



## **REGULATORY COMPLIANCE TEST REPORT**

**FCC CFR 47 Part 15 SubPart B**

**Report No.: ALER03-U4 Rev A**

**Company:** Alereon Inc.

**Model Name:** AL5350B Based UWB Modules

## REGULATORY COMPLIANCE TEST REPORT

**Company Name:** Alereon Inc.

**Model Name:** AL5350B Based UWB Modules

**To:** FCC CFR 47 Part 15 Subpart B FCC CFR 47 Part 15 Subpart B

**Test Report Serial No.:** ALER03-U4 Rev A

This report supersedes: NONE

Applicant: Alereon Inc.  
10800 Pecan Park Blvd, STE 100  
Austin, Texas 78750  
USA

Issue Date: 24<sup>rd</sup> March 2021

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

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**MiCOM Labs is an ISO 17025 Accredited Testing Laboratory**

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## 1. ACCREDITATION, LISTINGS & RECOGNITION

### 1.1. TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2017. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](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

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for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *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 24<sup>th</sup> day of February 2020.



Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 2381.01  
Valid to November 30, 2021

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

## 1.2. RECOGNITION

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

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

TCB – Telecommunications Certification Bodies (TCB)

FCB – Foreign Certification Body

CAB – Conformity Assessment Body

NB – Notified Body

AB – Approved Body

MRA – Mutual Recognition Agreement

MRA Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

### 1.3. PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) 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

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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 24<sup>th</sup> day of February 2020



Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 2381.02  
Valid to November 30, 2021

*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  
UK – Approved Body (AB), AB Identifier - 2280  
Japan – Recognized Certification Body (RCB), RCB Identifier - 210

## 2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	17 <sup>th</sup> March 2021	Draft for Review
Draft #2	22 <sup>nd</sup> March 2021	
Draft #3	23 <sup>rd</sup> March 2021	
Rev A	24 <sup>th</sup> March 2021	Initial Release

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

### 3. TEST RESULT CERTIFICATE

<b>Manufacturer:</b> Alereon Inc. 10800 Pecan Park Blvd, STE 100 Austin, Texas 78750 USA	<b>Tested By:</b> MiCOM Labs, Inc. 575 Boulder Court Pleasanton, California 94566 USA
<b>Model:</b> AL5350B Based UWB Modules	<b>Telephone:</b> +1 925 462 0304
<b>Equipment Type:</b> Mobile & Portable Client Device	<b>Fax:</b> +1 925 462 0306
<b>S/N's:</b> AL5834 Combat 256:20510161 AL5804 Impact: 21062294 AL5830 Commander 256: 20510133 AL5835 Camouflage 256: 20510302 AL5808 Octal: 21030754 AL5833 Destroyer 256:1037463-101	
<b>Test Date(s):</b> 5 <sup>th</sup> – 12 <sup>th</sup> March 2021	<b>Website:</b> www.micomlabs.com

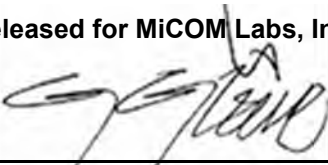
STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart B FCC	EQUIPMENT COMPLIES

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

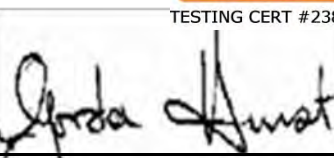
**Notes:**

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

**Approved & Released for MiCOM Labs, Inc. by:**



Graeme Grieve  
Quality Manager MiCOM Labs, Inc.



Gordon Hurst  
President & CEO MiCOM Labs, Inc.





## **4. REFERENCES AND MEASUREMENT UNCERTAINTY**

### **4.1. Normative References**

REF.	PUBLICATION	YEAR	TITLE
I	A2LA	October 2020	R105 - Requirement's When Making Reference to A2LA Accreditation Status
II	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
III	M 3003	Edition 3 Nov.2012	Expression of Uncertainty and Confidence in Measurements
IV	ICES-003	October 2020	Information Technology Equipment (including Digital Apparatus)
V	RSS-Gen Issue 5	March 2019 Amendment 1	General Requirements for Compliance of Radio Apparatus
VI	FCC CFR 47 Part 15 Subpart B	2020	Title 47 CFR Part 15, Sub Part B; Unintentional Radiators

## **4.2. Test and Uncertainty Procedure**

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

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

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

## 5. PRODUCT DETAILS AND TEST CONFIGURATIONS

### 5.1. Technical Details

Details	Description
Purpose:	Test of the Alereon AL5350B Based UWB Modules to FCC CFR 47 Part 15 Subpart B Unintentional Radiators
Applicant:	Alereon Inc. 10800 Pecan Park Blvd, STE 100 Austin, Texas 78750 USA
Manufacturer:	As applicant
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	ALER03-U4
Date EUT received:	5 <sup>th</sup> March 2021
Standard(s) applied:	FCC CFR 47 Part 15 Subpart B FCC
Dates of test (from - to):	8 <sup>th</sup> – 12 <sup>h</sup> March 2021
No of Units Tested:	1
Product Name:	AL5350B Based UWB Modules
Model(s):	AL5804 Impact: 1.7g, L1.215" x W0.565", Rev 1, SW Rev 30006 AL5808 Octal: 1.5g, L1.040" x W0.565", Rev 1, SW Rev 30006 AL5830 Commander 256: 2.8g, L1.040" x W0.565", Rev 1, SW Rev 30006 AL5833 Destroyer 256: 5.2g, L1.690" x W1.252", Rev 1, SW Rev 30006 AL5834 Combat 256: 5.2g, L1.790" x W0.710", Rev 1, SW Rev 30006 AL5835 Camouflage 256: 4.1g, L1.980" x W0.860", Rev 1, SW Rev 30006
Location for use:	Indoors and Outdoors
Declared Frequency Range(s):	3100-10600 MHz
Type of Modulation:	BPM/BPSK
EUT Modes of Operation:	UWB
Declared Nominal Output Power (dBm):	-41.3 dBm
Rated Input Voltage and Current:	AL5804 Impact: 5.0 VDC, 180mA AL5808 Octal: 3.3 VDC, 180mA AL5830 Commander 256: 3.3 VDC, 180mA AL5833 Destroyer 256: 3.3 VDC, 180mA AL5834 Combat 256: 5.0 VDC, 180mA AL5835 Camouflage 256: 5.0 VDC, 180mA
Operating Temp Range: (manufacturers declaration)	-40 to +85°C
Product Application:	Mobile & Portable Client Devices

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

Alereon Inc. Company: AL5350B Based UWB Modules

The scope of the test program was to test the Alereon Inc. Company AL5350B Based UWB Modules for compliance against the following specification:

- FCC CFR 47 Part 15, Subpart B - Title 47 CFR Part 15, SubPart B; Unintentional Radiators.

### **Model Differences**

AL5804 Impact – USB Interface  
AL5808 Octal – Serial Interface  
AL5830 Commander 256 – Serial Interface  
AL5833 Destroyer 256 – Serial Interface  
AL5834 Combat 256 – USB Interface  
AL5835 Camouflage 256 – Serial Interface

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

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Mfr.	Model No.	Serial No.
EUT	Combat 256	Alereon Inc	AL5834	20510161
	Impact	Alereon Inc	AL5804	21062294
	Commander 256	Alereon Inc	AL5830	20510133
	Camouflage 256	Alereon Inc	AL5835	20510302
	Octal	Alereon Inc	AL5808	21030754
	Destroyer 256	Alereon Inc	AL5833	1037463-101
Support	Host Board	Alereon Inc	N/A	N/A
Support	Laptop	Lenovo	N/A	N/A

### 5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
Chip	Taiyo Yuden	AH086M555003	Patch	1.0/0.2/0.2	N/A	--	No	3168-3696
Chip	Taiyo Yuden	AH086M555003	Patch	0.2/-0.2/0.1	N/A	--	No	6600-7656
Chip	Taiyo Yuden	AH086M555003	Patch	0.1/-1.8/-1.8	N/A	--	No	7656-8712

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

### 5.5. Cabling and I/O Ports

Custom 60 pin interface to Host Board/ USB

- a. USB Type A Port
- b. Custom USB Port
- c. Serial Port
- d. Parallel Interface

## **5.6. Test Configurations**

Test configurations are as noted in the test results.

## **5.7. Equipment Modifications**

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

1. NONE

## **5.8. Deviations from the Test Standard**

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

1. NONE

## 6. TEST SUMMARY

The following table represent the list of measurements required under the FCC CFR 47 Part 15B and ISED ICES-003 standards;

**TABLE OF REQUIRED TESTS – Class A Emissions**

Test Standard	Description	Limits	Compliance
FCC Part 15B	Radiated Emissions	Class B	Complies*
	ac Wireline Emissions	--	No requirement modules are Vdc

\*For results on emissions 1GHz - 6GHz refer to MiCOM Labs report: "ALER03-U2 AL5834 Combat 256 FCC"

## **7. TEST RESULTS**

### **7.1. EMC EMISSIONS TEST RESULTS**

#### **7.1.1 Radiated Emissions**

FCC, Part 15 Subpart B §15.109

#### **Test Procedure**

Testing 30 – 6,000 MHz was performed in a anechoic chamber using a CISPR compliant receiver. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. To further maximize emissions the receive antenna was varied between 1 and 4 meters. The emissions are recorded with receiver in peak hold mode.

Emissions nearest the limits were chosen for maximization and formal measurement using a CISPR Compliant receiver. Emissions from 30 MHz – 1000 MHz are measured utilizing a CISPR compliant quasi-peak detector with a tuned receiver, using a bandwidth of 120 kHz. Emissions above 1000 MHz are measured utilizing a CISPR compliant average detector with a tuned receiver, using a bandwidth of 1 MHz. Only the highest emissions relative to the limit are listed.



## 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.

$$\mathbf{FS = R + AF + CORR - FO}$$

FS = Field Strength  
R = Measured Spectrum analyzer Input Amplitude  
AF = Antenna Factor  
FO = Distance Falloff Factor

$$\mathbf{CORR = Correction Factor = CL - AG + NFL}$$

CL = Cable Loss  
AG = Amplifier Gain  
NFL = Notch Filter Loss or Waveguide Loss

### Field Strength Calculation Example:

Given receiver input reading of 51.5 dB $\mu$ V; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3 \text{ dB}\mu\text{V/m}$$

Conversion between dB $\mu$ V/m (or dB $\mu$ V) and  $\mu$ V/m (or  $\mu$ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (\mu\text{V/m}))}$$

$$40 \text{ dB}\mu\text{V/m} = 100 \mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250 \mu\text{V/m}$$

## FCC and IC Spurious Emissions Limits

FCC, Part 15 Subpart B §15.109  
 Industry Canada ICES-003 Section 3.2.2

Except for Class A digital device, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values.

### Limits below 1 GHz:

Class A limits

Frequency(MHz)	Quasi-peak Limit (dB $\mu$ V/m)	Measurement Distance (meters)	Quasi-peak Limit (dB $\mu$ V/m)	Measurement Distance (meters)
30 to 88	39.0	10	49.5	3
88-216	43.5	10	54	3
216-960	46.4	10	56.5	3
960-1000	49.5	10	60	3

Class B limits

Frequency(MHz)	Quasi-peak Limit (dB $\mu$ V/m)	Measurement Distance (meters)	Quasi-peak Limit (dB $\mu$ V/m)	Measurement Distance (meters)
30 to 88	29.5	10	40	3
88-216	33	10	43.5	3
216-960	35.6	10	46	3
960-1000	43.5	10	54	3

### Limits above 1GHz:

Frequency(MHz)	Average Limit (dB $\mu$ V/m)	Peak Limit (dB $\mu$ V/m)	Measurement Distance (meters)	Class (A/B)
1 000 to 6000	54	74	3	Class B

Frequency(MHz)	Average Limit (dB $\mu$ V/m)	Peak Limit (dB $\mu$ V/m)	Measurement Distance (meters)	Class (A/B)
1 000 to 6000	60	80	3	Class A

### Traceability

Laboratory Measurement Uncertainty	
Measurement uncertainty	+5.6/ -4.5 dB

Method
Work instruction WI-EMC-07: Radiated Emissions Test

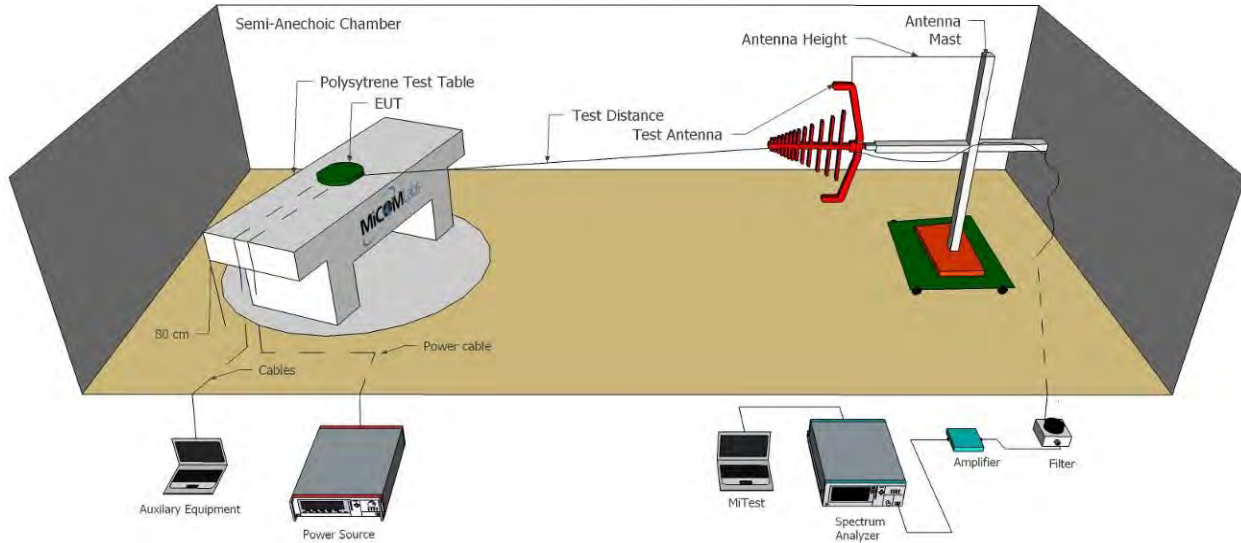
**Test Equipment Utilized**

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CU101	04R08507	Not Required
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	8 Oct 2021
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	26 Apr 2021
330	Variac 0-280 Vac	Staco Energy Co	3PN1020B	0546	Cal when used
336	Active loop Ant 10kHz to 30 MHz	EMCO	EMCO 6502	00060498	29 Nov 2021
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	4 Apr 2021
341	900MHz Notch Filter	EWT	EWT-14-0199	H1	4 May 2021
342	2.4 GHz Notch Filter	EWT	EWT-14-0203	H1	4 May 2021
346	1.6 TO 10GHz High Pass Filter	EWT	EWT-57-0112	H1	4 May 2021
373	26III RMS Multimeter	Fluke	Fluke 26 series III	76080720	21 Jun 2021
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	12 Jun 2021
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	9 May 2021
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	12 May 2021
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	9 May 2021
410	Desktop Computer	Dell	Inspiron 620	WS38	Not Required
411	Mast/Turntable Controller	Sunol Sciences	SC98V	060199-1D	Not Required
412	USB to GPIB Interface	National Instruments	GPIB-USB HS	11B8DC2	Not Required
413	Mast Controller	Sunol Science	TWR95-4	030801-3	Not Required
414	DC Power Supply 0-60V	HP	6274	1029A01285	Cal when used
415	Turntable Controller	Sunol Sciences	Turntable Controller	None	Not Required
416	Gigabit ethernet filter	ETS-Lingren	Gigafoil 260366	None	Not Required
447	MiTest Rad Emissions Test Software	MiCOM	Rad Emissions Test Software Version 1.0	447	Not Required
462	Schwarzbeck cable from Antenna to Amplifier.	Schwarzbeck	AK 9513	462	4 May 2021

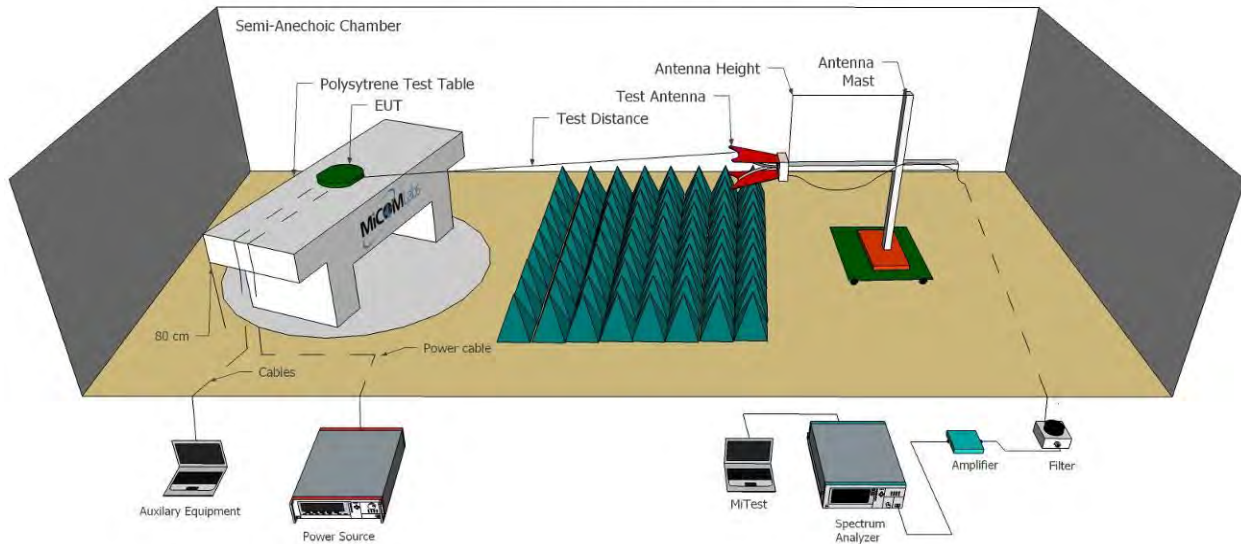
463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	4 May 2021
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	4 May 2021
466	Low Pass Filter DC-1500 MHz	Mini-Circuits	NLP-1750+	VUU10401438	4 May 2021
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	4 May 2021
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	4 May 2021
510	Barometer/Thermometer	Control Company	68000-49	170871375	20 Dec 2021
518	Cable - Amp to Antenna	SRC Haverhill	157-3051574	518	4 May 2021
87	Uninterruptible Power Supply	Falcon Electric	ED2000-1/2LC	F3471 02/01	Cal when used

**Test Setup for Radiated Emissions for above and below 1 GHz**

**Radiated Emissions Below 1GHz Test Setup**



**Radiated Emissions Above 1GHz Test Setup**



### 30-1000 MHz

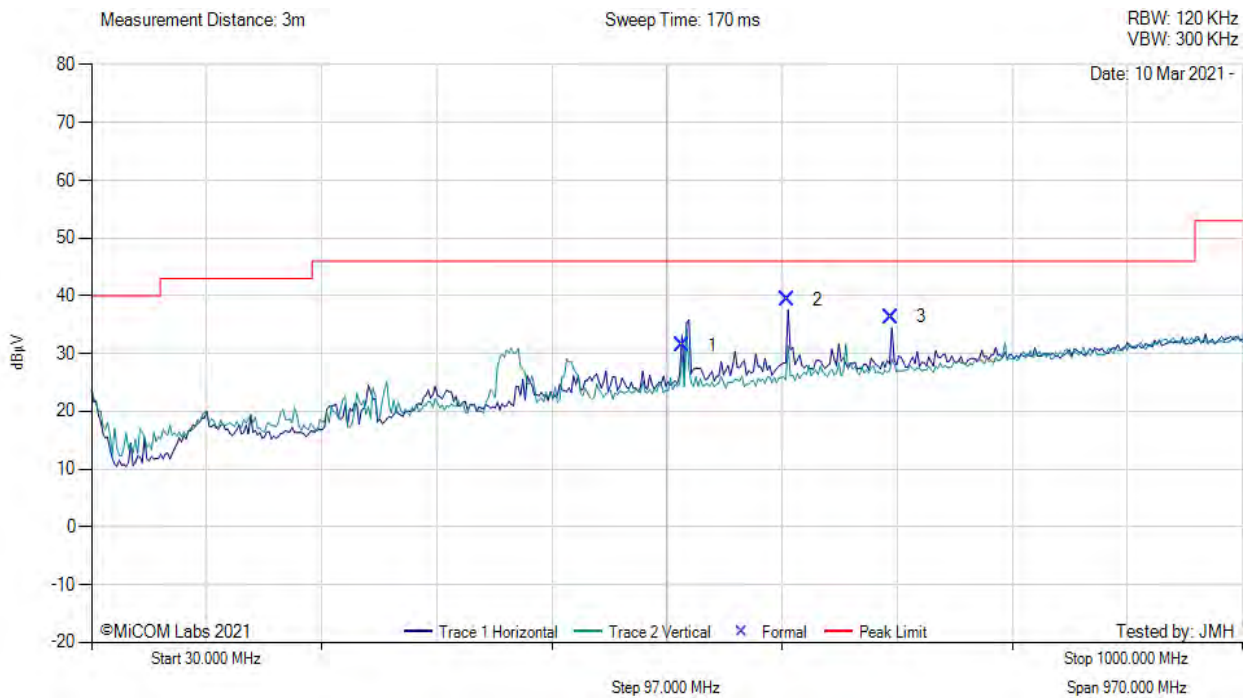
#### Equipment Configuration for Radiated Digital Emissions

<b>Antenna:</b>	Patch	<b>Variant:</b>	AL5834
<b>Antenna Gain (dBi):</b>	1.0/0.2/0.2	<b>Modulation:</b>	BPM/BPSK
<b>Beam Forming Gain (Y):</b>	Not Applicable	<b>Duty Cycle (%):</b>	99
<b>Channel Frequency (MHz):</b>	3432.00	<b>Data Rate:</b>	200 Mbp/s
<b>Power Setting:</b>	Default	<b>Tested By:</b>	JMH

#### Test Measurement Results for: Combat AL5834 powered by 5V (USB). Transmitting on 3432 MHz



Test Freq: 3432.00 MHz, Power Setting: Default



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	PoI	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	528.01	35.27	5.67	-9.55	31.39	MaxQP	Horizontal	162	346	46.0	-14.6	Pass
2	616.03	41.80	5.82	-8.24	39.38	MaxQP	Horizontal	139	201	46.0	-6.6	Pass
3	704.02	37.38	6.21	-7.25	36.34	MaxQP	Horizontal	119	195	46.0	-9.7	Pass

**Test Notes:** Combat AL5834 powered by 5V (USB). Transmitting on 3432 MHz

**Equipment Configuration for Radiated Digital Emissions**

<b>Antenna:</b>	Patch	<b>Variant:</b>	AL5804
<b>Antenna Gain (dBi):</b>	1.0/0.2/0.2	<b>Modulation:</b>	BPM/BPSK
<b>Beam Forming Gain (Y):</b>	Not Applicable	<b>Duty Cycle (%):</b>	99
<b>Channel Frequency (MHz):</b>	3432.00	<b>Data Rate:</b>	200 Mbp/s
<b>Power Setting:</b>	Default	<b>Tested By:</b>	JMH

**Test Measurement Results for:** Impact AL5804 powered by 5V (USB). Transmitting on 3432 MHz



Test Freq: 3432.00 MHz



30.00 - 1000.00 MHz												
Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	PoI	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	528.01	37.16	5.67	-9.55	33.28	MaxQP	Horizontal	169	352	46.0	-12.7	Pass
2	616.03	40.01	5.82	-8.24	37.59	MaxQP	Horizontal	146	202	46.0	-8.4	Pass
3	792.01	31.66	6.46	-5.98	32.14	MaxQP	Horizontal	101	210	46.0	-13.9	Pass

**Test Notes:** Impact AL5804 powered by 5V (USB). Transmitting on 3432 MHz

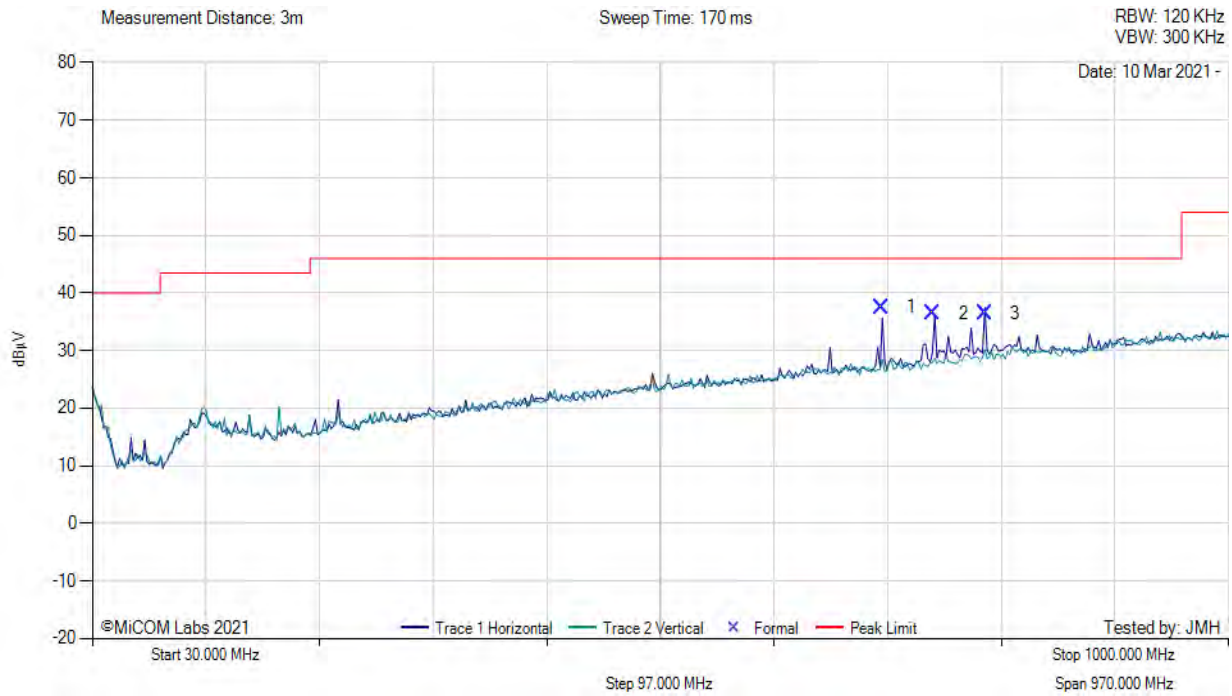
**Equipment Configuration for Radiated Digital Emissions (Class B)**

<b>Antenna:</b>	Patch	<b>Variant:</b>	AL5830
<b>Antenna Gain (dBi):</b>	1.0/0.2/0.2	<b>Modulation:</b>	BPM/BPSK
<b>Beam Forming Gain (Y):</b>	Not Applicable	<b>Duty Cycle (%):</b>	99
<b>Channel Frequency (MHz):</b>	3432.00	<b>Data Rate:</b>	200 Mbps
<b>Power Setting:</b>	Default	<b>Tested By:</b>	JMH

**Test Measurement Results for:** Commander AL5830 powered by 3.3V. Transmitting on 3432 MHz



Test Freq: 3432.00 MHz, Power Setting: Default



**30.00 - 1000.00 MHz**

Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	704.03	38.57	6.21	-7.25	37.53	MaxQP	Horizontal	124	7	46.0	-8.5	Pass
2	748.03	36.59	6.34	-6.49	36.44	MaxQP	Horizontal	110	27	46.0	-9.6	Pass
3	792.02	35.99	6.46	-5.98	36.47	MaxQP	Horizontal	98	193	46.0	-9.5	Pass

**Test Notes:** Commander AL5830 powered by 3.3V. Transmitting on 3432 MHz



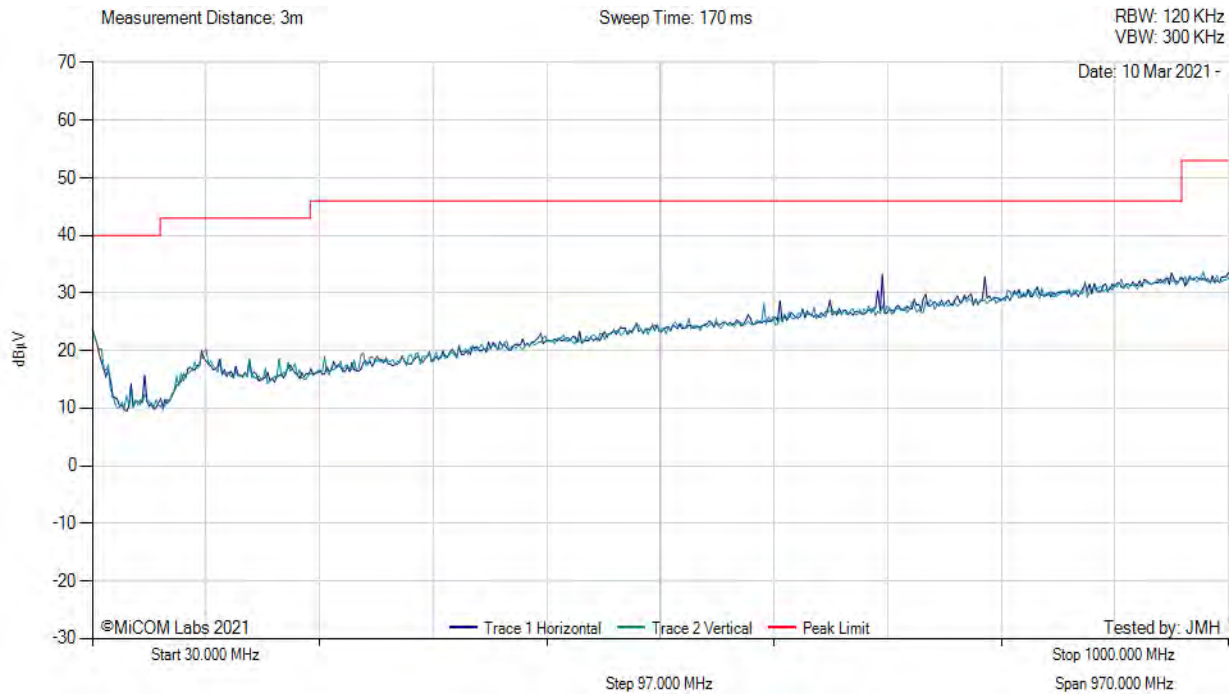
**Equipment Configuration for Radiated Digital Emissions (Class B)**

<b>Antenna:</b>	Patch	<b>Variant:</b>	AL5835
<b>Antenna Gain (dBi):</b>	1.0/0.2/0.2	<b>Modulation:</b>	BPM/BPSK
<b>Beam Forming Gain (Y):</b>	Not Applicable	<b>Duty Cycle (%):</b>	99
<b>Channel Frequency (MHz):</b>	3432.00	<b>Data Rate:</b>	200 Mbp/s
<b>Power Setting:</b>	Default	<b>Tested By:</b>	JMH

**Test Measurement Results for:** Camouflage AL5835 powered by 3.3V. Transmitting on 3432 MHz



Test Freq: 3432.00 MHz, Power Setting: Default



There are no emissions found within 6dB of the limit line.

**Test Notes:** Camouflage AL5835 powered by 3.3V. Transmitting on 3432 MHz

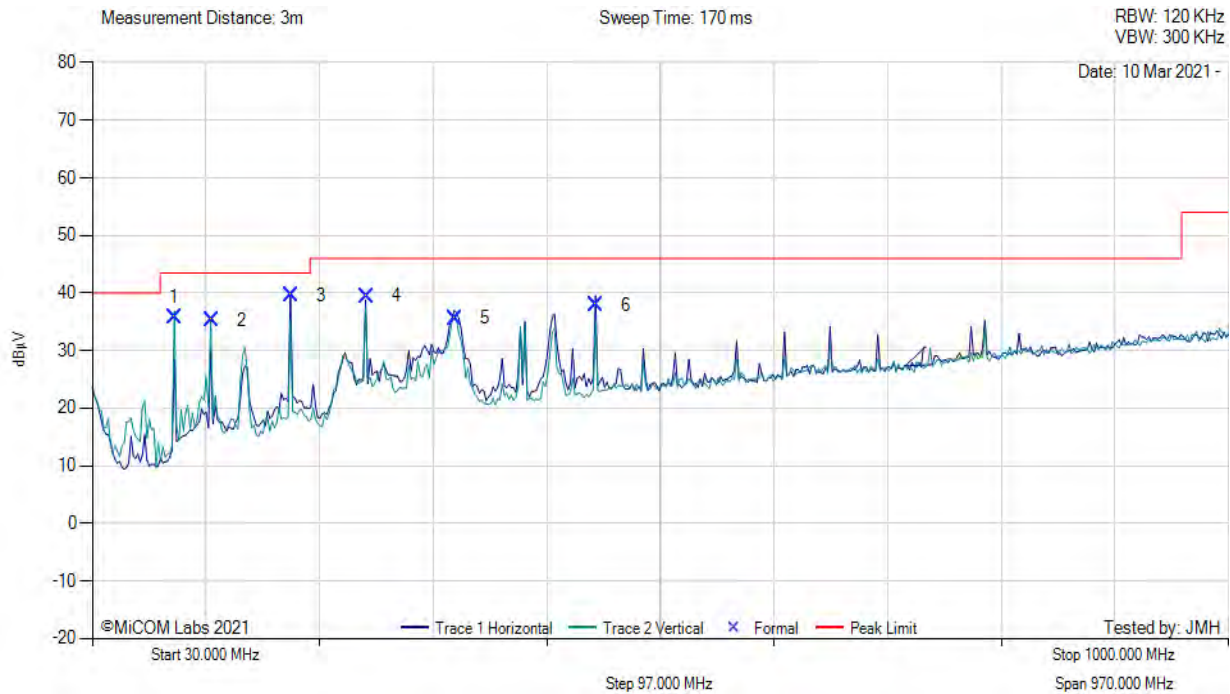
**Equipment Configuration for Radiated Digital Emissions (Class B)**

<b>Antenna:</b>	Patch	<b>Variant:</b>	AL5833
<b>Antenna Gain (dBi):</b>	1.0/0.2/0.2	<b>Modulation:</b>	BPM/BPSK
<b>Beam Forming Gain (Y):</b>	Not Applicable	<b>Duty Cycle (%):</b>	99
<b>Channel Frequency (MHz):</b>	3432.00	<b>Data Rate:</b>	200 Mbps
<b>Power Setting:</b>	Default	<b>Tested By:</b>	JMH

**Test Measurement Results for:** Destroyer AL5833 powered by 3.3V. Transmitting on 3432 MHz



Test Freq: 3432.00 MHz, Power Setting: Default



**30.00 - 1000.00 MHz**

Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	100.02	49.84	4.06	-18.09	35.81	MaxQP	Vertical	98	148	43.5	-7.7	Pass
2	132.02	45.84	4.22	-14.82	35.24	MaxQP	Vertical	98	5	43.5	-8.3	Pass
3	200.02	50.26	4.54	-15.22	39.58	MaxQP	Horizontal	154	147	43.5	-3.9	Pass
4	264.01	49.87	4.78	-15.18	39.47	MaxQP	Horizontal	119	356	46.0	-6.5	Pass
5	340.02	44.10	5.05	-13.56	35.59	MaxQP	Horizontal	101	356	46.0	-10.4	Pass
6	460.01	43.12	5.45	-10.64	37.93	MaxQP	Horizontal	198	19	46.0	-8.1	Pass

**Test Notes:** Destroyer AL5833 powered by 3.3V. Transmitting on 3432 MHz

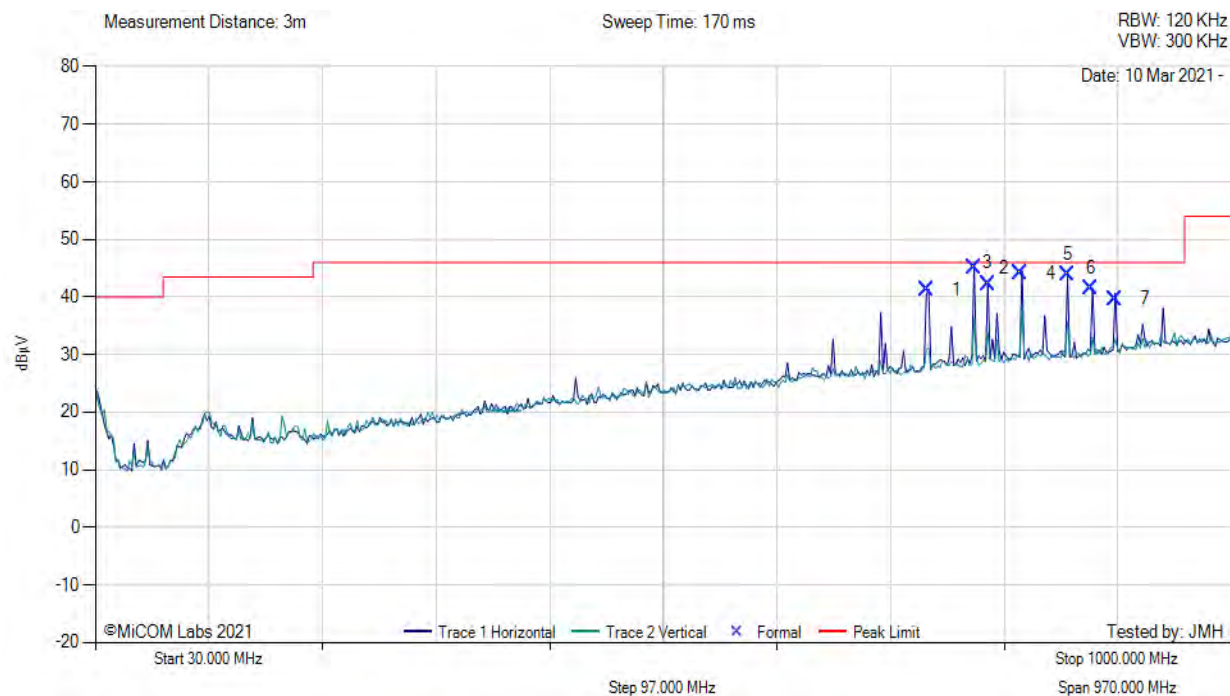
**Equipment Configuration for Radiated Digital Emissions (Class B)**

<b>Antenna:</b>	Patch	<b>Variant:</b>	AL5808
<b>Antenna Gain (dBi):</b>	1.0/0.2/0.2	<b>Modulation:</b>	BPM/BPSK
<b>Beam Forming Gain (Y):</b>	Not Applicable	<b>Duty Cycle (%):</b>	99
<b>Channel Frequency (MHz):</b>	3432.00	<b>Data Rate:</b>	200 Mbp/s
<b>Power Setting:</b>	Default	<b>Tested By:</b>	JMH

**Test Measurement Results for:** Octal AL5808 powered by 3.3V. Transmitting on 3432 MHz



Test Freq: 3432.00 MHz, Power Setting: Default



**30.00 - 1000.00 MHz**

Num	Frequency MHz	Raw dBµV	Cable Loss dB	AF dB/m	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	740.02	41.52	6.32	-6.61	41.23	MaxQP	Horizontal	114	167	46.0	-4.8	Pass
2	780.03	44.74	6.43	-6.10	45.07	MaxQP	Horizontal	108	188	46.0	-0.9	Pass
3	792.02	41.86	6.46	-5.98	42.34	MaxQP	Horizontal	100	182	46.0	-3.7	Pass
4	820.03	43.09	6.54	-5.58	44.05	MaxQP	Horizontal	101	188	46.0	-2.0	Pass
5	860.02	42.50	6.65	-5.34	43.81	MaxQP	Horizontal	100	25	46.0	-2.2	Pass
6	880.02	39.98	6.73	-5.19	41.52	MaxQP	Horizontal	183	18	46.0	-4.5	Pass
7	900.02	37.84	6.76	-4.92	39.68	MaxQP	Horizontal	101	321	46.0	-6.3	Pass

**Test Notes:** Octal AL5808 powered by 3.3V. Transmitting on 3432 MHz



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