470.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for Restricted Upper Band-Edge Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.50           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5320.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 13             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

**5300.00 - 5460.00 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  | 5350.00       | 13.95    | -2.69         | 34.46   | 45.72        | Max Avg          | Vertical | 137    | 280     | 54.0         | -8.3      | Pass       |
| #3  | 5351.28       | 35.92    | -2.62         | 34.46   | 67.76        | Max Peak         | Vertical | 137    | 280     | 68.2         | -0.5      | Pass       |
| #2  | 5350.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for Restricted Upper Band-Edge Emissions**

|                                 |                |                        |              |
|---------------------------------|----------------|------------------------|--------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11ac-80  |
| <b>Antenna Gain (dBi):</b>      | 5.50           | <b>Modulation:</b>     | OFDM         |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99           |
| <b>Channel Frequency (MHz):</b> | 5290.00        | <b>Data Rate:</b>      | 29.30 MBit/s |
| <b>Power Setting:</b>           | 12             | <b>Tested By:</b>      | JMH          |

**Test Measurement Results**

| 5300.00 - 5460.00 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                    | 5350.00       | 19.35    | -2.69         | 34.46   | 51.12        | Max Avg          | Vertical | 137    | 280     | 54.0         | -2.9      | Pass       |
| #3                    | 5352.89       | 35.34    | -2.69         | 34.47   | 67.12        | Max Peak         | Vertical | 137    | 280     | 68.2         | -1.1      | Pass       |
| #2                    | 5350.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for Restricted Upper Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5320.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 13             | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

| 5300.00 - 5460.00 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                    | 5350.00       | 14.19    | -2.69         | 34.46   | 45.96        | Max Avg          | Vertical | 137    | 280     | 54.0         | -8.0      | Pass       |
| #3                    | 5351.28       | 35.37    | -2.69         | 34.46   | 67.14        | Max Peak         | Vertical | 137    | 280     | 68.2         | -1.1      | Pass       |
| #2                    | 5350.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for Restricted Upper Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5310.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 12             | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

**5300.00 - 5460.00 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  | 5350.00       | 20.55    | -2.69         | 34.46   | 52.32        | Max Avg          | Vertical | 137    | 280     | 54.0         | -1.7      | Pass       |
| #3  | 5350.32       | 35.89    | -2.69         | 34.46   | 67.66        | Max Peak         | Vertical | 137    | 280     | 68.2         | -0.6      | Pass       |
| #2  | 5350.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5745.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

**5600.00 - 5780.00 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 |
|--------------------|---------------|----------|---------------|---------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| <a href="#">#1</a> | 5650.07       | 31.88    | -2.72         | 34.63   | 63.79        | Max Avg          | Vertical | 129    | 286     | 68.2         | -4.4      | Pass       |
| <a href="#">#2</a> | 5719.59       | 58.80    | -2.76         | 34.71   | 90.75        | Max Avg          | Vertical | 129    | 286     | 110.1        | -19.3     | Pass       |
| <a href="#">#3</a> | 5725.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions**

|                                 |                |                        |              |
|---------------------------------|----------------|------------------------|--------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11ac-80  |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM         |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99           |
| <b>Channel Frequency (MHz):</b> | 5775.00        | <b>Data Rate:</b>      | 29.30 MBit/s |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH          |

**Test Measurement Results**

**5600.00 - 5780.00 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 |
|--------------------|---------------|----------|---------------|---------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| <a href="#">#1</a> | 5624.10       | 34.28    | -2.73         | 34.64   | 66.19        | Max Avg          | Vertical | 129    | 286     | 68.2         | -2.0      | Pass       |
| <a href="#">#2</a> | 5686.21       | 45.55    | -2.77         | 34.67   | 77.45        | Max Avg          | Vertical | 129    | 286     | 94.8         | -17.4     | Pass       |
| <a href="#">#3</a> | 5725.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5745.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

**5600.00 - 5780.00 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 |
|--------------------|---------------|----------|---------------|---------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| <a href="#">#1</a> | 5650.43       | 31.97    | -2.72         | 34.63   | 63.88        | Max Avg          | Vertical | 129    | 286     | 68.2         | -4.4      | Pass       |
| <a href="#">#2</a> | 5720.00       | 57.15    | -2.76         | 34.71   | 89.10        | Max Avg          | Vertical | 129    | 286     | 110.2        | -21.1     | Pass       |
| <a href="#">#3</a> | 5725.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5755.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

**5600.00 - 5780.00 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  | 5643.22       | 32.34    | -2.72         | 34.63   | 64.25        | Max Avg          | Vertical | 129    | 286     | 68.2         | -4.0      | Pass       |
| #2  | 5714.90       | 54.11    | -2.78         | 34.71   | 86.04        | Max Avg          | Vertical | 129    | 286     | 109.4        | -23.4     | Pass       |
| #3  | 5725.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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**Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions**

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5825.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH         |

**Test Measurement Results**

**5770.00 - 6000.00 MHz**

| Num                | Frequency MHz | Raw dB $\mu$ V | Cable Loss dB | AF dB/m | Level dB $\mu$ V/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dB $\mu$ V/m | Margin dB | Pass /Fail |
|--------------------|---------------|----------------|---------------|---------|--------------------|------------------|----------|--------|---------|--------------------|-----------|------------|
| <a href="#">#2</a> | 5909.92       | 29.70          | -2.80         | 35.10   | 62.00              | Max Avg          | Vertical | 129    | 286     | 79.8               | -17.8     | Pass       |
| <a href="#">#3</a> | 5926.37       | 27.44          | -2.78         | 35.11   | 59.77              | Max Avg          | Vertical | 129    | 286     | 68.2               | -9.5      | Pass       |
| <a href="#">#1</a> | 5850.00       | --             | --            | --      | --                 | Band-Edge        | --       | --     | --      | --                 | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

Note: click the links in the above matrix to view the graphical image (plot).

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**To:** FCC CFR 47 15.407 ISSED RSS 247  
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**Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions**

|                                 |                |                        |              |
|---------------------------------|----------------|------------------------|--------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11ac-80  |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM         |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99           |
| <b>Channel Frequency (MHz):</b> | 5775.00        | <b>Data Rate:</b>      | 29.30 MBit/s |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH          |

**Test Measurement Results**

**5770.00 - 6000.00 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 |
|--------------------|---------------|----------|---------------|---------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| <a href="#">#2</a> | 5912.22       | 32.86    | -2.81         | 35.10   | 65.15        | Max Avg          | Vertical | 129    | 286     | 77.8         | -12.7     | Pass       |
| <a href="#">#3</a> | 5928.23       | 29.47    | -2.78         | 35.11   | 61.80        | Max Avg          | Vertical | 129    | 286     | 68.2         | -6.4      | Pass       |
| <a href="#">#1</a> | 5850.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

Note: click the links in the above matrix to view the graphical image (plot).

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**Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5825.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 18             | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

**5770.00 - 6000.00 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 |
|--------------------|---------------|----------|---------------|---------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| <a href="#">#2</a> | 5910.38       | 29.47    | -2.80         | 35.10   | 61.77        | Max Avg          | Vertical | 129    | 286     | 79.3         | -17.5     | Pass       |
| <a href="#">#3</a> | 5922.69       | 28.52    | -2.79         | 35.11   | 60.84        | Max Avg          | Vertical | 129    | 286     | 69.7         | -8.8      | Pass       |
| <a href="#">#1</a> | 5850.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

Note: click the links in the above matrix to view the graphical image (plot).

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**Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions**

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Pulse W3334    | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 5.5            | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5795.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 17             | <b>Tested By:</b>      | JMH           |

**Test Measurement Results**

**5770.00 - 6000.00 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 |
|--------------------|---------------|----------|---------------|---------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| <a href="#">#2</a> | 5917.29       | 30.98    | -2.81         | 35.11   | 63.28        | Max Avg          | Vertical | 129    | 286     | 73.5         | -10.2     | Pass       |
| <a href="#">#3</a> | 5924.99       | 31.17    | -2.79         | 35.11   | 63.49        | Max Avg          | Vertical | 129    | 286     | 68.2         | -4.7      | Pass       |
| <a href="#">#1</a> | 5850.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT connected to laptop via USB, separate USB power supply

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## **A. APPENDIX - GRAPHICAL IMAGES**

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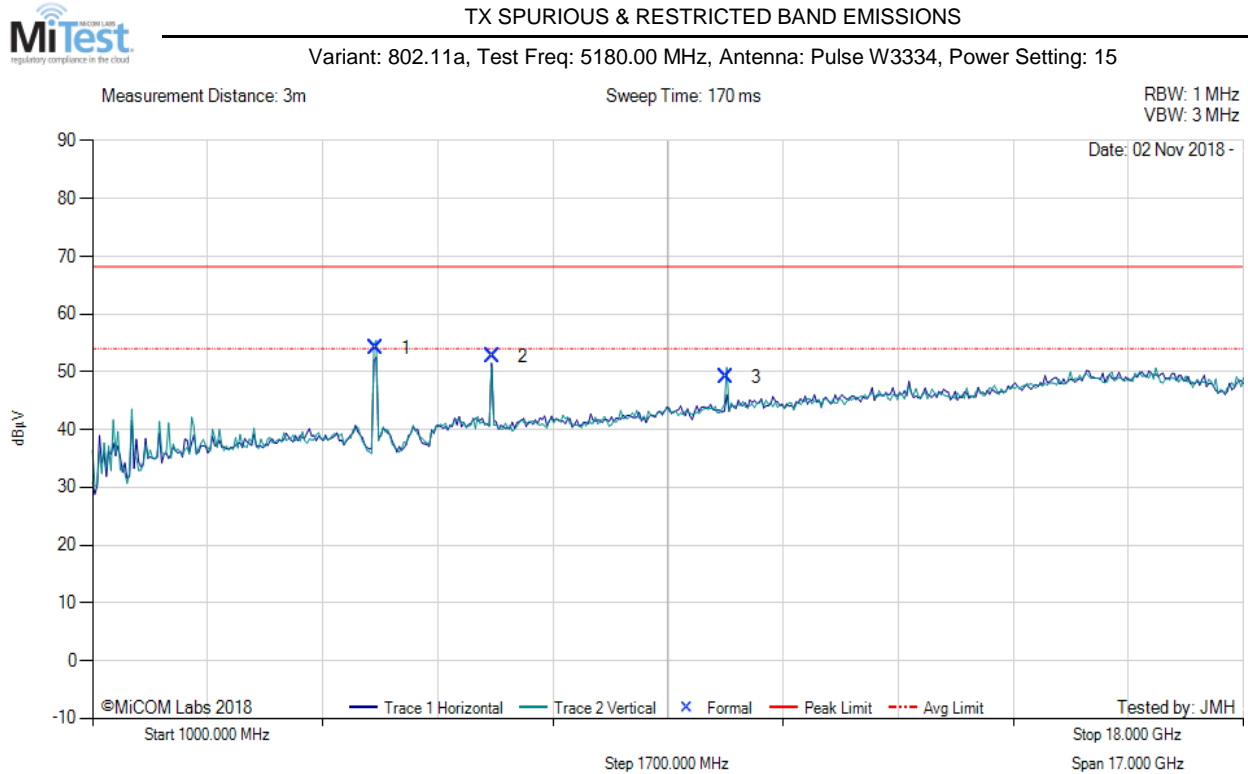
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## A.1. Radiated

### A.1.1. TX Spurious & Restricted Band Emissions

#### A.1.1.1. Pulse W3334



| 1000.00 - 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                      | 5177.54       | 68.73    | -2.65         | -11.95  | 54.13        | Fundamental      | Vertical   | 151    | 232     | --           | --        |            |
| 2                      | 6906.61       | 63.74    | -3.02         | -8.05   | 52.67        | Peak (NRB)       | Horizontal | 151    | 360     | --           | --        | Pass       |
| 3                      | 10359.97      | 58.60    | -3.86         | -5.61   | 49.13        | Peak (NRB)       | Vertical   | 151    | 146     | --           | --        | Pass       |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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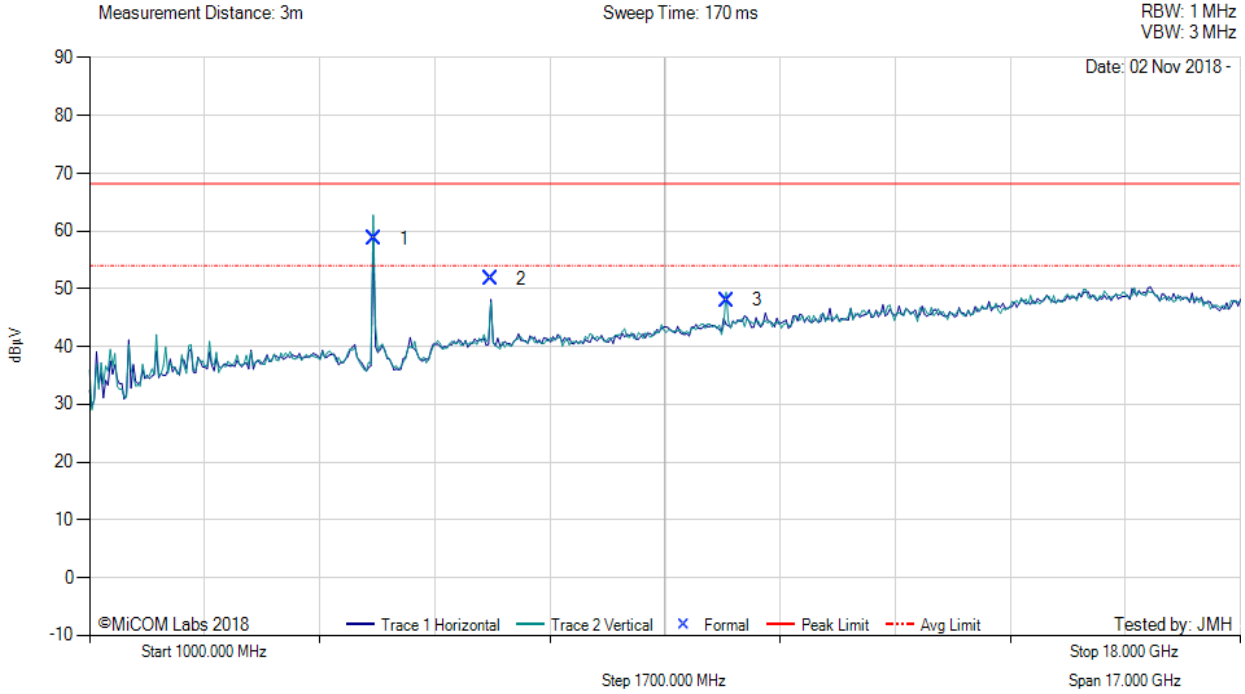


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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variant: 802.11a, Test Freq: 5200.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 1000.00 - 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                      | 5202.01       | 73.26    | -2.63         | -11.93  | 58.70        | Fundamental      | Vertical   | 151    | 0       | --           | --        |            |
| 2                      | 6933.33       | 62.71    | -3.00         | -7.96   | 51.75        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 3                      | 10407.55      | 57.76    | -3.90         | -5.85   | 48.01        | Peak (NRB)       | Vertical   | 100    | 164     | --           | --        | Pass       |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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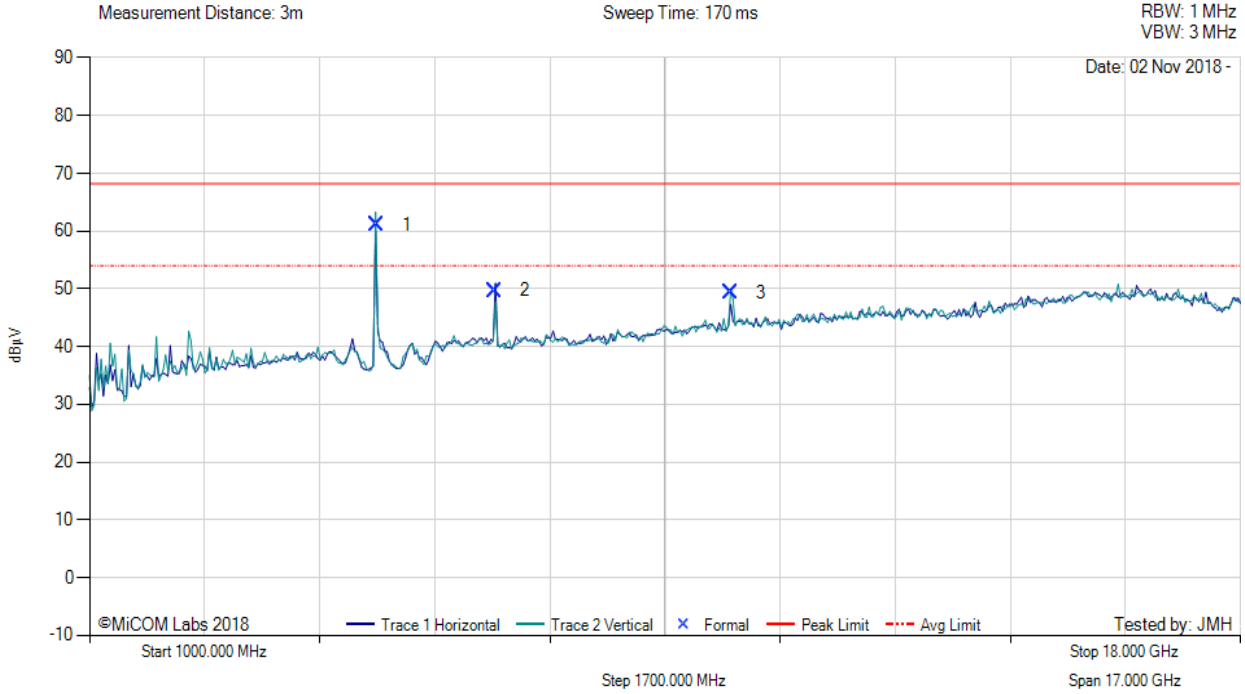


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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variant: 802.11a, Test Freq: 5240.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 1000.00 - 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                      | 5235.97       | 75.92    | -2.62         | -12.30  | 61.00        | Fundamental      | Vertical   | 151    | 0       | --           | --        |            |
| 2                      | 6986.62       | 60.53    | -3.06         | -7.74   | 49.73        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| 3                      | 10475.51      | 59.48    | -3.81         | -6.27   | 49.40        | Peak (NRB)       | Vertical   | 200    | 0       | --           | --        | Pass       |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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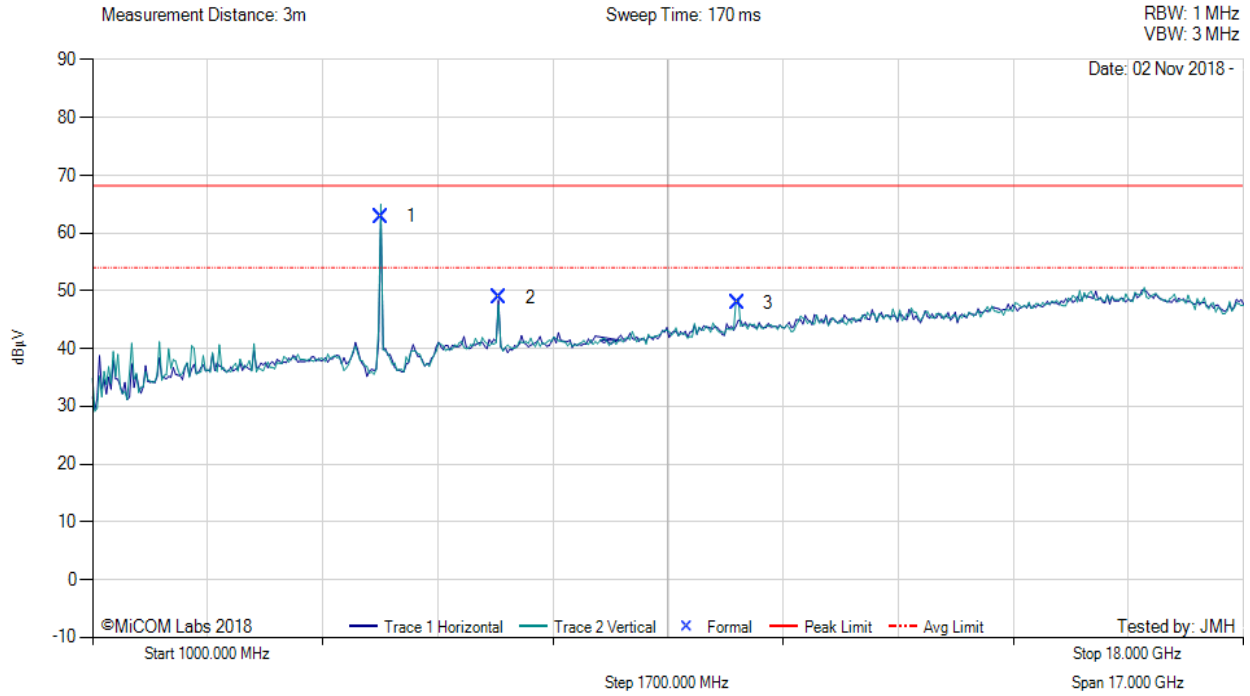


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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variat: 802.11a, Test Freq: 5260.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 1000.00 - 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                      | 5263.20       | 77.57    | -2.63         | -12.08  | 62.86        | Fundamental      | Vertical   | 151    | 0       | --           | --        |            |
| 2                      | 7013.39       | 59.70    | -3.04         | -7.77   | 48.89        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| 3                      | 10521.12      | 58.04    | -3.99         | -6.09   | 47.96        | Peak (NRB)       | Vertical   | 151    | 0       | --           | --        | Pass       |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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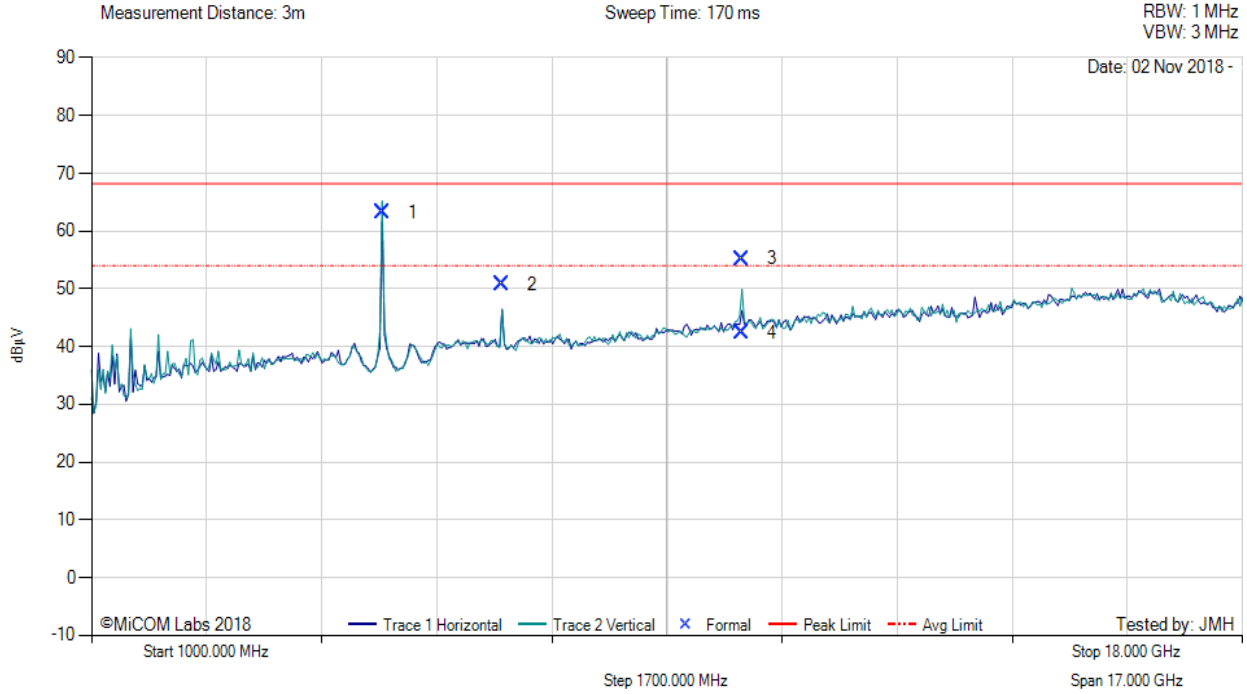


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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variat: 802.11a, Test Freq: 5300.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 1000.00 - 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                      | 5295.95       | 77.93    | -2.66         | -12.12  | 63.15        | Fundamental      | Vertical   | 100    | 0       | --           | --        |            |
| 2                      | 7066.55       | 61.26    | -3.01         | -7.52   | 50.73        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 3                      | 10600.10      | 64.50    | -3.83         | -5.44   | 55.23        | Max Peak         | Vertical   | 131    | 240     | 68.2         | -13.0     | Pass       |
| 4                      | 10600.10      | 51.65    | -3.83         | -5.44   | 42.38        | Max Avg          | Vertical   | 131    | 240     | 54.0         | -11.6     | Pass       |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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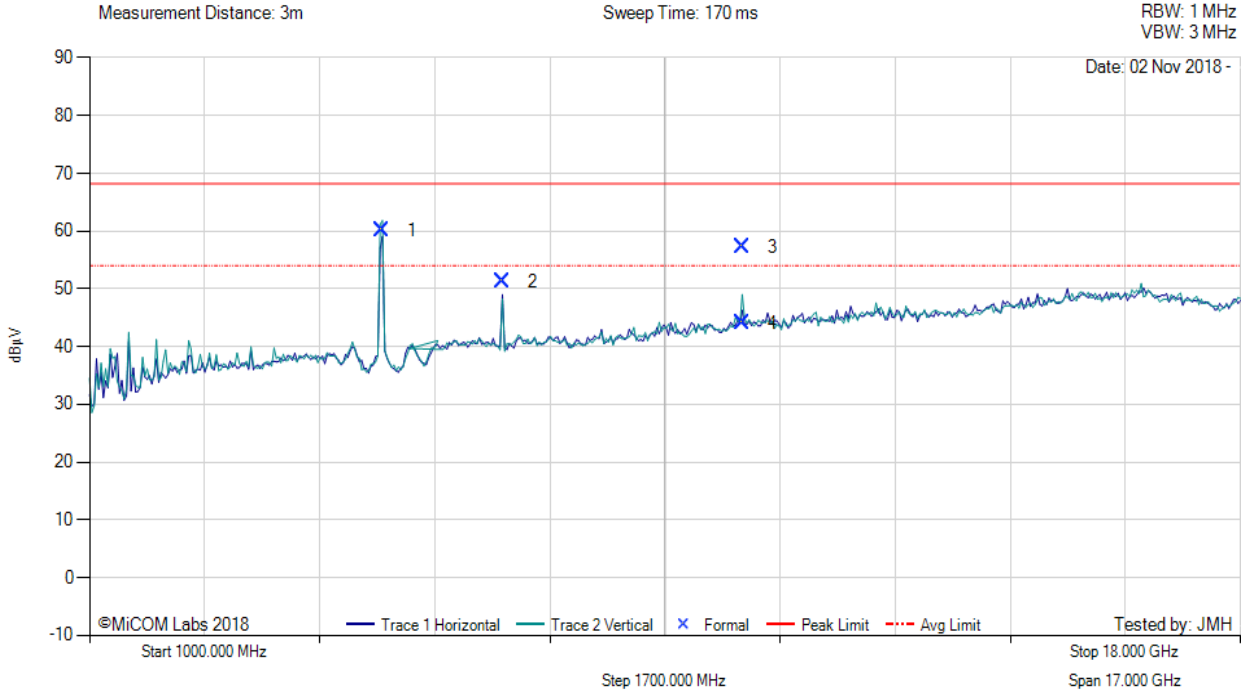


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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variat: 802.11a, Test Freq: 5320.00 MHz, Antenna: Pulse W3334, Power Setting: 15



| 1000.00 - 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                      | 5315.80       | 74.89    | -2.67         | -12.14  | 60.08        | Fundamental      | Vertical   | 100    | 0       | --           | --        |            |
| 2                      | 7093.40       | 61.88    | -3.01         | -7.62   | 51.25        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 3                      | 10640.12      | 66.50    | -4.21         | -5.00   | 57.29        | Max Peak         | Vertical   | 116    | 38      | 68.2         | -10.9     | Pass       |
| 4                      | 10640.12      | 53.27    | -4.21         | -5.00   | 44.06        | Max Avg          | Vertical   | 116    | 38      | 54.0         | -9.9      | Pass       |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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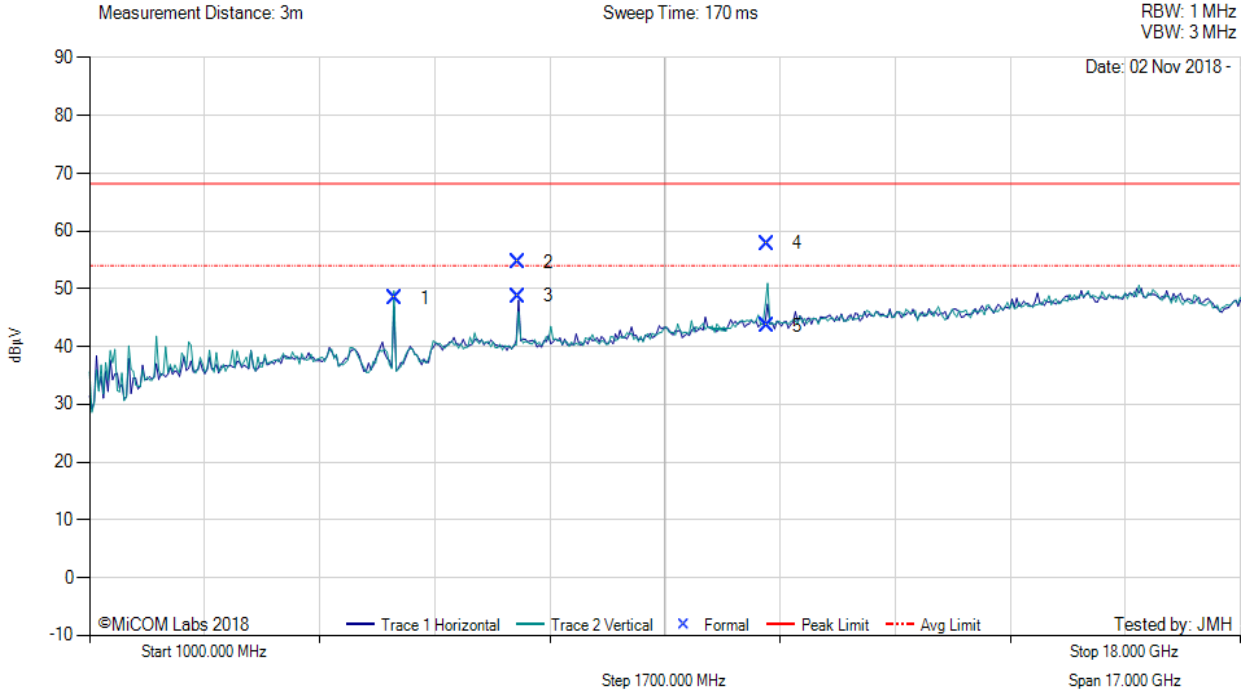


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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: Pulse W3334, Power Setting: 15



| 1000.00 - 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                      | 5503.49       | 62.75    | -2.70         | -11.61  | 48.44        | Fundamental      | Vertical   | 100    | 181     | --           | --        |            |
| 2                      | 7333.32       | 65.56    | -3.00         | -7.90   | 54.66        | Max Peak         | Horizontal | 101    | 345     | 68.2         | -13.6     | Pass       |
| 3                      | 7333.32       | 59.65    | -3.00         | -7.90   | 48.75        | Max Avg          | Horizontal | 101    | 345     | 54.0         | -5.3      | Pass       |
| 4                      | 11002.02      | 68.06    | -3.92         | -6.27   | 57.87        | Max Peak         | Vertical   | 115    | 117     | 68.2         | -10.4     | Pass       |
| 5                      | 11002.02      | 53.80    | -3.92         | -6.27   | 43.61        | Max Avg          | Vertical   | 115    | 117     | 54.0         | -10.4     | Pass       |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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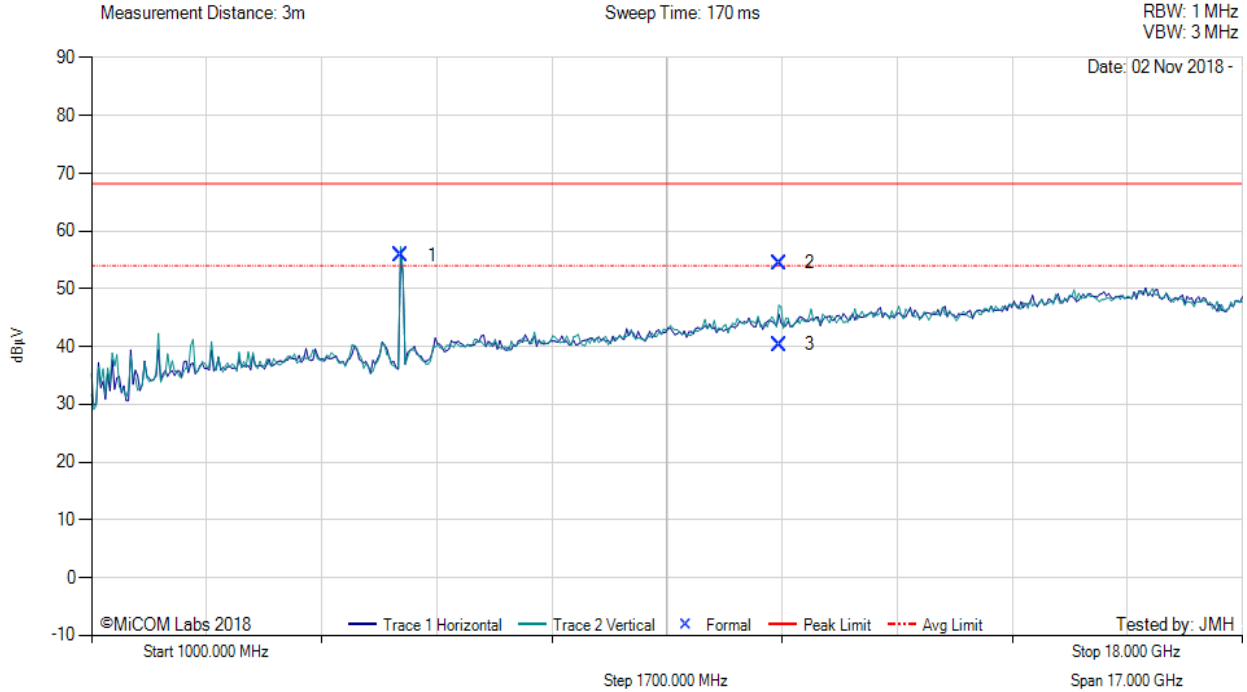


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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variant: 802.11a, Test Freq: 5580.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 1000.00 - 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                      | 5575.55       | 70.08    | -2.75         | -11.50  | 55.83        | Fundamental      | Vertical | 100    | 0       | --           | --        |            |
| 2                      | 11152.29      | 63.28    | -4.04         | -4.73   | 54.51        | Max Peak         | Vertical | 118    | 116     | 68.2         | -13.7     | Pass       |
| 3                      | 11152.29      | 49.11    | -4.04         | -4.73   | 40.34        | Max Avg          | Vertical | 118    | 116     | 54.0         | -13.7     | Pass       |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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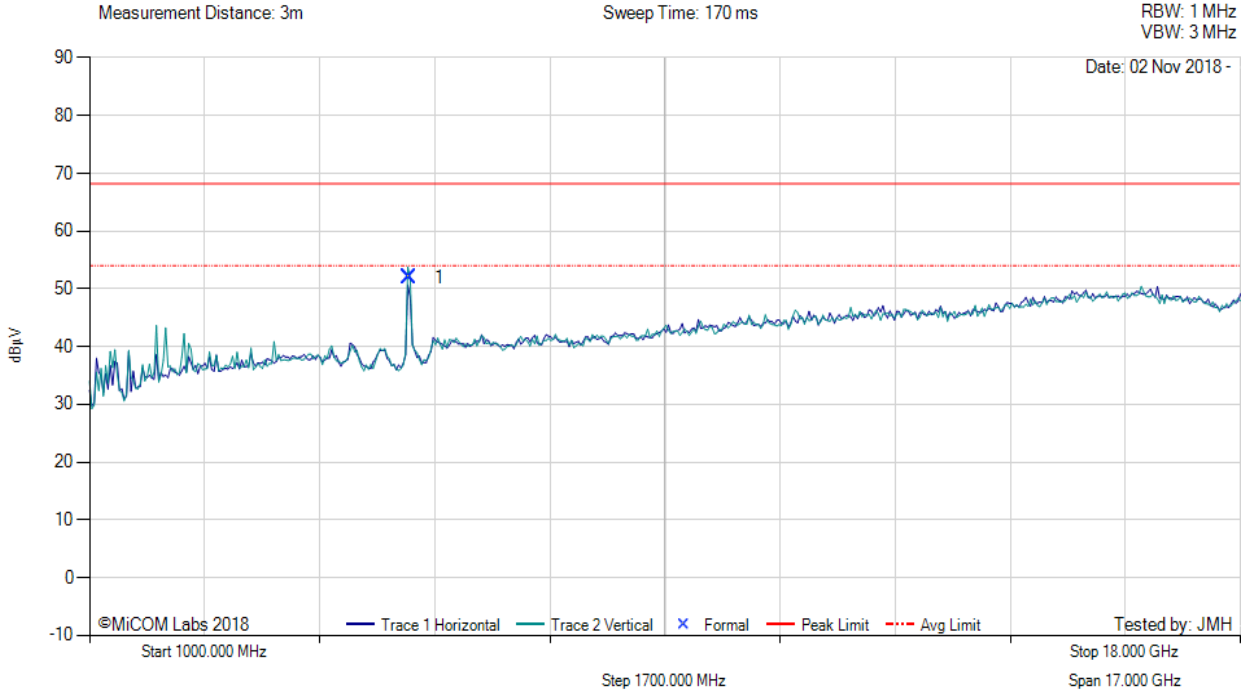


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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variant: 802.11a, Test Freq: 5720.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 1000.00 - 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                      | 5716.17       | 65.76    | -2.77         | -11.01  | 51.98        | Fundamental      | Vertical | 100    | 0       | --           | --        |            |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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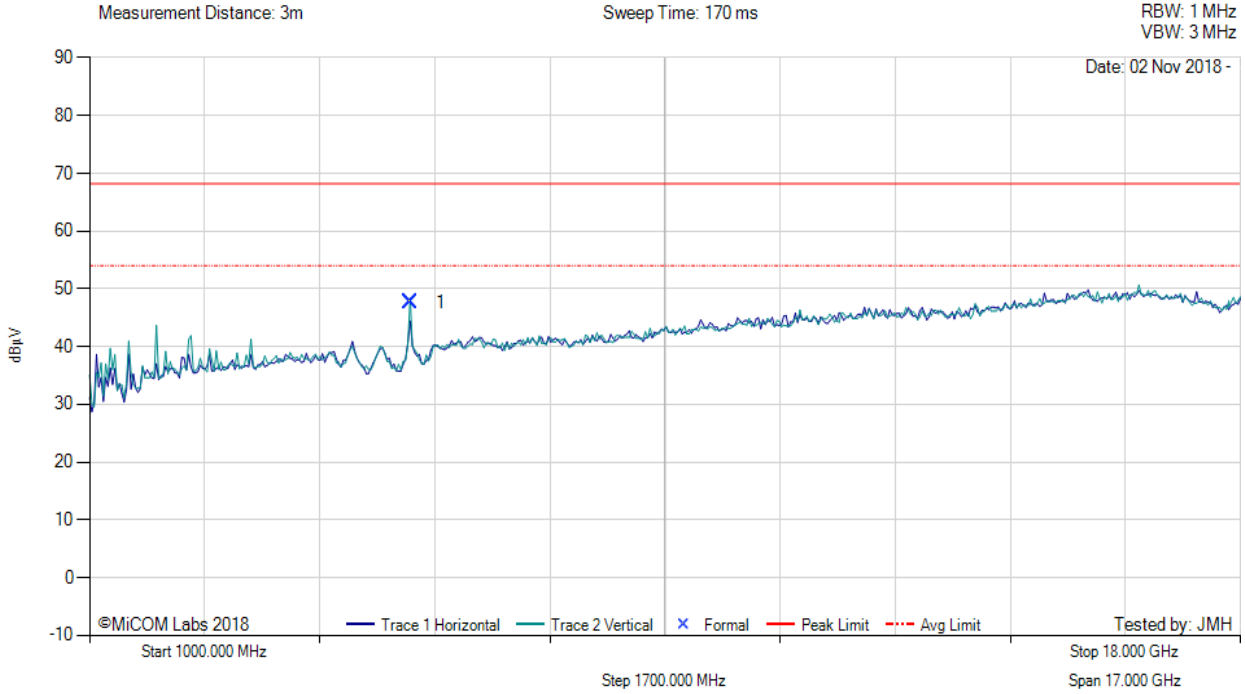


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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variant: 802.11a, Test Freq: 5745.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 1000.00 - 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                      | 5739.82       | 61.44    | -2.75         | -10.98  | 47.71        | Fundamental      | Vertical | 150    | 5       | --           | --        |            |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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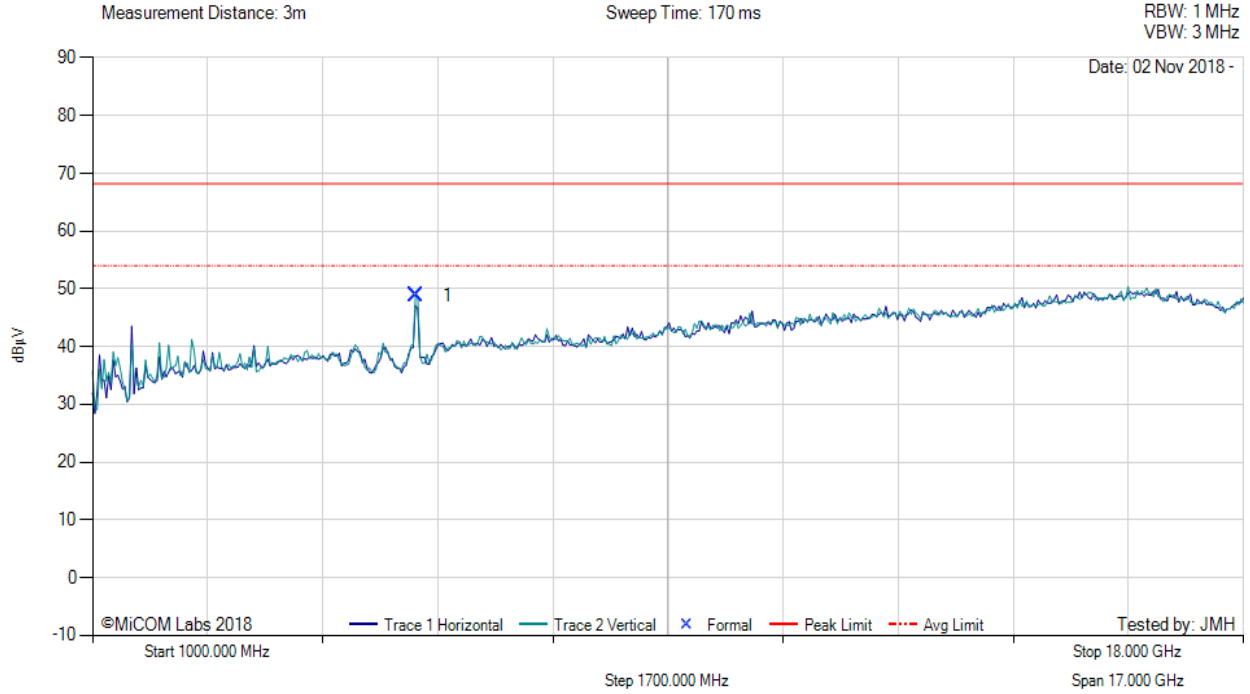


**Title:** Digi International ConnectCore i.MX6UL  
**To:** FCC CFR 47 15.407 ISED RSS 247  
**Serial #:** DIGI79-U2 Rev A  
**Issue Date:** 14th December 2018  
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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variant: 802.11a, Test Freq: 5785.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 1000.00 - 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                      | 5786.35       | 62.33    | -2.75         | -10.78  | 48.80        | Fundamental      | Vertical | 151    | 0       | --           | --        |            |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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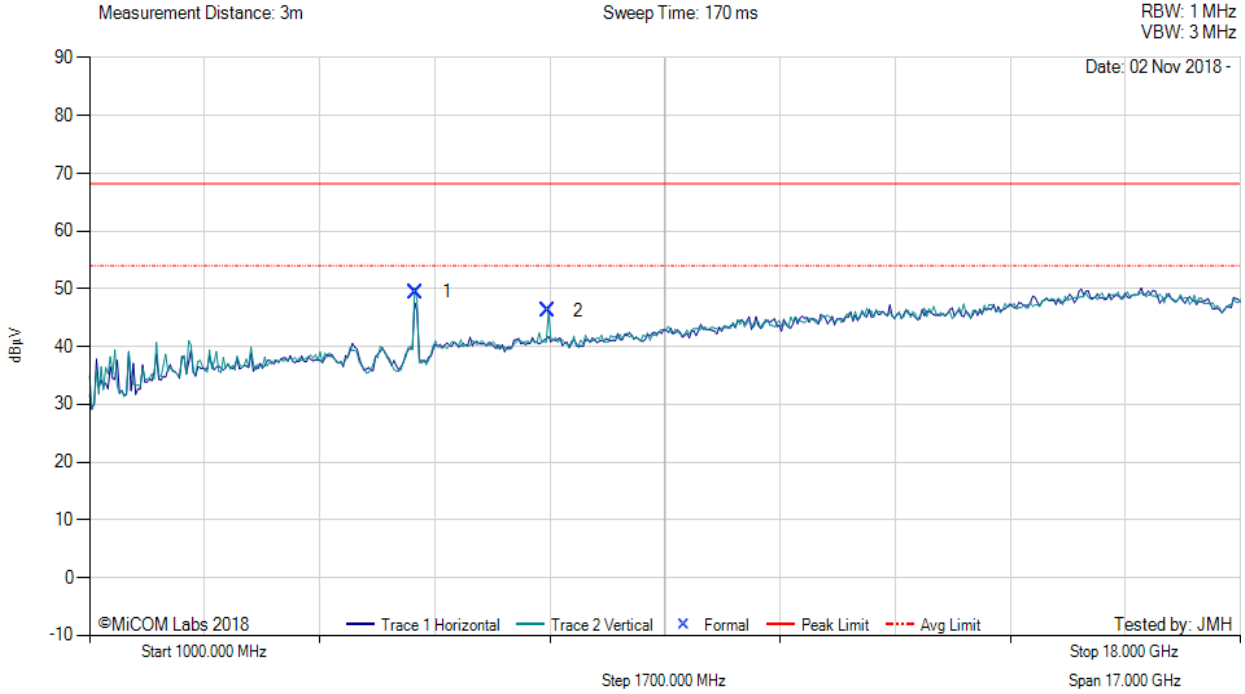


**Title:** Digi International ConnectCore i.MX6UL  
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**TX SPURIOUS & RESTRICTED BAND EMISSIONS**

Variant: 802.11a, Test Freq: 5825.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 1000.00 - 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                      | 5824.05       | 63.06    | -2.81         | -10.77  | 49.48        | Fundamental      | Vertical | 100    | 0       | --           | --        |            |
| 2                      | 7766.61       | 56.36    | -3.00         | -7.17   | 46.19        | Peak (NRB)       | Vertical | 100    | 281     | --           | --        | Pass       |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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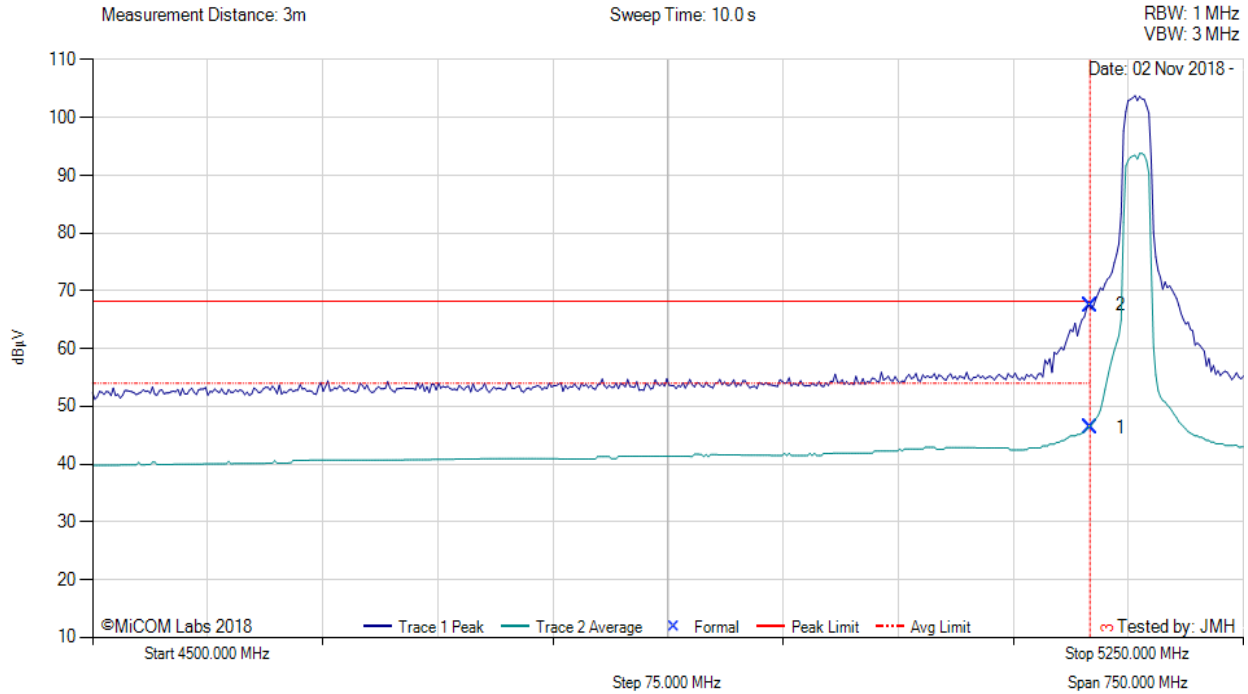
**A.1.2. Restricted Edge & Band-Edge Emissions**

**A.1.2.2. Pulse W3334**



**RESTRICTED LOWER BAND-EDGE EMISSIONS**

Variant: 802.11a, Test Freq: 5180.00 MHz, Antenna: Pulse W3334, Power Setting: 12



| 4500.00 - 5250.00 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                     | 5150.00       | 14.70    | -2.61         | 34.21   | 46.30        | Max Avg          | Vertical | 150    | 303     | 54.0         | -7.7      | Pass       |
| 2                     | 5150.00       | 35.92    | -2.61         | 34.21   | 67.52        | Max Peak         | Vertical | 150    | 303     | 68.2         | -0.7      | Pass       |
| 3                     | 5150.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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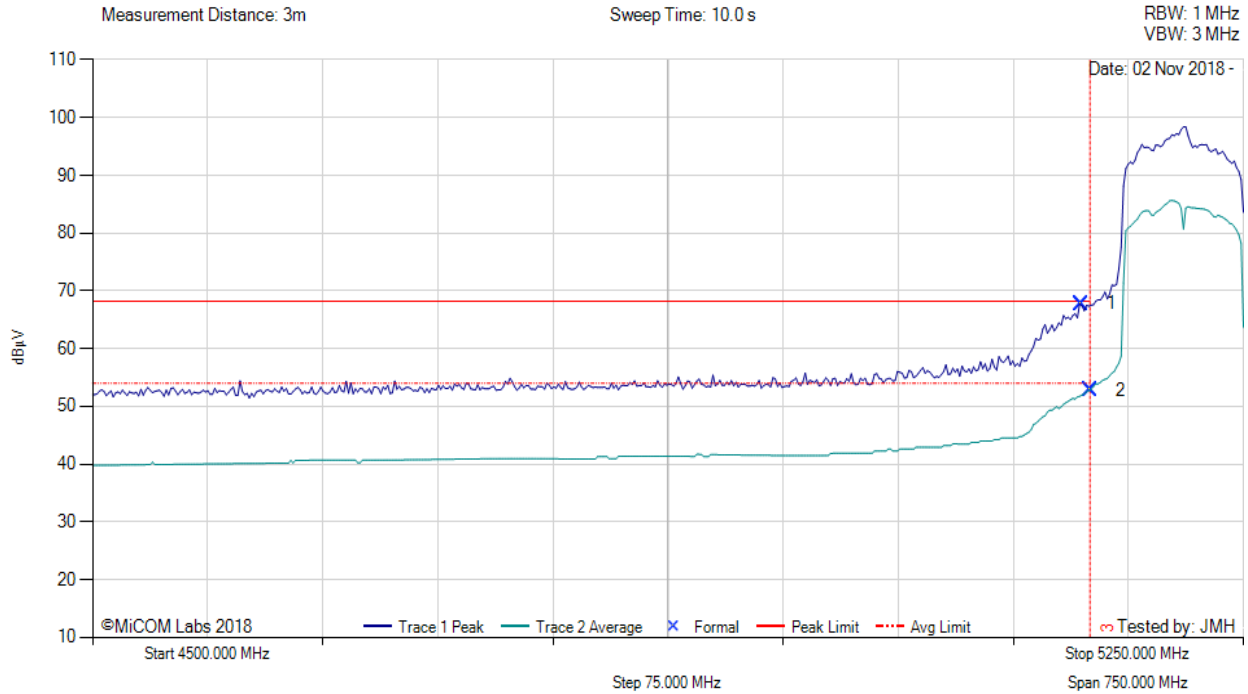


**Title:** Digi International ConnectCore i.MX6UL  
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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5210.00 MHz, Antenna: Pulse W3334, Power Setting: 10



| 4500.00 - 5250.00 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                     | 5143.99       | 36.17    | -2.62         | 34.20   | 67.75        | Max Peak         | Vertical | 150    | 303     | 68.2         | -0.5      | Pass       |
| 2                     | 5150.00       | 21.15    | -2.61         | 34.21   | 52.75        | Max Avg          | Vertical | 150    | 303     | 54.0         | -1.3      | Pass       |
| 3                     | 5150.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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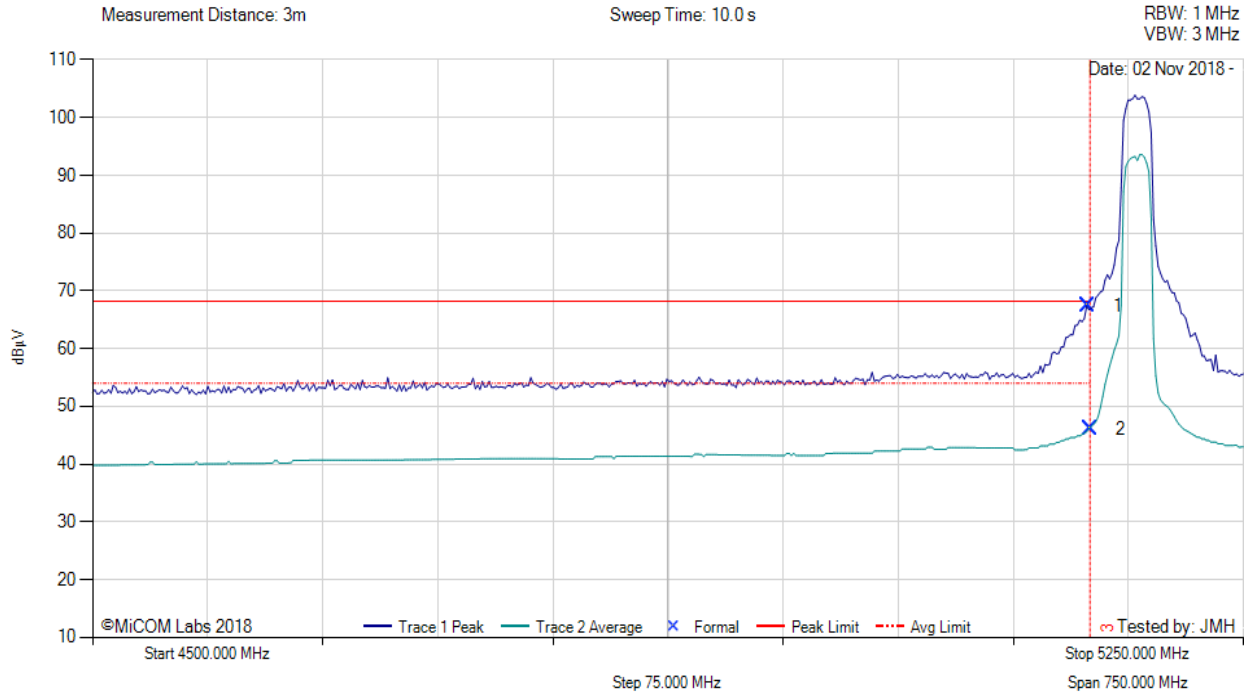


**Title:** Digi International ConnectCore i.MX6UL  
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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5180.00 MHz, Antenna: Pulse W3334, Power Setting: 12



| 4500.00 - 5250.00 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                     | 5148.50       | 35.75    | -2.61         | 34.21   | 67.35        | Max Peak         | Vertical | 150    | 303     | 68.2         | -0.9      | Pass       |
| 2                     | 5150.00       | 14.48    | -2.61         | 34.21   | 46.08        | Max Avg          | Vertical | 150    | 303     | 54.0         | -7.9      | Pass       |
| 3                     | 5150.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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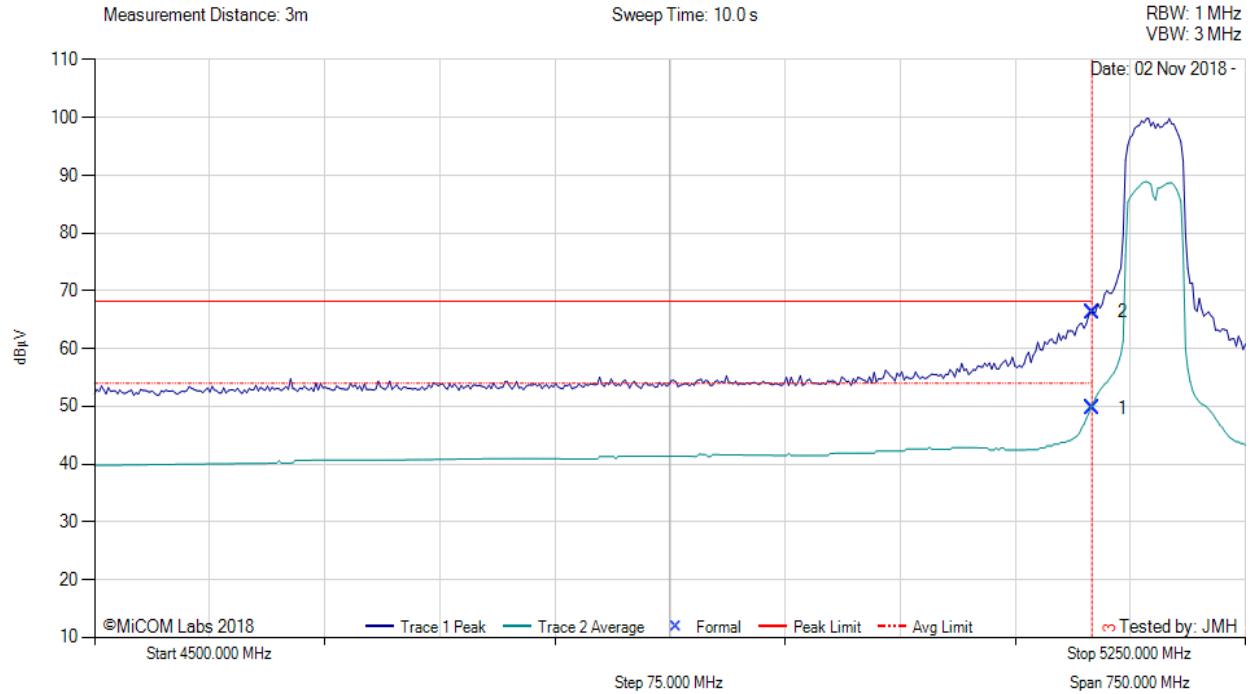


**Title:** Digi International ConnectCore i.MX6UL  
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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5190.00 MHz, Antenna: Pulse W3334, Power Setting: 10



| 4500.00 - 5250.00 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                     | 5150.00       | 18.08    | -2.61         | 34.21   | 49.68        | Max Avg          | Vertical | 150    | 303     | 54.0         | -4.3      | Pass       |
| 2                     | 5150.00       | 34.75    | -2.61         | 34.21   | 66.35        | Max Peak         | Vertical | 150    | 303     | 68.2         | -1.9      | Pass       |
| 3                     | 5150.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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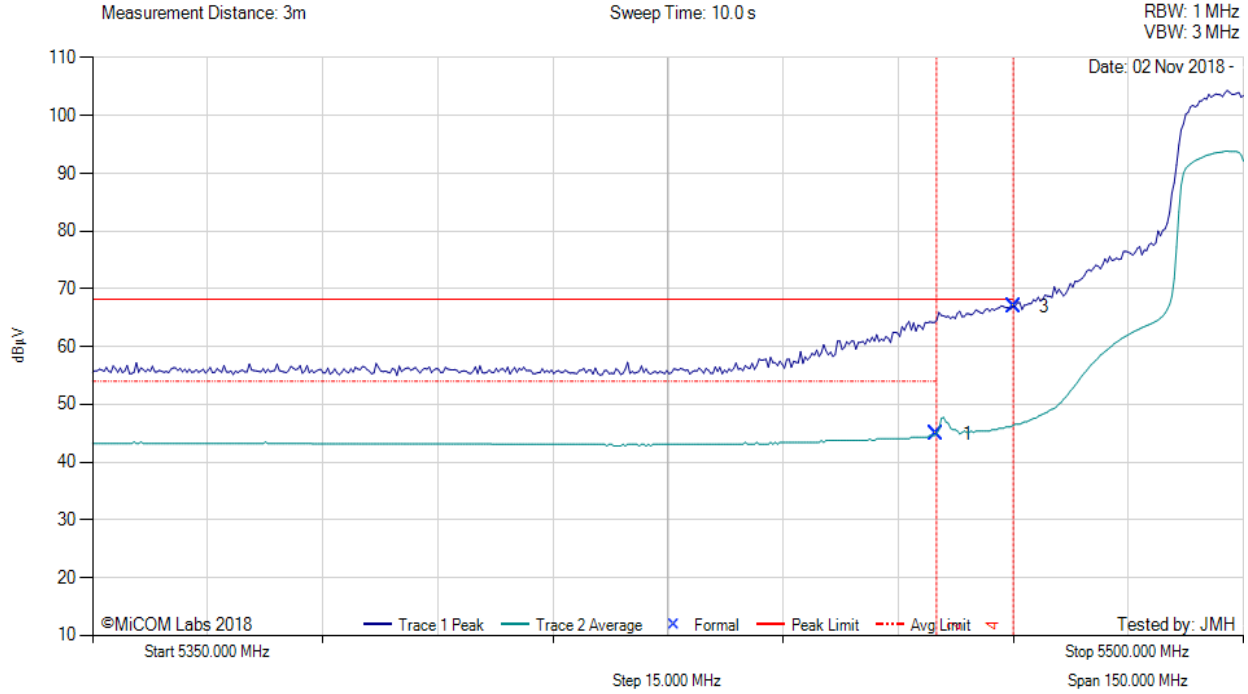


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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: Pulse W3334, Power Setting: 12



| 5350.00 - 5500.00 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                     | 5460.00       | 13.04    | -2.69         | 34.53   | 44.88        | Max Avg          | Vertical | 142    | 281     | 54.0         | -9.1      | Pass       |
| 3                     | 5470.00       | 35.08    | -2.69         | 34.55   | 66.94        | Max Peak         | Vertical | 142    | 281     | 68.2         | -1.3      | Pass       |
| 2                     | 5460.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| 4                     | 5470.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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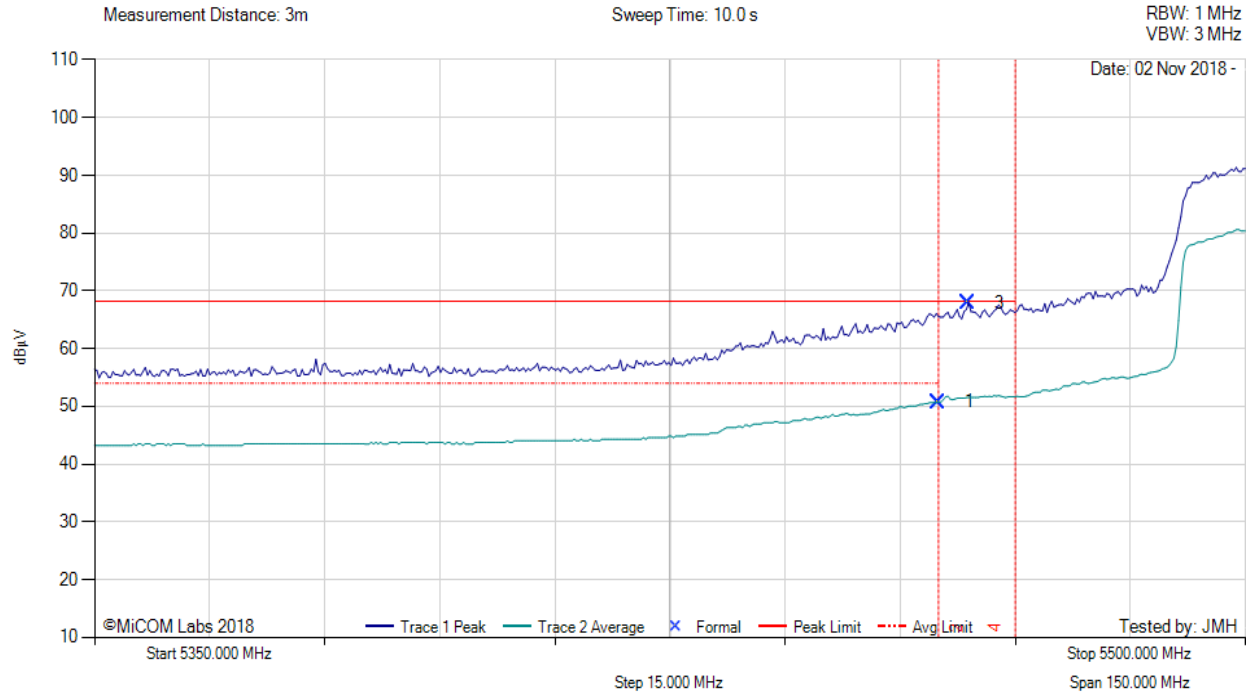


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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5530.00 MHz, Antenna: Pulse W3334, Power Setting: 8



| 5350.00 - 5500.00 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                     | 5460.00       | 18.92    | -2.69         | 34.53   | 50.76        | Max Avg          | Vertical | 142    | 281     | 54.0         | -3.2      | Pass       |
| 3                     | 5463.91       | 36.08    | -2.69         | 34.54   | 67.93        | Max Peak         | Vertical | 142    | 281     | 68.2         | -0.3      | Pass       |
| 2                     | 5460.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| 4                     | 5470.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

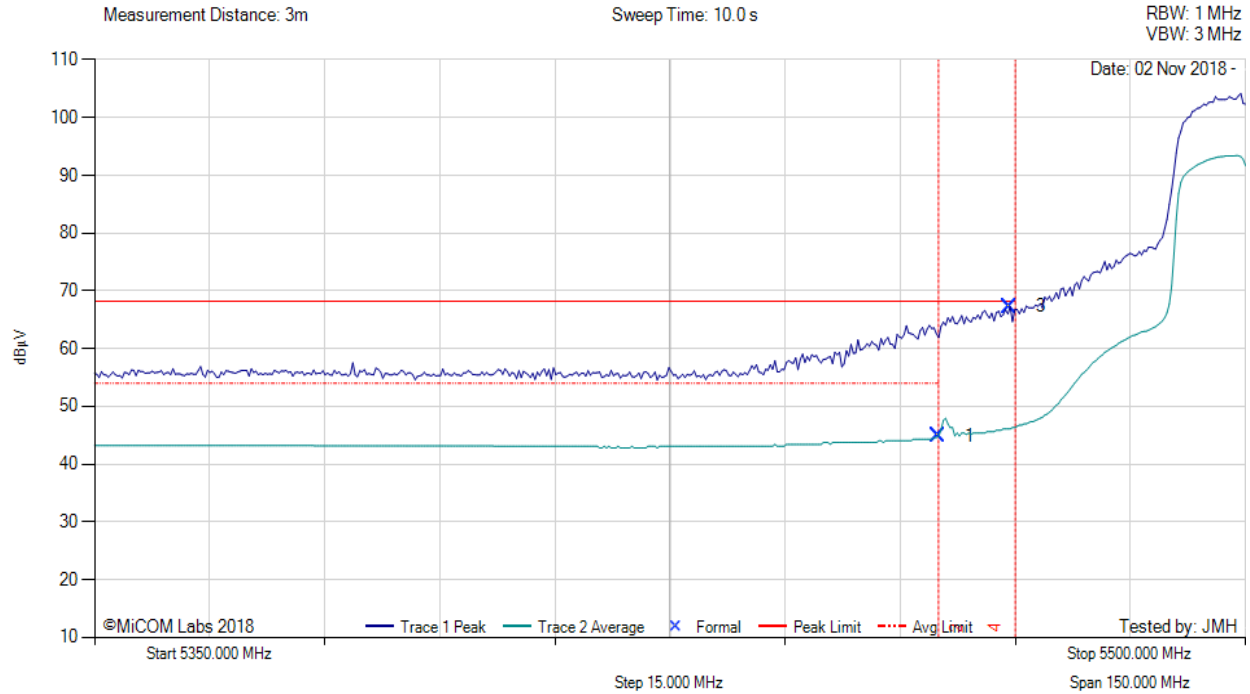
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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5500.00 MHz, Antenna: Pulse W3334, Power Setting: 12



| 5350.00 - 5500.00 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                     | 5460.00       | 13.04    | -2.69         | 34.53   | 44.88        | Max Avg          | Vertical | 142    | 281     | 54.0         | -9.1      | Pass       |
| 3                     | 5469.32       | 35.41    | -2.68         | 34.55   | 67.28        | Max Peak         | Vertical | 142    | 281     | 68.2         | -1.0      | Pass       |
| 2                     | 5460.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| 4                     | 5470.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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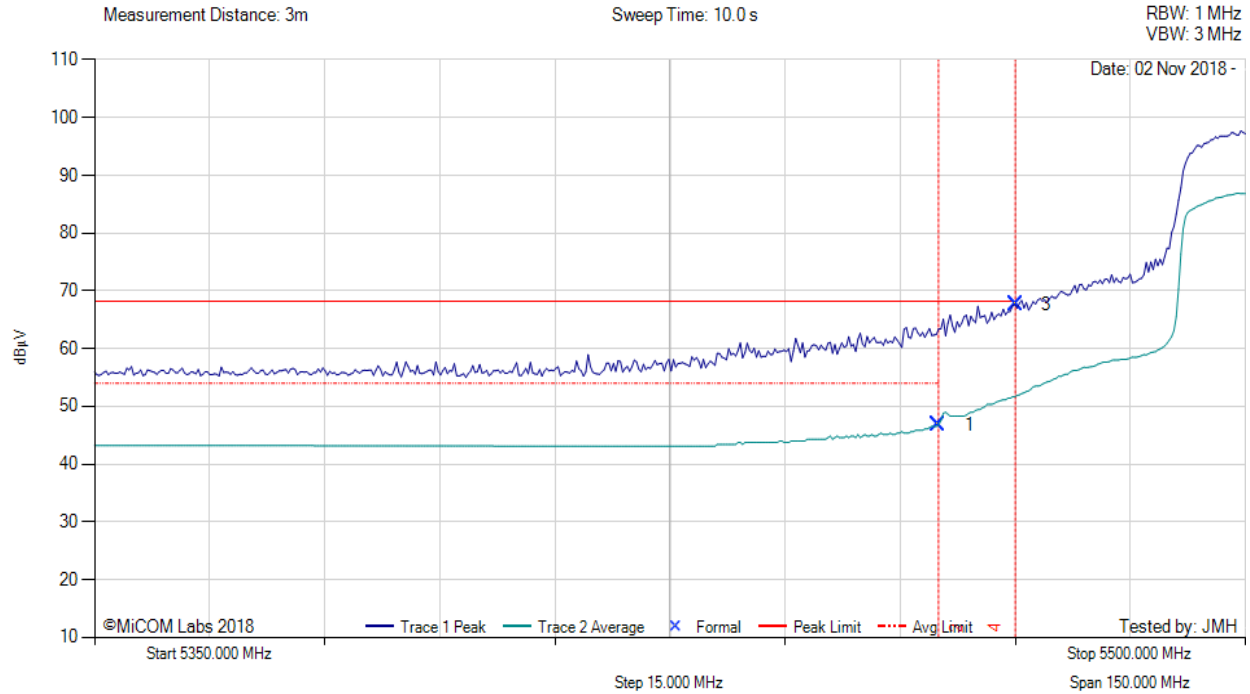


**Title:** Digi International ConnectCore i.MX6UL  
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RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5510.00 MHz, Antenna: Pulse W3334, Power Setting: 9



| 5350.00 - 5500.00 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                     | 5460.00       | 14.92    | -2.69         | 34.53   | 46.76        | Max Avg          | Vertical | 142    | 281     | 54.0         | -7.2      | Pass       |
| 3                     | 5470.00       | 35.77    | -2.69         | 34.55   | 67.63        | Max Peak         | Vertical | 142    | 281     | 68.2         | -0.6      | Pass       |
| 2                     | 5460.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| 4                     | 5470.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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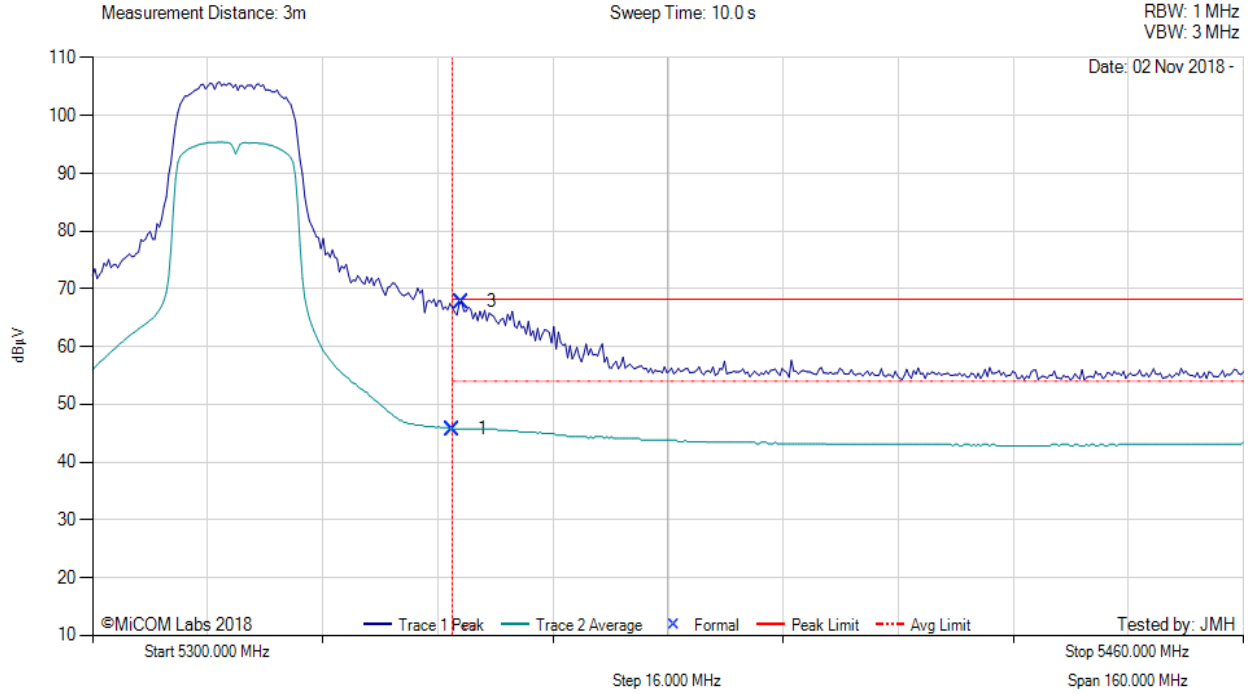


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RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5320.00 MHz, Antenna: Pulse W3334, Power Setting: 13



| 5300.00 - 5460.00 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                     | 5350.00       | 13.95    | -2.69         | 34.46   | 45.72        | Max Avg          | Vertical | 137    | 280     | 54.0         | -8.3      | Pass       |
| 3                     | 5351.28       | 35.92    | -2.62         | 34.46   | 67.76        | Max Peak         | Vertical | 137    | 280     | 68.2         | -0.5      | Pass       |
| 2                     | 5350.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

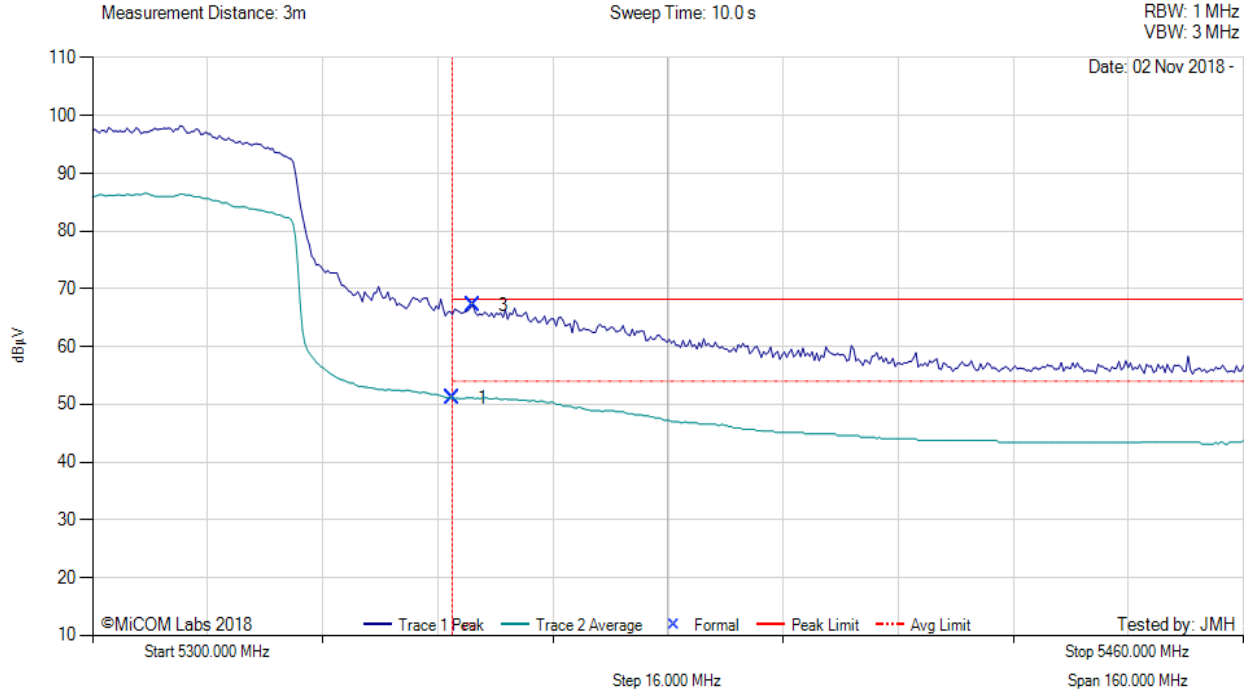
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RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5290.00 MHz, Antenna: Pulse W3334, Power Setting: 12



| 5300.00 - 5460.00 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                     | 5350.00       | 19.35    | -2.69         | 34.46   | 51.12        | Max Avg          | Vertical | 137    | 280     | 54.0         | -2.9      | Pass       |
| 3                     | 5352.89       | 35.34    | -2.69         | 34.47   | 67.12        | Max Peak         | Vertical | 137    | 280     | 68.2         | -1.1      | Pass       |
| 2                     | 5350.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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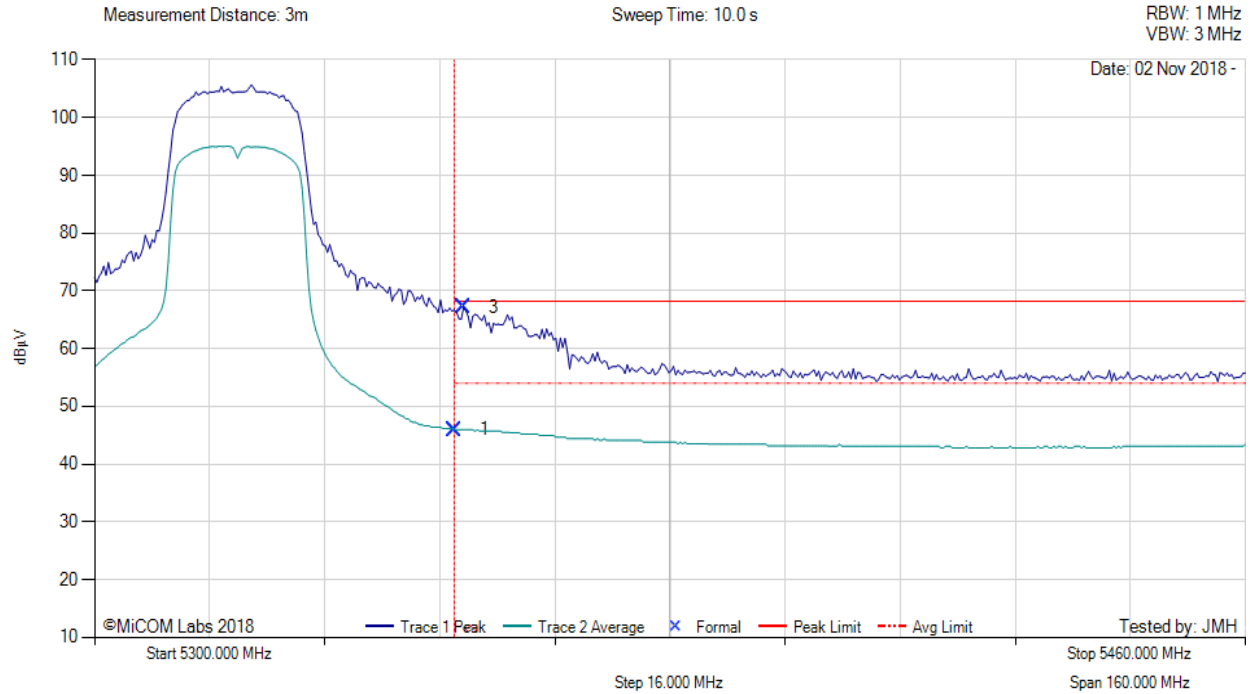
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RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5320.00 MHz, Antenna: Pulse W3334, Power Setting: 13



| 5300.00 - 5460.00 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                     | 5350.00       | 14.19    | -2.69         | 34.46   | 45.96        | Max Avg          | Vertical | 137    | 280     | 54.0         | -8.0      | Pass       |
| 3                     | 5351.28       | 35.37    | -2.69         | 34.46   | 67.14        | Max Peak         | Vertical | 137    | 280     | 68.2         | -1.1      | Pass       |
| 2                     | 5350.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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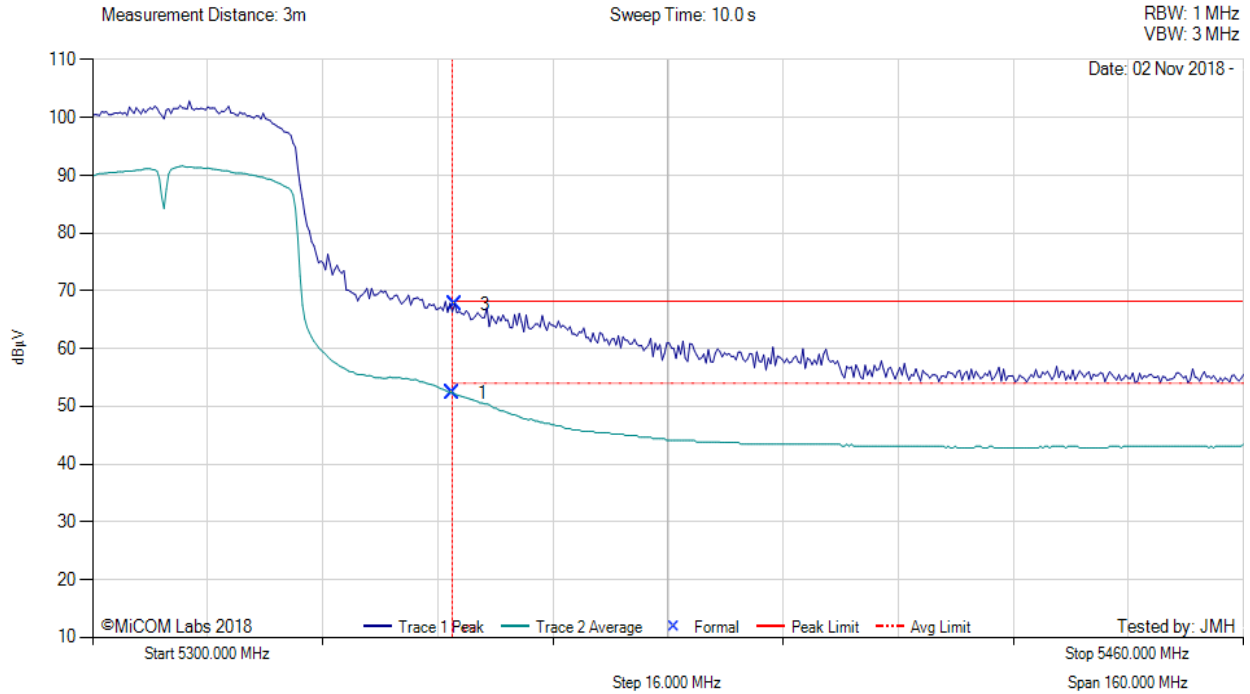


**Title:** Digi International ConnectCore i.MX6UL  
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RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5310.00 MHz, Antenna: Pulse W3334, Power Setting: 12



| 5300.00 - 5460.00 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                     | 5350.00       | 20.55    | -2.69         | 34.46   | 52.32        | Max Avg          | Vertical | 137    | 280     | 54.0         | -1.7      | Pass       |
| 3                     | 5350.32       | 35.89    | -2.69         | 34.46   | 67.66        | Max Peak         | Vertical | 137    | 280     | 68.2         | -0.6      | Pass       |
| 2                     | 5350.00       | --       | --            | --      | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

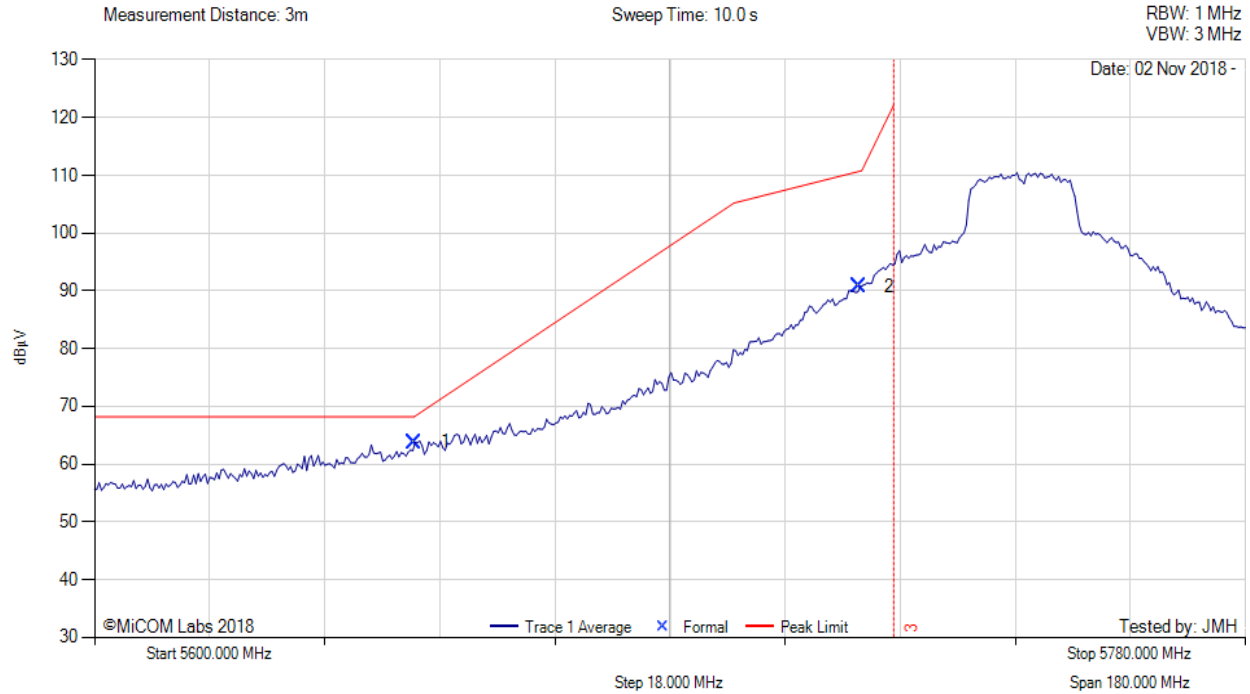
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5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5745.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 5600.00 - 5780.00 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                     | 5650.07       | 31.88    | -2.72         | 34.63   | 63.79        | Max Avg          | Vertical | 129    | 286     | 68.2         | -4.4      | Pass       |
| 2                     | 5719.59       | 58.80    | -2.76         | 34.71   | 90.75        | Max Avg          | Vertical | 129    | 286     | 110.1        | -19.3     | Pass       |
| 3                     | 5725.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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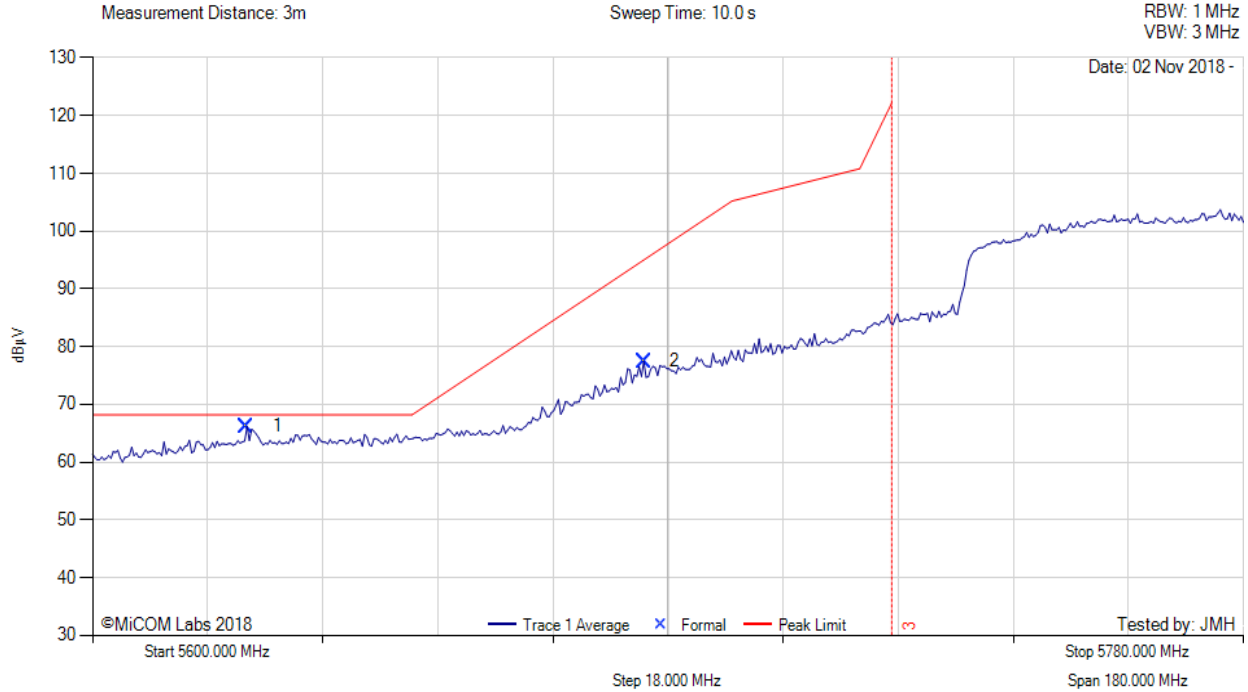


**Title:** Digi International ConnectCore i.MX6UL  
**To:** FCC CFR 47 15.407 ISSED RSS 247  
**Serial #:** DIGI79-U2 Rev A  
**Issue Date:** 14th December 2018  
**Page:** 84 of 91



5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11ac-80, Test Freq: 5775.00 MHz, Antenna: Pulse W3334, Power Setting: 16



| 5600.00 - 5780.00 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                     | 5624.10       | 34.28    | -2.73         | 34.64   | 66.19        | Max Avg          | Vertical | 129    | 286     | 68.2         | -2.0      | Pass       |
| 2                     | 5686.21       | 45.55    | -2.77         | 34.67   | 77.45        | Max Avg          | Vertical | 129    | 286     | 94.8         | -17.4     | Pass       |
| 3                     | 5725.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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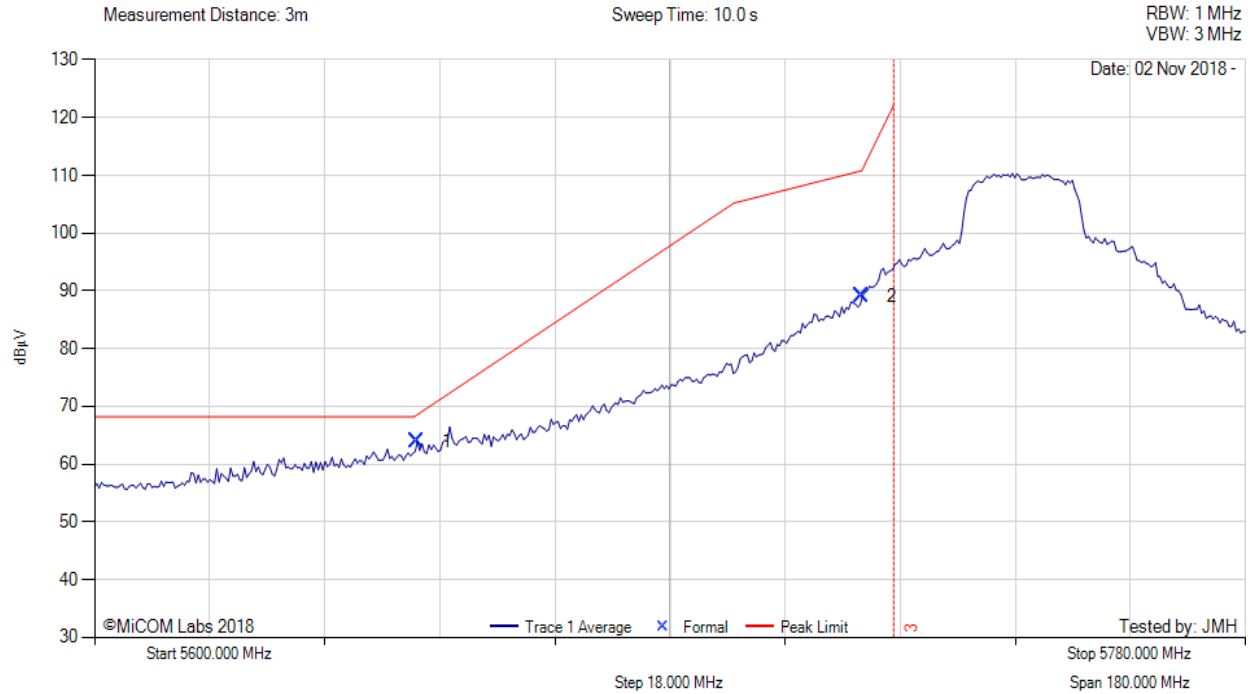


**Title:** Digi International ConnectCore i.MX6UL  
**To:** FCC CFR 47 15.407 ISED RSS 247  
**Serial #:** DIGI79-U2 Rev A  
**Issue Date:** 14th December 2018  
**Page:** 85 of 91



5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5745.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 5600.00 - 5780.00 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                     | 5650.43       | 31.97    | -2.72         | 34.63   | 63.88        | Max Avg          | Vertical | 129    | 286     | 68.2         | -4.4      | Pass       |
| 2                     | 5720.00       | 57.15    | -2.76         | 34.71   | 89.10        | Max Avg          | Vertical | 129    | 286     | 110.2        | -21.1     | Pass       |
| 3                     | 5725.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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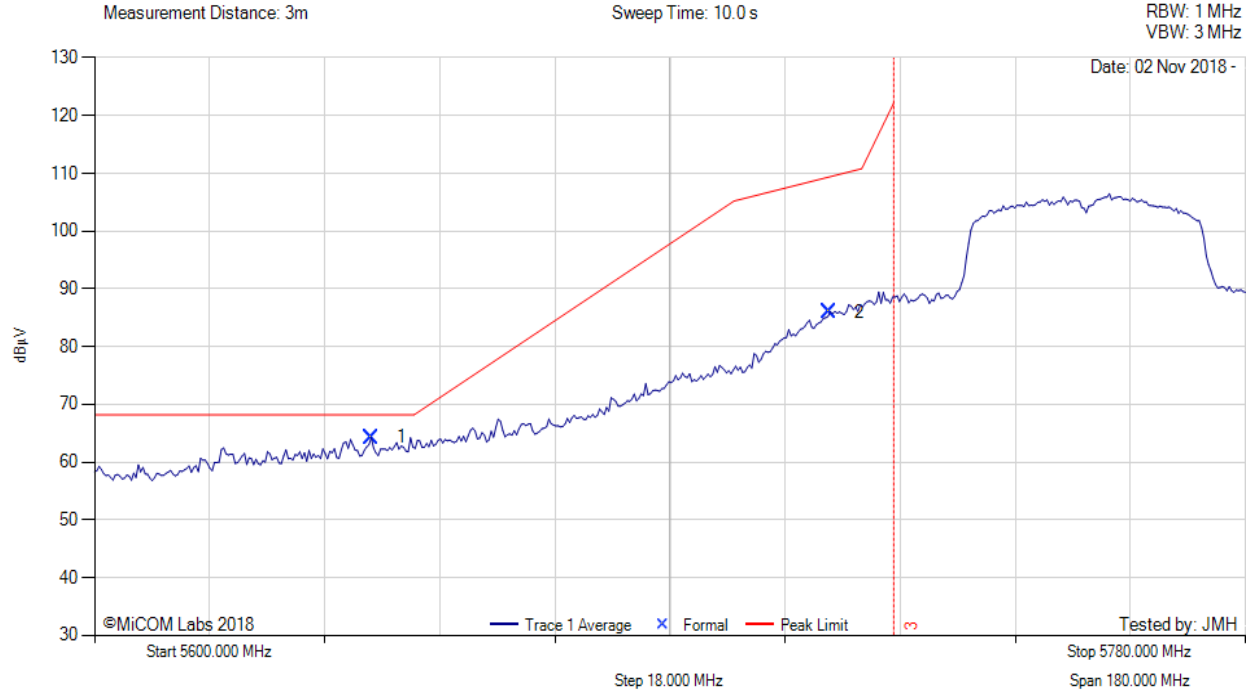


**Title:** Digi International ConnectCore i.MX6UL  
**To:** FCC CFR 47 15.407 ISSED RSS 247  
**Serial #:** DIGI79-U2 Rev A  
**Issue Date:** 14th December 2018  
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5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5755.00 MHz, Antenna: Pulse W3334, Power Setting: 16



| 5600.00 - 5780.00 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                     | 5643.22       | 32.34    | -2.72         | 34.63   | 64.25        | Max Avg          | Vertical | 129    | 286     | 68.2         | -4.0      | Pass       |
| 2                     | 5714.90       | 54.11    | -2.78         | 34.71   | 86.04        | Max Avg          | Vertical | 129    | 286     | 109.4        | -23.4     | Pass       |
| 3                     | 5725.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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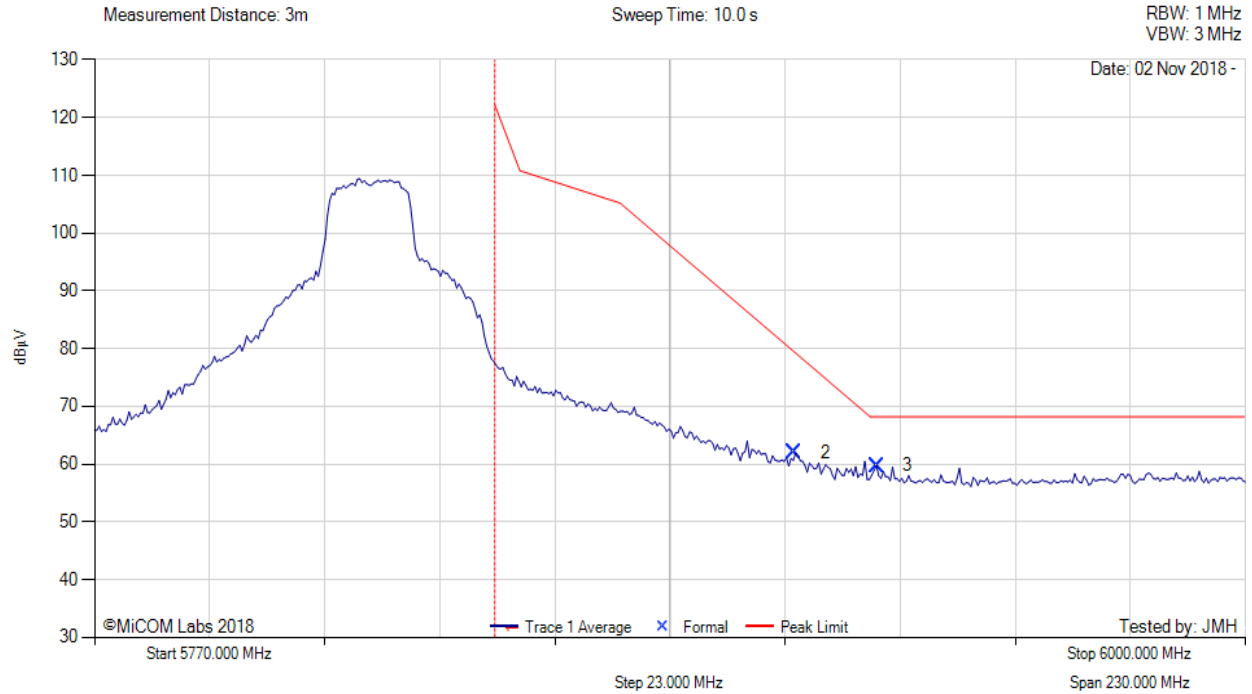


**Title:** Digi International ConnectCore i.MX6UL  
**To:** FCC CFR 47 15.407 ISED RSS 247  
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5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5825.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 5770.00 - 6000.00 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 |
| 2                     | 5909.92       | 29.70    | -2.80         | 35.10   | 62.00        | Max Avg          | Vertical | 129    | 286     | 79.8         | -17.8     | Pass       |
| 3                     | 5926.37       | 27.44    | -2.78         | 35.11   | 59.77        | Max Avg          | Vertical | 129    | 286     | 68.2         | -9.5      | Pass       |
| 1                     | 5850.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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**To:** FCC CFR 47 15.407 ISED RSS 247  
**Serial #:** DIGI79-U2 Rev A  
**Issue Date:** 14th December 2018  
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5850 MHz RADIATED BAND-EDGE EMISSIONS

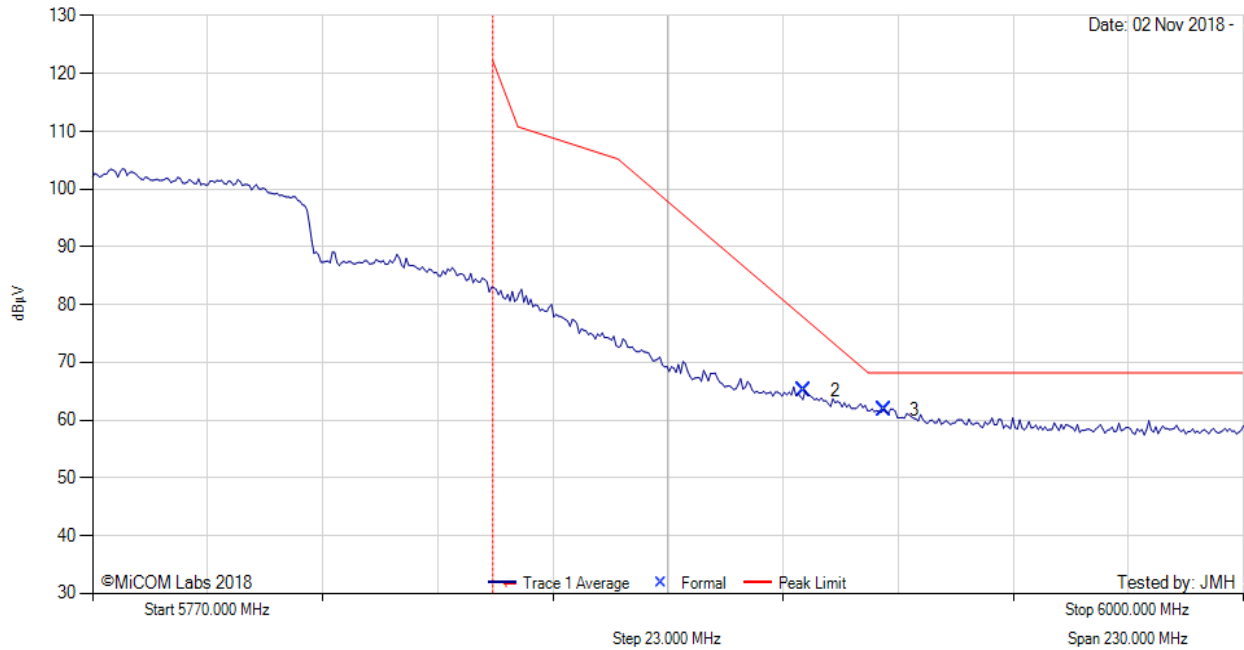
Variant: 802.11ac-80, Test Freq: 5775.00 MHz, Antenna: Pulse W3334, Power Setting: 16

Measurement Distance: 3m

Sweep Time: 10.0 s

RBW: 1 MHz  
VBW: 3 MHz

Date: 02 Nov 2018 -



| 5770.00 - 6000.00 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 |
| 2                     | 5912.22       | 32.86    | -2.81         | 35.10   | 65.15        | Max Avg          | Vertical | 129    | 286     | 77.8         | -12.7     | Pass       |
| 3                     | 5928.23       | 29.47    | -2.78         | 35.11   | 61.80        | Max Avg          | Vertical | 129    | 286     | 68.2         | -6.4      | Pass       |
| 1                     | 5850.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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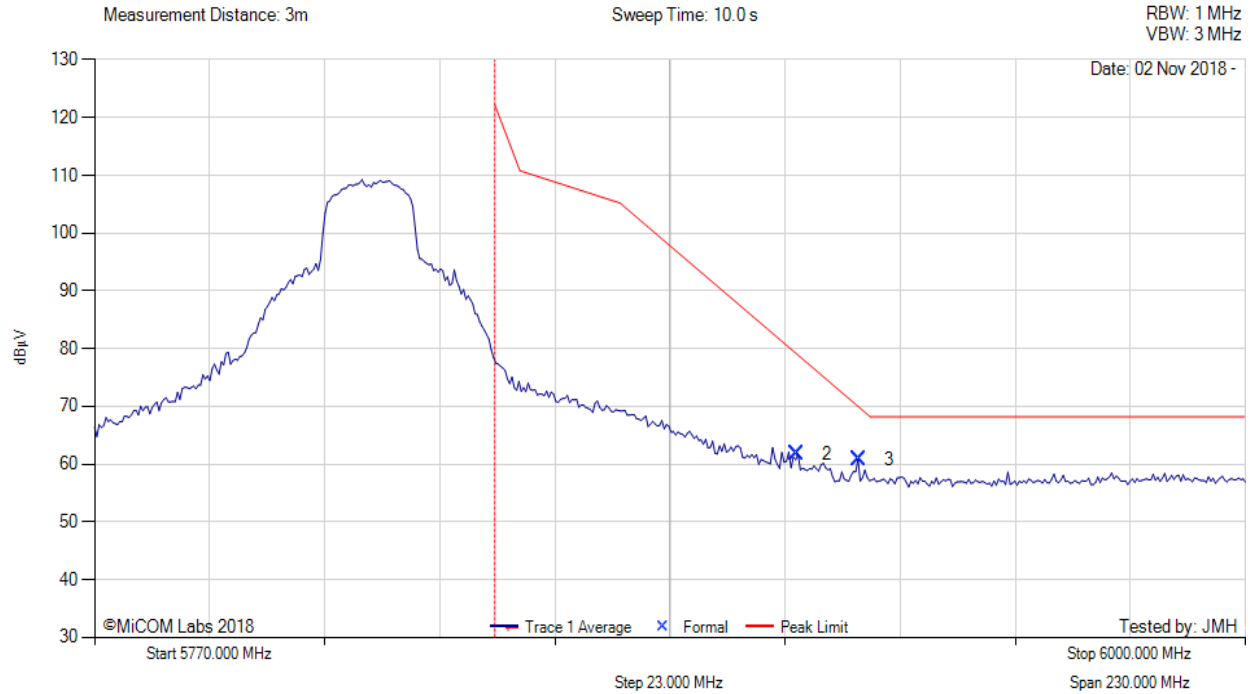
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5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5825.00 MHz, Antenna: Pulse W3334, Power Setting: 18



| 5770.00 - 6000.00 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 |
| 2                     | 5910.38       | 29.47    | -2.80         | 35.10   | 61.77        | Max Avg          | Vertical | 129    | 286     | 79.3         | -17.5     | Pass       |
| 3                     | 5922.69       | 28.52    | -2.79         | 35.11   | 60.84        | Max Avg          | Vertical | 129    | 286     | 69.7         | -8.8      | Pass       |
| 1                     | 5850.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

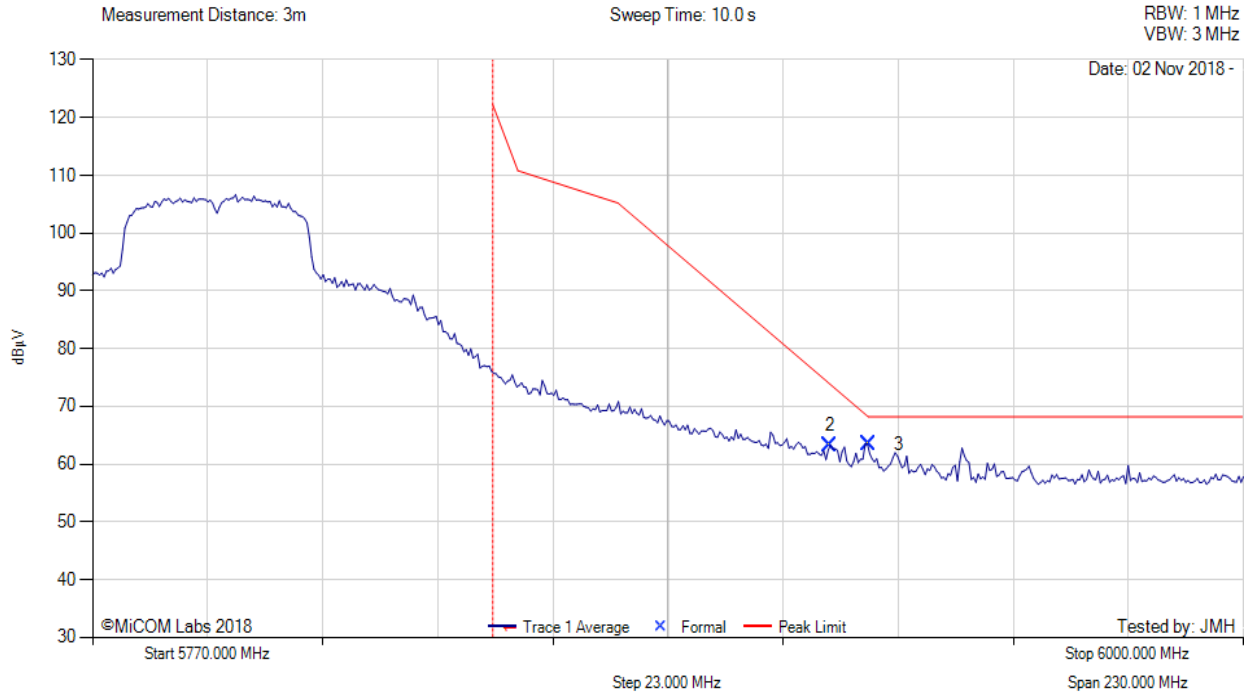
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5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5795.00 MHz, Antenna: Pulse W3334, Power Setting: 17



| 5770.00 - 6000.00 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 |
| 2                     | 5917.29       | 30.98    | -2.81         | 35.11   | 63.28        | Max Avg          | Vertical | 129    | 286     | 73.5         | -10.2     | Pass       |
| 3                     | 5924.99       | 31.17    | -2.79         | 35.11   | 63.49        | Max Avg          | Vertical | 129    | 286     | 68.2         | -4.7      | Pass       |
| 1                     | 5850.00       | --       | --            | --      | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT connected to laptop via USB, separate USB power supply

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