REGULATORY COMPLIANCE TEST REPORT

FCC Part 15 Subpart C 15.247 (DTS)
ISED RSS-247 Issue 3

Report No.: DIGI115-U4 Rev A

Company: Digi International

Model Name: ConnectCore 93

REGULATORY COMPLIANCE TEST REPORT

Company Name: Digi International

Model Name: ConnectCore 93

To: FCC Part 15 Subpart C 15.247 (DTS) & ISED RSS-247 Issue 3

Test Report Serial No.: DIGI115-U4 Rev A

This report supersedes: NONE

Applicant: Digi International
9350 Excelsior Blvd, Suite 700
Hopkins, MN 55343
United States of America

Issue Date: 25th April 2024

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
575 Boulder Court
Pleasanton California 94566
USA
Phone: +1 (925) 462-0304
Fax: +1 (925) 462-0306
www.micomlabs.com

ACCREDITED
TESTING CERT #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

Table of Contents

1. ACCREDITATION, LISTINGS & RECOGNITION

1.1. TESTING ACCREDITATION

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

ilac-MRA A2LA

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 17025:2017 *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*).

CORPORATE SEAL 1978 A2LA

Presented this 28th day of February 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2025

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
MRA Phase II – recognition for both product testing and certification

MiCOM Labs, 575 Boulder Court, Pleasanton, California 94566 USA, Phone: +1 (925) 462 0304, Fax: +1 (925) 462 0306, www.micomlabs.com

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 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 28th day of February 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2025

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	15th April 2024	Draft report for Client Review.
Rev A	25th April 2024	Initial release of report.

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

MiCOM Labs, 575 Boulder Court, Pleasanton, California 94566 USA, Phone: +1 (925) 462 0304, Fax: +1 (925) 462 0306, www.micomlabs.com

3. TEST RESULT CERTIFICATE

Manufacturer:	Digi International 9350 Excelsior Blvd, Suite 700 Hopkins MN 55343 United States of America	**Tested By:**	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model:	ConnectCore 93	**Telephone:**	+1 925 462 0304
Type Of Equipment:	Wireless Module	**Fax:**	+1 925 462 0306
S/N's:	AS6973000002		
Test Date(s):	27th March – 3rd April 2024	**Website:**	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart C 15.247 (DTS) **ISED RSS-247 Issue 3**	**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.

A2LA ACCREDITED
TESTING CERT #2381.01

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	KDB 558074 D01 v05r02	Apr 2019	Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices operating under section 15.247 of the FCC Rules.
II	A2LA	22nd June 2022	R105 - Requirement's When Making Reference to A2LA Accreditation Status
III	ANSI C63.10	2020	American National Standard for Testing Unlicensed Wireless Devices
IV	ANSI C63.4	2014	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
V	ETSI TR 100 028	2001-12	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
VI	FCC 47 CFR Part 15.247	Apr 2020	Radio Frequency Devices; Subpart C – Intentional Radiators
VII	ICES-003	Issue 7; Oct 2020	Information Technology Equipment (Including Digital Apparatus)
VIII	M 3003	EDITION 5 Sept 2022	Expression of Uncertainty and Confidence in Measurements
IX	RSS-247 Issue 3	Aug 2023	Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices
X	RSS-Gen Issue 5	Amendment 1,2 (Feb 2021)	General Requirements for Compliance of Radio Apparatus. With Amendments 1: March 2019 and 2: Feb 2021.
XI	FCC 47 CFR Part 2.1033	May 2023	FCC requirements and rules regarding photographs and test setup diagrams.
XII	KDB 789033 D02 V02r01	Dec 2017	Guidelines For Compliance Testing Of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

MiCOM Labs, 575 Boulder Court, Pleasanton, California 94566 USA, Phone: +1 (925) 462 0304, Fax: +1 (925) 462 0306, www.micomlabs.com

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.

MiCOM Labs, 575 Boulder Court, Pleasanton, California 94566 USA, Phone: +1 (925) 462 0304, Fax: +1 (925) 462 0306, www.micomlabs.com

5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

Details	Description
Purpose:	Test of the Digi International CC93 to FCC CFR 47 Part 15 Subpart C 15.247 (DTS) and ISED RSS-247 Issue 3.
Applicant:	Digi International 9350 Excelsior Blvd, Suite 700 Hopkin, MN 55343, United States of America
Manufacturer:	Digi International
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	DIGI115-U4
Date EUT received:	29th February 2024
Standard(s) applied:	FCC CFR 47 Part 15 Subpart C 15.247 (DTS) ISED RSS-247 Issue 3
Dates of test (from - to):	27th March to 3rd April 2024
No of Units Tested:	1
Product Family Name:	ConnectCore 93
Model(s):	CC93
Location for use:	Both
Declared Frequency Range(s):	2400 - 2483.5 MHz
Type of Modulation:	CCK & OFDM
EUT Modes of Operation:	2400 - 2483.5 MHz: b; g; HT-20, HT-40, AC-20, AC-40, AX-20,AX-40;
Declared Nominal Output Power:	+18.0 dBm
Transmit/Receive Operation:	Transceiver
Rated Input Voltage and Current:	5 VDC 3A
Operating Temperature Range:	-40°C – +85°C
ITU Emission Designator:	G1D, D1D
Equipment Dimensions:	1.575 in X 1.770 in X 0.138 in
Weight:	10 grams
Hardware Rev:	50002172-XX
Software Rev:	82004747

5.2. Scope Of Test Program

Digi International ConnectCore 93

The scope of the test program was to test the Digi International ConnectCore 93 for radiated emissions in its 802.11 configurations in the frequency ranges 2400 - 2483.5 MHz for compliance against the following specifications:

FCC CFR 47 Part 15 Subpart C 15.247 (DTS)
Radio Frequency Devices; Subpart C – Intentional Radiators

ISED RSS-247 Issue 3
Digital Transmission Systems (DTSs), Frequency Hopping System (FHSs) and License-Exempt Local Area Network (LE-LEN) Devices

Antenna Additions as per section 5.4 and as such testing was limited to:
Transmitter Spurious & Band Edge Emissions.

The following two antenna configurations have the highest gain for their type and were tested as representing the worst case for all antennas (highest emissions).

Type	Manufacturer	Model	Type	Gain (dBi)	Frequency Band (MHz)
external	TAOGLAS	GW.48.A151	Dipole	3.4	2400 - 2483.5
external	Yageo	ANTX100P001B24553	PCB	4.6	2400 - 2483.5

Radio Module is pre-certified any additional tests needed may be found in the following test reports:

TERF2211002513E2 P15.247+RSS-247 WLAN2.4G Rev. 01 Dated Mar. 22, 2023
TERF2307001775E2 P15.247+RSS-247 WLAN2.4G Rev. 00 Dated Aug. 23, 2023

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

Type (EUT/ Support)	Equipment Description	Manufacturer	Model No.	Serial No.
EUT Conducted	Wireless Radio Module	Digi International	CC93	AS6973000002
Support	Power Supply (5V 3A)	MEAN WELL	GE24I05	--

5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
external	Ethertronics	1001932	PCB	2.5	-	360	-	2400 - 2483.5
external	KYOCERA	W3P35x8W04-U100D3B0A	PCB	2.3	-	360	-	2400 - 2483.5
external	KYOCERA	X9001091-W3DRMB	Dipole	1.8	-	360	-	2400 - 2483.5
external	Linx Technologies	ANT-DB1-RAF-RPS	Dipole	2.5	-	360	-	2400 - 2483.5
external	TAOGLAS	FXP830.07.0100C	PCB	2.5	-	360	-	2400 - 2483.5
external	TAOGLAS	FXP831.07.0100C	PCB	3.0	-	360	-	2400 - 2483.5
external	TAOGLAS	GW.48.A151	Dipole	3.4	-	360	-	2400 - 2483.5
external	Yageo	ANTX100P001B24553	PCB	4.6	-	360	-	2400 - 2483.5

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

5.5. Cabling and I/O Ports

CC93:

Port Type	Max Cable Length	# of Ports	Screened	Conn Type	Data Type	Bit Rate	Environment
dc Jack	<3m	1	No			N/A	Indoors
Ethernet PoE IN	>30m	1	No	RJ45	Digital	10, 100, 1000 MBits/s	Indoors
Micro USB	<3m	1	Yes	Data	Digital	--	--
USB A	<3m	1	Yes	Data	Digital	--	--
HDMI	<3m	1	Yes	Data	Digital	--	--

5.6. Test Configurations

Results for the following configurations are provided in this report:

Operational Mode(s)	Data Rate with Highest Power MBit/s	Channel Frequency (MHz)		
		Low	Mid	High
2400 - 2483.5 MHz				
b	1	2,412.00	2,437.00	2,462.00
g	6	2,412.00	2,437.00	2,462.00
HT-20	6.5	2,412.00	2,437.00	2,462.00
HT-40	6.5	2,422.00	2,437.00	2,452.00
AX-20	6.5	2,412.00	2,437.00	2,462.00
AX-40	6.5	2,422.00	2,437.00	2,452.00

5.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:
1. NONE

5.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:
1. NONE

6. TEST SUMMARY

List of Measurements

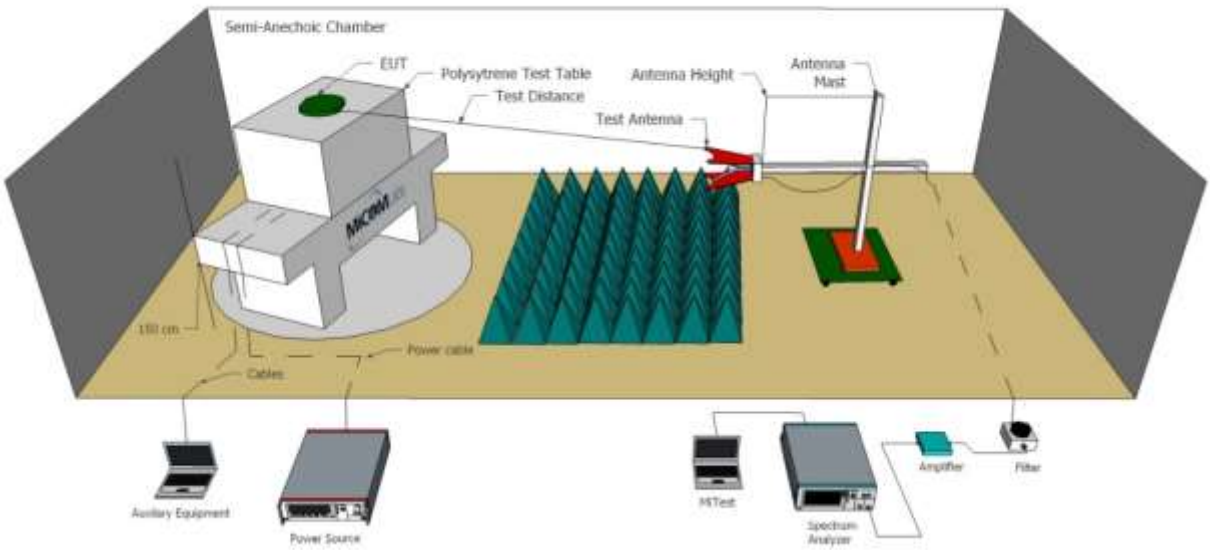
Test Header	Result	Data Link
Emissions	Complies	-
(1) Radiated Emissions	Complies	-
(i) TX Spurious & Restricted Band Emissions	Complies	View Data
(ii) Restricted Edge & Band-Edge Emissions	Complies	View Data

7. TEST EQUIPMENT CONFIGURATION(S)

7.1. Radiated Emissions

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

Radiated Emissions Above 1GHz Test Setup



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
266	10 Hz to 50GHz MXA Signal Analyzer	Keysight	N9020B	MY60110791	25 Jul 2024
285	DC Power Supply	Keysight	E36155A	MY63000156	4 Dec 2024
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	11 May 2024
330	Variac 0-280 Vac	Staco Energy Co	3PN1020B	0546	Cal when used
336	Active loop Ant 10kHz to 30 MHz	EMCO	EMCO 6502	00060498	7 Dec 2024
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	5 Dec 2024
342	2.4 GHz Notch Filter	EWT	EWT-14-0203	H1	13 Sep 2024
343	5.15 GHz Notch Filter	EWT	EWT-14-0200	H1	13 Sep 2024
344	5.35 GHz Notch Filter	EWT	EWT-14-0201	H1	13 Sep 2024
345	5.46 GHz Notch Filter	EWT	EWT-14-0202	H1	13 Sep 2024
373	26III RMS Multimeter	Fluke	Fluke 26 series III	76080720	29 Sep 2024
377	Band Rejection Filter 5150 to 5880MHz	Microtronics	BRM50716	034	13 Sep 2024
396	2.4 GHz Notch Filter	Microtronics	BRM50701	001	13 Sep 2024
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	27 Apr 2024
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	7 Dec 2024
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	2 Nov 2024
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	18 Sep 2024
463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	18 Sep 2024
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	16 Sep 2024
465	Low Pass Filter DC-1000 MHz	Mini-Circuits	NLP-1200+	VUU01901402	14 Sep 2024
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	18 Sep 2024
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	18 Sep 2024
510	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2026
554	Precision SMA Cable	Fairview Microwave	SCE18060101-400CM	554	18 Sep 2024
555	Rhode & Schwarz Receiver (Firmware Version : 3.10 SP1)	Rhode & Schwarz	ESW 44	101893	28 Jun 2024
87	Uninterruptible Power Supply	Falcon Electric	ED2000-1/2LC	F3471 02/01	Cal when used
CC05	Confidence Check	MiCOM	CC05	None	11 May 2024

8. MEASUREMENT AND PRESENTATION OF TEST DATA

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

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

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

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

9. TEST RESULTS

9.1. Radiated Emissions

Radiated Test Conditions for Radiated Spurious and Band-Edge Emissions (Restricted Bands)			
Standard:	FCC CFR 47 Part 15 Subpart C 15.247 (DTS) ISED RSS-247	**Ambient Temp. (ºC):**	20.0 - 24.5
Test Heading:	Radiated Spurious and Band-Edge Emissions	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.205, 15.209 RSS-247:5.5	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Radiated Spurious and Band-Edge Emissions (Restricted Bands)
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 and waveguide 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 Radiated Spurious and Band-Edge Measurement were per the Radiated Test Set-up specified in this document.

Orientation testing of the EUT was performed and the EUT standing upright was determined to be the worst case for Spurious and Band Edge emissions with the integral antennas attached.

Limits for Restricted Bands
Peak emission: 74 dBuV/m
Average emission: 54 dBuV/m
Average Measurements were performed following ANSI C63.10 section11.12.2.5.2 Trace averaging across on and off times of the EUT transmissions followed by a duty cycle correction.
RMS detector used, DCCF of 10log (1/D) where D is the Duty Cycle.

Field Strength Calculation
The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.
FS = R + AF + CORR - FO

where:
FS = Field Strength
R = Measured Spectrum analyzer Input Amplitude
AF = Antenna Factor
CORR = Correction Factor = CL – AG + NFL
CL = Cable Loss
AG = Amplifier Gain
FO = Distance Falloff Factor
NFL = Notch Filter Loss or Waveguide Loss

Example:
Given receiver input reading of 51.5 dBmV; 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 (FS) of the measured emission is:

FS = 51.5 + 8.5 + 1.3 - 26.0 +1 = 36.3 dBmV/m

Conversion between dBmV/m (or dBmV) and mV/m (or mV) are as follows:
Level (dBmV/m) = 20 * Log (level (mV/m))
40 dBmV/m = 100 mV/m
48 dBmV/m = 250 mV/m

MiCOM Labs, 575 Boulder Court, Pleasanton, California 94566 USA, Phone: +1 (925) 462 0304, Fax: +1 (925) 462 0306, www.micomlabs.com

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
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).

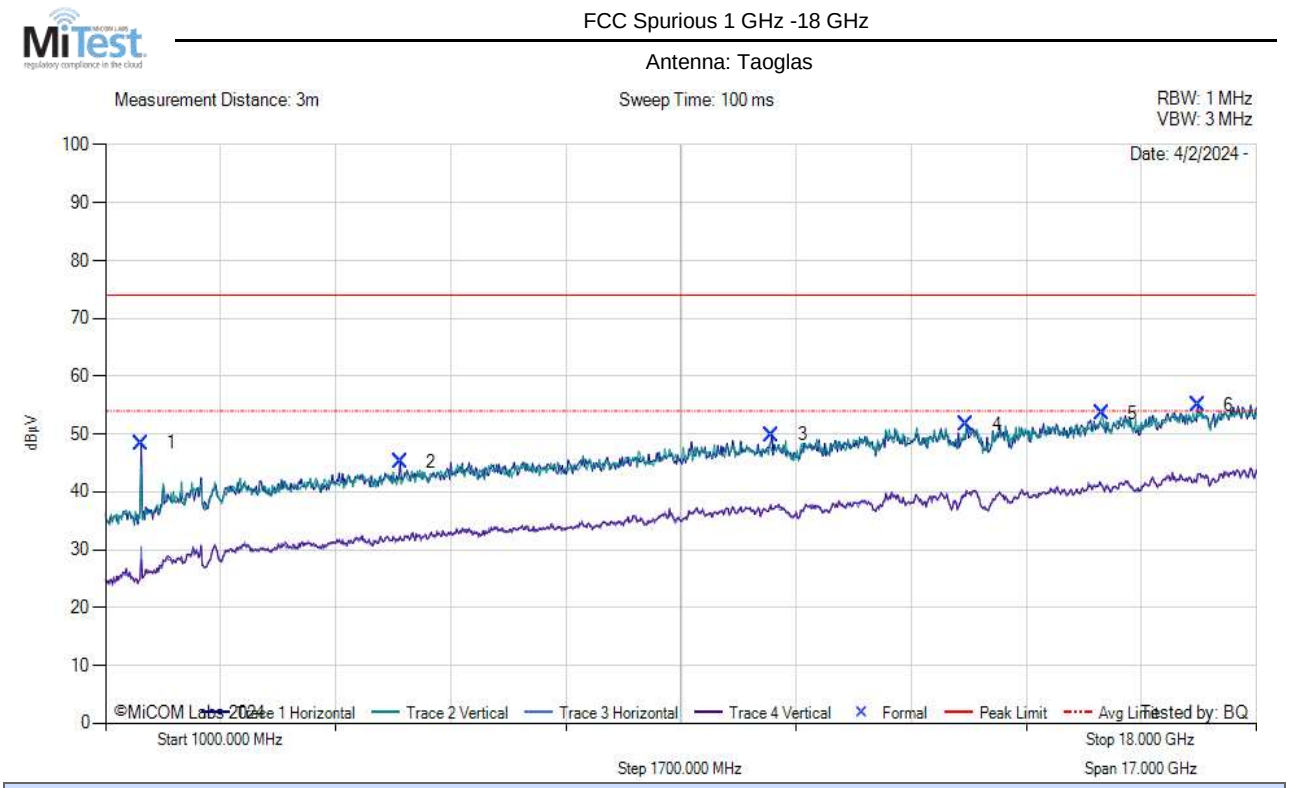
(e) Harmonic emissions appearing in the restricted bands above 17.7 GHz from field disturbance sensors operating under the provisions of §15.245 shall not exceed the limits specified in §15.245(b).

9.1.1. TX Spurious & Restricted Band Emissions

9.1.1.1. GW.48.A151 Dipole

Equipment Configuration for FCC SPURIOUS 1 GHZ -18 GHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	-
Channel Frequency (MHz):	2412	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

Test Measurement Results



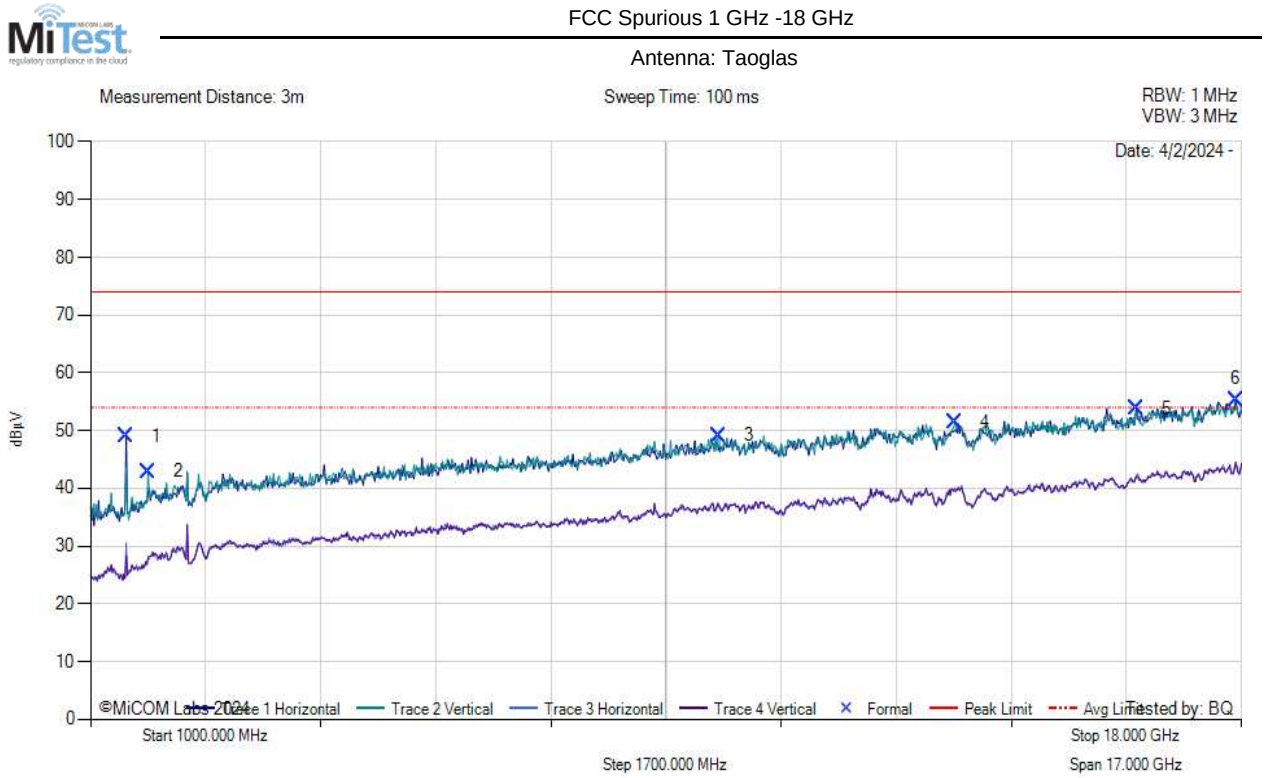
1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1527.00	63.59	1.58	28.19	48.46	MaxP	Horizontal	100	300	74.0	-25.5	Pass
2	5352.00	53.50	3.03	34.45	45.18	MaxP	Horizontal	100	270	74.0	-28.8	Pass
3	10843.00	50.20	4.52	37.76	49.91	MaxP	Horizontal	199	30	74.0	-24.1	Pass
4	13716.00	52.70	5.47	39.08	51.67	MaxP	Vertical	199	239	74.0	-22.3	Pass
5	15722.00	49.53	5.83	40.45	53.52	MaxP	Vertical	100	0	74.0	-20.5	Pass
6	17133.00	48.67	6.91	41.39	55.02	MaxP	Horizontal	100	270	74.0	-19.0	Pass

Test Notes: FCC RSE 1-18GHz 802.11b 2412MHz

Equipment Configuration for FCC SPURIOUS 1 GHZ -18 GHZ

Antenna:	Taoglas GW.48.A151	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	-
Channel Frequency (MHz):	2437	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

Test Measurement Results



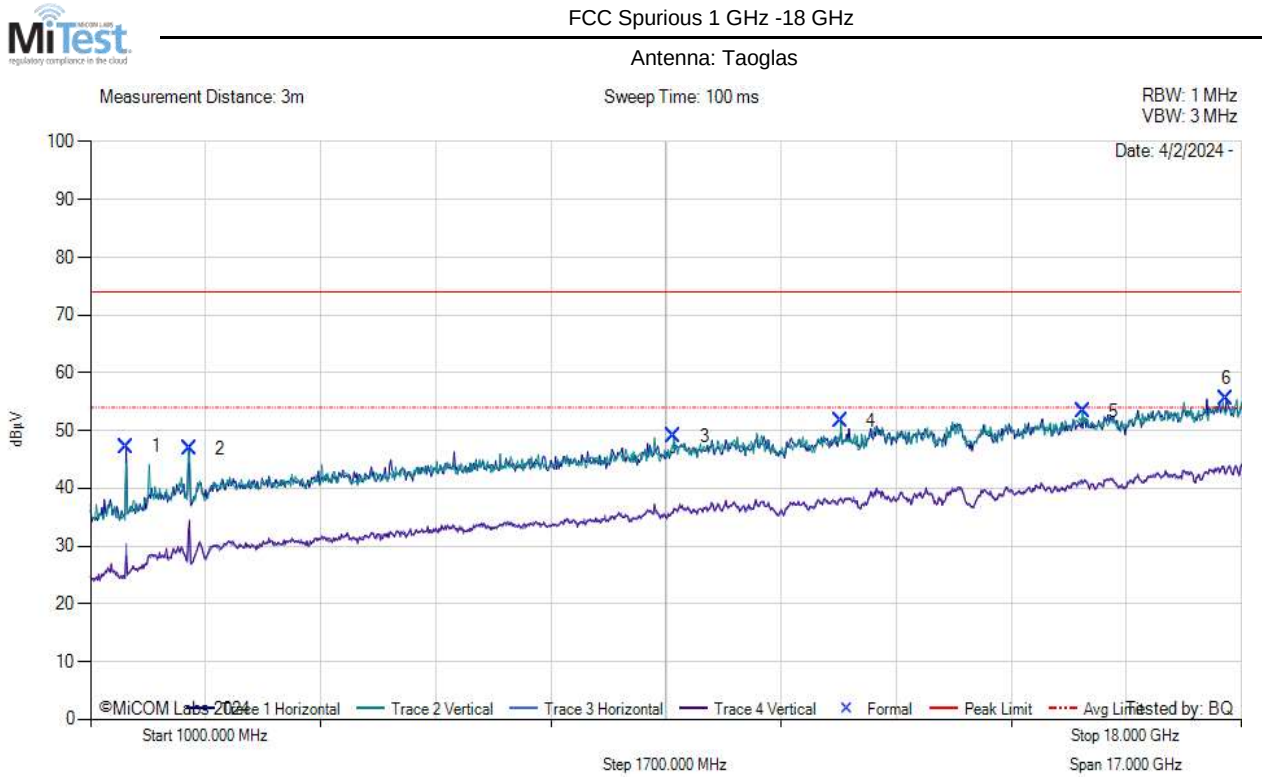
1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1527.00	64.13	1.58	28.19	49.00	MaxP	Horizontal	100	240	74.0	-25.0	Pass
2	1850.00	55.36	1.70	30.70	42.87	MaxP	Vertical	149	0	74.0	-31.1	Pass
3	10282.00	49.78	4.29	37.47	49.16	MaxP	Vertical	101	0	74.0	-24.8	Pass
4	13767.00	53.08	5.10	39.09	51.42	MaxP	Vertical	199	90	74.0	-22.6	Pass
5	16453.00	48.33	6.22	40.98	53.86	MaxP	Horizontal	199	300	74.0	-20.1	Pass
6	17915.00	47.46	6.67	41.55	55.41	MaxP	Horizontal	100	90	74.0	-18.6	Pass

Test Notes: FCC RSE 1-18GHz 802.11b 2437MHz

Equipment Configuration for FCC SPURIOUS 1 GHZ -18 GHZ

Antenna:	Taoglas GW.48.A151	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	-
Channel Frequency (MHz):	2462	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

Test Measurement Results



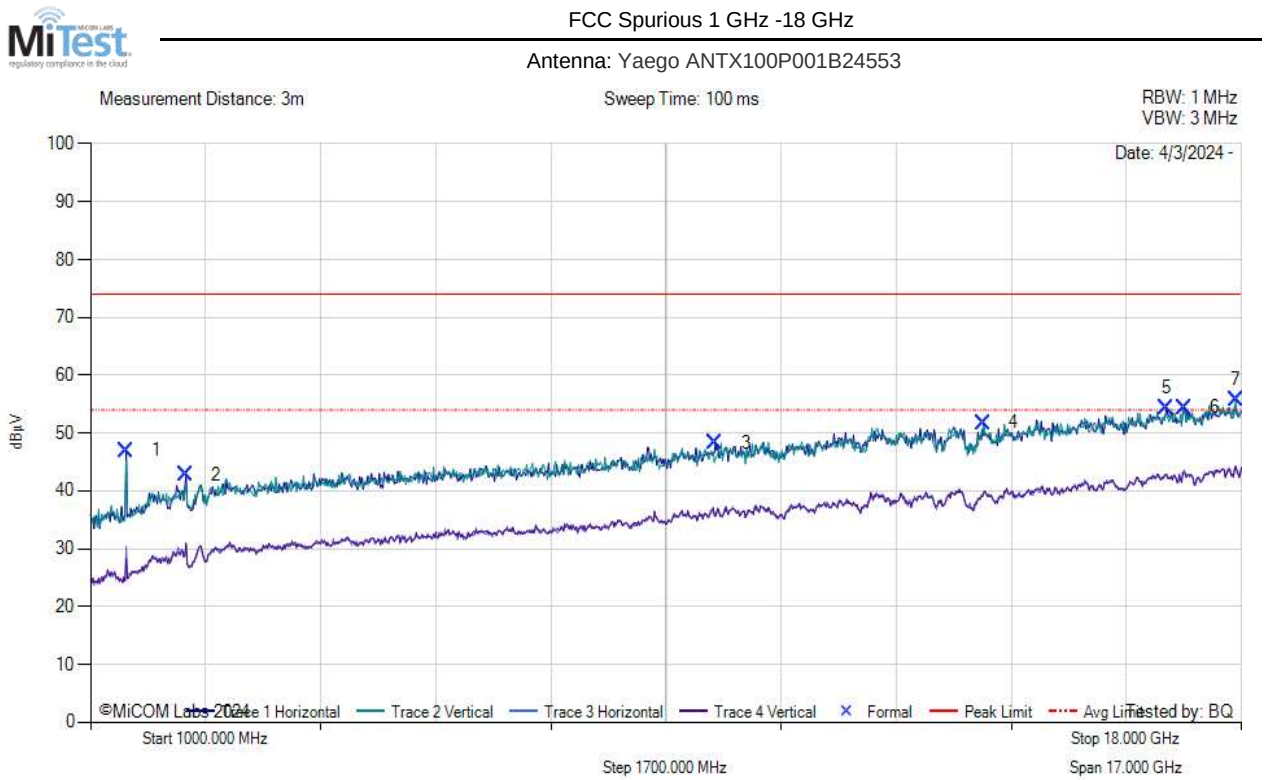
1000.00 - 18000.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1527.00	62.32	1.58	28.19	47.19	MaxP	Horizontal	100	240	74.0	-26.8	Pass
2	2462.00	56.77	2.00	32.37	46.82	MaxP	Vertical	199	209	74.0	-27.2	Pass
3	9619.00	50.87	4.59	36.69	49.00	MaxP	Vertical	100	149	74.0	-25.0	Pass
4	12084.00	52.47	4.85	38.92	51.65	MaxP	Vertical	199	179	74.0	-22.4	Pass
5	15654.00	50.25	5.68	40.36	53.33	MaxP	Vertical	101	0	74.0	-22.6	Pass
6	17779.00	49.30	6.55	41.66	55.53	MaxP	Horizontal	100	300	74.0	-18.5	Pass

Test Notes: FCC RSE 1-18GHz 802.11b 2462MHz

9.1.1.2. ANTX100P001B24553 PCB

Equipment Configuration for FCC SPURIOUS 1 GHZ -18 GHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	-
Channel Frequency (MHz):	2412	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

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	1527.00	62.09	1.58	28.19	46.96	MaxP	Horizontal	149	270	74.0	-27.0	Pass
2	2411.00	52.91	1.97	32.22	42.78	MaxP	Horizontal	149	240	74.0	-31.2	Pass
3	10231.00	49.67	4.37	37.46	48.25	MaxP	Horizontal	149	210	74.0	-25.7	Pass
4	14192.00	54.16	5.18	39.33	51.78	MaxP	Vertical	149	29	74.0	-22.2	Pass
5	16895.00	48.37	6.49	41.69	54.28	MaxP	Horizontal	149	120	74.0	-19.7	Pass
6	17150.00	47.85	6.67	41.37	54.39	MaxP	Horizontal	149	270	74.0	-19.6	Pass
7	17915.00	47.79	6.67	41.55	55.74	MaxP	Vertical	149	29	74.0	-18.3	Pass

Test Notes: FCC RSE 1-18GHz 802.11b 2412MHz

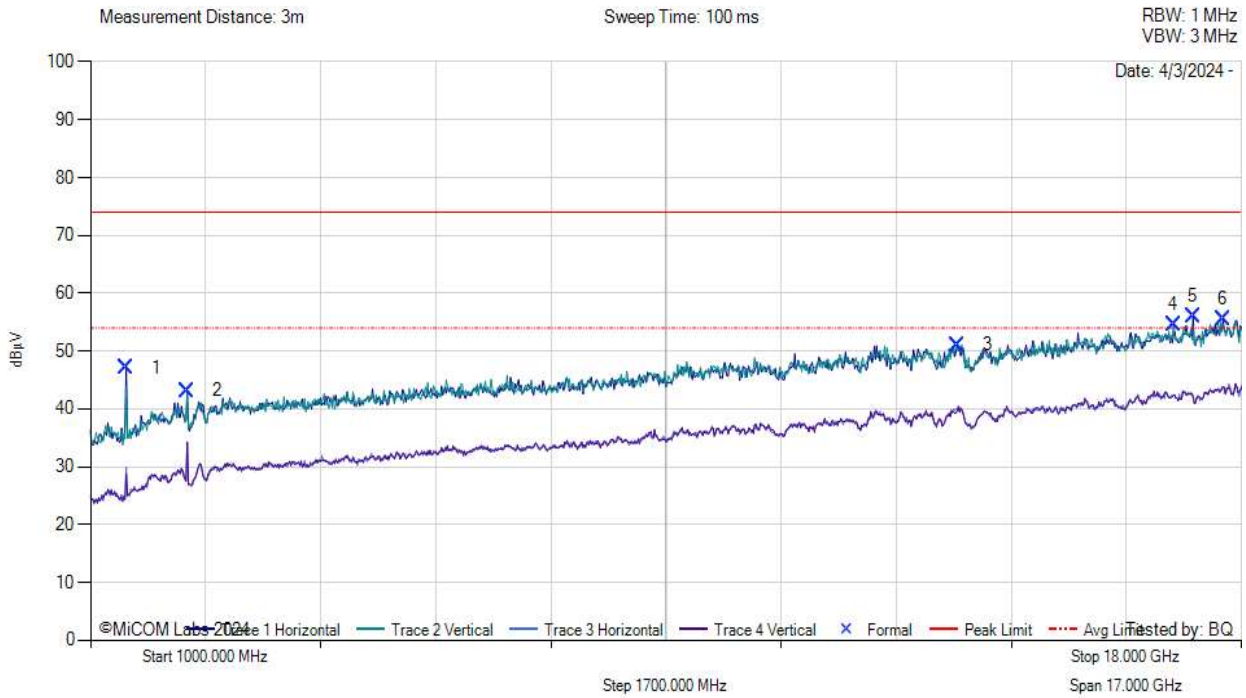
Equipment Configuration for FCC SPURIOUS 1 GHZ -18 GHZ

Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	-
Channel Frequency (MHz):	2437	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

Test Measurement Results

FCC Spurious 1 GHz -18 GHz

Antenna: Yaego ANTX100P001B24553



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	1527.00	62.30	1.58	28.19	47.17	MaxP	Horizontal	150	270	74.0	-26.8	Pass
2	2428.00	53.19	1.99	32.27	43.12	MaxP	Vertical	150	269	74.0	-30.9	Pass
3	13801.00	52.66	5.30	39.08	51.10	MaxP	Horizontal	199	300	74.0	-22.9	Pass
4	16997.00	48.45	6.60	41.56	54.55	MaxP	Vertical	199	29	74.0	-19.4	Pass
5	17286.00	50.06	6.48	41.30	55.98	MaxP	Horizontal	199	300	74.0	-18.0	Pass
6	17728.00	48.69	6.37	41.67	55.45	MaxP	Horizontal	199	90	74.0	-18.5	Pass

Test Notes: FCC RSE 1-18GHz 802.11b 2437MHz

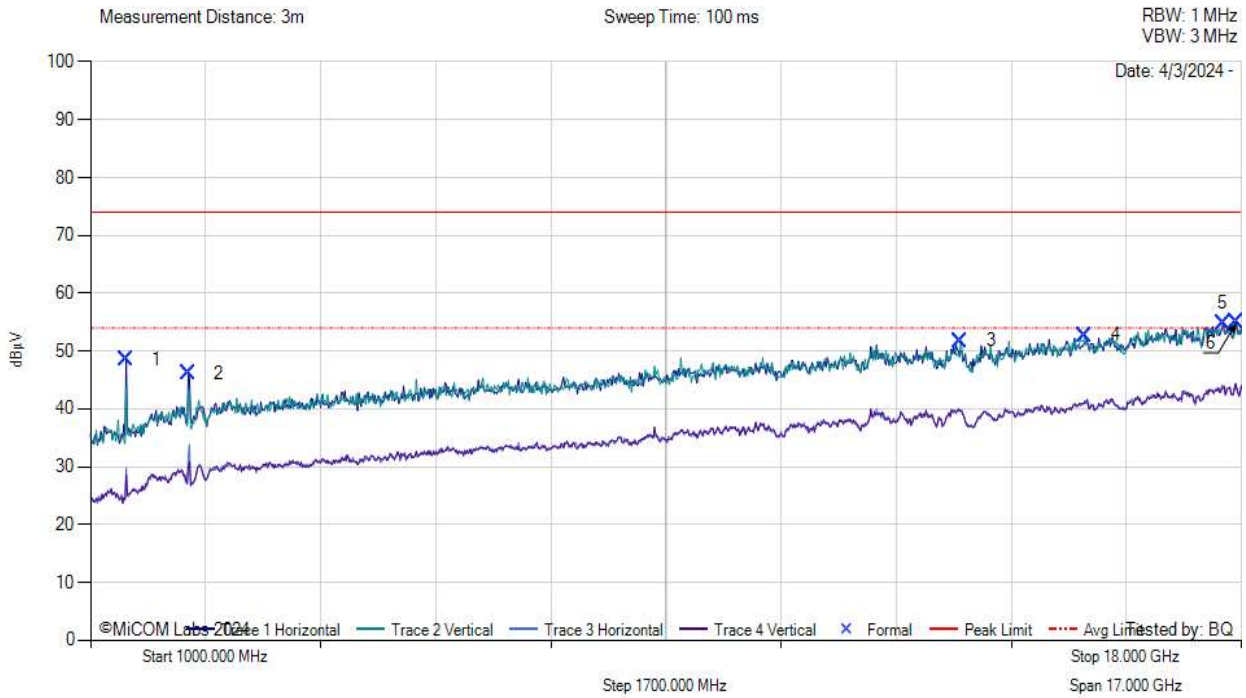
Equipment Configuration for FCC SPURIOUS 1 GHZ -18 GHZ

Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	-
Channel Frequency (MHz):	2462	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

Test Measurement Results

FCC Spurious 1 GHz -18 GHz

Antenna: Yaego ANTX100P001B24553



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	1527.00	63.67	1.58	28.19	48.53	MaxP	Horizontal	150	270	74.0	-25.5	Pass
2	2445.00	56.19	2.01	32.32	46.15	MaxP	Horizontal	199	210	74.0	-27.9	Pass
3	13852.00	53.58	5.29	39.11	51.74	MaxP	Vertical	150	239	74.0	-22.3	Pass
4	15688.00	48.86	5.75	40.41	52.74	MaxP	Vertical	199	59	74.0	-21.3	Pass
5	17728.00	48.09	6.37	41.67	54.86	MaxP	Horizontal	199	210	74.0	-19.1	Pass
6	17932.00	47.66	6.50	41.53	55.07	MaxP	Vertical	199	299	74.0	-18.9	Pass

Test Notes: FCC RSE 1-18GHz 802.11b 2462MHz

9.1.2. Restricted Edge & Band-Edge Emissions

9.1.2.3. GW.48.A151 Dipole

9.1.2.3.1. Lower Band-Edge

CC93		Band-Edge Freq	Limit 74.0dBµV/m	Limit 54.0dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	dBµV/m	
802.11ax HE20	2412.00	2390.00	67.99	44.52	16
802.11ax HE40	2422.00	2390.00	58.24	40.56	15
802.11b	2412.00	2390.00	53.00	39.46	18
802.11g	2422.00	2390.00	60.70	40.22	15
802.11n HT-20	2412.00	2390.00	67.42	43.01	16
802.11n HT-40	2422.00	2390.00	67.45	44.49	17

9.1.2.3.2. Upper Band-Edge

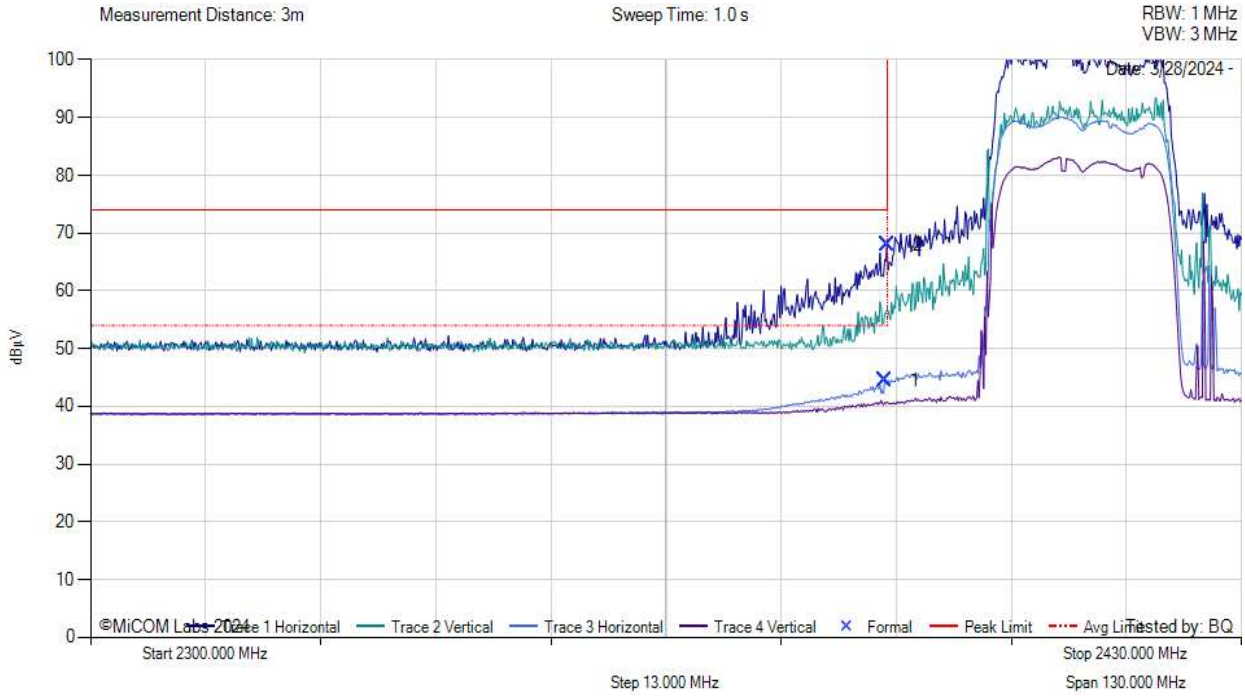
CC93		Band-Edge Freq	Limit 74.0dBµV/m	Limit 54.0dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	dBµV/m	
802.11ax HE20	2462.00	2483.50	62.44	40.65	14
802.11ax HE40	2452.00	2483.50	63.41	42.05	13
802.11b	2462.00	2483.50	52.69	40.65	18
802.11g	2462.00	2483.50	57.16	40.24	14
802.11n HT-20	2462.00	2483.50	59.46	40.37	14
802.11n HT-40	2452.00	2483.50	69.13	44.84	15

Equipment Configuration for BE 2400 MHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11ax
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2412	**Data Rate:**	MCS0
Power Setting:	16	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Taoglas



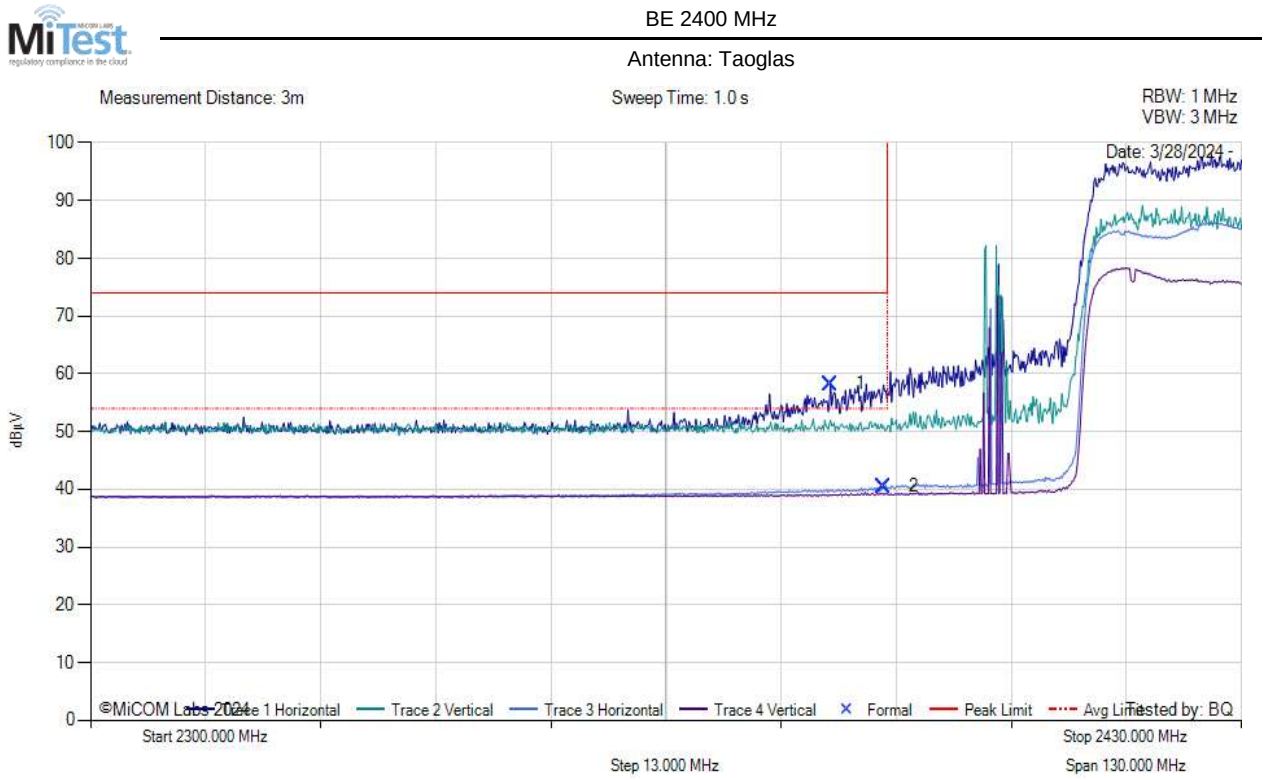
2300.00 - 2430.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	2389.70	20.42	1.96	32.14	44.52	AVG	Horizontal	149	180	54.0	-9.5	Pass
2	2389.96	43.89	1.96	32.14	67.99	MaxP	Horizontal	149	180	74.0	-6.0	Pass

Test Notes: BE 11ax HE20 2412MHz

back to matrix

Equipment Configuration for BE 2400 MHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11ax
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2422	**Data Rate:**	MCS0
Power Setting:	15	**Tested By:**	BQ

Test Measurement Results



2300.00 - 2430.00 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	2383.59	34.16	1.97	32.11	58.24	MaxP	Horizontal	149	30	74.0	-15.8	Pass
2	2389.57	16.45	1.96	32.14	40.56	AVG	Horizontal	149	180	54.0	-13.4	Pass

Test Notes: BE 11ax HE40 2422MHz

back to matrix

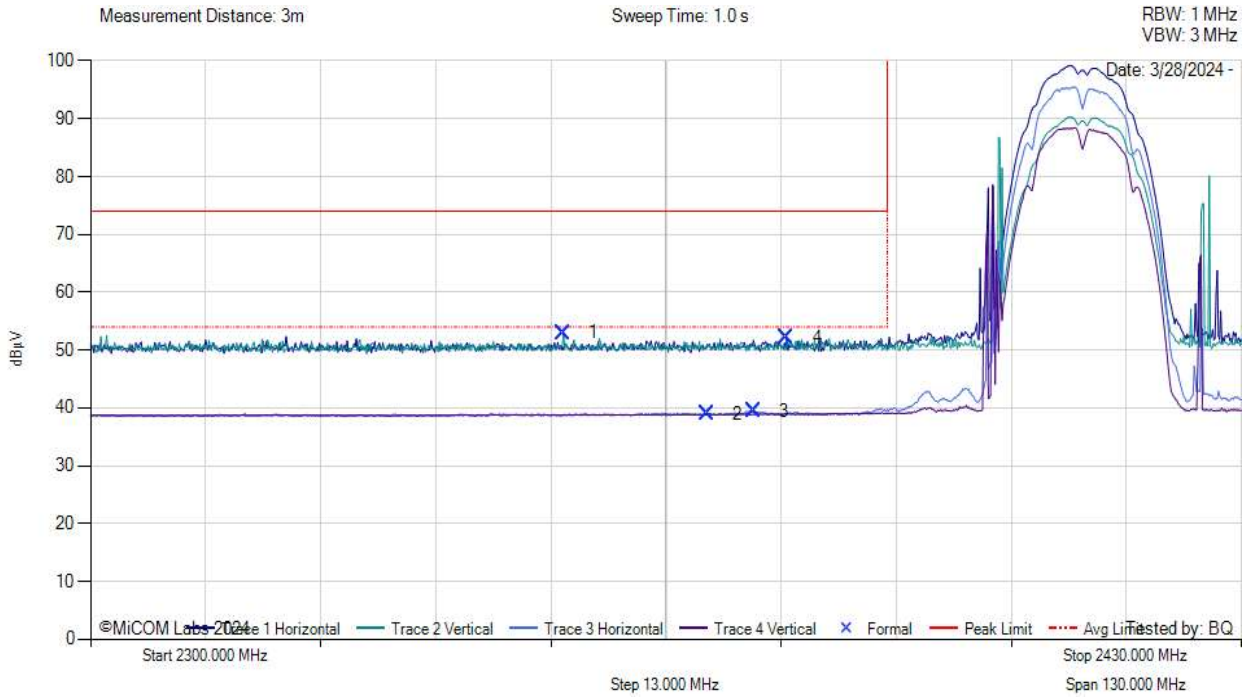
Equipment Configuration for BE 2400 MHZ

Antenna:	Taoglas GW.48.A151	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2412	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Taoglas



2300.00 - 2430.00 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	2353.43	29.06	1.97	31.97	53.00	MaxP	Vertical	99	299	74.0	-21.0	Pass
2	2369.68	15.01	1.98	32.05	39.03	AVG	Vertical	149	330	54.0	-15.0	Pass
3	2374.88	15.41	1.98	32.07	39.46	AVG	Horizontal	149	210	54.0	-14.5	Pass
4	2378.65	28.01	1.97	32.09	52.08	MaxP	Horizontal	149	180	74.0	-21.9	Pass

Test Notes: BE 11b 2412MHz

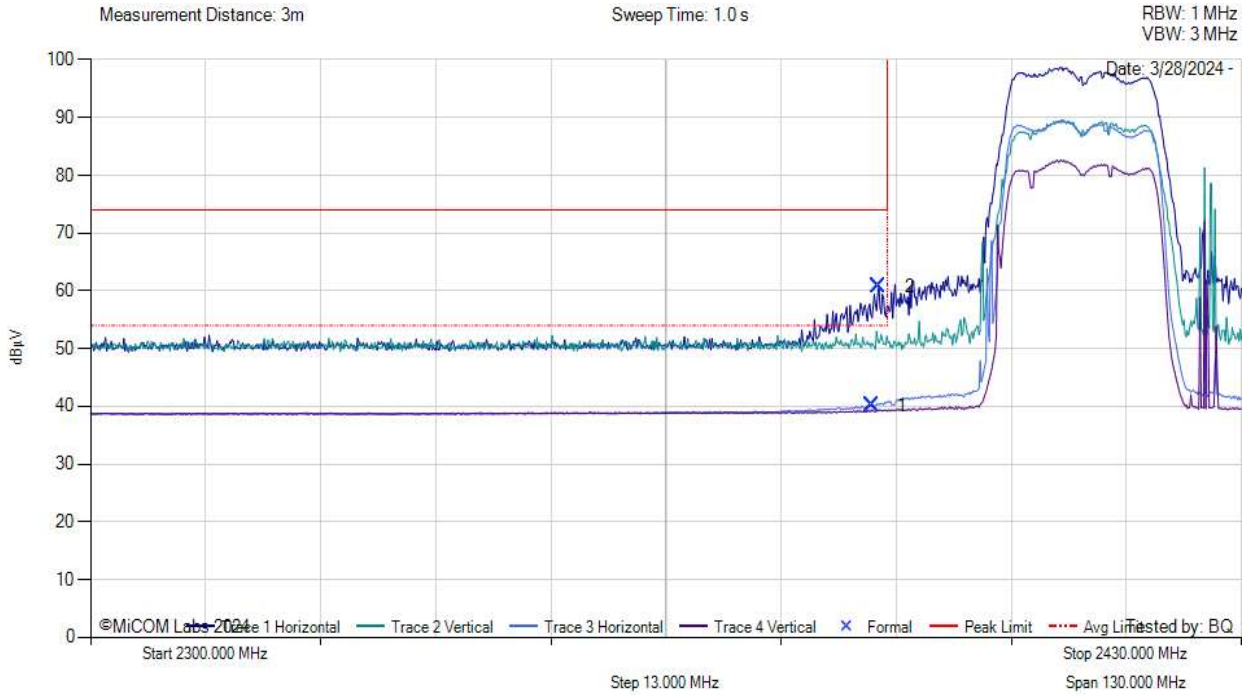
back to matrix

Equipment Configuration for BE 2400 MHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11g
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2412	**Data Rate:**	1 Mbps
Power Setting:	14	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Taoglas



2300.00 - 2430.00 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	2388.27	16.12	1.96	32.13	40.22	AVG	Horizontal	149	180	54.0	-13.8	Pass
2	2389.05	36.60	1.96	32.14	60.70	MaxP	Horizontal	149	180	74.0	-13.3	Pass

Test Notes: BE 11g 2412MHz

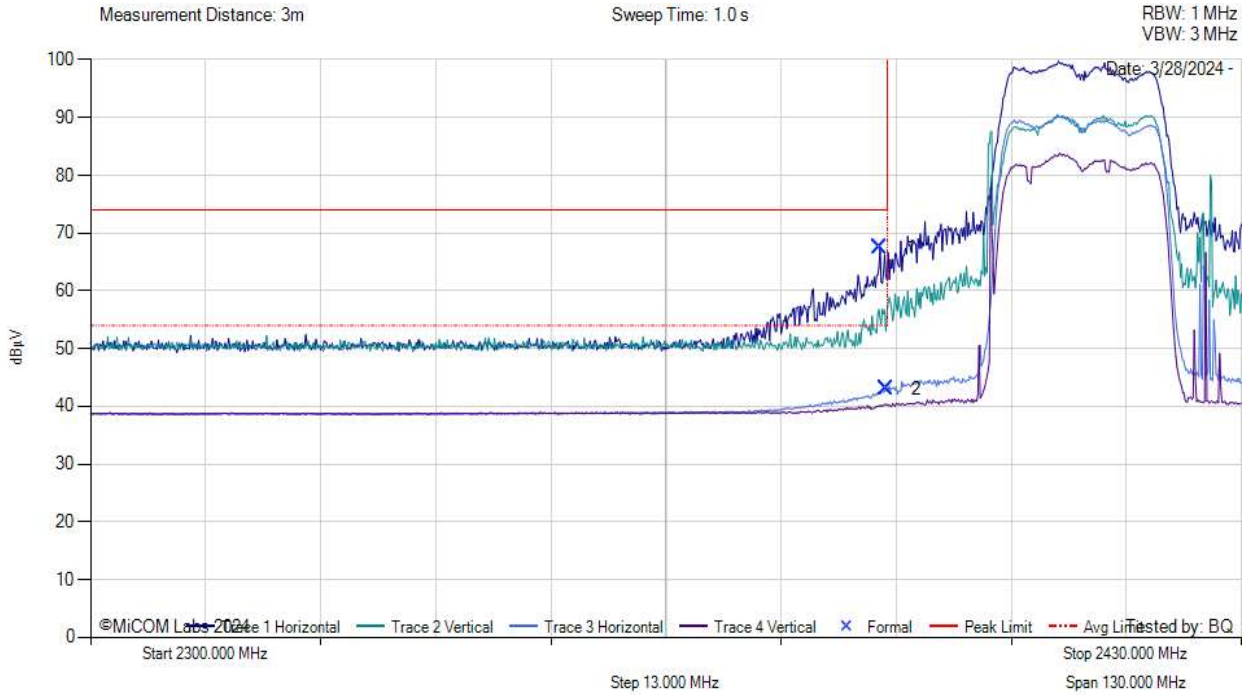
back to matrix

Equipment Configuration for BE 2400 MHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11n
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2412	**Data Rate:**	1 Mbps
Power Setting:	14	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Taoglas



2300.00 - 2430.00 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	2389.18	43.32	1.96	32.14	67.42	MaxP	Horizontal	149	180	74.0	-6.6	Pass
2	2389.83	18.91	1.96	32.14	43.01	AVG	Horizontal	149	180	54.0	-11.0	Pass

Test Notes: BE 11n HT20 2412MHz

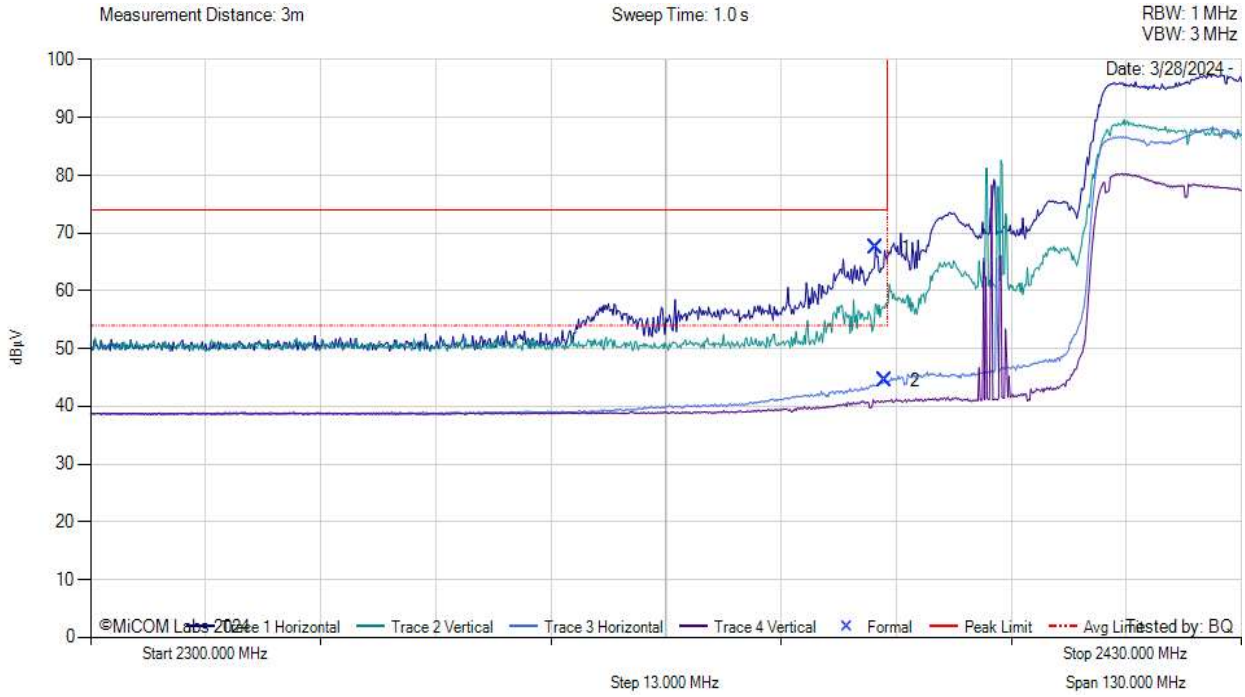
back to matrix

Equipment Configuration for BE 2400 MHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11n
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2422	**Data Rate:**	1 Mbps
Power Setting:	15	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Taoglas



2300.00 - 2430.00 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	2388.66	43.35	1.96	32.14	67.45	MaxP	Horizontal	149	180	74.0	-6.6	Pass
2	2389.70	20.39	1.96	32.14	44.49	AVG	Horizontal	149	180	54.0	-9.5	Pass

Test Notes: BE 11n HT40 2422MHz

back to matrix

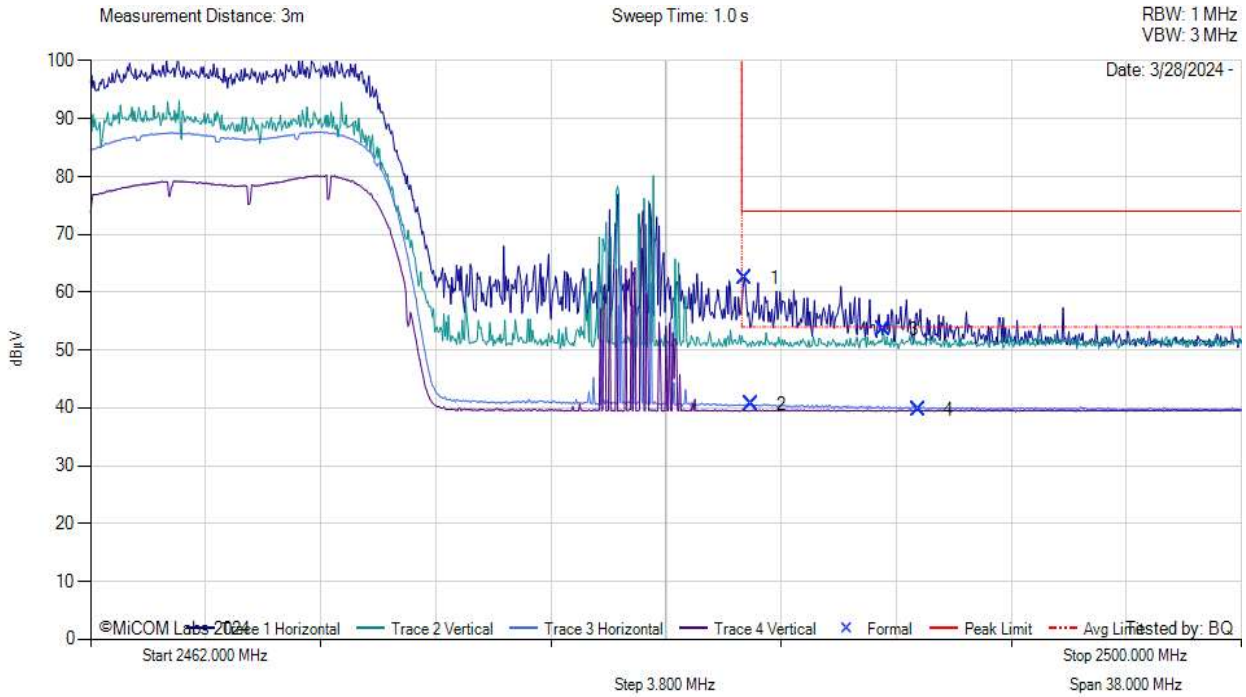
Equipment Configuration for BE 2483.5 MHZ

Antenna:	Taoglas GW.48.A151	**Variant:**	802.11ax
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2462	**Data Rate:**	MCS0
Power Setting:	14	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Taoglas



2462.00 - 2500.00 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	2483.58	38.05	1.98	32.41	62.44	MaxP	Horizontal	100	180	74.0	-11.6	Pass
2	2483.81	16.26	1.98	32.41	40.65	AVG	Horizontal	100	180	54.0	-13.3	Pass
3	2488.18	29.18	1.98	32.42	53.58	MaxP	Vertical	149	269	74.0	-20.4	Pass
4	2489.32	15.31	1.98	32.43	39.72	AVG	Vertical	149	330	54.0	-14.3	Pass

Test Notes: BE 11n HE20 2462MHz

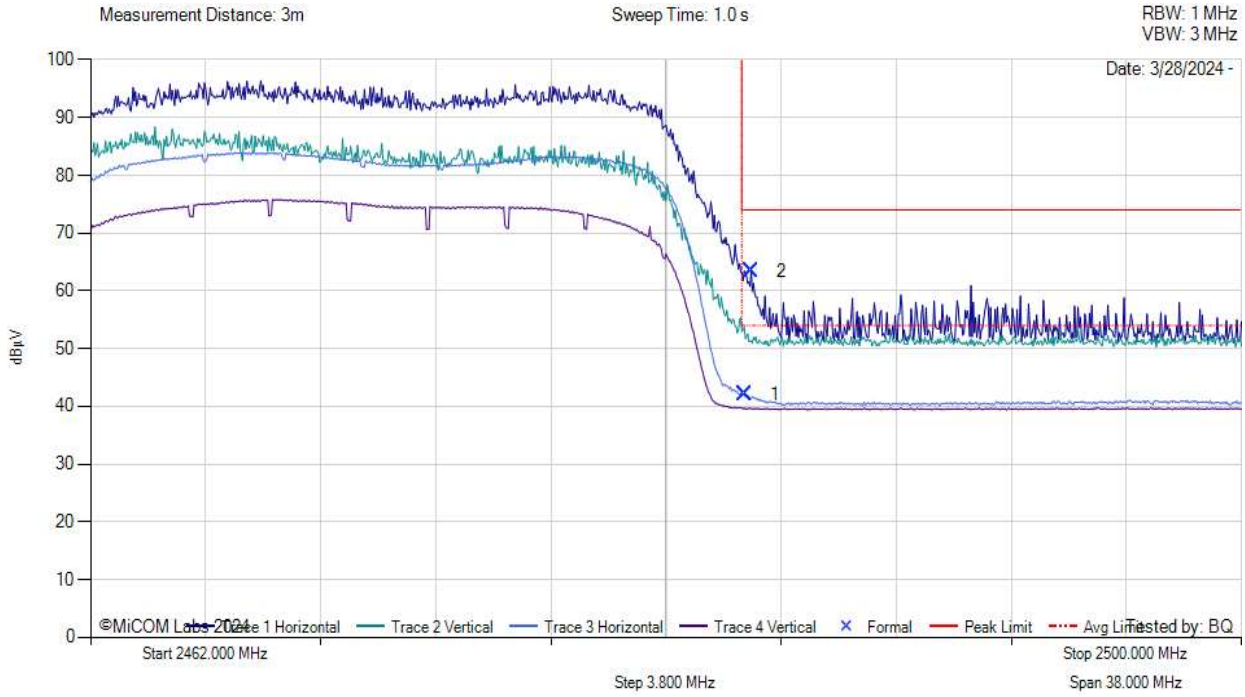
back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11ax
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2452	**Data Rate:**	MCS0
Power Setting:	13	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Taoglas



2462.00 - 2500.00 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	2483.58	17.66	1.98	32.41	42.05	AVG	Horizontal	100	180	54.0	-11.9	Pass
2	2483.81	38.97	1.98	32.41	63.36	MaxP	Horizontal	149	60	74.0	-10.6	Pass

Test Notes: BE 11n HE40 2452MHz

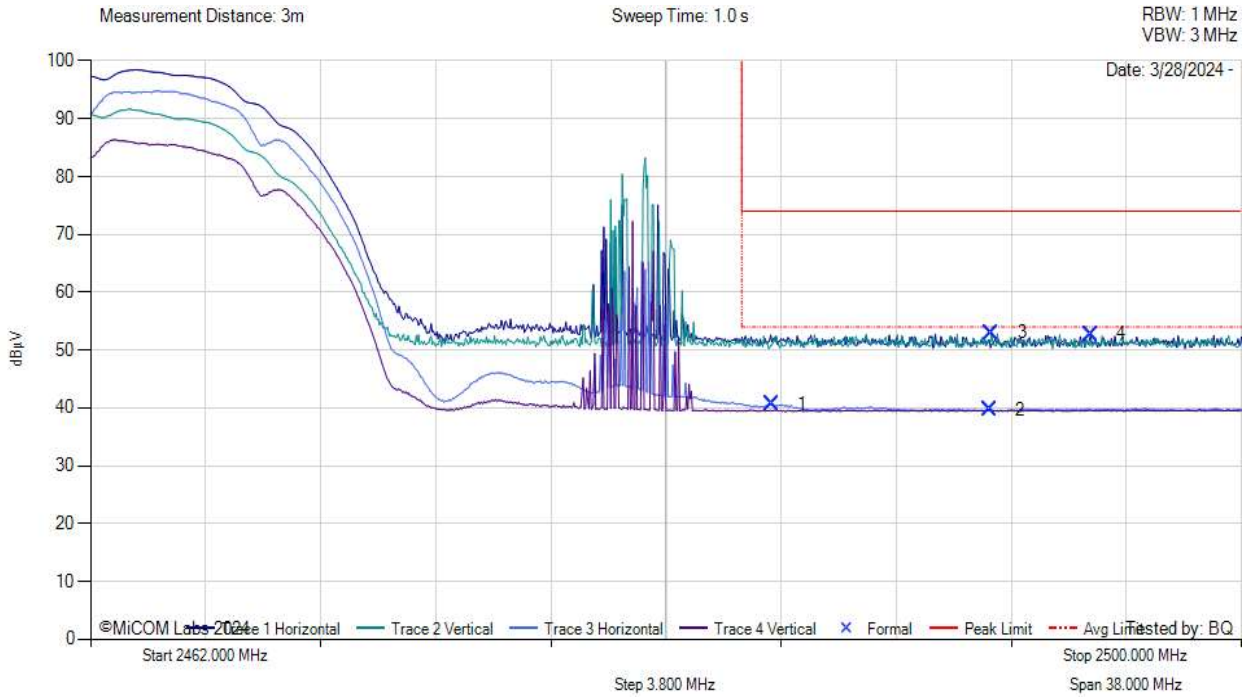
back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2462	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Taoglas



2462.00 - 2500.00 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	2484.50	16.26	1.98	32.41	40.65	AVG	Horizontal	100	180	54.0	-13.3	Pass
2	2491.68	15.34	1.99	32.43	39.75	AVG	Vertical	149	149	54.0	-14.2	Pass
3	2491.75	28.59	1.99	32.43	53.00	MaxP	Vertical	149	119	74.0	-21.0	Pass
4	2495.02	28.26	2.00	32.44	52.69	MaxP	Horizontal	100	270	74.0	-21.3	Pass

Test Notes: BE 11b 2462MHz

back to matrix

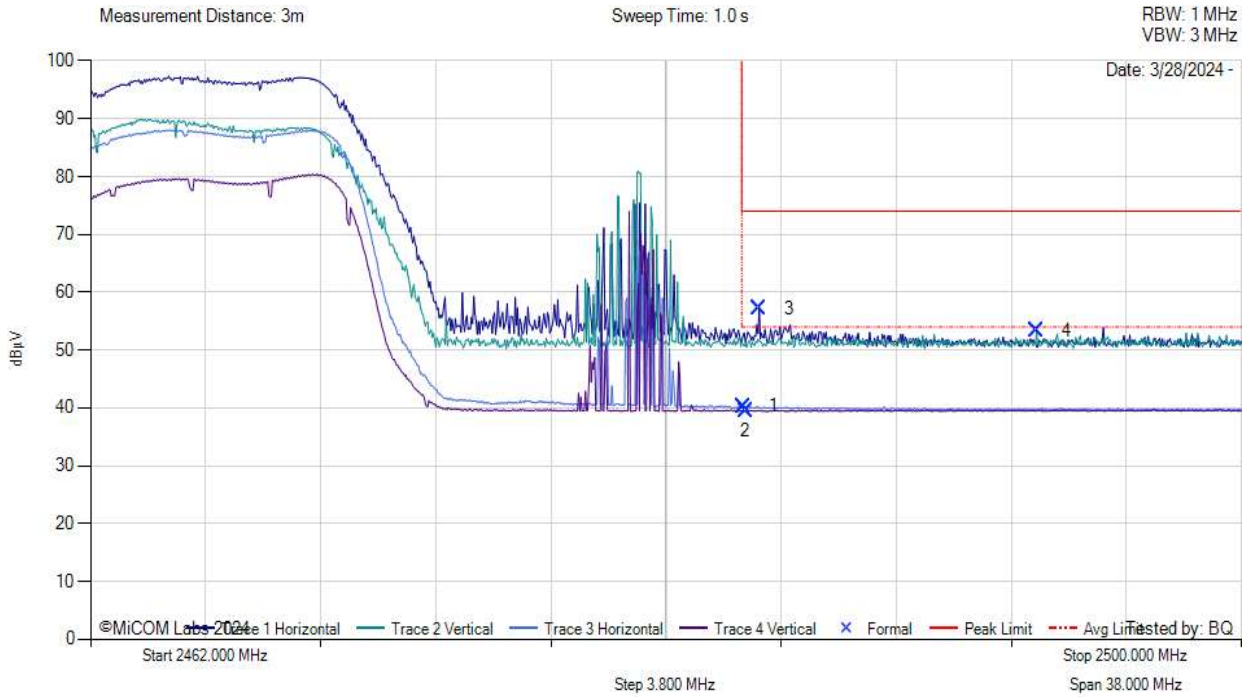
Equipment Configuration for BE 2483.5 MHZ

Antenna:	Taoglas GW.48.A151	**Variant:**	802.11g
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2462	**Data Rate:**	6 Mbps
Power Setting:	14	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Taoglas



2462.00 - 2500.00 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	2483.55	15.84	1.98	32.41	40.24	AVG	Horizontal	99	180	54.0	-13.8	Pass
2	2483.62	15.18	1.98	32.41	39.57	AVG	Vertical	99	209	54.0	-14.4	Pass
3	2484.08	32.77	1.98	32.41	57.16	MaxP	Horizontal	99	180	74.0	-16.8	Pass
4	2493.24	28.85	1.99	32.43	53.28	MaxP	Vertical	99	149	74.0	-20.7	Pass

Test Notes: BE 11g 2462MHz

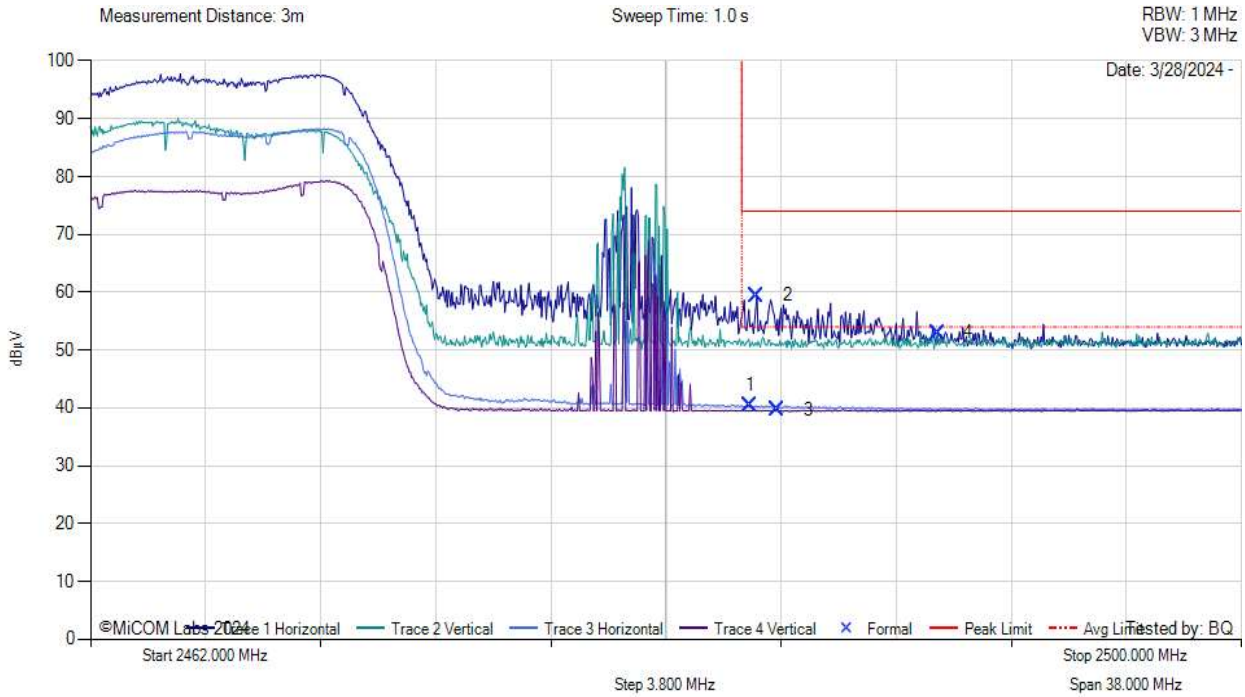
back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11n
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2462	**Data Rate:**	MCS0
Power Setting:	14	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Taoglas



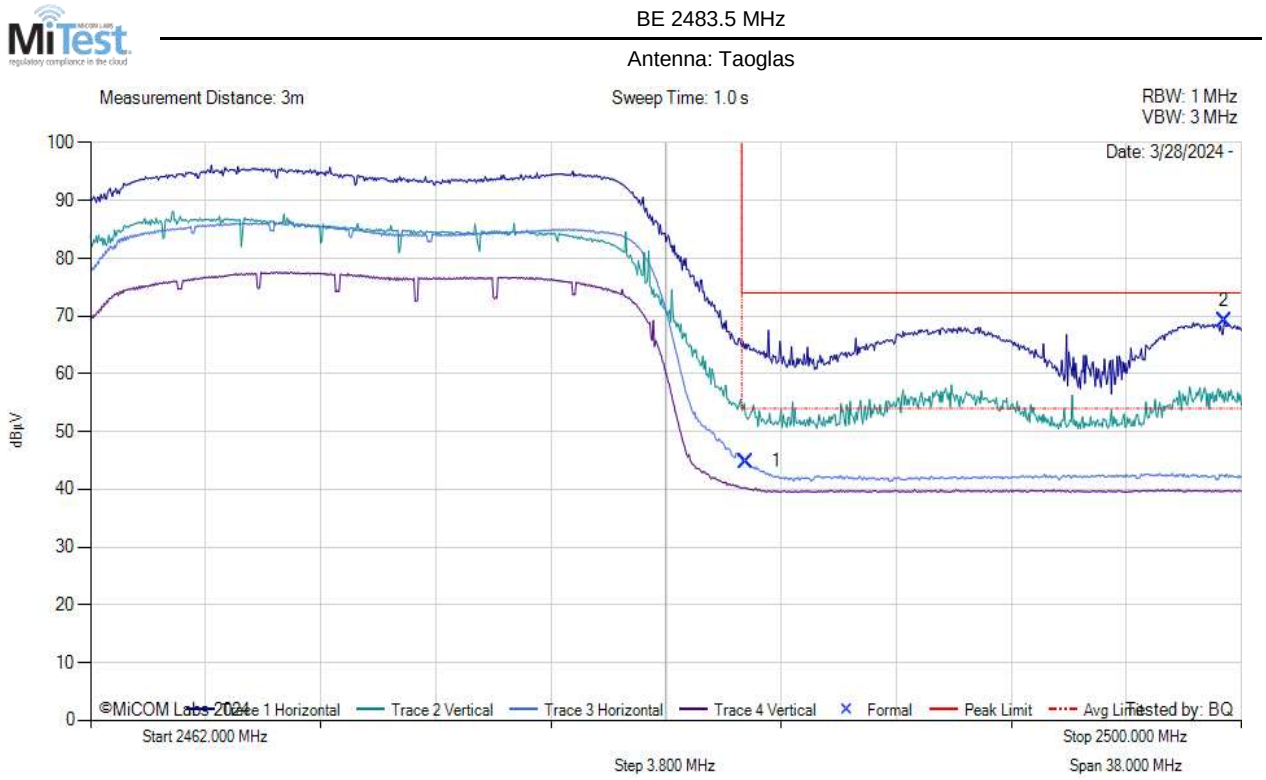
2462.00 - 2500.00 MHz												
Num	**Frequency MHz**	**Raw dBµV**	**Cable Loss dB**	**AF dB/m**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	2483.77	15.98	1.98	32.41	40.37	AVG	Horizontal	100	180	54.0	-13.6	Pass
2	2484.00	35.07	1.98	32.41	59.46	MaxP	Horizontal	149	210	74.0	-14.5	Pass
3	2484.69	15.32	1.98	32.42	39.72	AVG	Vertical	149	330	54.0	-14.3	Pass
4	2489.97	28.55	1.98	32.43	52.95	MaxP	Vertical	149	119	74.0	-21.0	Pass

Test Notes: BE 11n HT20 2462MHz

back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Taoglas GW.48.A151	**Variant:**	802.11n
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2452	**Data Rate:**	MCS0
Power Setting:	15	**Tested By:**	BQ

Test Measurement Results



2462.00 - 2500.00 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	2483.62	20.45	1.98	32.41	44.84	AVG	Horizontal	100	180	54.0	-9.2	Pass
2	2499.43	44.67	2.01	32.45	69.13	MaxP	Horizontal	149	180	74.0	-4.9	Pass

Test Notes: BE 802.11n HT40 2452MHz

back to matrix

9.1.2.4. ANTX100P001B24553 PCB

9.1.2.4.1. Lower Band-Edge

CC93		Band-Edge Freq	Limit 74.0dBµV/m	Limit 54.0dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	dBµV/m	
802.11ax HE20	2412.00	2390.00	72.21	51.85	16
802.11ax HE40	2422.00	2390.00	66.76	49.68	15
802.11b	2412.00	2390.00	60.96	48.47	18
802.11g	2422.00	2390.00	65.61	48.84	15
802.11n HT-20	2412.00	2390.00	68.90	51.06	16
802.11n HT-40	2422.00	2390.00	71.31	52.99	17

9.1.2.4.2. Upper Band-Edge

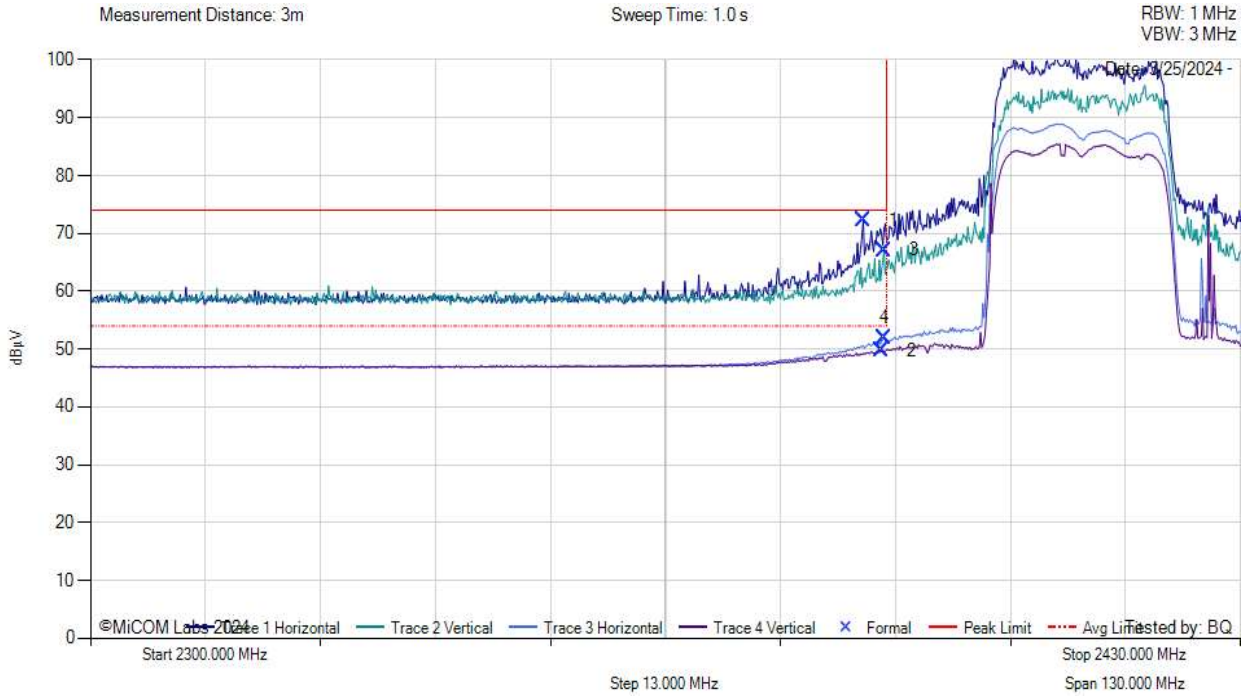
CC93		Band-Edge Freq	Limit 74.0dBµV/m	Limit 54.0dBµV/m	Power Setting
Operational Mode	Operating Frequency (MHz)	MHz	dBµV/m	dBµV/m	
802.11ax HE20	2462.00	2483.50	66.35	48.30	14
802.11ax HE40	2452.00	2483.50	64.11	48.31	13
802.11b	2462.00	2483.50	62.14	48.05	18
802.11g	2462.00	2483.50	61.51	48.14	14
802.11n HT-20	2462.00	2483.50	63.99	48.01	14
802.11n HT-40	2452.00	2483.50	72.56	50.42	15

Equipment Configuration for BE 2400 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11ax
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2412	**Data Rate:**	MCS0
Power Setting:	16	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Yaego ANTX100P001B24553



2300.00 - 2430.00 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	2387.36	48.12	1.97	32.13	72.21	MaxP	Horizontal	100	90	74.0	-1.8	Pass
2	2389.44	25.67	1.96	32.14	49.78	AVG	Vertical	149	330	54.0	-4.2	Pass
3	2389.70	43.04	1.96	32.14	67.14	MaxP	Vertical	149	0	74.0	-6.9	Pass
4	2389.70	27.75	1.96	32.14	51.85	AVG	Horizontal	100	90	54.0	-2.1	Pass

Test Notes: BE 11ax HE20 2412MHz

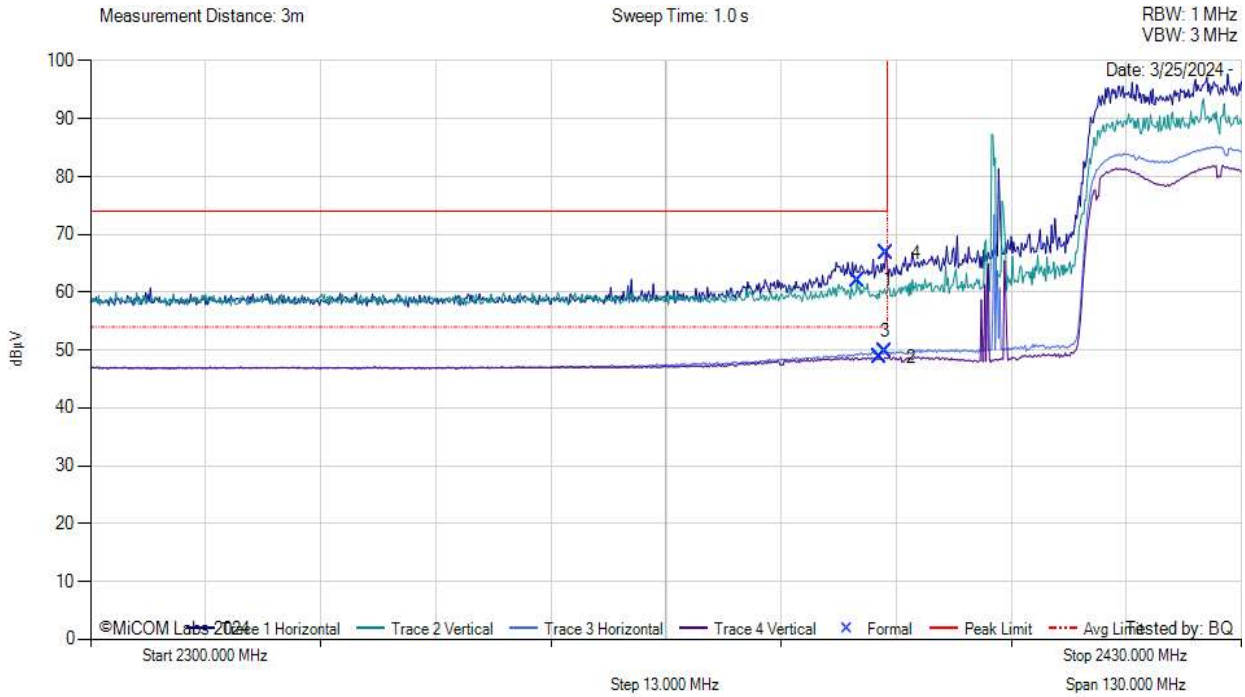
back to matrix

Equipment Configuration for BE 2400 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11ax
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2422	**Data Rate:**	MCS0
Power Setting:	15	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Yaego ANTX100P001B24553



2300.00 - 2430.00 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	2386.58	38.02	1.97	32.13	62.11	MaxP	Vertical	149	269	74.0	-11.9	Pass
2	2389.18	24.63	1.96	32.14	48.73	AVG	Vertical	149	330	54.0	-5.3	Pass
3	2389.70	25.57	1.96	32.14	49.68	AVG	Horizontal	100	90	54.0	-4.3	Pass
4	2389.83	42.65	1.96	32.14	66.76	MaxP	Horizontal	100	90	74.0	-7.2	Pass

Test Notes: BE 11ax HE40 2422MHz

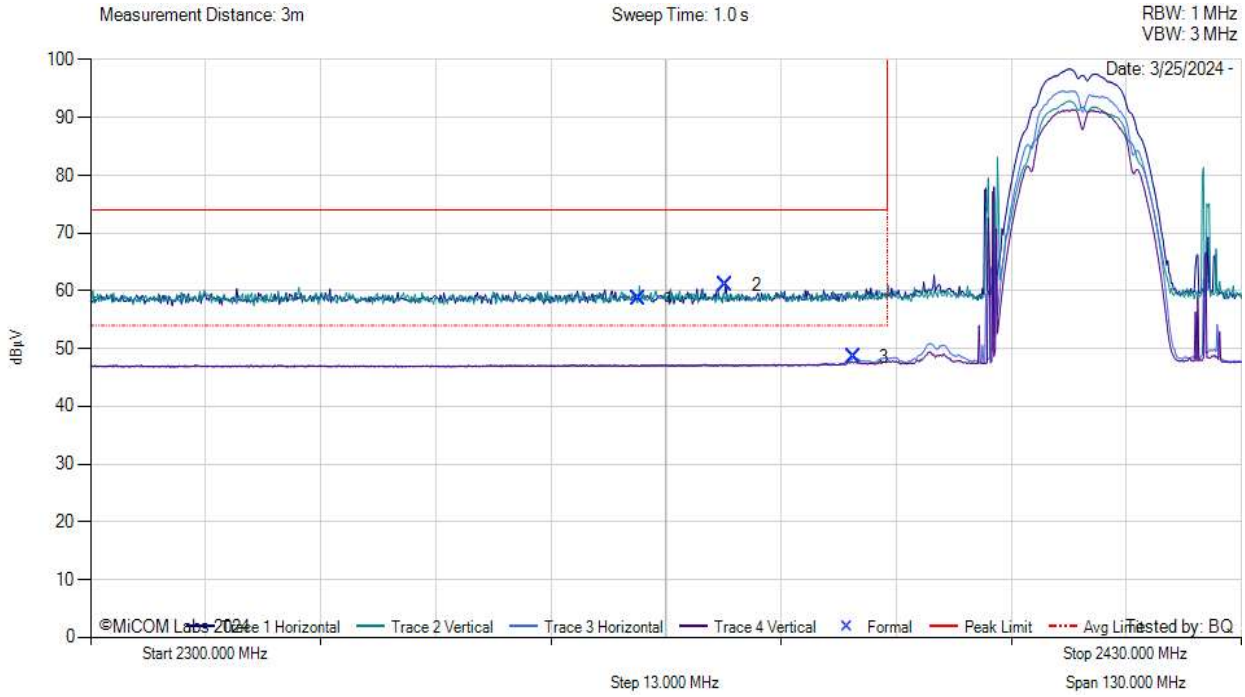
back to matrix

Equipment Configuration for BE 2400 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2412	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Yaego ANTX100P001B24553



2300.00 - 2430.00 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	2361.88	34.67	1.97	32.01	58.66	MaxP	Vertical	149	330	74.0	-15.3	Pass
2	2371.76	36.92	1.98	32.06	60.96	MaxP	Horizontal	98	90	74.0	-13.0	Pass
3	2386.19	24.38	1.97	32.12	48.47	AVG	Horizontal	98	90	54.0	-5.5	Pass

Test Notes: BE 11b 2412MHz

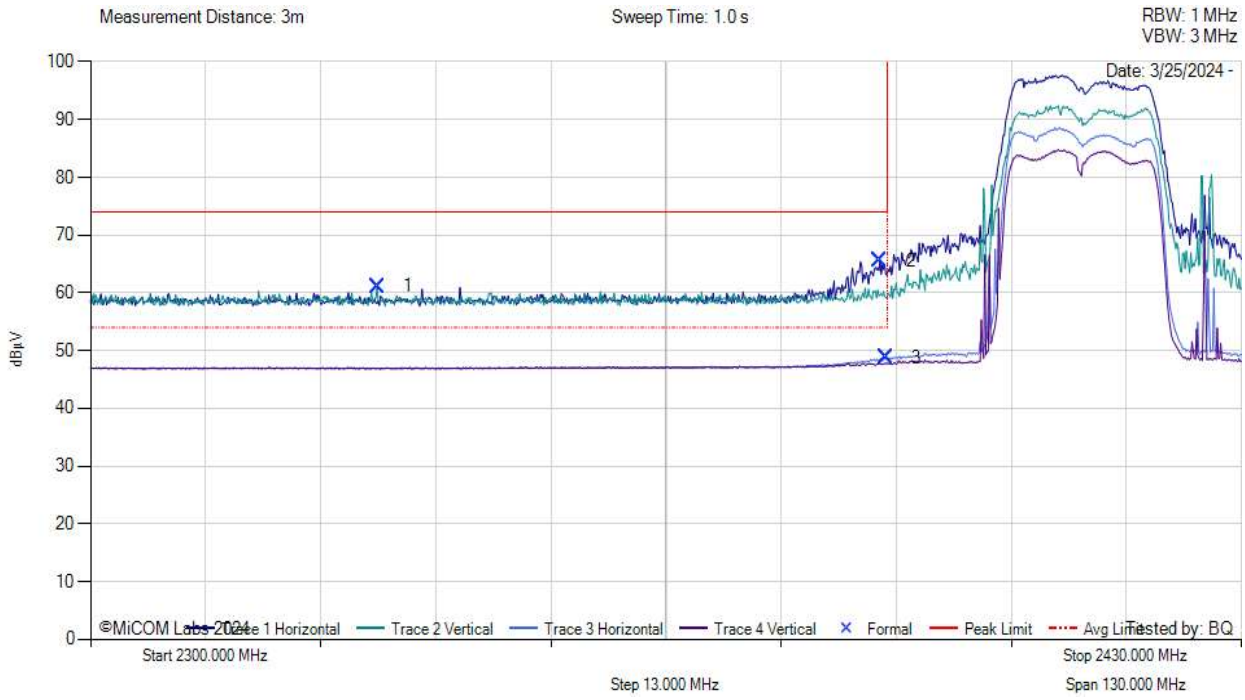
back to matrix

Equipment Configuration for BE 2400 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11g
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2412	**Data Rate:**	1 Mbps
Power Setting:	15	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Yaego ANTX100P001B24553



2300.00 - 2430.00 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	2332.37	37.31	1.93	31.91	61.15	MaxP	Vertical	99	179	74.0	-12.8	Pass
2	2389.18	41.51	1.96	32.14	65.61	MaxP	Horizontal	149	180	74.0	-8.4	Pass
3	2389.83	24.74	1.96	32.14	48.84	AVG	Horizontal	99	90	54.0	-5.2	Pass

Test Notes: BE 11g 2412MHz

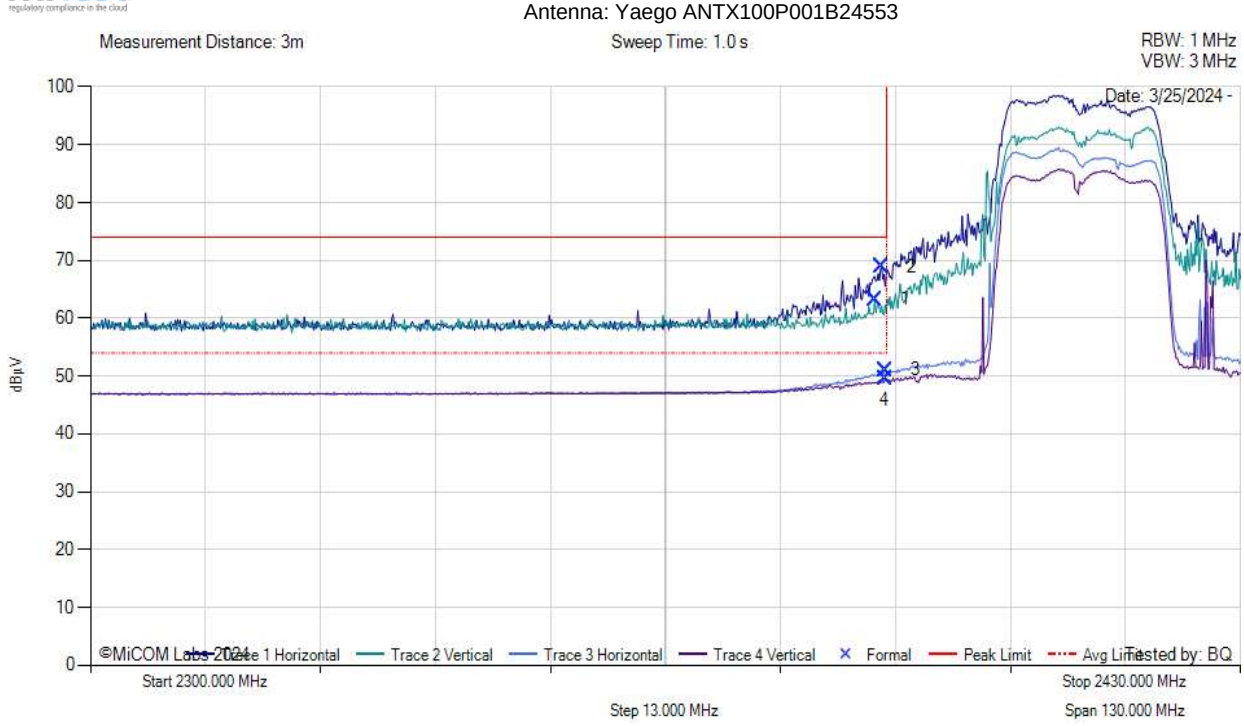
back to matrix

Equipment Configuration for BE 2400 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11n
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2412	**Data Rate:**	1 Mbps
Power Setting:	16	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Yaego ANTX100P001B24553



2300.00 - 2430.00 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	2388.66	39.14	1.96	32.14	63.24	MaxP	Vertical	149	269	74.0	-10.8	Pass
2	2389.44	44.80	1.96	32.14	68.90	MaxP	Horizontal	100	90	74.0	-5.1	Pass
3	2389.83	26.95	1.96	32.14	51.06	AVG	Horizontal	100	90	54.0	-2.9	Pass
4	2389.83	25.43	1.96	32.14	49.53	AVG	Vertical	149	330	54.0	-4.5	Pass

Test Notes: BE 11n HT20 2412MHz

back to matrix

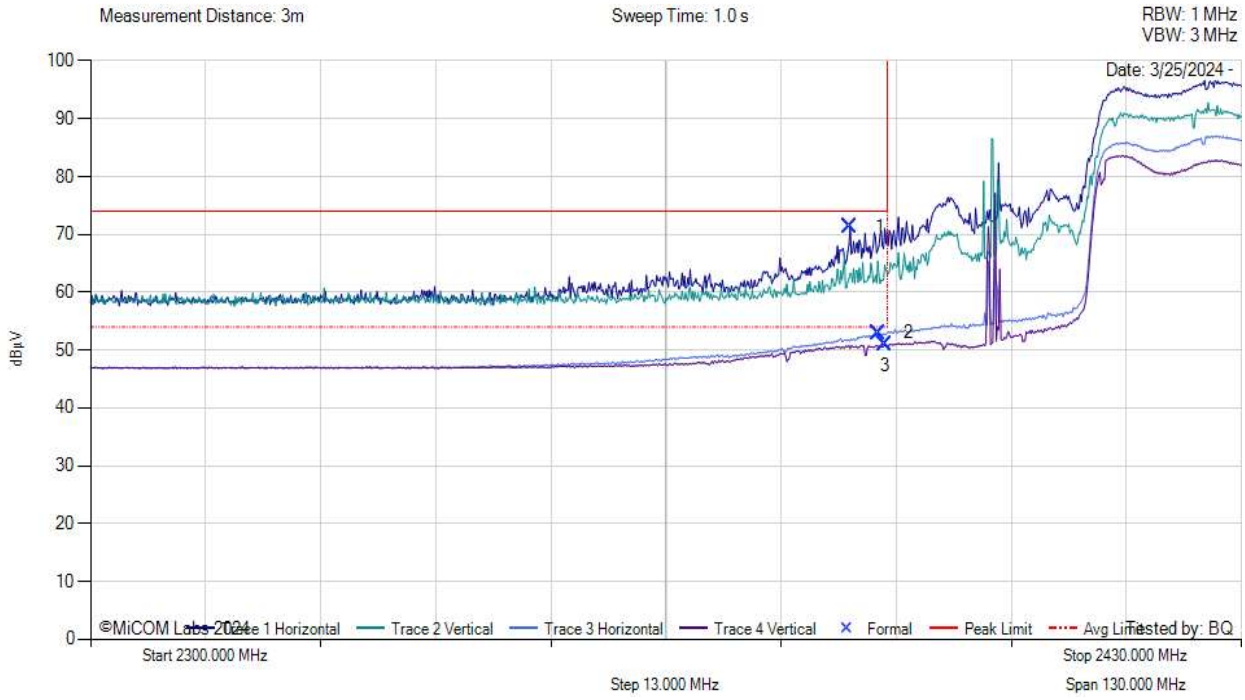
Equipment Configuration for BE 2400 MHZ

Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11n
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2422	**Data Rate:**	1 Mbps
Power Setting:	17	**Tested By:**	BQ

Test Measurement Results

BE 2400 MHz

Antenna: Yaego ANTX100P001B24553



2300.00 - 2430.00 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	2385.80	47.22	1.97	32.12	71.31	MaxP	Horizontal	100	90	74.0	-2.7	Pass
2	2388.92	28.89	1.96	32.14	52.99	AVG	Horizontal	100	90	54.0	-1.0	Pass
3	2389.70	26.81	1.96	32.14	50.92	AVG	Vertical	149	330	54.0	-3.1	Pass

Test Notes: BE 11n HT40 2422MHz

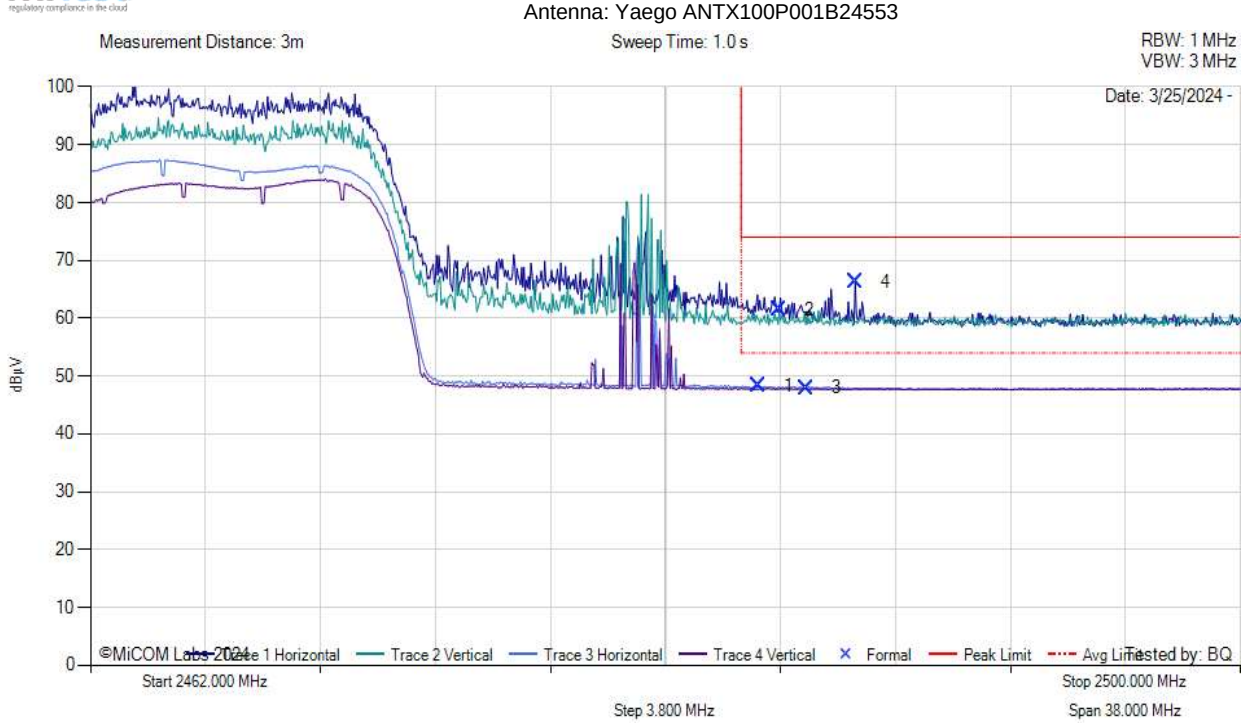
back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11ax
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2462	**Data Rate:**	MCS0
Power Setting:	14	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Yaego ANTX100P001B24553



2462.00 - 2500.00 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	2484.08	23.91	1.98	32.41	48.30	AVG	Horizontal	100	210	54.0	-5.7	Pass
2	2484.76	37.04	1.98	32.42	61.43	MaxP	Vertical	149	269	74.0	-12.6	Pass
3	2485.64	23.54	1.98	32.42	47.94	AVG	Vertical	149	89	54.0	-6.1	Pass
4	2487.27	41.95	1.98	32.42	66.35	MaxP	Horizontal	100	210	74.0	-7.7	Pass

Test Notes: BE 11n HE20 2462MHz

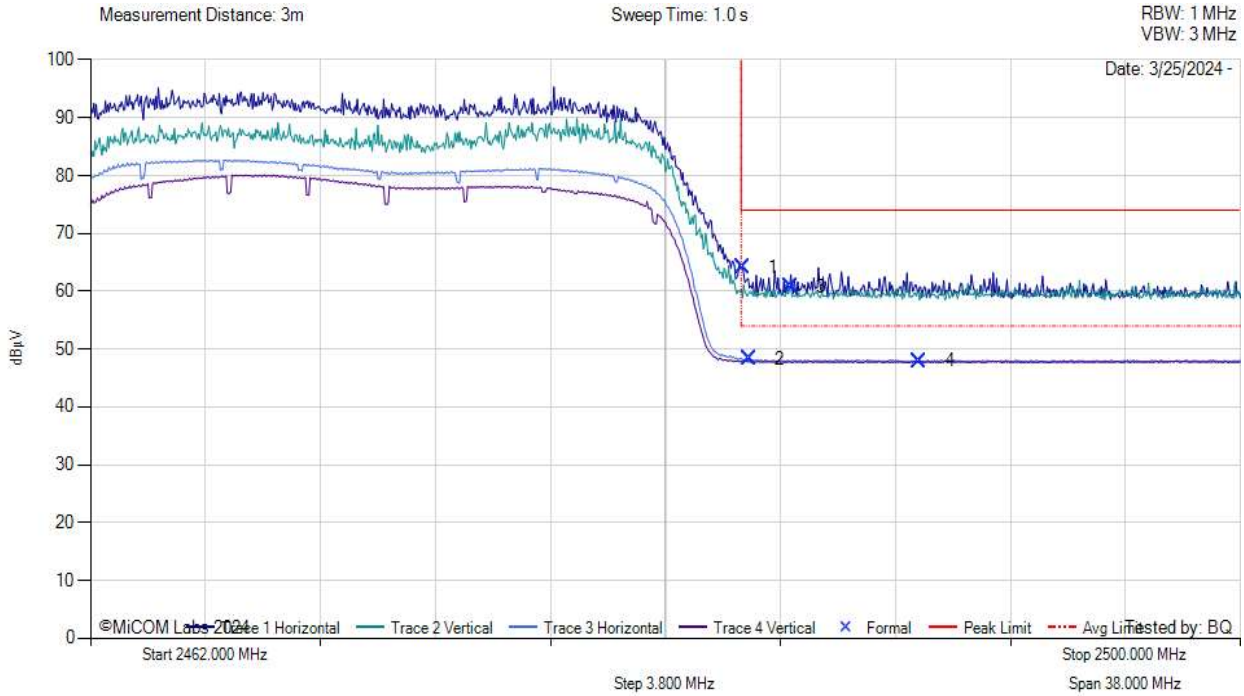
back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11ax
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2452	**Data Rate:**	MCS0
Power Setting:	13	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Yaego ANTX100P001B24553



2462.00 - 2500.00 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	2483.55	39.72	1.98	32.41	64.11	MaxP	Horizontal	149	210	74.0	-9.9	Pass
2	2483.77	23.92	1.98	32.41	48.31	AVG	Horizontal	100	210	54.0	-5.7	Pass
3	2485.14	36.32	1.98	32.42	60.72	MaxP	Vertical	149	0	74.0	-13.3	Pass
4	2489.40	23.58	1.98	32.43	47.99	AVG	Vertical	101	0	54.0	-6.0	Pass

Test Notes: BE 11n HE40 2452MHz

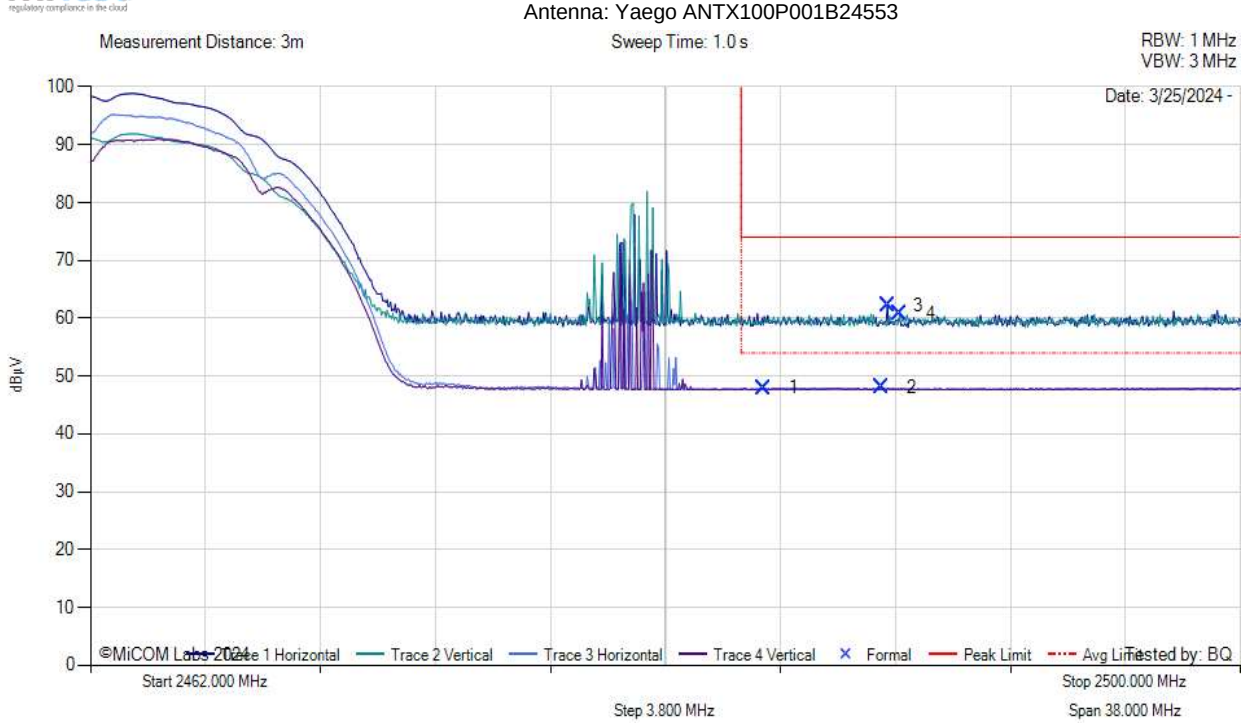
back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11b
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2462	**Data Rate:**	1 Mbps
Power Setting:	18	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Yaego ANTX100P001B24553



2462.00 - 2500.00 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	2484.23	23.54	1.98	32.41	47.93	AVG	Vertical	149	90	54.0	-6.1	Pass
2	2488.14	23.65	1.98	32.42	48.05	AVG	Horizontal	149	210	54.0	-5.9	Pass
3	2488.33	37.74	1.98	32.42	62.14	MaxP	Horizontal	100	300	74.0	-11.9	Pass
4	2488.75	36.29	1.98	32.42	60.69	MaxP	Vertical	100	239	74.0	-13.3	Pass

Test Notes: BE 11b 2462MHz

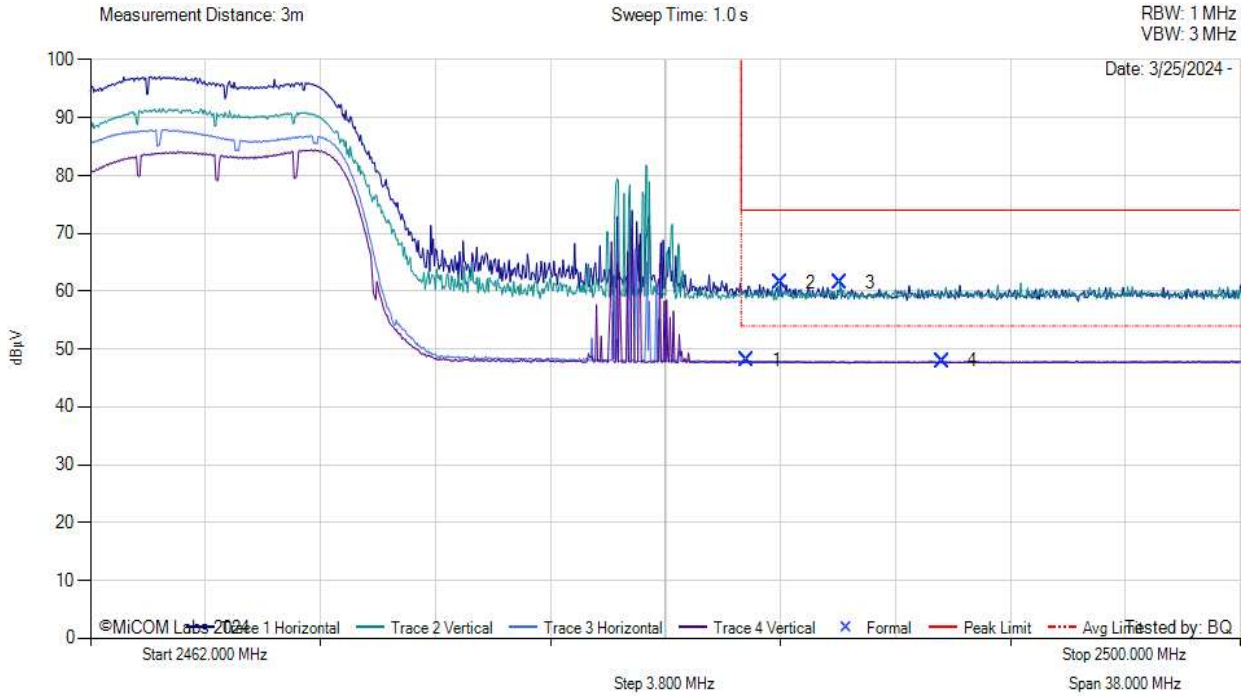
back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11g
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2462	**Data Rate:**	6 Mbps
Power Setting:	14	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Yaego ANTX100P001B24553



2462.00 - 2500.00 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	2483.70	23.75	1.98	32.41	48.14	AVG	Horizontal	149	210	54.0	-5.9	Pass
2	2484.80	37.05	1.98	32.42	61.45	MaxP	Horizontal	100	210	74.0	-12.6	Pass
3	2486.78	37.11	1.98	32.42	61.51	MaxP	Vertical	100	179	74.0	-12.5	Pass
4	2490.16	23.50	1.98	32.43	47.91	AVG	Vertical	149	0	54.0	-6.1	Pass

Test Notes: BE 11g 2462MHz

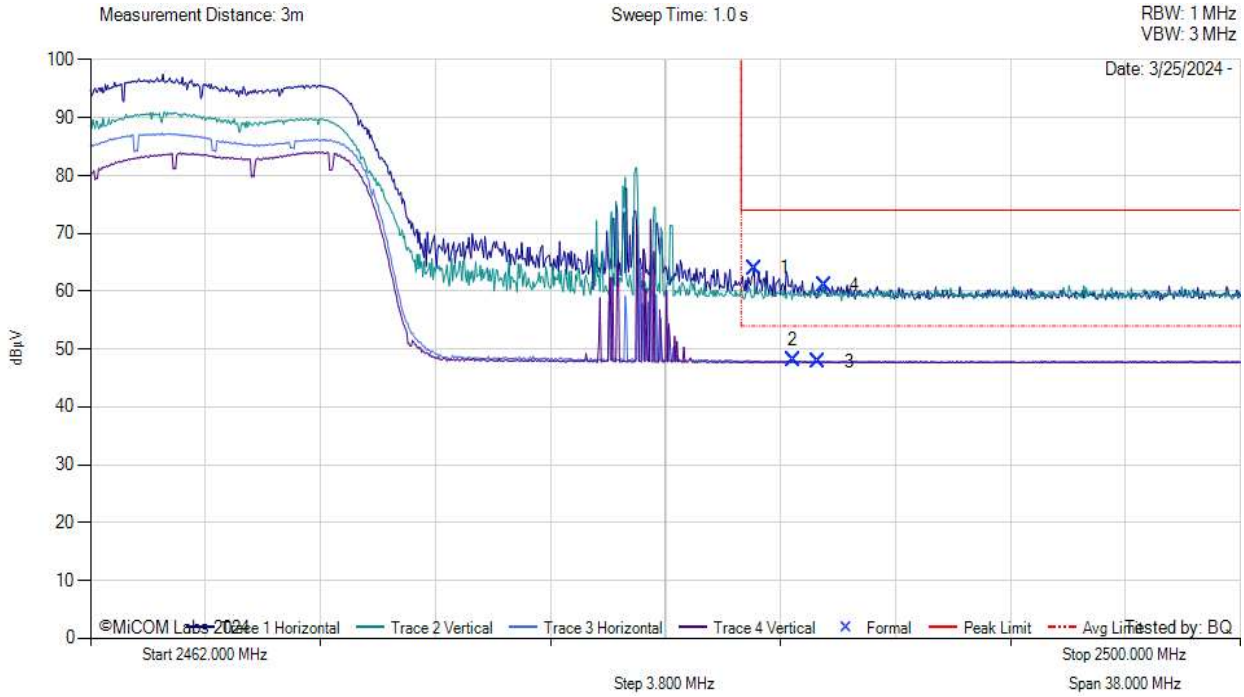
back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11n
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2462	**Data Rate:**	MCS0
Power Setting:	14	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Yaego ANTX100P001B24553



2462.00 - 2500.00 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	2483.93	39.60	1.98	32.41	63.99	MaxP	Horizontal	100	210	74.0	-10.0	Pass
2	2485.22	23.61	1.98	32.42	48.01	AVG	Horizontal	100	210	54.0	-6.0	Pass
3	2486.05	23.49	1.98	32.42	47.89	AVG	Vertical	149	0	54.0	-6.1	Pass
4	2486.24	36.62	1.98	32.42	61.02	MaxP	Vertical	100	0	74.0	-13.0	Pass

Test Notes: BE 11n HT20 2462MHz

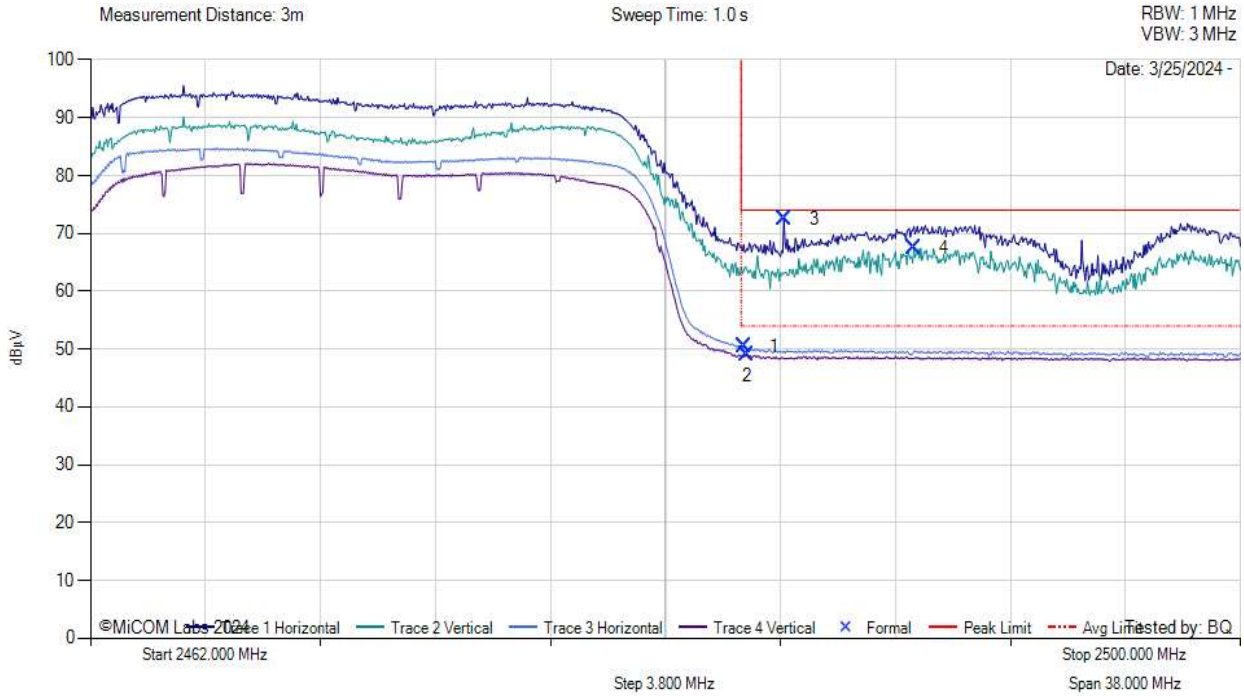
back to matrix

Equipment Configuration for BE 2483.5 MHZ			
Antenna:	Yaego ANTX100P001B24553	**Variant:**	802.11n
Antenna Gain (dBi):	Not Applicable	**Modulation:**	OFDM
Channel Frequency (MHz):	2452	**Data Rate:**	MCS0
Power Setting:	15	**Tested By:**	BQ

Test Measurement Results

BE 2483.5 MHz

Antenna: Yaego ANTX100P001B24553



2462.00 - 2500.00 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	2483.58	26.03	1.98	32.41	50.42	AVG	Horizontal	149	210	54.0	-3.6	Pass
2	2483.70	24.58	1.98	32.41	48.97	AVG	Vertical	149	269	54.0	-5.0	Pass
3	2484.91	48.17	1.98	32.42	72.56	MaxP	Horizontal	149	210	74.0	-1.4	Pass
4	2489.21	43.09	1.98	32.43	67.50	MaxP	Vertical	149	269	74.0	-6.5	Pass

Test Notes: BE 11n HT40 2452MHz

back to matrix

575 Boulder Court
Pleasanton, California 94566, USA
Tel: +1 (925) 462 0304
Fax: +1 (925) 462 0306
www.micomlabs.com