



Digital Control Incorporated

WiFi/BT Module WL18MODGI

FCC 15.247:2026

RSS-247 Issue 4:2025

RSS-Gen Issue 5:2018+A1:2019+A2:2021

Wi-Fi 802.11 b/g/n 2x2 MIMO Radio

Report: DIGC0286.1 Rev. 02, Issue Date: May 13, 2026



This report must not be used to claim product certification, approval, or endorsement by A2LA or any agency of the U.S. Government. This Report shall not be reproduced, except in full without written approval of the laboratory.

This report is Blockchain Verified. To verify the report's authenticity, please visit <https://www.blockchain-verified.com/> or by clicking the logo to the right.



TABLE OF CONTENTS

Section	Page Number
Certificate of Test	3
Revision History	4
Facilities	5
Measurement Uncertainty	6
Test Setup Block Diagrams	7
Product Description	10
Power Settings and Antennas	11
Configurations	12
Modifications	14
Duty Cycle	15
DTS and Occupied Bandwidth	20
Output Power - MIMO	28
Output Power - SISO	32
Spurious Radiated Emissions - SISO Port 1	37
Spurious Radiated Emissions - MIMO	47
Radiated Band Edge - MIMO	57
Radiated Band Edge - SISO	62
End of Report	69

CERTIFICATE OF TEST

Last Date of Test: December 9, 2025

Digital Control Incorporated

EUT: WiFi/BT Module WL18MODGI

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2026	ANSI C63.10:2020 + Cor. 1-2023
RSS-247 Issue 4:2025	ANSI C63.10:2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024
RSS-Gen Issue 5:2018+A1:2019+A2:2021	

Guidance

FCC KDB 558074 v05r02:2019, FCC KDB 662911
Notice 2021 - CEB0001

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Powerline Conducted Emissions	N/A	15.207	RSS-Gen 8.8	6.2	Not required for a C2PC
Duty Cycle	Pass	KDB 558074 -6.0	RSS-Gen 3.2	11.6	
DTS and Occupied Bandwidth	Pass	15.247(a)(2), KDB 558074 -8.2, -2.1	RSS-Gen 6.7	11.8.2, 6.9.3	
Output Power	Pass	15.247(b)(3), KDB 558074 -8.3.2	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.2.2.4	
Equivalent Isotropic Radiated Power (EIRP)	N/A	15.247(b)(3), KDB 558074 -8.3.2	RSS-247 5.4(d, f), RSS-Gen 6.12	11.9.2.2.4	Not required for a C2PC
Power Spectral Density	N/A	15.247(e), KDB 558074 -8.4	RSS-247 5.2(b)	11.10.5	Not required for a C2PC
Band Edge Compliance	N/A	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	Not required for a C2PC
Spurious Conducted Emissions	N/A	15.247(d), KDB 558074 -8.5	RSS-247 5.5	11.11	Not required for a C2PC
Radiated Band Edge Emissions	Pass	N/A	RSS-247 5.5, RSS-Gen 6.13, 8.10	11.12.1, 11.13.2, 6.6	
Spurious Radiated Emissions	Pass	N/A	RSS-247 5.5, RSS-Gen 6.13, 8.10	11.12.1, 11.13.2, 6.4, 6.5, 6.6	

Deviations From Test Standards

None

Approved By:



Chuck Heller, Operations Manager
Signed for and on behalf of Element

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		
01	Updated FCC year to 2026 and RSS-247 to Issue 4 2025.	2026-04-06	1
	Updated CoT for BE compliance	2026-04-06	3
	Updated MU range	2026-04-06	7
	Updated Power settings table to clearly show SISO / MIMO modes of operation. Also updated Ant 1 and 2 to Port 1 and 2. Added Modulation types.	2026-04-06	12
	Updated the testing objective - removed mention of testing in the host product.	2026-04-06	10
	Added configuration DIGC0286-3.	2026-04-06	14
	Updated first date of test on product description page.	2026-04-06	10
	Updated naming convention to "Port 1" and "Port 2" for all tests and updated notes to show MIMO mode or SISO mode.	2026-04-06	16-92
	Added comment: The measured emission is a mixed signal which consists of a CW tone and a signal that is temporally associated with the transmitter. Applying a DCCF would erroneously correct the AVG value above the measured peak.	2026-04-06	54, 64, 74
	Removed SISO modes for antenna 2.	2026-04-06	N/A
02	Added AIY prior to calibration as it was calibrated in the middle of the testing period.	2026-05-12	47, 57
	Removed config-3	2026-05-12	N/A
	Removed SISO port 2 related data	2026-05-12	11

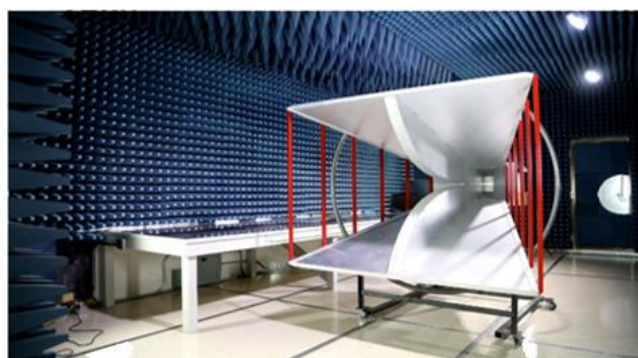
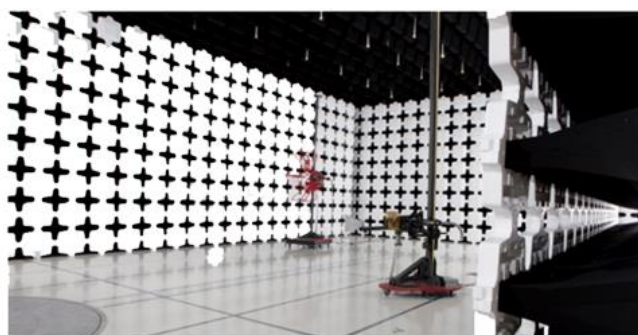
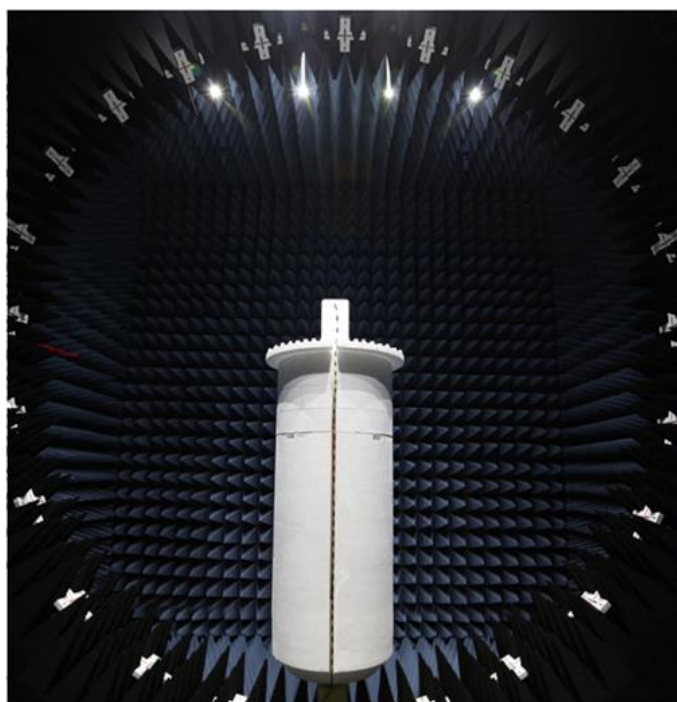
FACILITIES

Testing was performed at the following location(s)

	Location	Labs ⁽¹⁾	Address	A2LA ⁽²⁾	ISED ⁽³⁾	BSMI ⁽⁴⁾	VCCI ⁽⁵⁾	CAB	FDA ⁽⁶⁾
☐	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
☐	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
☐	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
☒	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
☐	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

- (1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
- (2) A2LA Certificate No.
- (3) ISED Company No.
- (4) BSMI No.
- (5) VCCI Site Filing No.
- (6) FDA ASCA No.



MEASUREMENT UNCERTAINTY

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation reported is based on statistical analysis that was performed by the laboratory. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty ($k=2$) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable) and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Various Measurements

Test	All Labs (+/-)
Frequency Accuracy (%)	0.0007
Amplitude Accuracy (dB)	1.2
Conducted Power (dB)	1.2
Radiated Power via Substitution (dB)	0.7
Temperature (degrees C)	0.7
Humidity (% RH)	2.5
Voltage (AC) (%)	1
Voltage (DC) (%)	0.7
Near-field Measurement of E-Field (dB)	1.89
Near-field Measurement of H-Field (dB)	2.65

Field Strength Measurements (dB)

Range	NC01 (+/-)
9kHz-30MHz	1.7
30MHz-1GHz 3m	4.9
1GHz-6GHz	5.1
6GHz-40GHz	5.3

TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

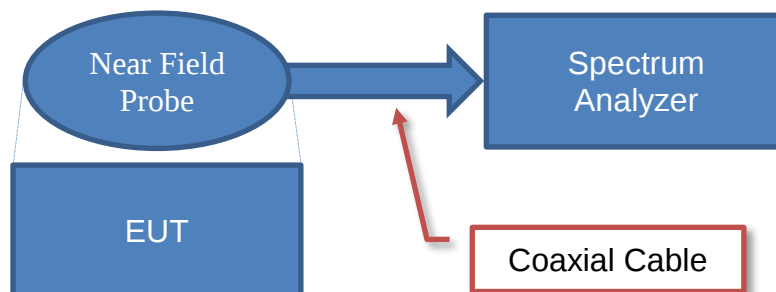
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements

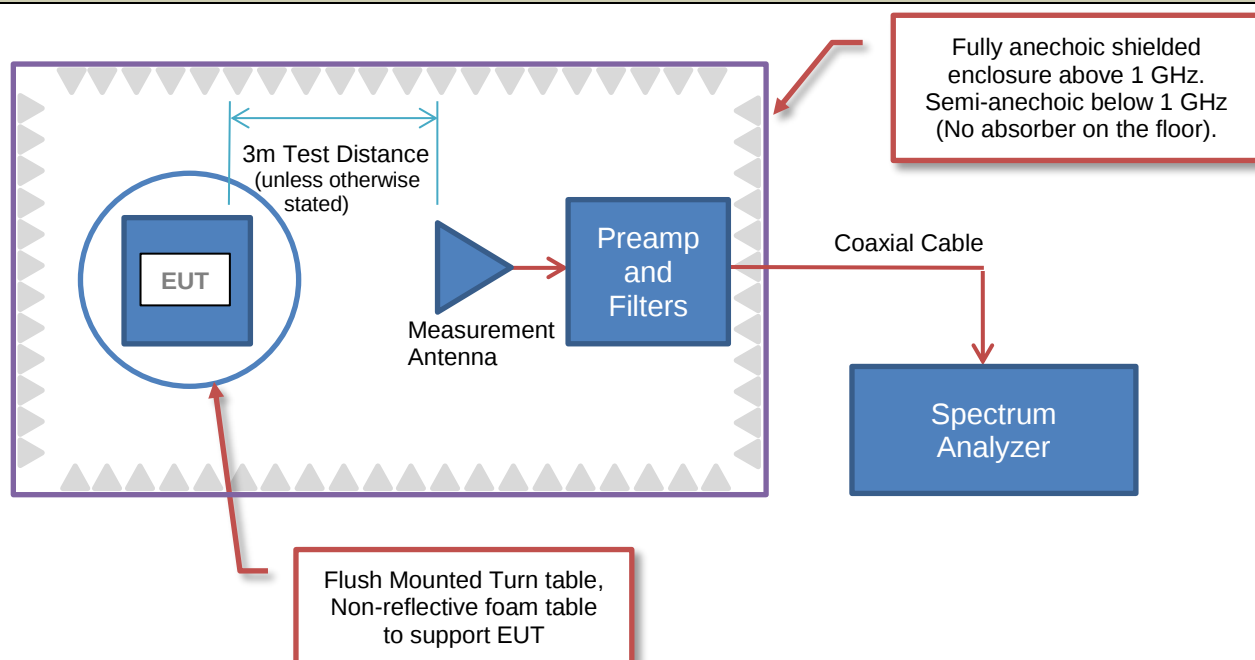


Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)	Factor			Distance Adjustment Factor	External Attenuation	Field Strength
	Antenna Factor	Cable Factor	Amplifier Gain			
42.6	28.6	3.1	40.8	0.0	0.0	33.5

Conducted Emissions:

Measured Level (Amplitude)	Factor		External Attenuation	Adjusted Level
	Transducer Factor	Cable Factor		
26.7	0.3	0.1	20.0	47.1

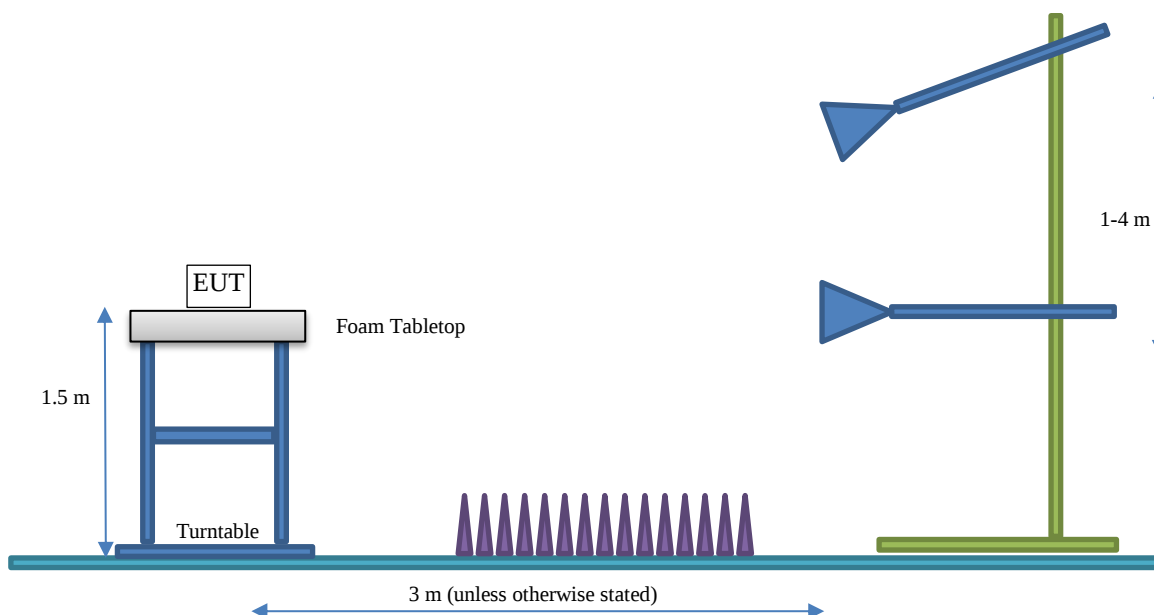
Radiated Power (ERP/EIRP) – Substitution Method:

Measured Level into Substitution Antenna (Amplitude dBm)	Substitution Antenna Factor (dBi)	EIRP to ERP (if applicable)	Measured power (dBm ERP/EIRP)
10.0	6.0	2.15	13.9/16.0

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION



Client and Equipment under Test (EUT) Information

Company Name:	Digital Control Incorporated
Address:	19625 62nd Ave South, Suite B103
City, State, Zip:	Kent, WA 98032
Test Requested By:	Ashley Olson
EUT:	WiFi/BT Module WL18MODGI
First Date of Test:	October 24, 2025
Last Date of Test:	December 9, 2025
Receipt Date of Samples:	October 24, 2025
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Dual-Band Industrial Module – Wi-Fi®, Bluetooth®, and BLE
Model number: WL18MODGI; (The WL1837 reference is a TI part number.)

Testing Objective:

To demonstrate compliance of the Wi-Fi 802.11 b/g/n 2x2 MIMO radio under FCC 15.247/RSS-247 for operation in the 2.4 GHz band.

POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Mini FR4 PCB	Taoglas	2400-2500	4.7

The EUT was tested using the power settings provided by the manufacturer which were based upon:

- ☒ Test software settings Firmware used for testing: Rev 8.9.0.0.83
☐ Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

	Port	Modulation Type	Data Rates	Channel Bandwidths (MHz)	Channels Number	Channel Position	Power Setting (dBm)	
							Port 1	Port 2
802.11(b) DSSS	1 (SISO)	DBPSK	1 Mbps	20	1, 6, 11	Low, Mid, High	18.5	N/A
802.11(g) OFDM		BPSK	6 Mbps	20	1, 6, 11	Low, Mid, High	19.5	N/A
802.11(n) OFDM		BPSK	MCS0	20	1, 6, 11	Low, Mid, High	19.5	N/A
				40	1/5, 4/8, 7/11	Low, Mid, High	19.5	N/A
802.11(n) OFDM	12 (MIMO)	16-QAM	MCS12	20	1, 6, 11	Low, Mid, High	19.5 (Low, Mid) 13.5 (High)	17.5 (Low, Mid) 11.5 (High)

CONFIGURATIONS



Configuration DIGC0286-1

Software/Firmware Running During Test	
Description	Version
PHY firmware	Rev 8.2.0.0.243
Firmware booted	Rev 8.9.0.0.83

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
BLE/Wi-Fi Module	Texas Instrument	WL18MODGI-WL1837	119

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Main Board with remote and display	Digital Control Incorporated	600-0266-00	N/A
Adapter board	Digital Control Incorporated	600-0274-00X1	N/A

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	None	1.5 m	None	DC Power Supply	Test Board

CONFIGURATIONS



Configuration DIGC0286-2

Software/Firmware Running During Test	
Description	Version
PHY firmware	Rev 8.2.0.0.243
Firmware booted	Rev 8.9.0.0.83

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
BLE/Wi-Fi Module	Texas Instrument	WL18MODGI-WL1837	119
MMCX Main Antenna 1	Taoglas	PC.11.17.0180	N/A
MMCX Diverse Antenna 2	Taoglas	PC.11.17.0180	N/A

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Main Board with remote and display	Digital Control Incorporated	600-0266-00	N/A
Adapter board	Digital Control Incorporated	600-0274-00X1	N/A

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	None	1.5 m	None	DC Power Supply	Test Board
MMCX Antenna	None	0.2 m	None	MMCX Main Antenna 1	BLE/Wi-Fi Module
MMCX Antenna	None	0.2 m	None	MMCX Diverse Antenna 2	BLE/Wi-Fi Module

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2025-10-24	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2025-10-24	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2025-10-24	DTS and Occupied Bandwidth (99%)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2025-10-30	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2025-11-03	Radiated Band Edge	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2025-12-09	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

DUTY CYCLE

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only take the measurement during the burst duration.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2025-01-09	2026-01-09
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2025-05-09	2026-05-09
Generator - Signal	Agilent	N5183A	TIA	2024-07-09	2026-07-09
Block - DC	Weinschel Corp.	7006	AMS	2025-01-27	2026-01-27
Attenuator	Fairview Microwave	SA4014-20	QAA	2025-05-09	2026-05-09

DUTY CYCLE

EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-10-24
Customer:	Digital Control Incorporated	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	43.2%
Customer Project:	None	Bar. Pressure (PMSL):	1027 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	12 VDC	Configuration:	DIGC0286-1

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator, measurement cable and customer MMCX to SMA patch cable.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

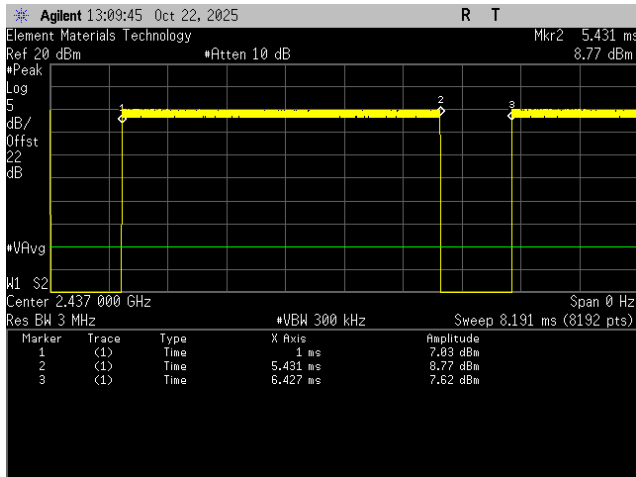


Tested By

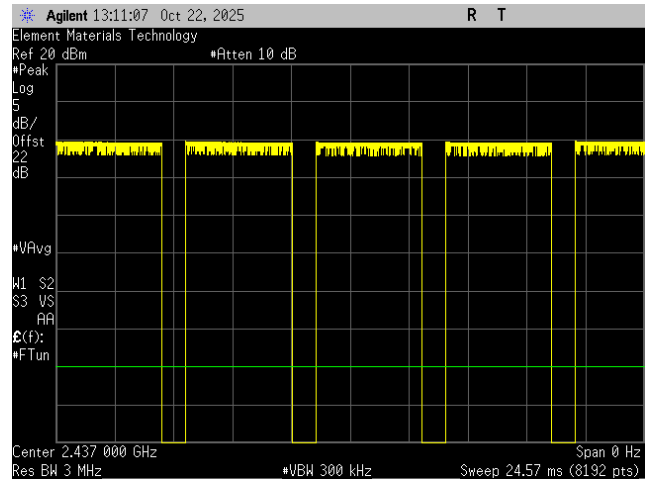
TEST RESULTS

	Pulse Width	Period	Number of Pulses	Value (%)	Limit N/A ()	Results
Port 1						
20 MHz BW						
802.11(b) 1 Mbps						
Mid Channel 6, 2437 MHz	4.431 ms	5.427 ms	1	81.6	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
802.11(g) 6 Mbps						
Mid Channel 6, 2437 MHz	731.435 us	1.731 ms	1	42.3	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
802.11(n) MCS0						
Mid Channel 6, 2437 MHz	691.501 us	1.691 ms	1	40.9	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
40 MHz BW						
802.11(n) MCS0						
Mid Channel 4/8, 2437 MHz	352.7 us	1.35 ms	1	26.1	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
MIMO Port 1						
20 MHz BW						
802.11(n) MCS12						
Mid Channel 6, 2437 MHz	96.7 us	1.095 ms	1	8.8	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A
MIMO Port 2						
20 MHz BW						
802.11(n) MCS12						
Mid Channel 6, 2437 MHz	96.356 us	1.095 ms	1	8.8	N/A	N/A
	N/A	N/A	5	N/A	N/A	N/A

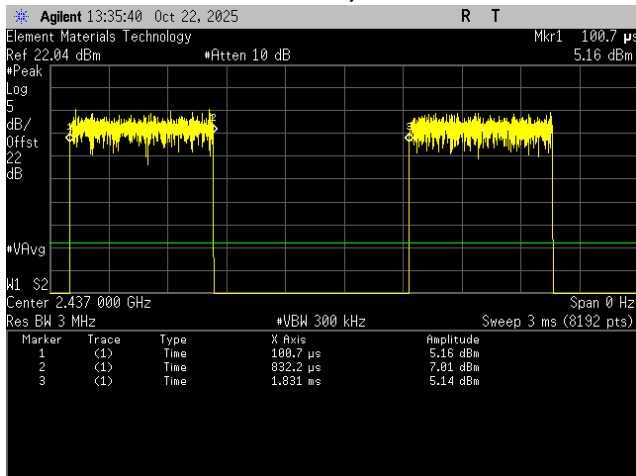
DUTY CYCLE



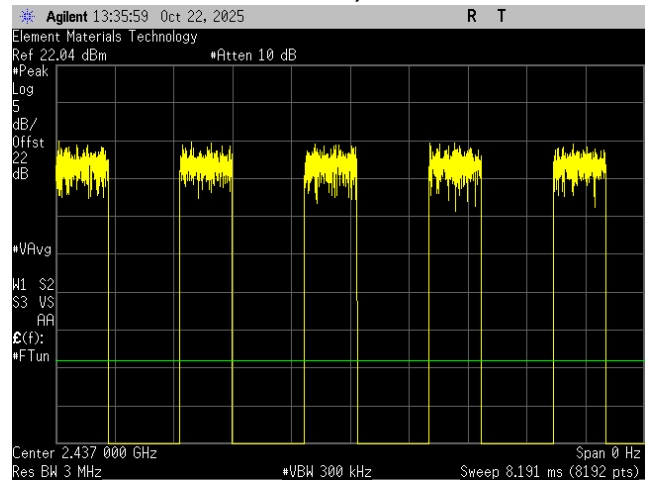
Port 1
20 MHz BW
802.11(b) 1 Mbps
Mid Channel 6, 2437 MHz



Port 1
20 MHz BW
802.11(b) 1 Mbps
Mid Channel 6, 2437 MHz

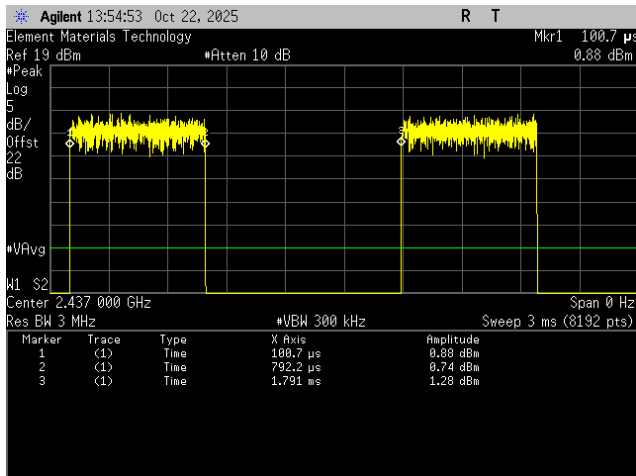


Port 1
20 MHz BW
802.11(g) 6 Mbps
Mid Channel 6, 2437 MHz

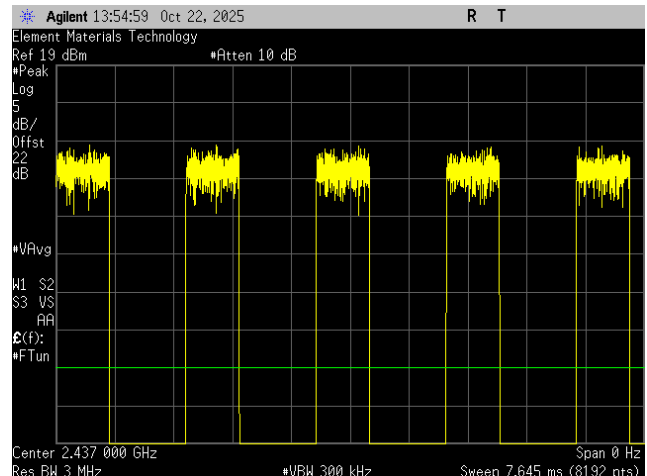


Port 1
20 MHz BW
802.11(g) 6 Mbps
Mid Channel 6, 2437 MHz

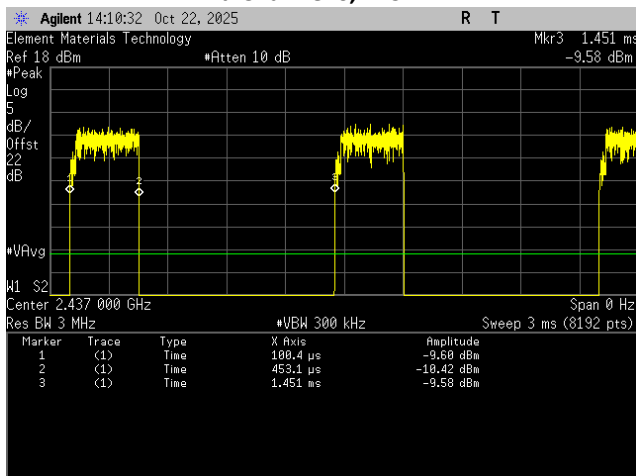
DUTY CYCLE



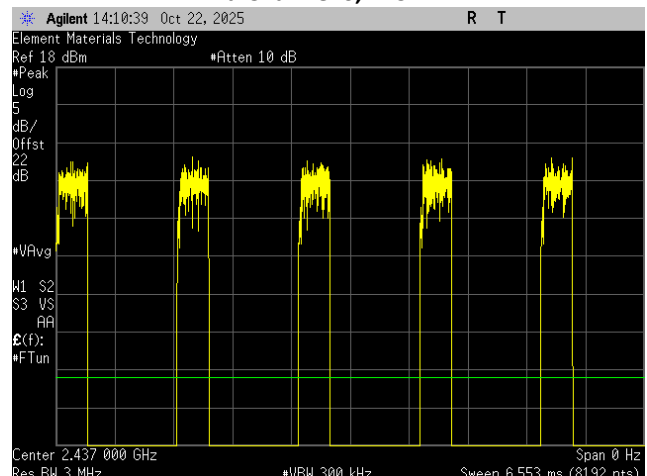
Port 1
20 MHz BW
802.11(n) MCS0
Mid Channel 6, 2437 MHz



Port 1
20 MHz BW
802.11(n) MCS0
Mid Channel 6, 2437 MHz

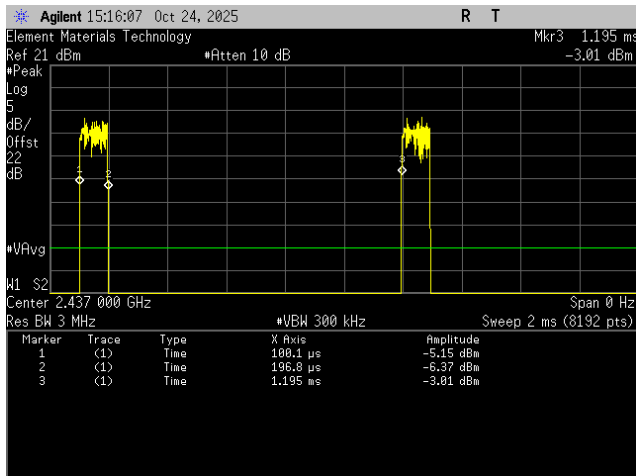


Port 1
40 MHz BW
802.11(n) MCS0
Mid Channel 4/8, 2437 MHz

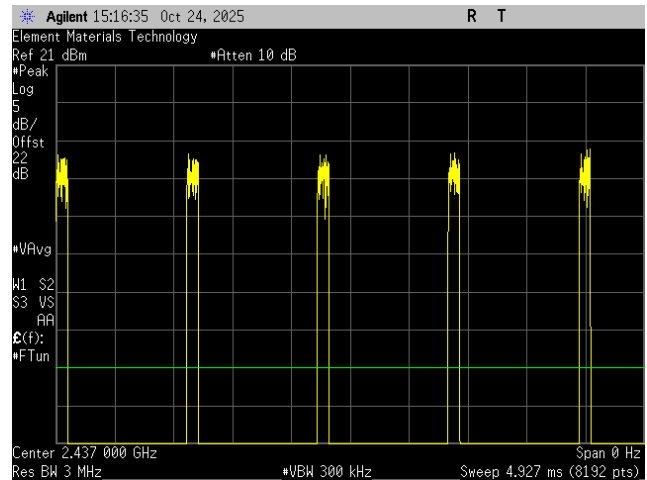


Port 1
40 MHz BW
802.11(n) MCS0
Mid Channel 4/8, 2437 MHz

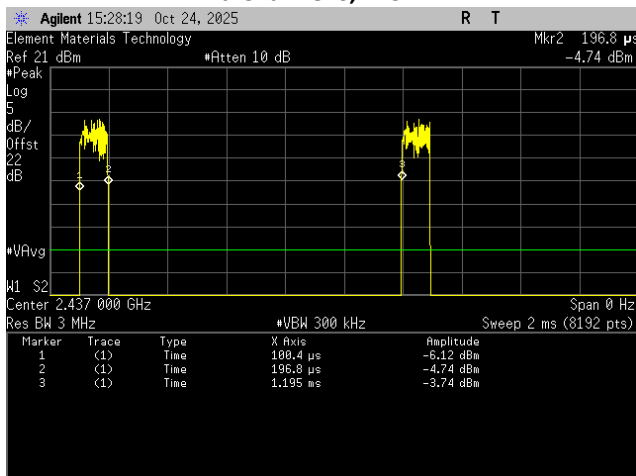
DUTY CYCLE



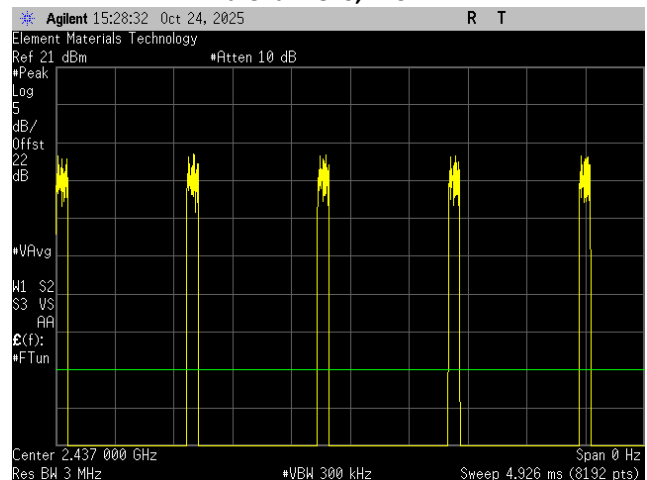
MIMO Port 1
20 MHz BW
802.11(n) MCS12
Mid Channel 6, 2437 MHz



MIMO Port 1
20 MHz BW
802.11(n) MCS12
Mid Channel 6, 2437 MHz



MIMO Port 2
20 MHz BW
802.11(n) MCS12
Mid Channel 6, 2437 MHz



MIMO Port 2
20 MHz BW
802.11(n) MCS12
Mid Channel 6, 2437 MHz

DTS (6 DB) AND OCCUPIED BANDWIDTH (99%)



TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth. The 6dB DTS bandwidth was also measured.

Per ANSI C63.10:2020, 6.9.3, and 11.8.1 the spectrum analyzer was configured as follows:

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts (between 1.5 and 5 times the OBW per section 6.9.3a).

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) with a minimum of 100 kHz (section 11.8.1). The video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A Peak detector and max hold were used per 6.9.3e and 11.8.1c.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2025-01-09	2026-01-09
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2025-05-09	2026-05-09
Generator - Signal	Agilent	N5183A	TIA	2024-07-09	2026-07-09
Block - DC	Weinschel Corp.	7006	AMS	2025-01-27	2026-01-27
Attenuator	Fairview Microwave	SA4014-20	QAA	2025-05-09	2026-05-09

DTS (6 DB) AND OCCUPIED BANDWITH (99%)



EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-10-24
Customer:	Digital Control Incorporated	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	43.1%
Customer Project:	None	Bar. Pressure (PMSL):	1027 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	12 VDC	Configuration:	DIGC0286-1

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator, measurement cable and customer MMCX to SMA patch cable.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

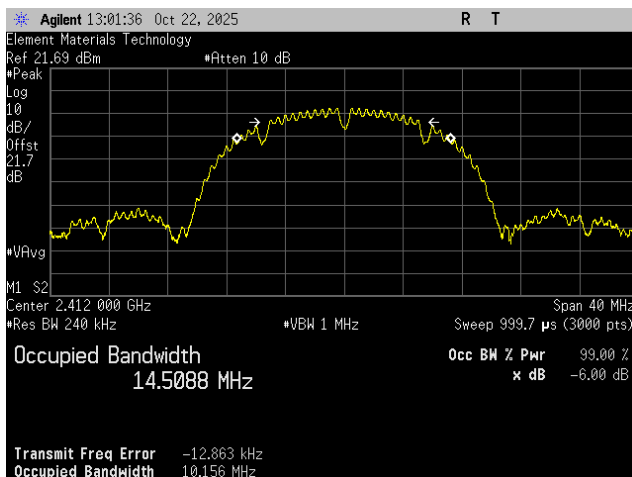
	Value (%)	Value (dB)	Limit (>)	Result
Port 1				
20 MHz BW				
802.11(b) 1 Mbps				
Low Channel 1, 2412 MHz	14.509 MHz	10.156 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	14.491 MHz	10.163 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	14.509 MHz	10.156 MHz	500 kHz	Pass
802.11(g) 6 Mbps				
Low Channel 1, 2412 MHz	16.315 MHz	15.837 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	17.121 MHz	15.835 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	16.334 MHz	15.801 MHz	500 kHz	Pass
802.11(n) MCS0				
Low Channel 1, 2412 MHz	17.486 MHz	16.576 MHz	500 kHz	Pass
Mid Channel 6, 2437 MHz	17.727 MHz	16.621 MHz	500 kHz	Pass
High Channel 11, 2462 MHz	17.474 MHz	17.022 MHz	500 kHz	Pass
40 MHz BW				
802.11(n) MCS0				
Low Channel 1/5, 2422 MHz	35.704 MHz	33.387 MHz	500 kHz	Pass
Mid Channel 4/8, 2437 MHz	36.079 MHz	32.254 MHz	500 kHz	Pass
High Channel 7/11, 2452 MHz	35.656 MHz	33.886 MHz	500 kHz	Pass

DTS (6 DB) AND OCCUPIED BANDWITH (99%)

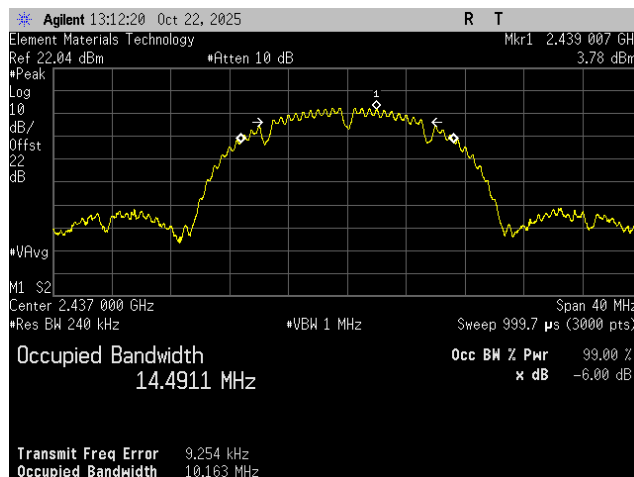


MIMO Port 1					
20 MHz BW					
802.11(n) MCS12					
Low Channel 1, 2412 MHz	17.397 MHz	16.4 MHz	500 kHz	Pass	
Mid Channel 6, 2437 MHz	17.471 MHz	15.91 MHz	500 kHz	Pass	
High Channel 11, 2462 MHz	17.386 MHz	15.199 MHz	500 kHz	Pass	
MIMO Port 2					
20 MHz BW					
802.11(n) MCS12					
Low Channel 1, 2412 MHz	17.506 MHz	15.926 MHz	500 kHz	Pass	
Mid Channel 6, 2437 MHz	17.581 MHz	15.782 MHz	500 kHz	Pass	
High Channel 11, 2462 MHz	17.432 MHz	15.992 MHz	500 kHz	Pass	

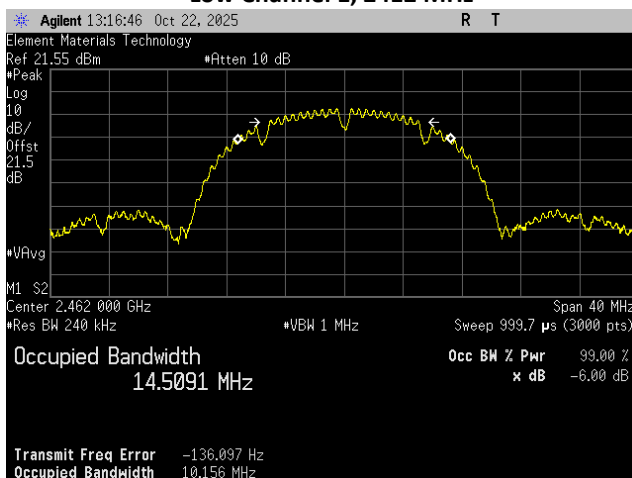
DTS (6 DB) AND OCCUPIED BANDWIDTH (99%)



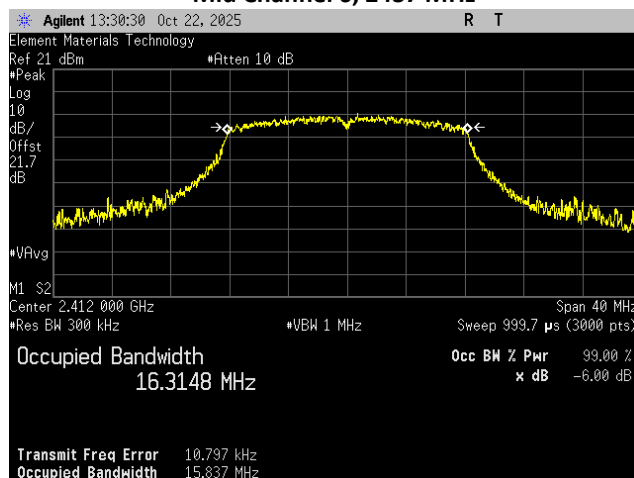
Port 1
20 MHz BW
802.11(b) 1 Mbps
Low Channel 1, 2412 MHz



Port 1
20 MHz BW
802.11(b) 1 Mbps
Mid Channel 6, 2437 MHz

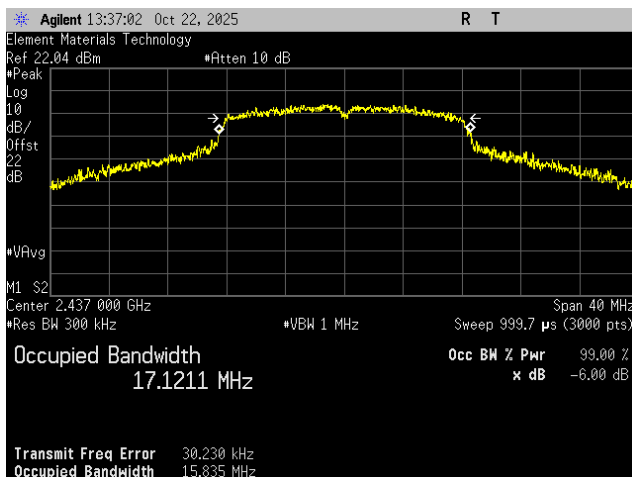


Port 1
20 MHz BW
802.11(b) 1 Mbps
High Channel 11, 2462 MHz

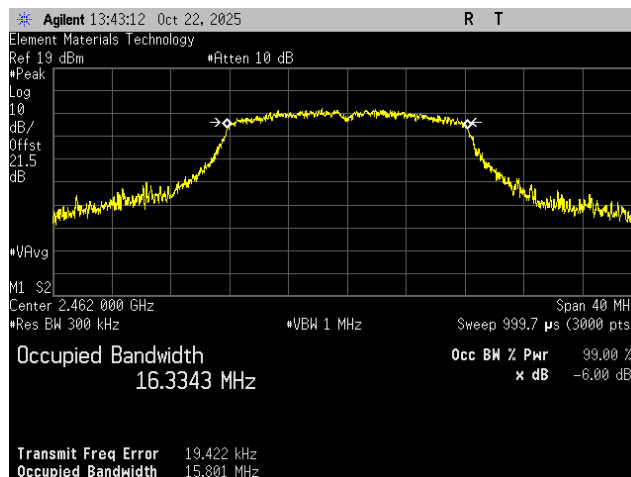


Port 1
20 MHz BW
802.11(g) 6 Mbps
Low Channel 1, 2412 MHz

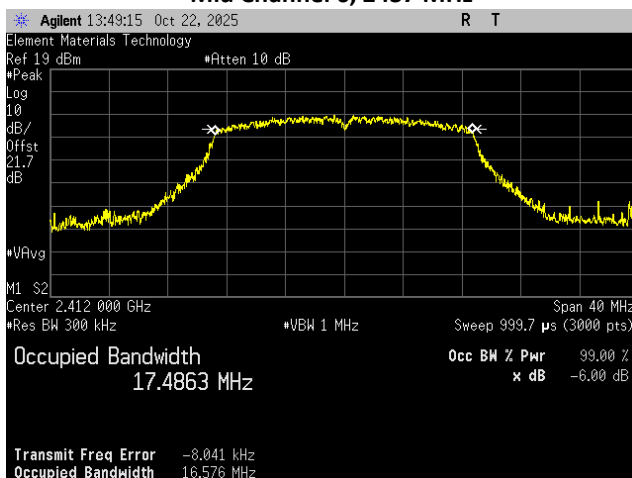
DTS (6 DB) AND OCCUPIED BANDWIDTH (99%)



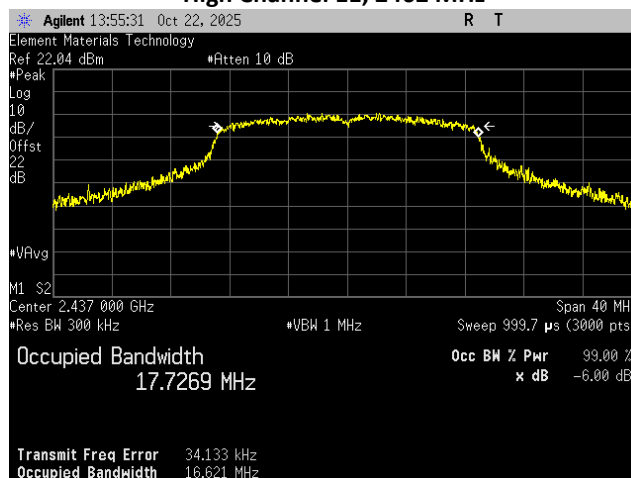
Port 1
20 MHz BW
802.11(g) 6 Mbps
Mid Channel 6, 2437 MHz



Port 1
20 MHz BW
802.11(g) 6 Mbps
High Channel 11, 2462 MHz

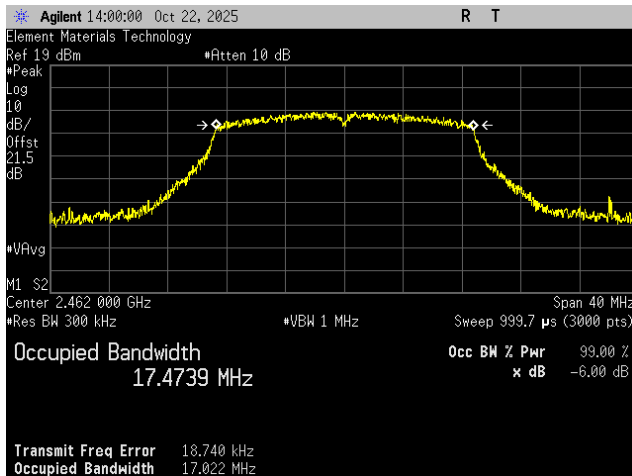


Port 1
20 MHz BW
802.11(n) MCS0
Low Channel 1, 2412 MHz

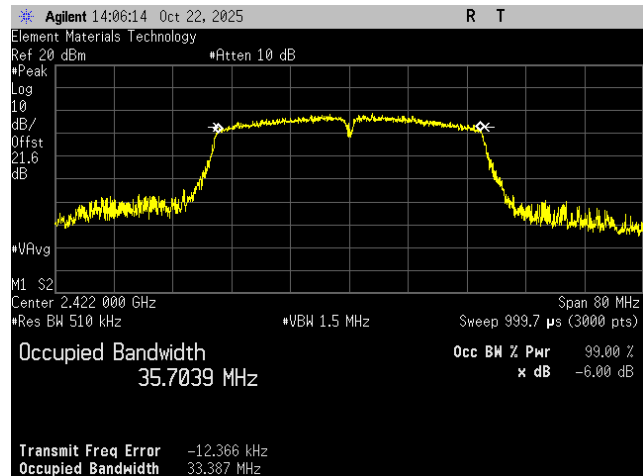


Port 1
20 MHz BW
802.11(n) MCS0
Mid Channel 6, 2437 MHz

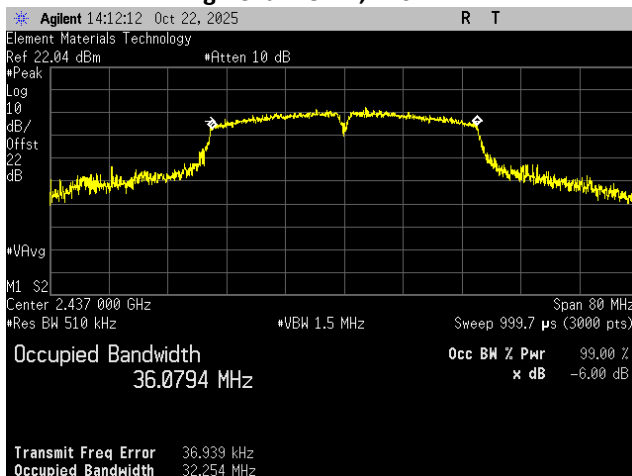
DTS (6 DB) AND OCCUPIED BANDWIDTH (99%)



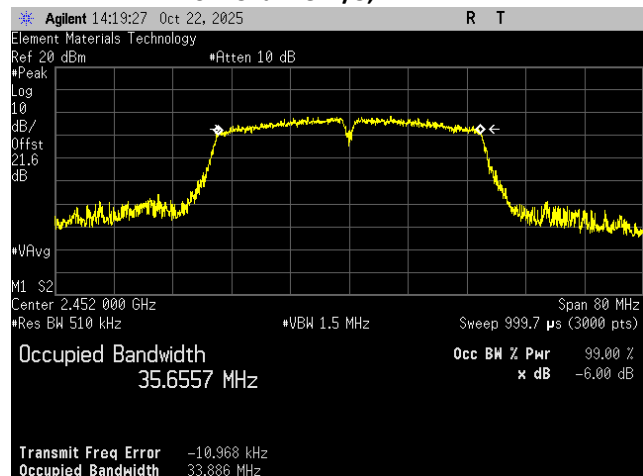
Port 1
20 MHz BW
802.11(n) MCS0
High Channel 11, 2462 MHz



Port 1
40 MHz BW
802.11(n) MCS0
Low Channel 1/5, 2422 MHz

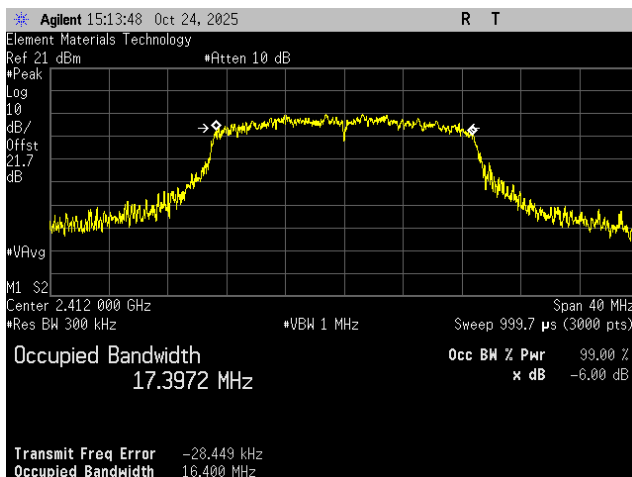


Port 1
40 MHz BW
802.11(n) MCS0
Mid Channel 4/8, 2437 MHz

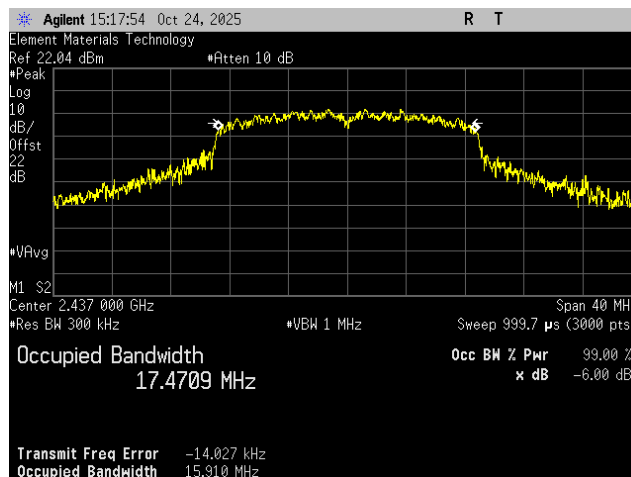


Port 1
40 MHz BW
802.11(n) MCS0
High Channel 7/11, 2452 MHz

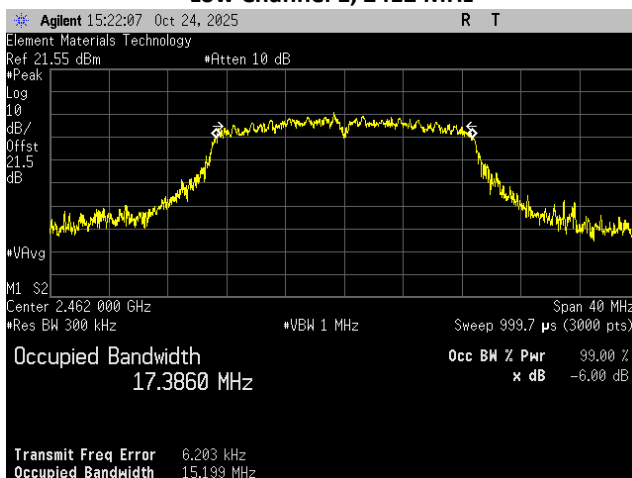
DTS (6 DB) AND OCCUPIED BANDWIDTH (99%)



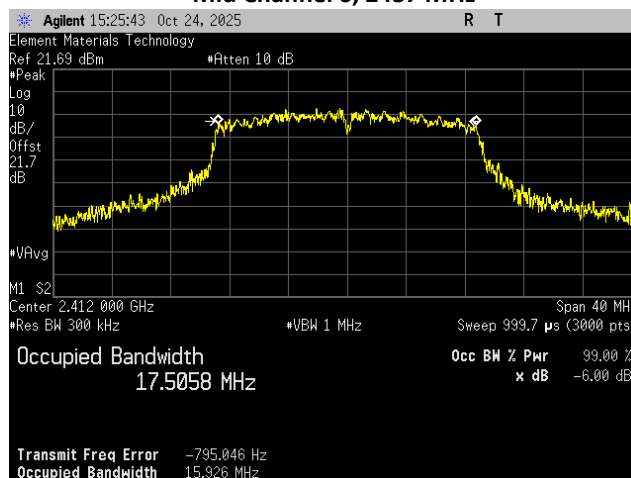
MIMO Port 1
20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz



MIMO Port 1
20 MHz BW
802.11(n) MCS12
Mid Channel 6, 2437 MHz

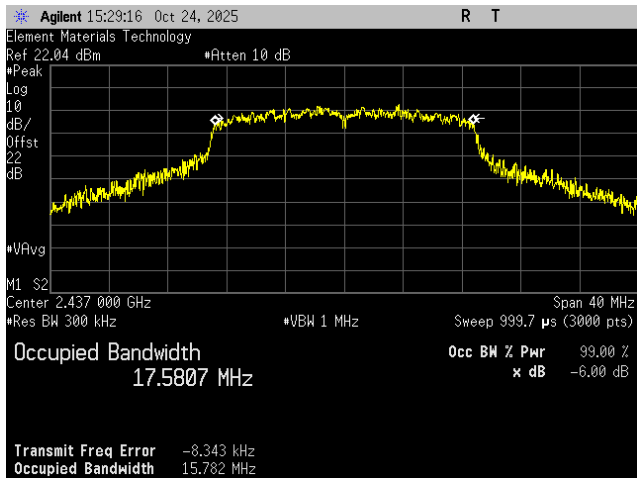


MIMO Port 1
20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz

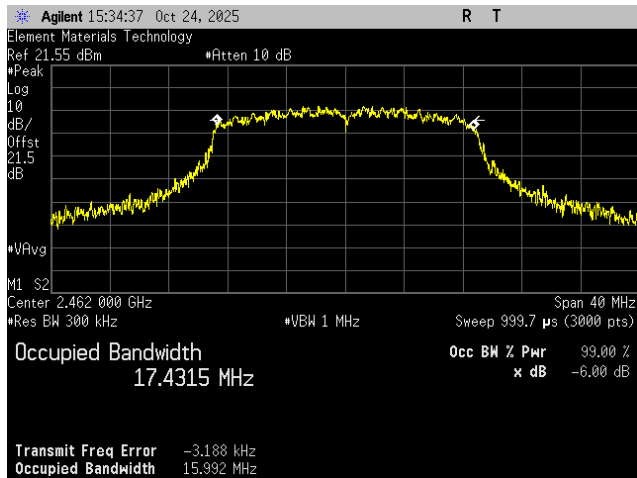


MIMO Port 2
20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz

DTS (6 DB) AND OCCUPIED BANDWITH (99%)



MIMO Port 2
20 MHz BW
802.11(n) MCS12
Mid Channel 6, 2437 MHz



MIMO Port 2
20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz

OUTPUT POWER - MIMO

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The EUT was configured to MIMO mode of operation. Measurements were collected on each antenna port using a direct connection between the RF output of the EUT and a spectrum analyzer. The port that was not under test was terminated with a 50 Ohm load.

The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

Prior to measuring output power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method AVGSA-2 in section 11.9.2.2.4 of ANSI C63.10:2020 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

In the summing table, the measured power for each port was converted to linear terms, summed together, and converted back to log terms. The combined power of both ports was then compared to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2025-01-09	2026-01-09
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2025-05-09	2026-05-09
Generator - Signal	Agilent	N5183A	TIA	2024-07-09	2026-07-09
Block - DC	Weinschel Corp.	7006	AMS	2025-01-27	2026-01-27
Attenuator	Fairview Microwave	SA4014-20	QAA	2025-05-09	2026-05-09

OUTPUT POWER - MIMO

EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-10-24
Customer:	Digital Control Incorporated	Temperature:	20.3°C
Attendees:	None	Relative Humidity:	56.2%
Customer Project:	None	Bar. Pressure (PMSL):	1004 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	12 VDC	Configuration:	DIGC0286-1

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator, measurement cable and customer MMCX to SMA patch cable.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

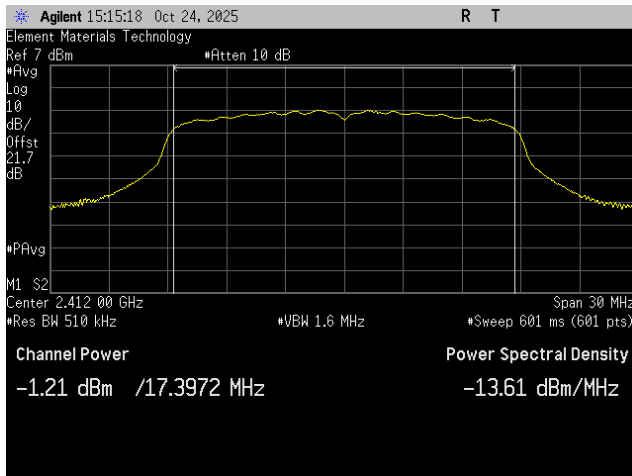


Tested By

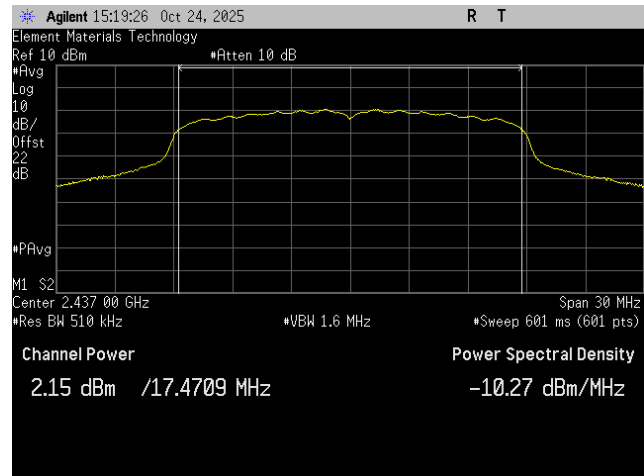
TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)			
MIMO Port 1						
20 MHz BW						
802.11(n) MCS12						
Low Channel 1, 2412 MHz	-1.206	10.5	9.3			
Mid Channel 6, 2437 MHz	2.152	10.6	12.8			
High Channel 11, 2462 MHz	-0.986	10.5	9.5			
MIMO Port 2						
20 MHz BW						
802.11(n) MCS12						
Low Channel 1, 2412 MHz	1.833	10.6	12.4			
Mid Channel 6, 2437 MHz	2.035	10.6	12.6			
High Channel 11, 2462 MHz	1.567	10.6	12.2			
MIMO Power Summing Table:						
	Port 1 AVG Cond Pwr (mW)	Port 2 AVG Cond Pwr (mW)	Port 1 + Port 2 Avg Cond Pwr (mW)	Port 1 + Port 2 Avg Cond Pwr (dBm)	Limit (dBm)	Result
Low Channel 1, 2412 MHz	8.5	17.4	25.9	14.1	≤ 30	Pass
Mid Channel 6, 2437 MHz	19.1	18.2	37.3	15.7	≤ 30	Pass
High Channel 11, 2462 MHz	8.9	16.6	25.5	14.1	≤ 30	Pass

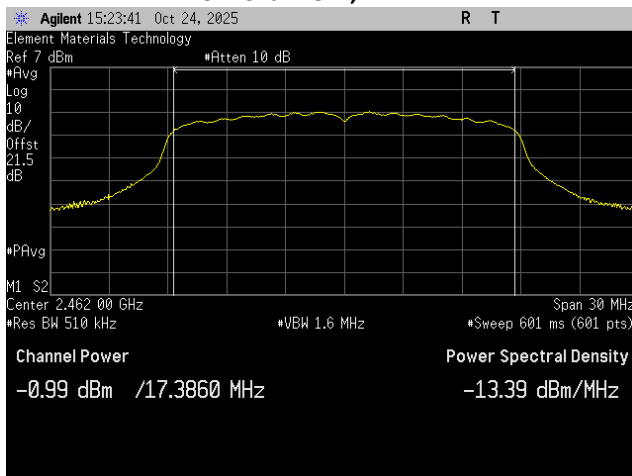
OUTPUT POWER - MIMO



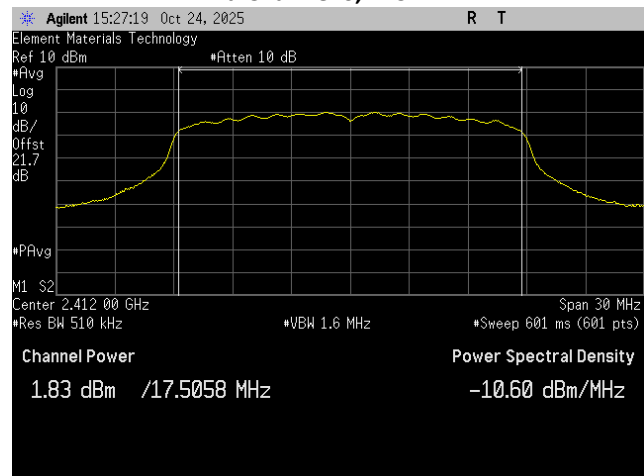
MIMO Port 1
20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz



MIMO Port 1
20 MHz BW
802.11(n) MCS12
Mid Channel 6, 2437 MHz

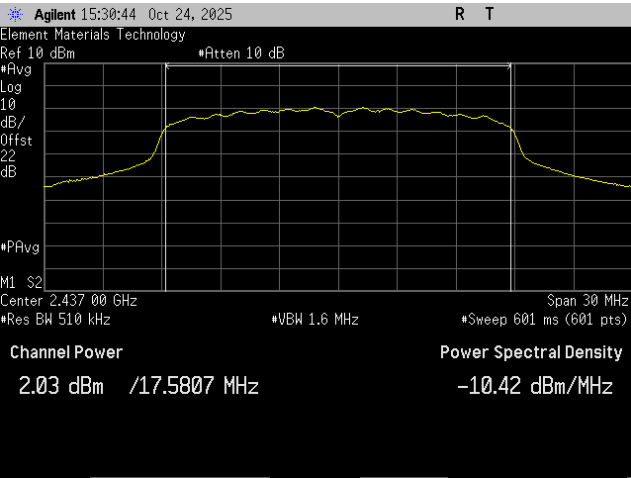


MIMO Port 1
20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz

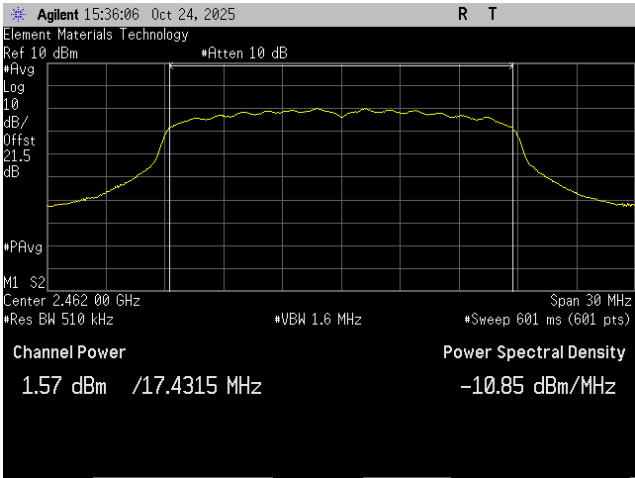


MIMO Port 2
20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz

OUTPUT POWER - MIMO



MIMO Port 2
20 MHz BW
802.11(n) MCS12
Mid Channel 6, 2437 MHz



MIMO Port 2
20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz

OUTPUT POWER - SISO

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

Prior to measuring output power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method AVGSA-2 in section 11.9.2.2.4 of ANSI C63.10:2020 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2025-01-09	2026-01-09
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	2025-05-09	2026-05-09
Generator - Signal	Agilent	N5183A	TIA	2024-07-09	2026-07-09
Block - DC	Weinschel Corp.	7006	AMS	2025-01-27	2026-01-27
Attenuator	Fairview Microwave	SA4014-20	QAA	2025-05-09	2026-05-09

OUTPUT POWER - SISO

EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-10-24
Customer:	Digital Control Incorporated	Temperature:	20.4°C
Attendees:	None	Relative Humidity:	56.4%
Customer Project:	None	Bar. Pressure (PMSL):	1004 mbar
Tested By:	Harry Zhao	Job Site:	NC06
Power:	12 VDC	Configuration:	DIGC0286-1

COMMENTS

Reference level offset includes: DC Block, 20 dB attenuator, measurement cable and customer MMCX to SMA patch cable.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass



Tested By

TEST RESULTS

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Out Pwr (dBm)	Limit (dBm)	Result
Port 1					
20 MHz BW					
802.11(b) 1 Mbps					
Low Channel 1, 2412 MHz	11.655	0.9	12.6	30	Pass
Mid Channel 6, 2437 MHz	12.128	0.9	13.0	30	Pass
High Channel 11, 2462 MHz	11.864	0.9	12.8	30	Pass
802.11(g) 6 Mbps					
Low Channel 1, 2412 MHz	5.498	3.7	9.2	30	Pass
Mid Channel 6, 2437 MHz	10.677	3.7	14.4	30	Pass
High Channel 11, 2462 MHz	5.673	3.7	9.4	30	Pass
802.11(n) MCS0					
Low Channel 1, 2412 MHz	3.305	3.9	7.2	30	Pass
Mid Channel 6, 2437 MHz	7.231	3.9	11.1	30	Pass
High Channel 11, 2462 MHz	3.270	3.9	7.2	30	Pass
40 MHz BW					
802.11(n) MCS0					
Low Channel 1/5, 2422 MHz	1.663	5.8	7.5	30	Pass
Mid Channel 4/8, 2437 MHz	6.672	5.8	12.5	30	Pass
High Channel 7/11, 2452 MHz	1.638	5.8	7.4	30	Pass

OUTPUT POWER - SISO



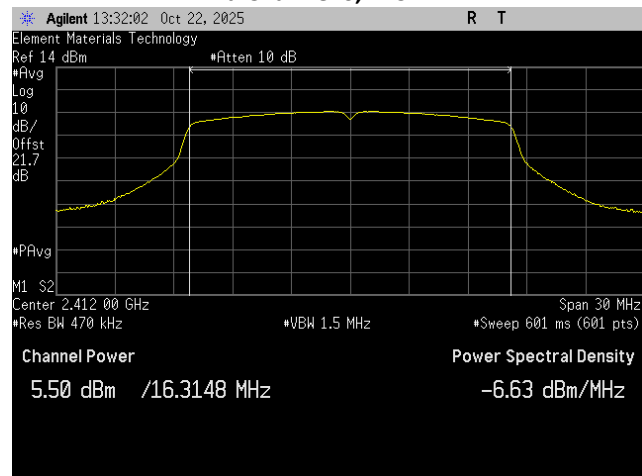
Port 1
20 MHz BW
802.11(b) 1 Mbps
Low Channel 1, 2412 MHz



Port 1
20 MHz BW
802.11(b) 1 Mbps
Mid Channel 6, 2437 MHz

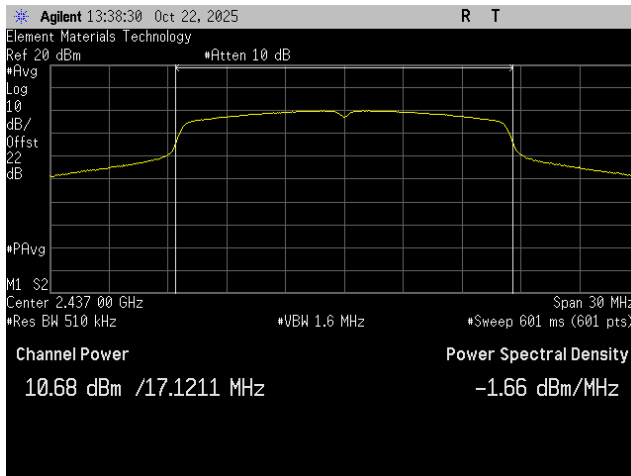


Port 1
20 MHz BW
802.11(b) 1 Mbps
High Channel 11, 2462 MHz

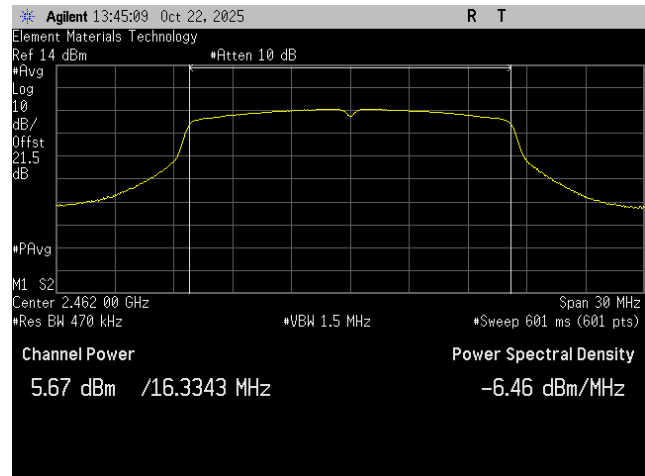


Port 1
20 MHz BW
802.11(g) 6 Mbps
Low Channel 1, 2412 MHz

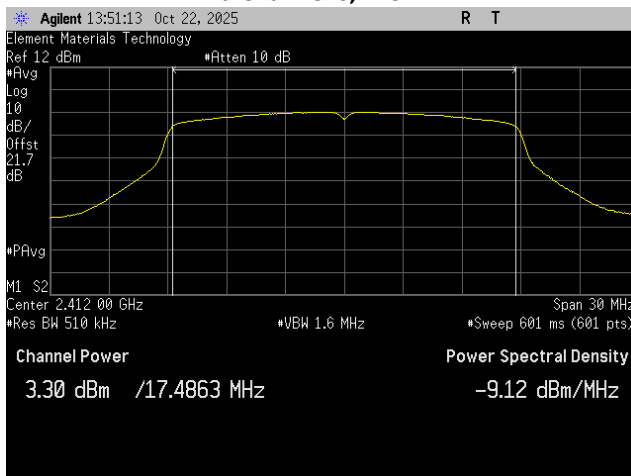
OUTPUT POWER - SISO



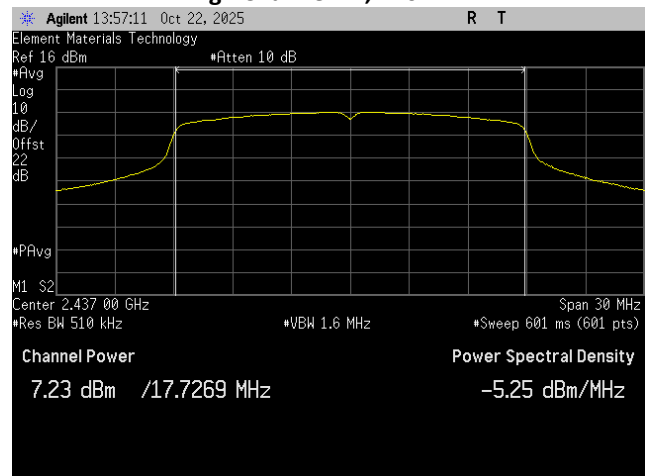
Port 1
20 MHz BW
802.11(g) 6 Mbps
Mid Channel 6, 2437 MHz



Port 1
20 MHz BW
802.11(g) 6 Mbps
High Channel 11, 2462 MHz

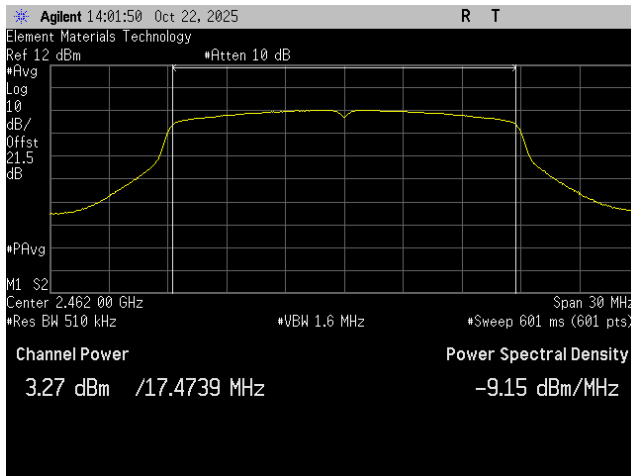


Port 1
20 MHz BW
802.11(n) MCS0
Low Channel 1, 2412 MHz

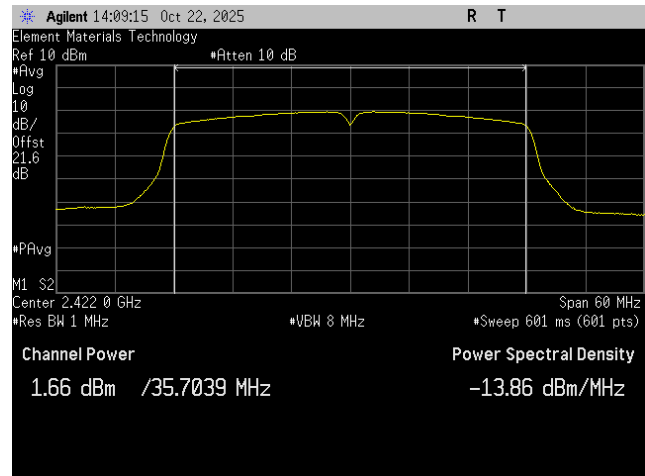


Port 1
20 MHz BW
802.11(n) MCS0
Mid Channel 6, 2437 MHz

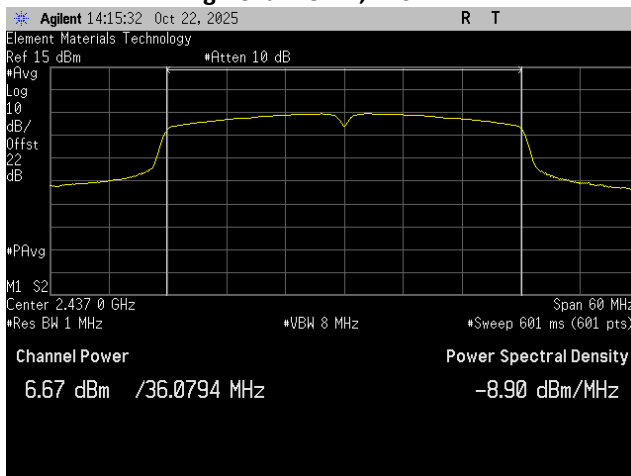
OUTPUT POWER - SISO



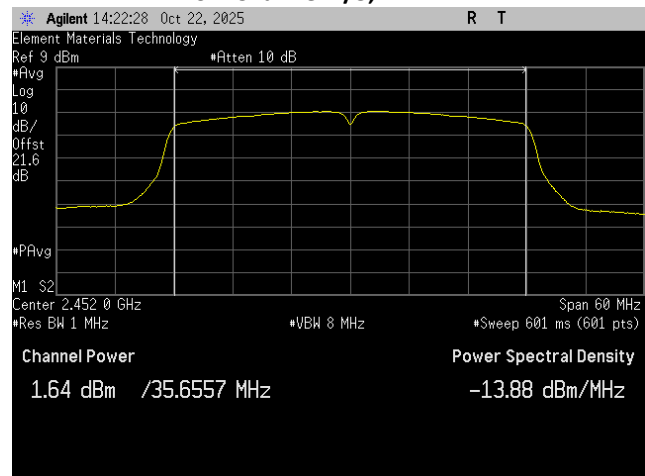
Port 1
20 MHz BW
802.11(n) MCS0
High Channel 11, 2462 MHz



Port 1
40 MHz BW
802.11(n) MCS0
Low Channel 1/5, 2422 MHz



Port 1
40 MHz BW
802.11(n) MCS0
Mid Channel 4/8, 2437 MHz



Port 1
40 MHz BW
802.11(n) MCS0
High Channel 7/11, 2452 MHz

SPURIOUS RADIATED EMISSIONS – SISO PORT 1

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as shown in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axes if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out-of-band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	2025-04-21	2026-04-21
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2025-10-15	2026-10-15
Cable	Northwest EMC	Bilog Cables	NC1	2025-10-15	2026-10-15
Antenna - Biconilog	Teseq	CBL 6141B	AYD	2024-03-18	2026-03-18
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2025-10-15	2026-10-15
Antenna - Double Ridge	EMCO	3115	AHM	2024-06-24	2026-06-24
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2025-05-10	2026-05-10
Cable	Northwest EMC	3115 Horn Cable	NC2	2025-05-10	2026-05-10
Attenuator	Fairview Microwave	SA18E-20	AQV	2025-07-31	2026-07-31
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2025-09-24	2026-09-24
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2025-07-31	2026-07-31
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2025-07-31	2026-07-31
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2025-07-31	2026-07-31
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	2025-11-18	2026-11-18
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2025-05-29	2026-05-29
Cable	Northwest EMC	N/A	NC8	2025-05-29	2026-05-29
Antenna - Loop	EMCO	6502	AZC	2025-08-28	2027-08-28
Cable	Northwest EMC	NC01 Mag Field Loop / Near Field Probe cable	NC6	2025-09-29	2026-09-29
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2025-10-30	2027-10-30
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	2024-11-18	2025-11-18

SPURIOUS RADIATED EMISSIONS – SISO PORT 1



FREQUENCY RANGE INVESTIGATED

9 kHz TO 26.5 GHz

POWER INVESTIGATED

12 VDC

CONFIGURATIONS INVESTIGATED

DIGC0286-2

MODES INVESTIGATED

Transmitting 2.4 GHz WiFi; 802.11(bgn), Port 1. Ch. 1 = 2412 MHz, Ch. 6 = 2437 MHz, Ch. 11 = 2462 MHz

SPURIOUS RADIATED EMISSIONS – SISO PORT 1



EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-10-23
Customer:	Digital Control Incorporated	Temperature:	20.8°C
Attendees:	None	Relative Humidity:	50.9%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	12 VDC	Configuration:	DIGC0286-2

TEST PARAMETERS

Run #:	31	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
--------	----	--------------------	---	---------------------	-----------

COMMENTS

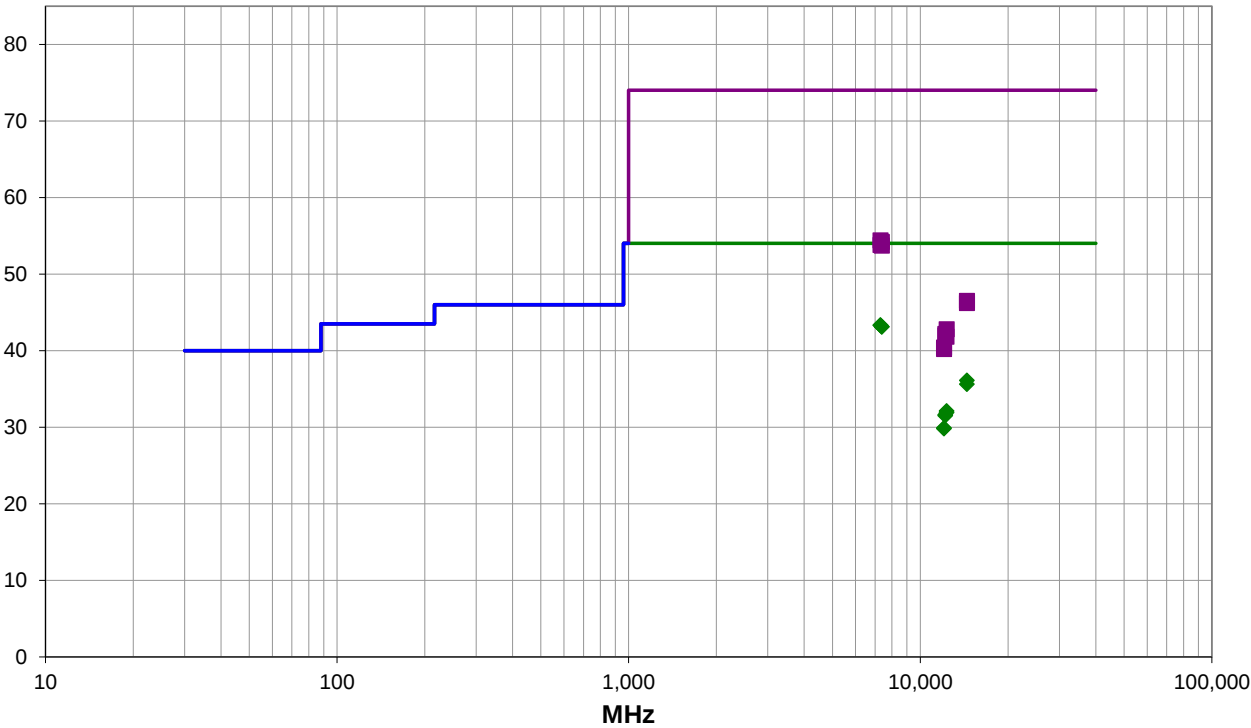
See data comments below for EUT orientation, channel, bandwidth & data rate

EUT OPERATING MODES

Transmitting 2.4 GHz WiFi; 802.11(bgn), Port 1. Ch. 1 = 2412 MHz, Ch. 6 = 2437 MHz, Ch. 11 = 2462 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 31

PK AV QP

SPURIOUS RADIATED EMISSIONS – SISO PORT 1

RESULTS - Run #31

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7311.650	27.8	14.6	1.5	46.0	0.9	0.0	Horz	AV	0.0	43.3	54.0	-10.7	Ch. 6, EUT on side, 20 MHz BW, 1 Mbps
7311.700	27.8	14.6	1.5	125.0	0.9	0.0	Vert	AV	0.0	43.3	54.0	-10.7	Ch. 6, EUT Vertical, 20 MHz BW, 1 Mbps
7384.708	27.3	14.9	1.5	7.0	0.9	0.0	Horz	AV	0.0	43.1	54.0	-10.9	Ch. 11, EUT Horizontal, 20 MHz BW, 1 Mbps
7385.267	27.3	14.9	1.5	25.0	0.9	0.0	Vert	AV	0.0	43.1	54.0	-10.9	Ch. 11, EUT Horizontal, 20 MHz BW, 1 Mbps
14472.040	28.5	6.7	1.5	183.0	0.9	0.0	Horz	AV	0.0	36.1	54.0	-17.9	Ch. 1, EUT on side, 20 MHz, 1 Mbps
14472.650	28.0	6.7	2.3	139.0	0.9	0.0	Vert	AV	0.0	35.6	54.0	-18.4	Ch. 1, EUT Vertical, 20 MHz, 1 Mbps
7308.983	39.8	14.6	1.5	46.0	0.0	0.0	Horz	PK	0.0	54.4	74.0	-19.6	Ch. 6, EUT on side, 20 MHz BW, 1 Mbps
7384.133	39.3	14.9	1.5	7.0	0.0	0.0	Horz	PK	0.0	54.2	74.0	-19.8	Ch. 11, EUT Horizontal, 20 MHz BW, 1 Mbps
7308.508	39.2	14.6	1.5	125.0	0.0	0.0	Vert	PK	0.0	53.8	74.0	-20.2	Ch. 6, EUT Vertical, 20 MHz BW, 1 Mbps
7386.050	38.8	14.9	1.5	25.0	0.0	0.0	Vert	PK	0.0	53.7	74.0	-20.3	Ch. 11, EUT Horizontal, 20 MHz BW, 1 Mbps
12312.400	30.6	0.6	1.1	36.0	0.9	0.0	Horz	AV	0.0	32.1	54.0	-21.9	Ch. 11, EUT on side, 20 MHz BW, 1 Mbps
12310.950	30.4	0.6	1.5	60.0	0.9	0.0	Vert	AV	0.0	31.9	54.0	-22.1	Ch. 11, EUT Vertical, 20 MHz BW, 1 Mbps
12185.470	30.5	0.2	1.5	232.0	0.9	0.0	Horz	AV	0.0	31.6	54.0	-22.4	Ch. 6, EUT on side, 20 MHz BW, 1 Mbps
12187.290	30.4	0.2	1.5	252.0	0.9	0.0	Vert	AV	0.0	31.5	54.0	-22.5	Ch. 6, EUT Vertical, 20 MHz BW, 1 Mbps
12062.400	30.0	-1.0	1.5	279.0	0.9	0.0	Horz	AV	0.0	29.9	54.0	-24.1	Ch. 1, EUT on side, 20 MHz BW, 1 Mbps
12062.480	29.9	-1.0	1.5	360.0	0.9	0.0	Vert	AV	0.0	29.8	54.0	-24.2	Ch. 1, EUT Vertical, 20 MHz BW, 1 Mbps
14473.980	39.8	6.7	2.3	139.0	0.0	0.0	Vert	PK	0.0	46.5	74.0	-27.5	Ch. 1, EUT Vertical, 20 MHz, 1 Mbps
14472.100	39.5	6.7	1.5	183.0	0.0	0.0	Horz	PK	0.0	46.2	74.0	-27.8	Ch. 1, EUT on side, 20 MHz, 1 Mbps
12310.460	42.2	0.6	1.1	36.0	0.0	0.0	Horz	PK	0.0	42.8	74.0	-31.2	Ch. 11, EUT on side, 20 MHz BW, 1 Mbps
12185.690	42.0	0.2	1.5	252.0	0.0	0.0	Vert	PK	0.0	42.2	74.0	-31.8	Ch. 6, EUT Vertical, 20 MHz BW, 1 Mbps
12185.110	41.8	0.2	1.5	232.0	0.0	0.0	Horz	PK	0.0	42.0	74.0	-32.0	Ch. 6, EUT on side, 20 MHz BW, 1 Mbps
12307.730	41.3	0.5	1.5	60.0	0.0	0.0	Vert	PK	0.0	41.8	74.0	-32.2	Ch. 11, EUT Vertical, 20 MHz BW, 1 Mbps
12058.740	41.4	-1.0	1.5	360.0	0.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	Ch. 1, EUT Vertical, 20 MHz BW, 1 Mbps
12059.210	41.2	-1.0	1.5	279.0	0.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	Ch. 1, EUT on side, 20 MHz BW, 1 Mbps
12185.110	41.8	0.2	1.5	232.0	0.0	0.0	Horz	PK	0.0	42.0	74.0	-32.0	Ch. 6, EUT on side, 20 MHz BW, 1 Mbps

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS – SISO PORT 1



EUT:	TI Model WL18MODGI WiFi Module	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-10-23
Customer:	Digital Control Incorporated	Temperature:	20.8°C
Attendees:	None	Relative Humidity:	50.9%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	12 VDC	Configuration:	DIGC0286-2

TEST PARAMETERS

Run #:	31	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
--------	----	--------------------	---	---------------------	-----------

COMMENTS

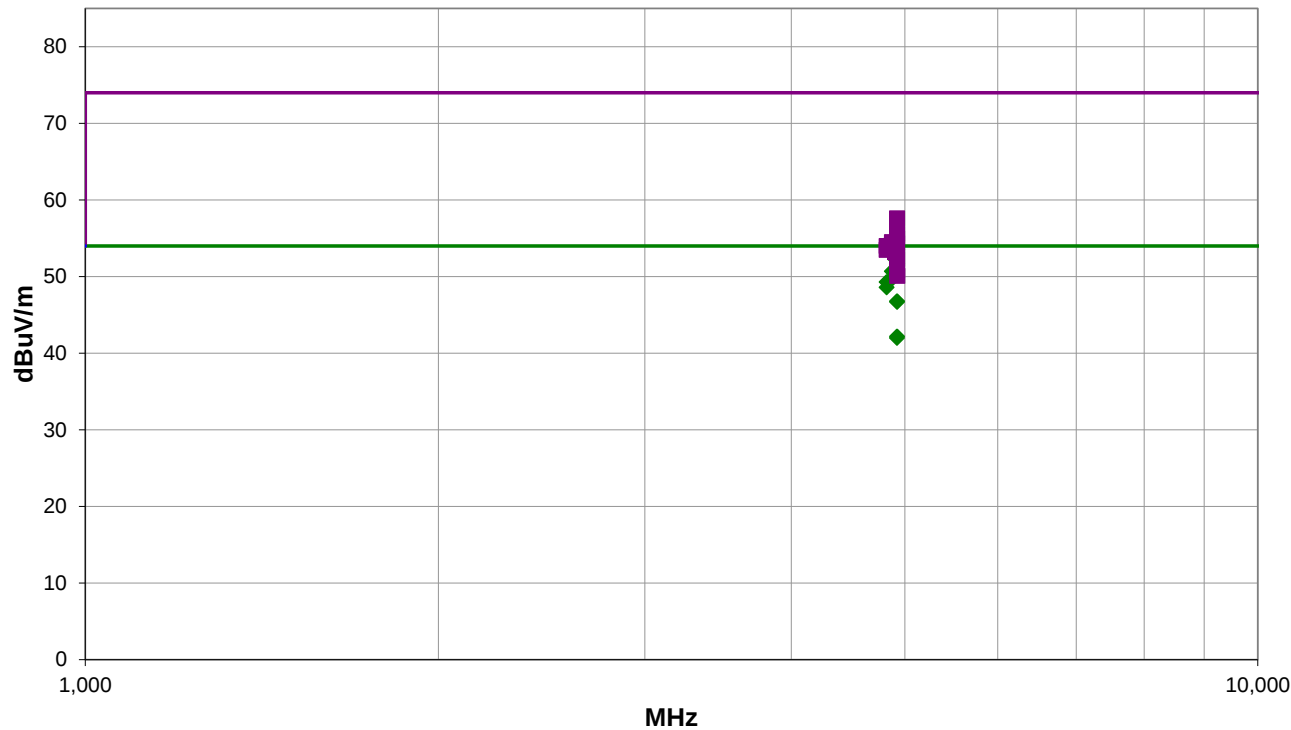
Measurements performed on worst case non noise floor emission. See data comments below for EUT orientation, channel, bandwidth & data rate.

EUT OPERATING MODES

Transmitting 2.4 GHz WiFi; 802.11(bgn), Port 1. Ch. 1 = 2412 MHz, Ch. 6 = 2437 MHz, Ch. 11 = 2462 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 31

PK AV QP

SPURIOUS RADIATED EMISSIONS – SISO PORT 1

RESULTS - Run #31

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4904.050	35.7	10.8	1.5	38.0	5.8	0.0	Horz	AV	0.0	52.3	54.0	-1.7	Ch. 7/11, EUT on side, 40 MHz BW, MCS0
4924.017	40.4	10.6	1.6	45.0	0.9	0.0	Horz	AV	0.0	51.9	54.0	-2.1	Ch. 11, EUT on side, 20 MHz BW, 1 Mbps
4923.983	37.0	10.6	4.0	51.0	3.7	0.0	Horz	AV	0.0	51.3	54.0	-2.7	Ch. 11, EUT on side, 20 MHz BW, 6 Mbps
4873.967	39.2	10.6	1.7	46.0	0.9	0.0	Horz	AV	0.0	50.7	54.0	-3.3	Ch. 6, EUT on side, 20 MHz BW, 1 Mbps
4924.025	39.2	10.6	2.6	63.0	0.9	0.0	Horz	AV	0.0	50.7	54.0	-3.3	Ch. 11, EUT Horizontal, 20 MHz BW, 1 Mbps
4923.983	39.0	10.6	1.5	176.0	0.9	0.0	Vert	AV	0.0	50.5	54.0	-3.5	Ch. 11, EUT Vertical, 20 MHz BW, 1 Mbps
4874.000	38.2	10.6	1.5	319.0	0.9	0.0	Vert	AV	0.0	49.7	54.0	-4.3	Ch. 6, EUT Vertical, 20 MHz BW, 1 Mbps
4824.000	38.0	10.4	1.5	22.0	0.9	0.0	Vert	AV	0.0	49.3	54.0	-4.7	Ch. 1, EUT Vertical, 20 MHz BW, 1 Mbps
4823.983	37.3	10.4	1.5	316.0	0.9	0.0	Horz	AV	0.0	48.6	54.0	-5.4	Ch. 1, EUT on side, 20 MHz BW, 1 Mbps
4924.058	35.3	10.6	2.1	35.0	0.9	0.0	Horz	AV	0.0	46.8	54.0	-7.2	Ch. 11, EUT Vertical, 20 MHz BW, 1 Mbps
4923.975	35.2	10.6	3.6	15.0	0.9	0.0	Vert	AV	0.0	46.7	54.0	-7.3	Ch. 11, EUT on side, 20 MHz BW, 1 Mbps
4923.983	30.7	10.6	1.5	67.0	0.9	0.0	Vert	AV	0.0	42.2	54.0	-11.8	Ch. 11, EUT Horizontal, 20 MHz BW, 1 Mbps
4923.125	27.5	10.6	1.5	24.0	3.9	0.0	Horz	AV	0.0	42.0	54.0	-12.0	Ch. 11, EUT on side, 20 MHz BW, MCS0
4923.892	43.3	10.6	4.0	51.0	3.7	0.0	Horz	PK	0.0	57.6	74.0	-16.4	Ch. 11, EUT on side, 20 MHz BW, 6 Mbps
4923.917	45.0	10.6	1.6	45.0	0.0	0.0	Horz	PK	0.0	55.6	74.0	-18.4	Ch. 11, EUT on side, 20 MHz BW, 1 Mbps
4923.892	44.4	10.6	2.6	63.0	0.0	0.0	Horz	PK	0.0	55.0	74.0	-19.0	Ch. 11, EUT Horizontal, 20 MHz BW, 1 Mbps
4873.958	43.9	10.6	1.7	46.0	0.0	0.0	Horz	PK	0.0	54.5	74.0	-19.5	Ch. 6, EUT on side, 20 MHz BW, 1 Mbps
4924.092	43.8	10.6	1.5	176.0	0.0	0.0	Vert	PK	0.0	54.4	74.0	-19.6	Ch. 11, EUT Vertical, 20 MHz BW, 1 Mbps
4874.050	43.6	10.6	1.5	319.0	0.0	0.0	Vert	PK	0.0	54.2	74.0	-19.8	Ch. 6, EUT Vertical, 20 MHz BW, 1 Mbps
4824.117	43.6	10.4	1.5	22.0	0.0	0.0	Vert	PK	0.0	54.0	74.0	-20.0	Ch. 1, EUT Vertical, 20 MHz BW, 1 Mbps
4824.142	43.1	10.4	1.5	316.0	0.0	0.0	Horz	PK	0.0	53.5	74.0	-20.5	Ch. 1, EUT on side, 20 MHz BW, 1 Mbps
4903.933	42.4	10.8	1.5	38.0	0.0	0.0	Horz	PK	0.0	53.2	74.0	-20.8	Ch. 7/11, EUT on side, 40 MHz BW, MCS0
4923.917	42.1	10.6	2.1	35.0	0.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	Ch. 11, EUT Vertical, 20 MHz BW, 1 Mbps
4923.817	41.7	10.6	3.6	15.0	0.0	0.0	Vert	PK	0.0	52.3	74.0	-21.7	Ch. 11, EUT on side, 20 MHz BW, 1 Mbps
4923.533	40.2	10.6	1.5	67.0	0.0	0.0	Vert	PK	0.0	50.8	74.0	-23.2	Ch. 11, EUT Horizontal, 20 MHz BW, 1 Mbps
4925.875	39.7	10.4	1.5	24.0	0.0	0.0	Horz	PK	0.0	50.1	74.0	-23.9	Ch. 11, EUT on side, 20 MHz BW, MCS0

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS – SISO PORT 1



EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-12-09
Customer:	Digital Control Incorporated	Temperature:	21.6°C
Attendees:	None	Relative Humidity:	46.4%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	12 VDC	Configuration:	DIGC0286-2

TEST PARAMETERS

Run #:	288	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
--------	-----	--------------------	---	---------------------	-----------

COMMENTS

See data comments below for EUT orientation, channel, bandwidth, & data rate. The measured emission is a mixed signal which consists of a CW tone and a signal that is temporally associated with the transmitter. Applying a DCCF would erroneously correct the AVG value above the measured peak.

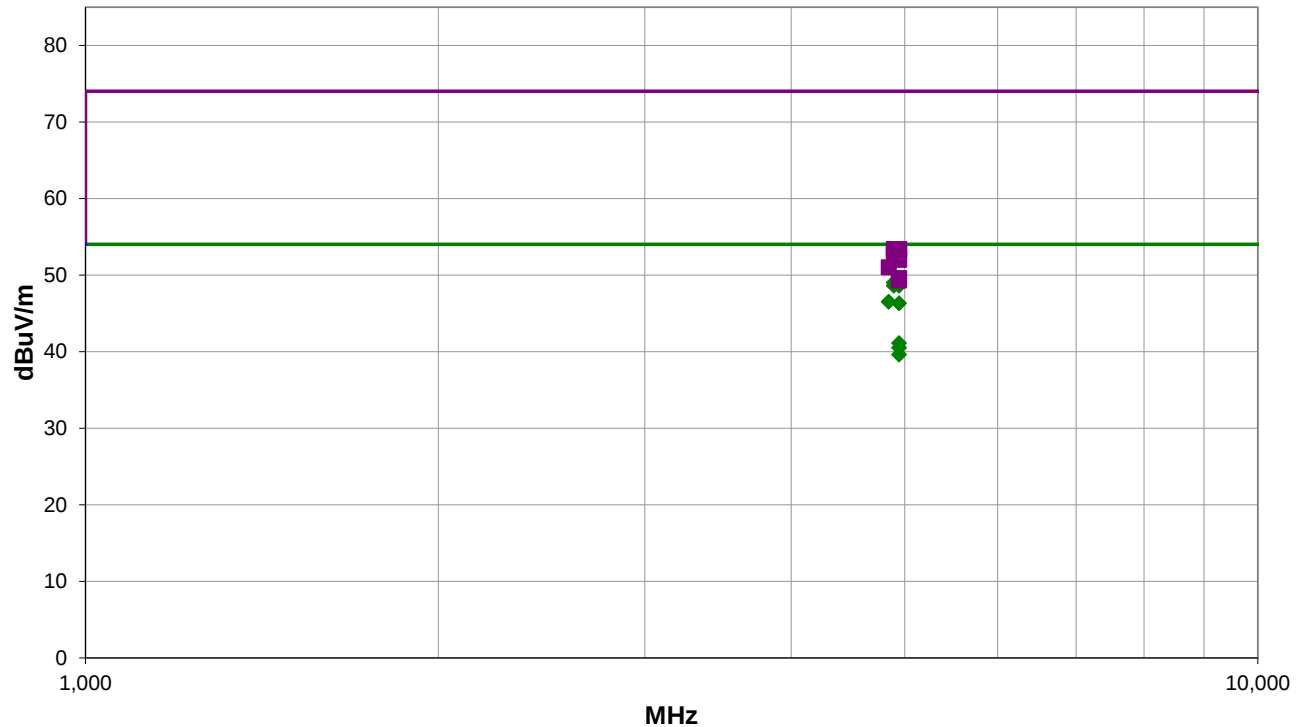
Therefore, reduced VBW averaging across on and off times as outlined in ANSI C63.10:2020, clause 11.12.2.5.2.3 was used. For all measurements the VBW was set to 11 kHz.

EUT OPERATING MODES

Transmitting 2.4 GHz WiFi; 802.11(bgn), Port 1. Ch. 1 = 2412 MHz, Ch. 6 = 2437 MHz, Ch. 11 = 2462 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 288

PK AV QP

SPURIOUS RADIATED EMISSIONS – SISO PORT 1

RESULTS - Run #288

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4944.000	38.8	10.2	2.51	53.0	3.0	0.0	Horz	AV	0.0	49.0	54.0	-5.0	Ch. 11, EUT Horizontal, 20 MHz BW, MCS0
4894.000	38.2	10.8	2.63	55.0	3.0	0.0	Horz	AV	0.0	49.0	54.0	-5.0	Ch. 6, EUT Horizontal, 20 MHz BW, MCS0
4944.000	38.4	10.2	1.59	136.0	3.0	0.0	Vert	AV	0.0	48.6	54.0	-5.4	Ch. 11, EUT Vertical, 20 MHz BW, MCS0
4894.000	37.8	10.8	1.46	140.0	3.0	0.0	Vert	AV	0.0	48.6	54.0	-5.4	Ch. 6, EUT Vertical, 20 MHz BW, MCS0
4844.000	36.0	10.5	2.51	61.0	3.0	0.0	Horz	AV	0.0	46.5	54.0	-7.5	Ch. 1, EUT Horizontal, 20 MHz BW, MCS0
4944.000	36.1	10.2	1.51	69.0	3.0	0.0	Horz	AV	0.0	46.3	54.0	-7.7	Ch. 11, EUT on side, 20 MHz BW, MCS0
4944.000	30.9	10.2	1.33	202.0	3.0	0.0	Vert	AV	0.0	41.1	54.0	-12.9	Ch. 11, EUT on side, 20 MHz BW, MCS0
4944.000	30.3	10.2	2.78	23.0	3.0	0.0	Vert	AV	0.0	40.5	54.0	-13.5	Ch. 11, EUT Horizontal, 20 MHz BW, MCS0
4944.000	29.4	10.2	1.5	94.0	3.0	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Ch. 11, EUT Vertical, 20 MHz BW, MCS0
4943.867	43.2	10.2	1.59	136.0	3.0	0.0	Vert	PK	0.0	53.4	74.0	-20.6	Ch. 11, EUT Vertical, 20 MHz BW, MCS0
4894.017	42.6	10.8	2.63	55.0	3.0	0.0	Horz	PK	0.0	53.4	74.0	-20.6	Ch. 6, EUT Horizontal, 20 MHz BW, MCS0
4944.000	43.1	10.2	2.51	53.0	3.0	0.0	Horz	PK	0.0	53.3	74.0	-20.7	Ch. 11, EUT Horizontal, 20 MHz BW, MCS0
4893.808	42.1	10.8	1.46	140.0	3.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	Ch. 6, EUT Vertical, 20 MHz BW, MCS0
4943.775	41.8	10.2	1.51	69.0	3.0	0.0	Horz	PK	0.0	52.0	74.0	-22.0	Ch. 11, EUT on side, 20 MHz BW, MCS0
4844.058	40.5	10.5	2.51	61.0	3.0	0.0	Horz	PK	0.0	51.0	74.0	-23.0	Ch. 1, EUT Horizontal, 20 MHz BW, MCS0
4944.192	39.4	10.2	1.33	202.0	3.0	0.0	Vert	PK	0.0	49.6	74.0	-24.4	Ch. 11, EUT on side, 20 MHz BW, MCS0
4942.783	39.1	10.2	1.5	94.0	3.0	0.0	Horz	PK	0.0	49.3	74.0	-24.7	Ch. 11, EUT Vertical, 20 MHz BW, MCS0
4942.475	39.1	10.2	2.78	23.0	3.0	0.0	Vert	PK	0.0	49.3	74.0	-24.7	Ch. 11, EUT Horizontal, 20 MHz BW, MCS0

CONCLUSION

Pass

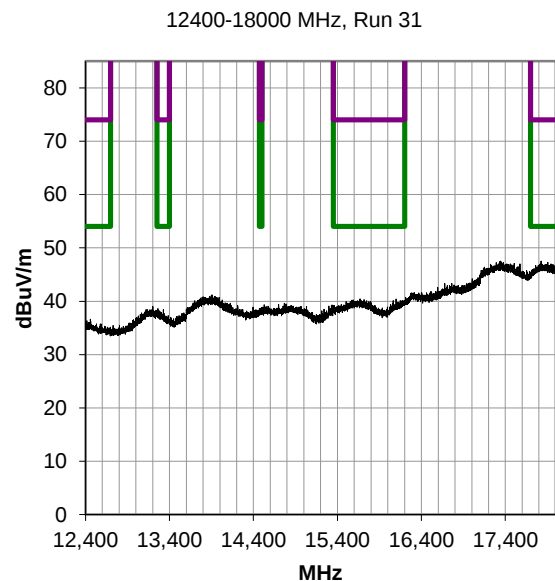
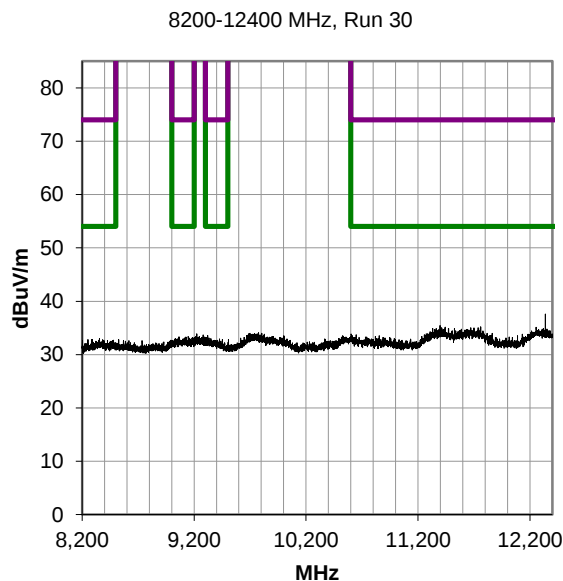
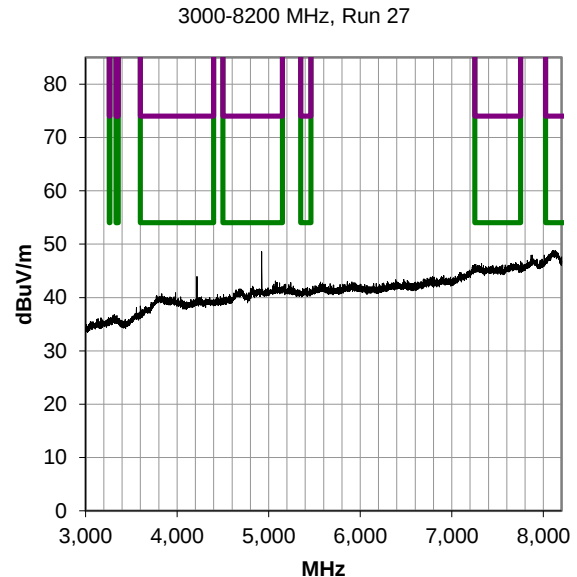
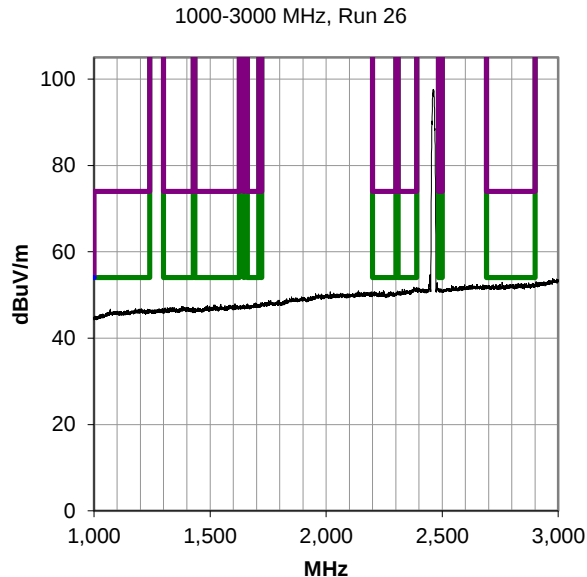


Tested By

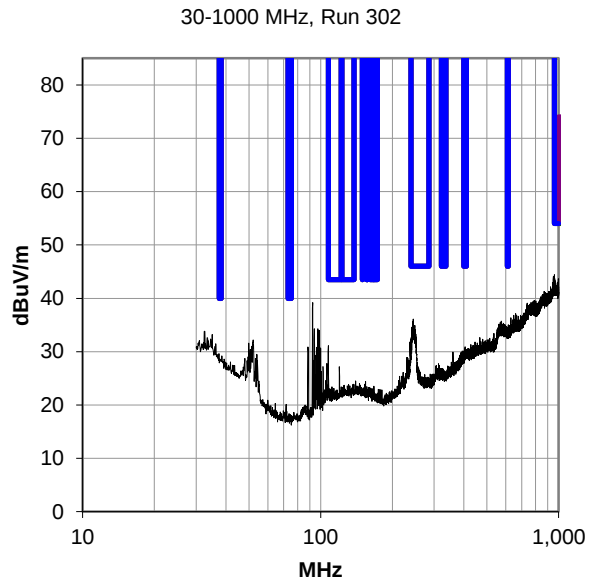
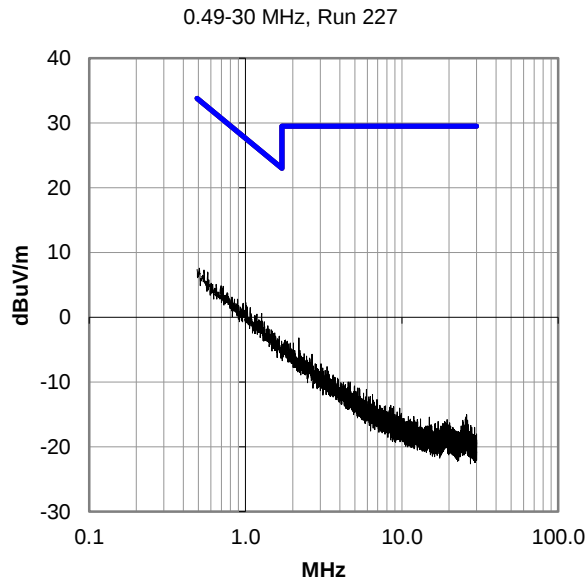
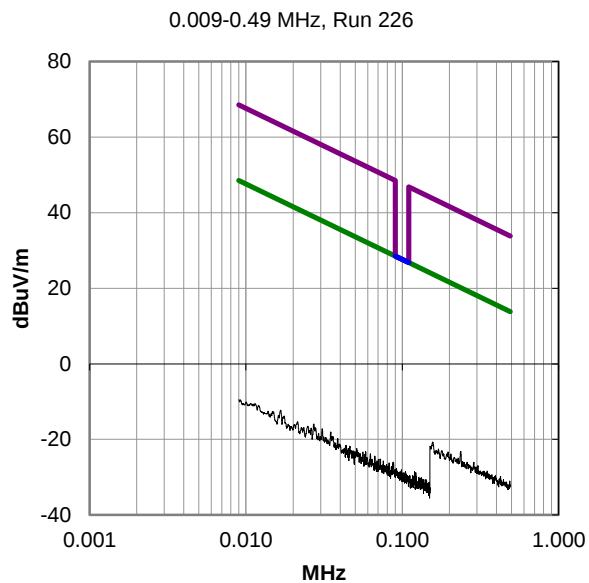
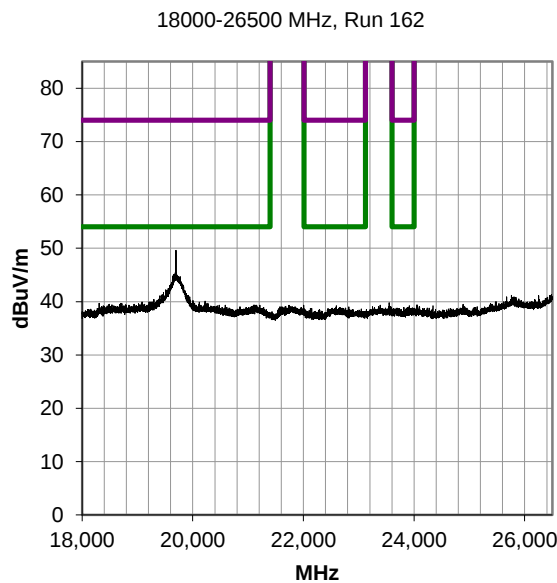
SPURIOUS RADIATED EMISSIONS – SISO PORT 1

PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.



SPURIOUS RADIATED EMISSIONS – SISO PORT 1



SPURIOUS RADIATED EMISSIONS - MIMO

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as shown in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axes if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out-of-band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Double Ridge	EMCO	3115	AHM	2024-06-24	2026-06-24
Cable	Micro-Coax	UFD150A-1-0720-200200	NCW	2025-01-27	2026-01-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	2025-04-21	2026-04-21
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2025-10-15	2026-10-15
Cable	Northwest EMC	Bilog Cables	NC1	2025-10-15	2026-10-15
Antenna - Biconilog	Teseq	CBL 6141B	AYD	2024-03-18	2026-03-18
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2025-10-15	2026-10-15
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2025-05-10	2026-05-10
Cable	Northwest EMC	3115 Horn Cable	NC2	2025-05-10	2026-05-10
Attenuator	Fairview Microwave	SA18E-20	AQV	2025-07-31	2026-07-31
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2025-09-24	2026-09-24
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2025-07-31	2026-07-31
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2025-07-31	2026-07-31
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2025-07-31	2026-07-31
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	2025-11-18	2026-11-18
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2025-05-29	2026-05-29
Cable	Northwest EMC	N/A	NC8	2025-05-29	2026-05-29
Antenna - Loop	EMCO	6502	AZC	2025-08-28	2027-08-28
Cable	Northwest EMC	NC01 Mag Field Loop / Near Field Probe cable	NC6	2025-09-29	2026-09-29
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2025-10-30	2027-10-30

SPURIOUS RADIATED EMISSIONS - MIMO



Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	2024-11-18	2025-11-18

FREQUENCY RANGE INVESTIGATED

9 kHz TO 26.5 GHz

POWER INVESTIGATED

12 VDC

CONFIGURATIONS INVESTIGATED

DIGC0286-2

MODES INVESTIGATED

Transmitting 2.4 GHz WiFi; 802.11(bgn), Port 1+2. Ch. 1 = 2412 MHz, Ch. 6 = 2437 MHz, Ch. 11 = 2462 MHz

SPURIOUS RADIATED EMISSIONS - MIMO



EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-10-30
Customer:	Digital Control Incorporated	Temperature:	20°C
Attendees:	None	Relative Humidity:	43.6%
Customer Project:	None	Bar. Pressure (PMSL):	1021 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	12 VDC	Configuration:	DIGC0286-2

TEST PARAMETERS

Run #:	130	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
--------	-----	--------------------	---	---------------------	-----------

COMMENTS

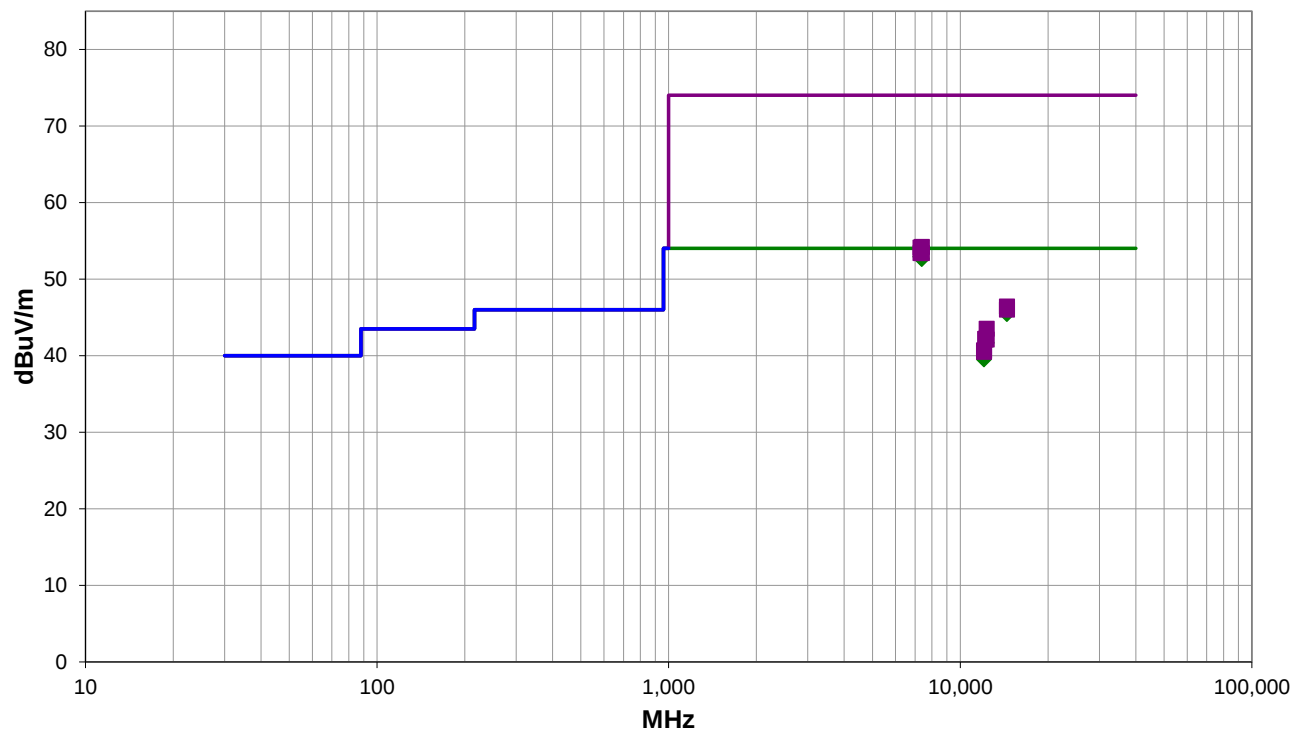
See data comments below for EUT orientation, channel, bandwidth & data rate

EUT OPERATING MODES

Transmitting 2.4 GHz WiFi; 802.11(bgn), Port 1+2. Ch. 1 = 2412 MHz, Ch. 6 = 2437 MHz, Ch. 11 = 2462 MHz.
--

DEVIATIONS FROM TEST STANDARD

None



Run #: 130

PK AV QP

SPURIOUS RADIATED EMISSIONS - MIMO

RESULTS - Run #130

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7310.033	27.7	14.6	1.5	130.0	10.6	0.0	Vert	AV	0.0	52.9	54.0	-1.1	Ch. 6, EUT Vertical, 20 MHz, MCS12
7310.907	27.7	14.6	1.5	67.0	10.6	0.0	Horz	AV	0.0	52.9	54.0	-1.1	Ch. 6, EUT Horizontal, 20 MHz, MCS12
7383.600	27.2	14.9	1.5	327.0	10.6	0.0	Vert	AV	0.0	52.7	54.0	-1.3	Ch. 11, EUT Vertical, 20 MHz, MCS12
7383.517	27.1	14.9	1.5	115.0	10.6	0.0	Horz	AV	0.0	52.6	54.0	-1.4	Ch. 11, EUT Horizontal, 20 MHz, MCS12
14473.490	28.3	6.7	1.5	272.0	10.6	0.0	Horz	AV	0.0	45.6	54.0	-8.4	Ch. 1, EUT Horizontal, 20 MHz, MCS12
14473.460	28.1	6.7	1.4	124.0	10.6	0.0	Vert	AV	0.0	45.4	54.0	-8.6	Ch. 1, EUT Vertical, 20 MHz, MCS12
12310.760	30.5	0.6	1.5	105.0	10.6	0.0	Horz	AV	0.0	41.7	54.0	-12.3	Ch. 11, EUT Horizontal, 20 MHz, MCS12
12311.820	30.4	0.6	1.5	360.0	10.6	0.0	Vert	AV	0.0	41.6	54.0	-12.4	Ch. 11, EUT Vertical, 20 MHz, MCS12
12184.750	30.4	0.2	1.5	39.0	10.6	0.0	Horz	AV	0.0	41.2	54.0	-12.8	Ch. 6, EUT Horizontal, 20 MHz, MCS12
12186.700	30.4	0.2	1.5	135.0	10.6	0.0	Vert	AV	0.0	41.2	54.0	-12.8	Ch. 6, EUT Vertical, 20 MHz, MCS12
12060.330	30.1	-1.0	4.0	277.0	10.6	0.0	Vert	AV	0.0	39.7	54.0	-14.3	Ch. 1, EUT Vertical, 20 MHz, MCS12
12062.420	29.9	-1.0	1.5	162.0	10.6	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Ch. 1, EUT Horizontal, 20 MHz, MCS12
7386.642	39.3	14.9	1.5	115.0	0.0	0.0	Horz	PK	0.0	54.2	74.0	-19.8	Ch. 11, EUT Horizontal, 20 MHz, MCS12
7311.953	39.5	14.6	1.5	130.0	0.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	Ch. 6, EUT Vertical, 20 MHz, MCS12
7312.413	38.8	14.6	1.5	67.0	0.0	0.0	Horz	PK	0.0	53.4	74.0	-20.6	Ch. 6, EUT Horizontal, 20 MHz, MCS12
7386.658	38.5	14.9	1.5	327.0	0.0	0.0	Vert	PK	0.0	53.4	74.0	-20.6	Ch. 11, EUT Vertical, 20 MHz, MCS12
14470.890	39.7	6.7	1.4	124.0	0.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	Ch. 1, EUT Vertical, 20 MHz, MCS12
14473.390	39.3	6.7	1.5	272.0	0.0	0.0	Horz	PK	0.0	46.0	74.0	-28.0	Ch. 1, EUT Horizontal, 20 MHz, MCS12
12311.680	42.9	0.6	1.5	105.0	0.0	0.0	Horz	PK	0.0	43.5	74.0	-30.5	Ch. 11, EUT Horizontal, 20 MHz, MCS12
12183.750	42.0	0.2	1.5	135.0	0.0	0.0	Vert	PK	0.0	42.2	74.0	-31.8	Ch. 6, EUT Vertical, 20 MHz, MCS12
12186.690	42.0	0.2	1.5	39.0	0.0	0.0	Horz	PK	0.0	42.2	74.0	-31.8	Ch. 6, EUT Horizontal, 20 MHz, MCS12
12312.000	41.5	0.6	1.5	360.0	0.0	0.0	Vert	PK	0.0	42.1	74.0	-31.9	Ch. 11, EUT Vertical, 20 MHz, MCS12
12060.640	41.7	-1.0	4.0	277.0	0.0	0.0	Vert	PK	0.0	40.7	74.0	-33.3	Ch. 1, EUT Vertical, 20 MHz, MCS12
12059.840	41.5	-1.0	1.5	162.0	0.0	0.0	Horz	PK	0.0	40.5	74.0	-33.5	Ch. 1, EUT Horizontal, 20 MHz, MCS12

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS - MIMO



EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-10-30
Customer:	Digital Control Incorporated	Temperature:	20°C
Attendees:	None	Relative Humidity:	43.6%
Customer Project:	None	Bar. Pressure (PMSL):	1021 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	12 VDC	Configuration:	DIGC0286-2

TEST PARAMETERS

Run #:	130	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
--------	-----	--------------------	---	---------------------	-----------

COMMENTS

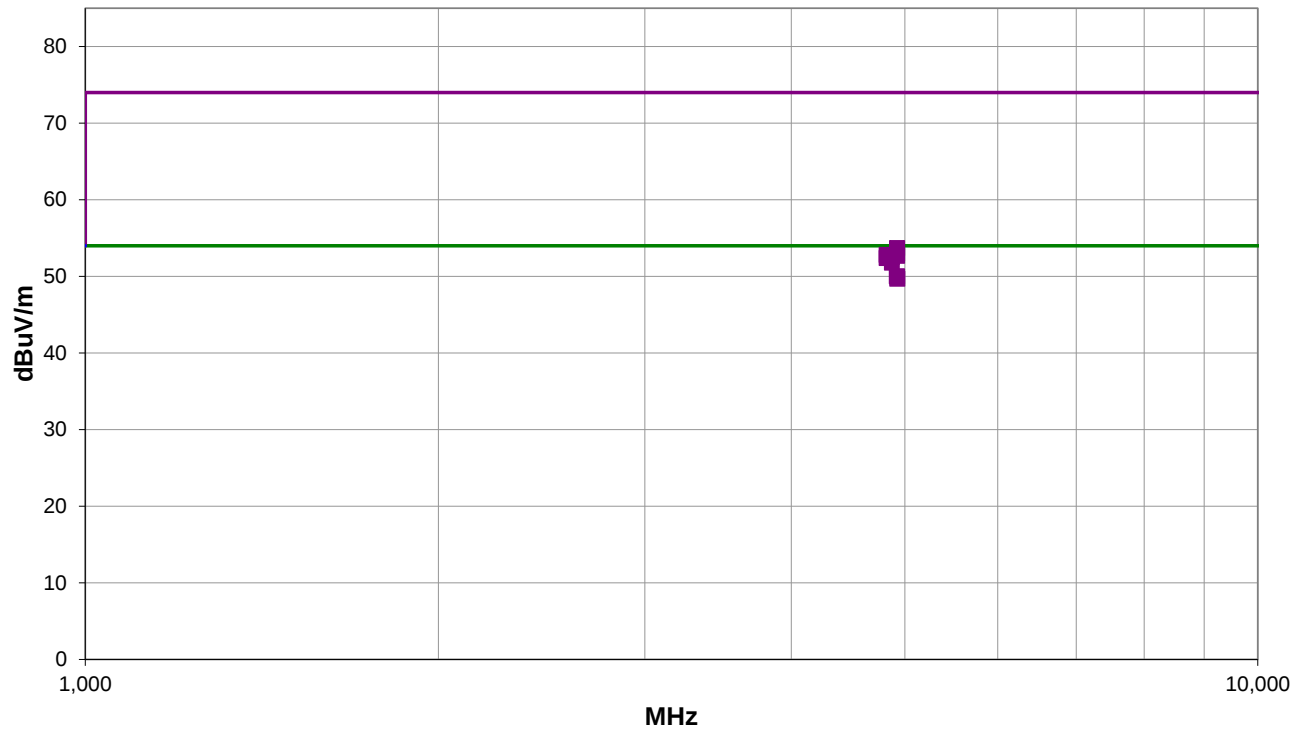
Measurements performed on worst case non noise floor emission. See data comments below for EUT orientation, channel, bandwidth & data rate. Peak data was used to compare with the average limits which is considered the worst case.

EUT OPERATING MODES

Transmitting 2.4 GHz WiFi; 802.11(bgn), Port 1+2. Ch. 1 = 2412 MHz, Ch. 6 = 2437 MHz, Ch. 11 = 2462 MHz.

DEVIATIONS FROM TEST STANDARD

None



Run #: 130

PK AV QP

SPURIOUS RADIATED EMISSIONS - MIMO

RESULTS - Run #130

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4923.667	43.1	10.6	2.59	52.0	3.0	0.0	Horz	PK	0.0	53.7	54.0	-0.3	Ch. 11, EUT Horizontal, 20 MHz, MCS12
4923.783	42.4	10.6	3.4	39.0	3.0	0.0	Horz	PK	0.0	53.0	54.0	-1.0	Ch. 11, EUT on Side, 20 MHz, MCS12
4824.220	42.4	10.4	2.44	56.0	3.0	0.0	Horz	PK	0.0	52.8	54.0	-1.2	Ch. 1, EUT Horizontal, 20 MHz, MCS12
4924.100	42.1	10.6	1.5	139.0	3.0	0.0	Vert	PK	0.0	52.7	54.0	-1.3	Ch. 11, EUT Vertical, 20 MHz, MCS12
4873.967	41.9	10.6	1.5	55.0	3.0	0.0	Horz	PK	0.0	52.5	54.0	-1.5	Ch. 6, EUT Horizontal, 20 MHz, MCS12
4824.213	42.0	10.4	1.5	141.0	3.0	0.0	Vert	PK	0.0	52.4	54.0	-1.6	Ch. 1, EUT Vertical, 20 MHz, MCS12
4873.820	41.2	10.6	1.5	140.0	3.0	0.0	Vert	PK	0.0	51.8	54.0	-2.2	Ch. 6, EUT Vertical, 20 MHz, MCS12
4922.200	39.4	10.6	1.5	136.0	3.0	0.0	Vert	PK	0.0	50.0	54.0	-4.0	Ch. 11, EUT Horizontal, 20 MHz, MCS12
4924.283	39.4	10.6	1.5	11.0	3.0	0.0	Horz	PK	0.0	50.0	54.0	-4.0	Ch. 11, EUT Vertical, 20 MHz, MCS12
4925.992	39.3	10.4	1.24	210.0	3.0	0.0	Vert	PK	0.0	49.7	54.0	-4.3	Ch. 11, EUT on Side, 20 MHz, MCS12

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS - MIMO



EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-12-08
Customer:	Digital Control Incorporated	Temperature:	20.5°C
Attendees:	None	Relative Humidity:	48.7%
Customer Project:	None	Bar. Pressure (PMSL):	1011 mb
Tested By:	Harry Zhao	Job Site:	NC01
Power:	12 VDC	Configuration:	DIGC0286-2

TEST PARAMETERS

Run #:	265	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
--------	-----	--------------------	---	---------------------	-----------

COMMENTS

See data comments below for EUT orientation, channel, bandwidth, & data rate. The measured emission is a mixed signal which consists of a CW tone and a signal that is temporally associated with the transmitter. Applying a DCCF would erroneously correct the AVG value above the measured peak.

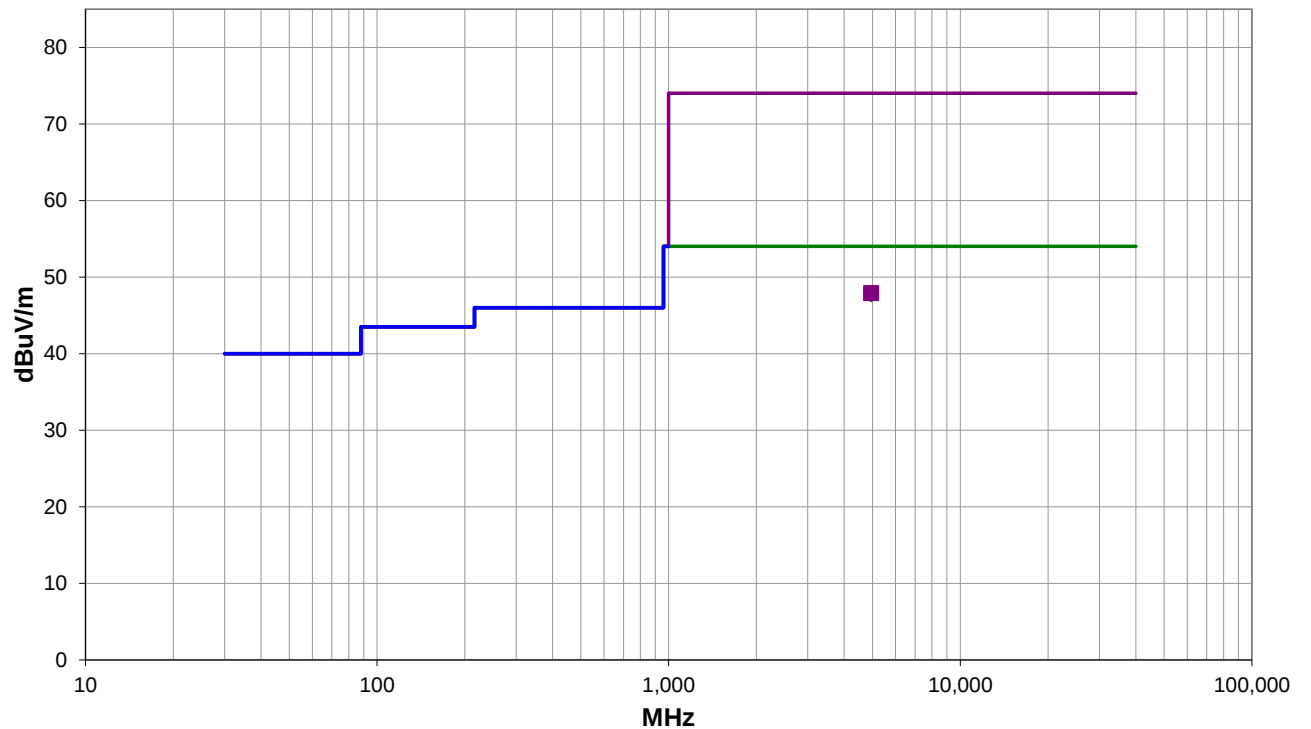
Therefore, reduced VBW averaging across on and off times as outlined in ANSI C63.10:2020, clause 11.12.2.5.2.3 was used. For all measurements the VBW was set to 11 kHz.

EUT OPERATING MODES

Transmitting 2.4 GHz WiFi; 802.11(bgn), Port 1+2. Ch. 1 = 2412 MHz, Ch. 6 = 2437 MHz, Ch. 11 = 2462 MHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 265

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS - MIMO

RESULTS - Run #265

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4944.000	37.5	10.2	2.53	53.0	3.0	0.0	Horz	AV	0.0	47.7	54.0	-6.3	Ch. 11, EUT Horizontal, 20 MHz BW, MCS12
4944.008	37.7	10.2	2.53	53.0	3.0	0.0	Horz	PK	0.0	47.9	74.0	-26.1	Ch. 11, EUT Horizontal, 20 MHz BW, MCS12

CONCLUSION
Pass



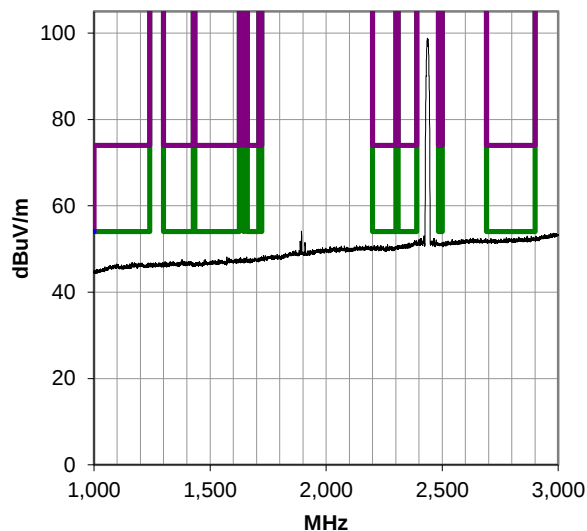
Tested By

SPURIOUS RADIATED EMISSIONS - MIMO

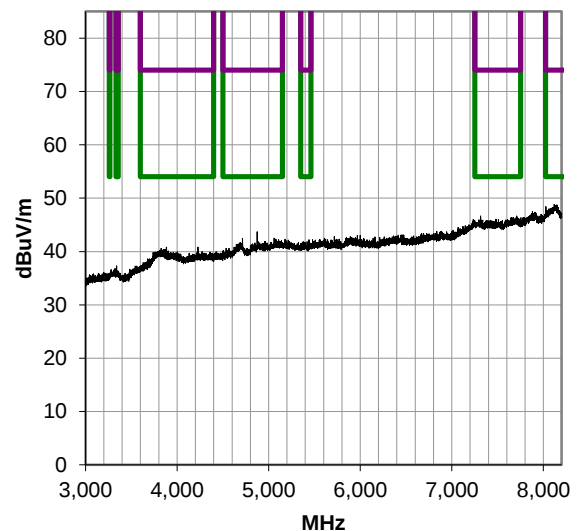
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

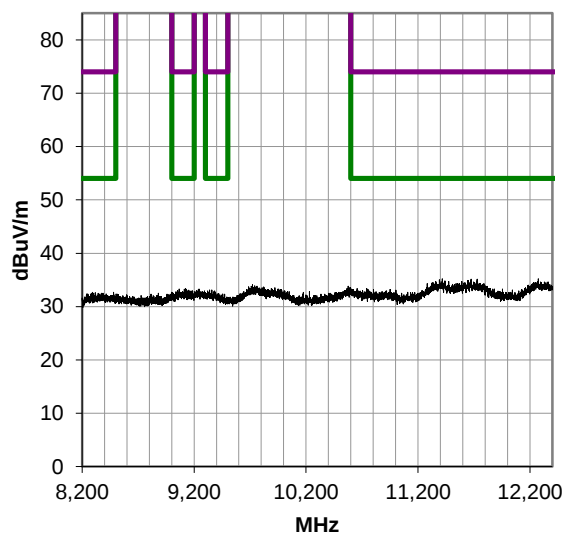
1000-3000 MHz, Run 114



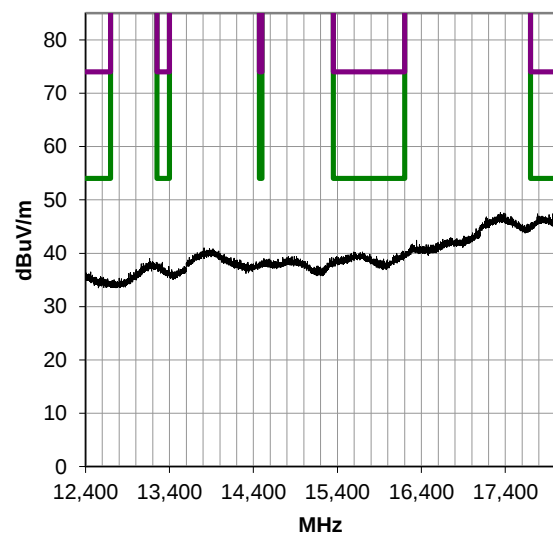
3000-8200 MHz, Run 115



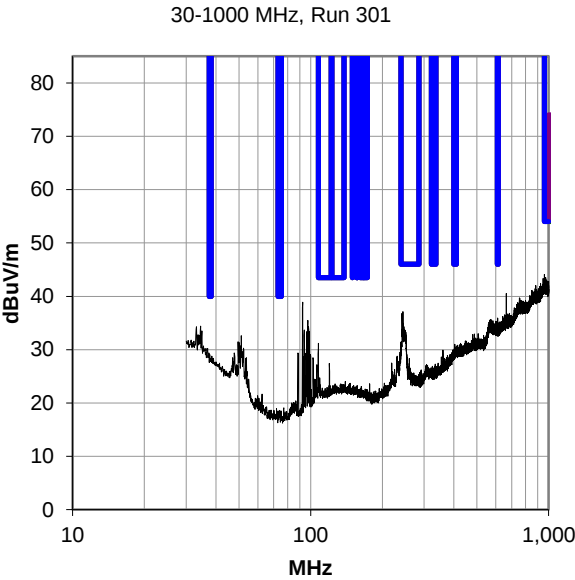
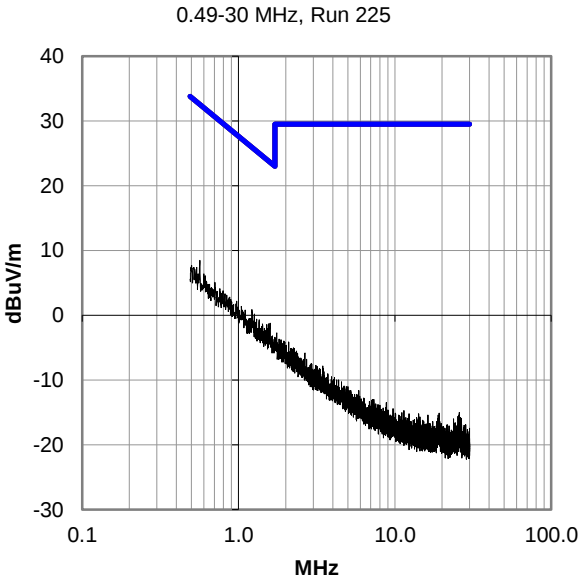
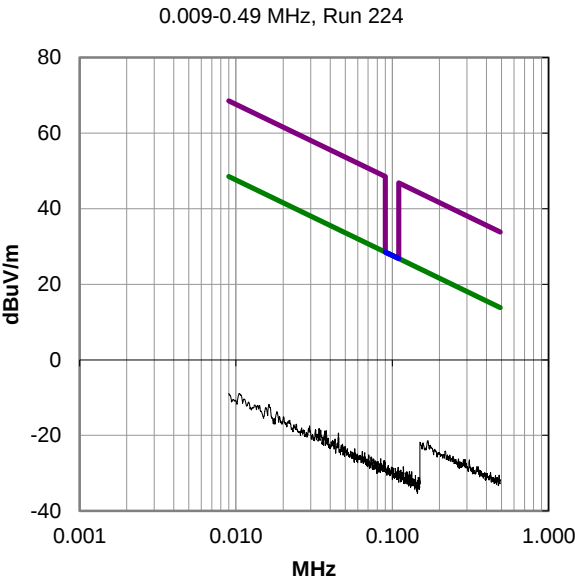
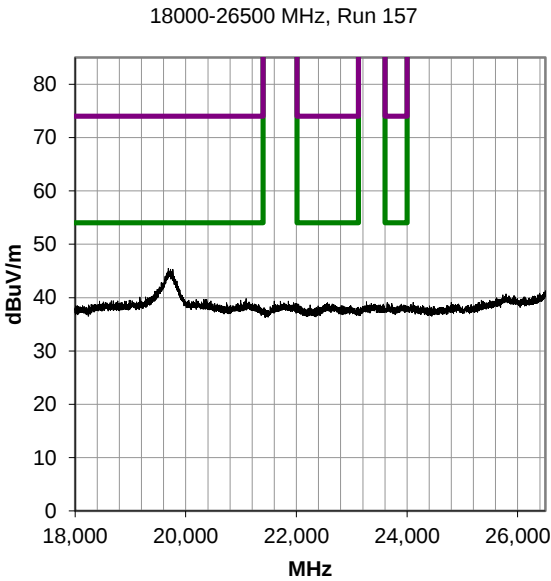
8200-12400 MHz, Run 116



12400-18000 MHz, Run 117



SPURIOUS RADIATED EMISSIONS - MIMO



RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE - MIMO



TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power.

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

The emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and attenuation were used (if needed) for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

PK = Peak Detector
AV = RMS Detector

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	2025-04-21	2026-04-21
Antenna - Double Ridge	EMCO	3115	AHM	2024-06-24	2026-06-24
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2025-05-10	2026-05-10
Cable	Northwest EMC	3115 Horn Cable	NC2	2025-05-10	2026-05-10
Attenuator	S.M. Electronics	SA3N-10	REI	2025-03-07	2026-03-07

RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE - MIMO



EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-11-03
Customer:	Digital Control Incorporated	Temperature:	20.2°C
Attendees:	None	Relative Humidity:	43.2%
Customer Project:	None	Bar. Pressure (PMSL):	1022 mbar
Tested By:	Harry Zhao	Job Site:	NC01
Power:	12 VDC	Configuration:	DIGC0286-2

COMMENTS

See data comments below for EUT orientation, channel, bandwidth, & data rate

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

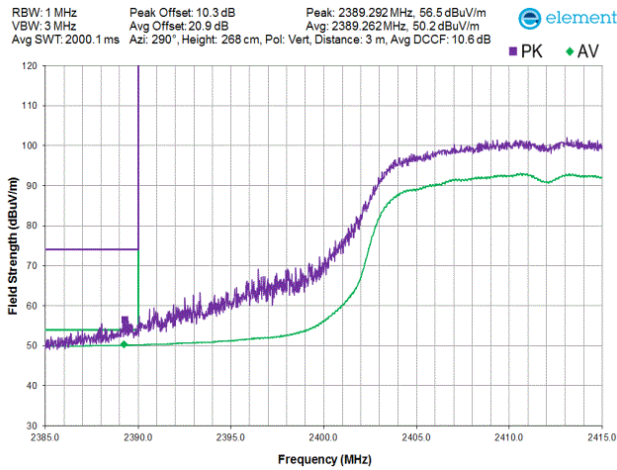
Pass

Tested By

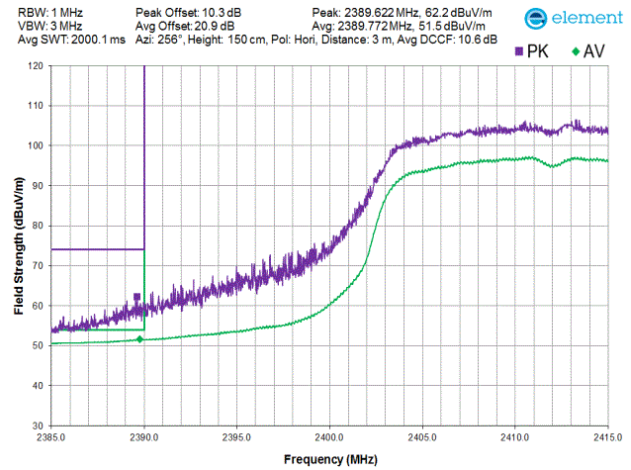
TEST RESULTS

	Frequency (MHz)	PK (dBuV/m) AV (dBuV/m)	PK Lim (dBuV/m) AV Lim (dBuV/m)	Worst Margin (dB)	Pol. (H/V)	EUT Orientation	Results
20 MHz BW							
802.11(n) MCS12							
Low Channel 1, 2412 MHz	2389.292	56.5	74.0	-3.8	V	EUT on side	Pass
	2389.262	50.2	54.0				
	2389.622	62.2	74.0	-2.5	H	EUT on side	Pass
	2389.772	51.5	54.0				
	2389.457	59.8	74.0	-3.4	V	EUT Vertical	Pass
	2389.367	50.6	54.0				
	2389.772	58.4	74.0	-3.5	H	EUT Vertical	Pass
	2389.367	50.5	54.0				
	2389.967	60.8	74.0	-2.9	H	EUT Horizontal	Pass
	2389.487	51.1	54.0				
High Channel 11, 2462 MHz	2389.712	58.2	74.0	-3.7	V	EUT Horizontal	Pass
	2389.202	50.3	54.0				
	2483.890	63.4	74.0	-2.8	H	EUT on side	Pass
	2483.510	51.2	54.0				
	2483.970	52.3	74.0	-4.2	V	EUT on side	Pass
	2483.510	49.8	54.0				
	2484.290	56.2	74.0	-3.6	V	EUT Vertical	Pass
	2483.510	50.4	54.0				
	2483.630	59.6	74.0	-3.5	H	EUT Vertical	Pass
	2483.510	50.5	54.0				
	2483.910	60.4	74.0	-3.5	H	EUT Horizontal	Pass
	2483.510	50.5	54.0				
	2483.670	58.9	74.0	-3.6	V	EUT Horizontal	Pass
	2483.550	50.4	54.0				

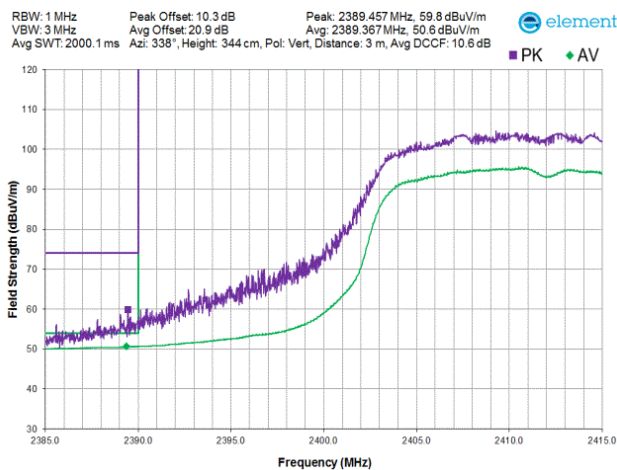
RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE - MIMO



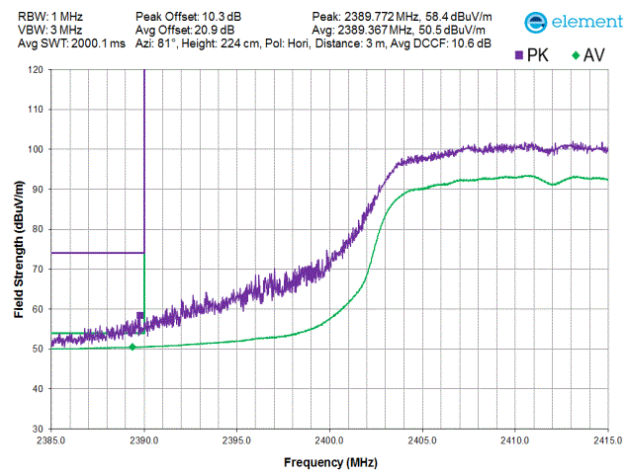
20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz



20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz

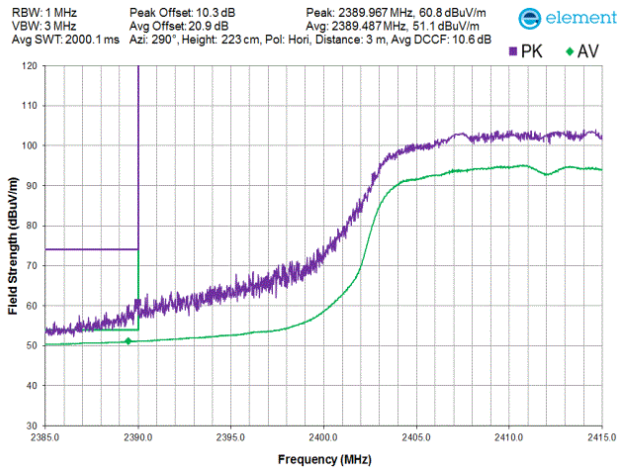


20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz

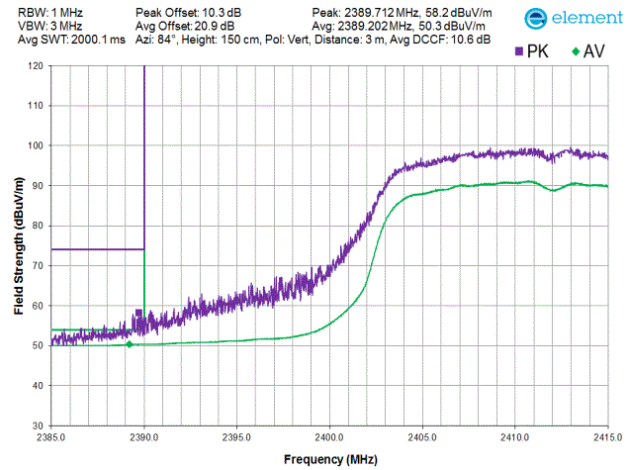


20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz

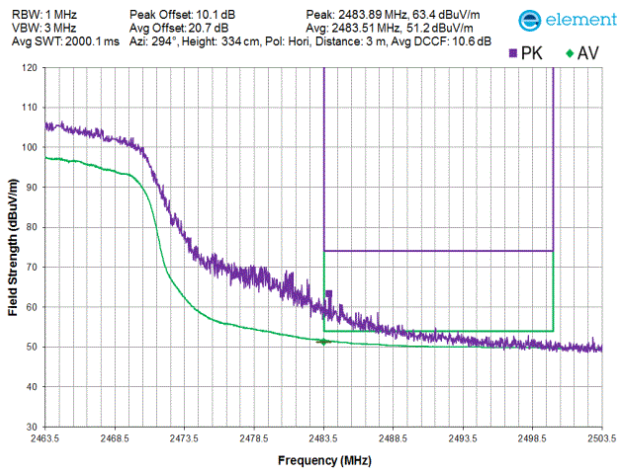
RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE - MIMO



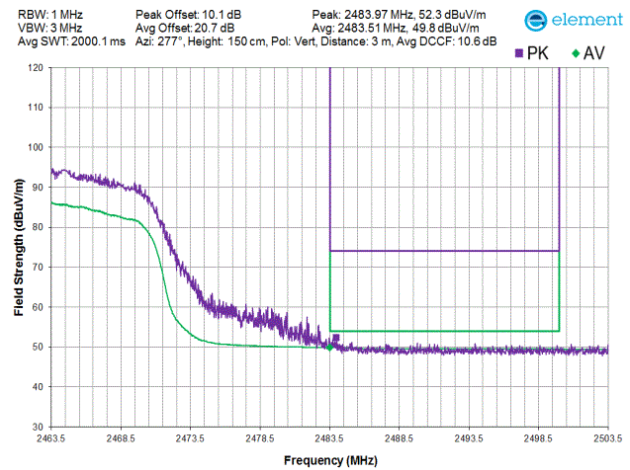
20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz



20 MHz BW
802.11(n) MCS12
Low Channel 1, 2412 MHz

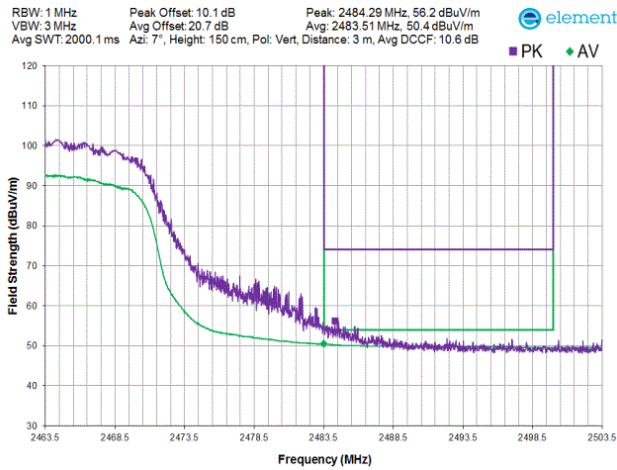


20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz

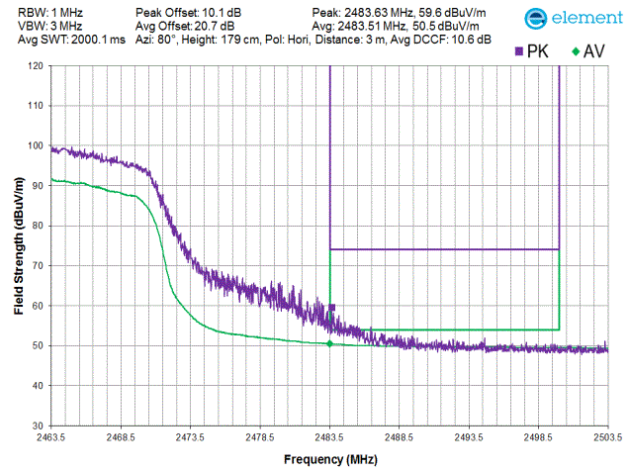


20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz

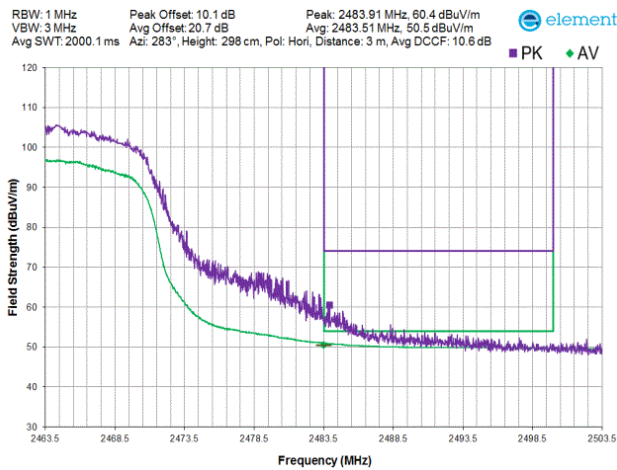
RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE - MIMO



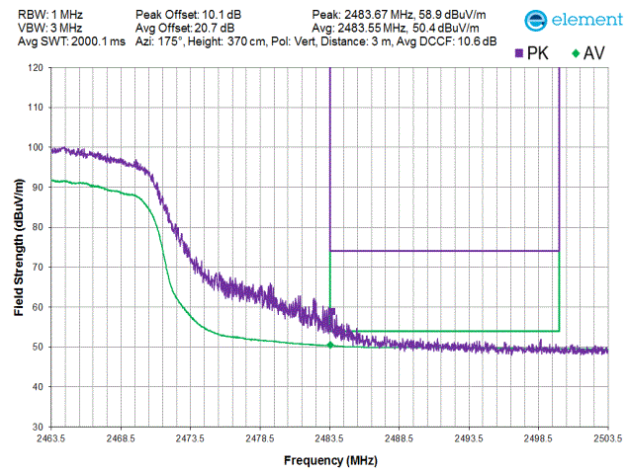
20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz



20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz



20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz



20 MHz BW
802.11(n) MCS12
High Channel 11, 2462 MHz

RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE – SISO



TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power.

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

The emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and attenuation were used (if needed) for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

PK = Peak Detector
AV = RMS Detector

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	2025-04-21	2026-04-21
Antenna - Double Ridge	EMCO	3115	AHM	2024-06-24	2026-06-24
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2025-05-10	2026-05-10
Cable	Northwest EMC	3115 Horn Cable	NC2	2025-05-10	2026-05-10
Attenuator	S.M. Electronics	SA3N-10	REI	2025-03-07	2026-03-07

RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE – SISO



EUT:	WiFi/BT Module WL18MODGI	Work Order:	DIGC0286
Serial Number:	119	Date:	2025-11-03
Customer:	Digital Control Incorporated	Temperature:	21.1°C
Attendees:	None	Relative Humidity:	41.1%
Customer Project:	None	Bar. Pressure (PMSL):	1022 mbar
Tested By:	Harry Zhao	Job Site:	NC01
Power:	12 VDC	Configuration:	DIGC0286-2

COMMENTS

See data comments below for EUT orientation, channel, bandwidth, & data rate

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

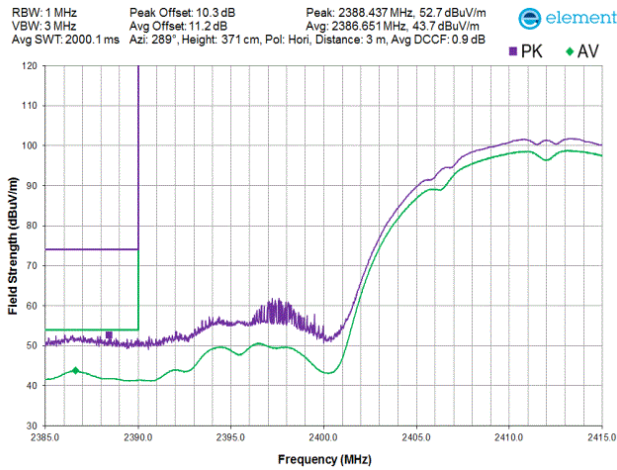
TEST RESULTS

	Frequency (MHz)	PK (dBuV/m) AV (dBuV/m)	PK Lim (dBuV/m) AV Lim (dBuV/m)	Worst Margin (dB)	Pol. (H/V)	EUT Orientation	Results
SISO - Port 1, 20 MHz BW							
802.11(b) 1 Mbps							
Low Channel 1, 2412 MHz	2388.437	52.7	74.0	-10.3	H	EUT on side	Pass
	2386.651	43.7	54.0				
High Channel 11, 2462 MHz	2389.712	51.4	74.0	-13.0	V	EUT Vertical	Pass
	2389.952	41.0	54.0				
	2487.272	52.5	74.0	-11.5	H	EUT on side	Pass
	2487.272	42.5	54.0				
	2487.232	52.6	74.0	-11.2	V	EUT Vertical	Pass
	2487.192	42.8	54.0				
802.11(g) 6 Mbps							
Low Channel 1, 2412 MHz	2388.887	62.2	74.0	-8.5	H	EUT on side	Pass
	2389.727	45.5	54.0				
High Channel 11, 2462 MHz	2389.667	59.2	74.0	-10.3	V	EUT Vertical	Pass
	2389.862	43.7	54.0				
	2483.650	60.6	74.0	-10.2	H	EUT on side	Pass
	2483.510	43.8	54.0				
	2484.230	57.7	74.0	-10.6	V	EUT Vertical	Pass
	2483.510	43.4	54.0				
802.11(n) MCS0							
Low Channel 1, 2412 MHz	2387.611	61.6	74.0	-8.6	H	EUT on side	Pass
	2389.907	45.4	54.0				
High Channel 11, 2462 MHz	2386.126	58.1	74.0	-10.0	V	EUT Vertical	Pass
	2387.251	44.0	54.0				
	2496.517	61.9	74.0	-7.2	H	EUT on side	Pass
	2483.510	46.8	54.0				
	2493.675	62.3	74.0	-8.5	V	EUT Vertical	Pass
	2498.217	45.5	54.0				
SISO - Port 1, 40 MHz BW							
802.11(n) MCS0							

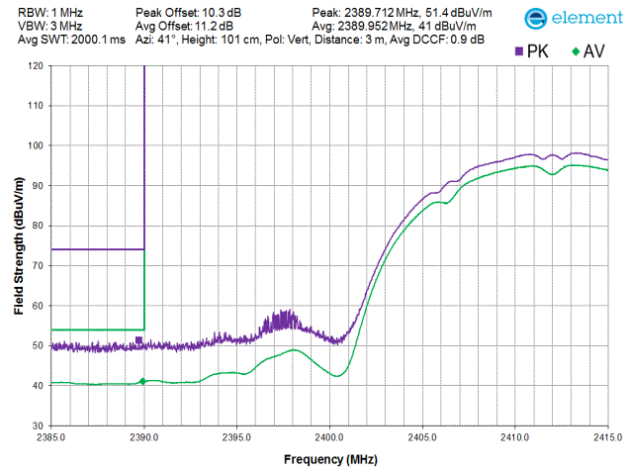
RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE – SISO

	Frequency (MHz)	PK (dBuV/m) AV (dBuV/m)	PK Lim (dBuV/m) AV Lim (dBuV/m)	Worst Margin (dB)	Pol. (H/V)	EUT Orientation	Results
Low Channel 1/5, 2422 MHz	2385.525	59.4	74.0	-8.5	H	EUT on side	Pass
	2385.000	45.5	54.0				
	2389.817	59.6	74.0	-8.1	V	EUT Vertical	Pass
	2389.142	45.9	54.0				
High Channel 7/11, 2452 MHz	2486.722	56.3	74.0	-8.7	H	EUT on side	Pass
	2483.520	45.3	54.0				
	2483.800	57.6	74.0	-8.4	V	EUT Vertical	Pass
	2483.520	45.6	54.0				

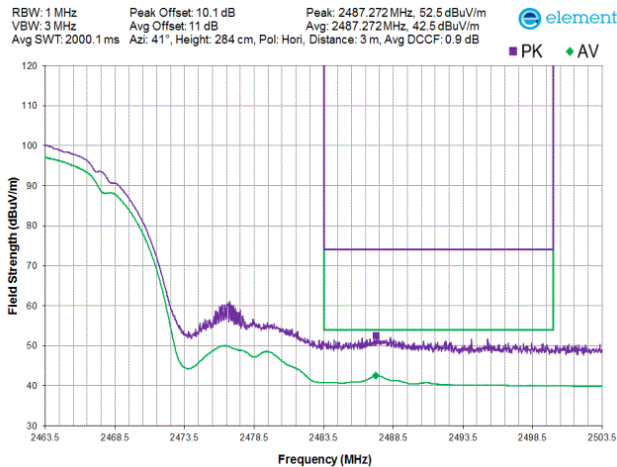
RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE – SISO



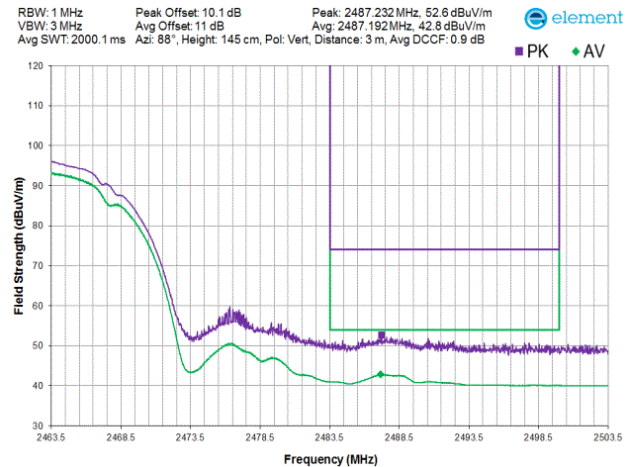
**SISO - Port 1, 20 MHz BW
802.11(b) 1 Mbps
Low Channel 1, 2412 MHz**



**SISO - Port 1, 20 MHz BW
802.11(b) 1 Mbps
Low Channel 1, 2412 MHz**

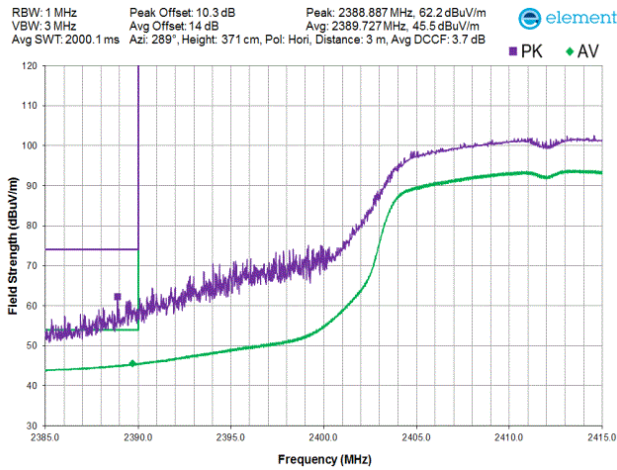


**SISO - Port 1, 20 MHz BW
802.11(b) 1 Mbps
High Channel 11, 2462 MHz**

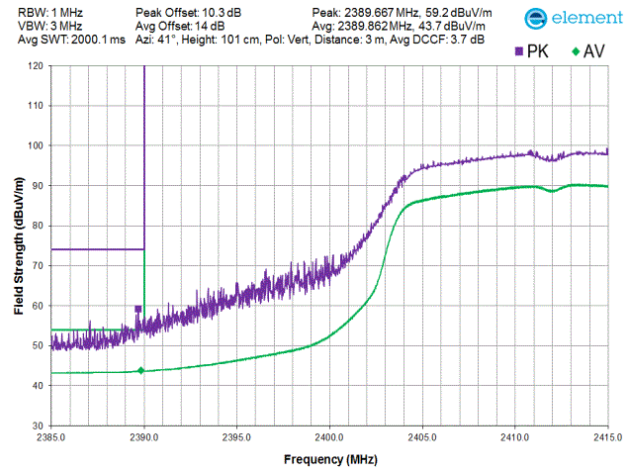


**SISO - Port 1, 20 MHz BW
802.11(b) 1 Mbps
High Channel 11, 2462 MHz**

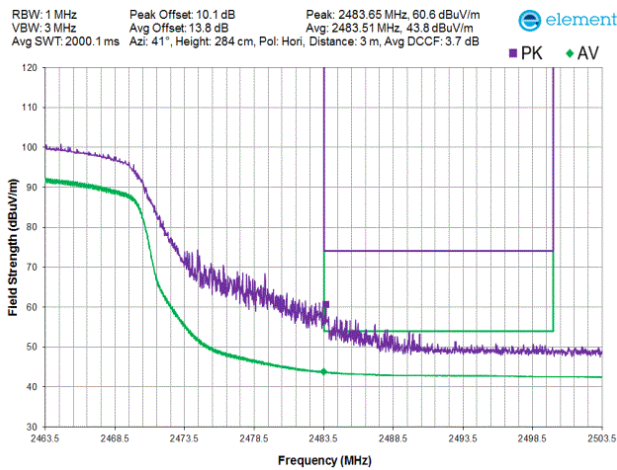
RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE – SISO



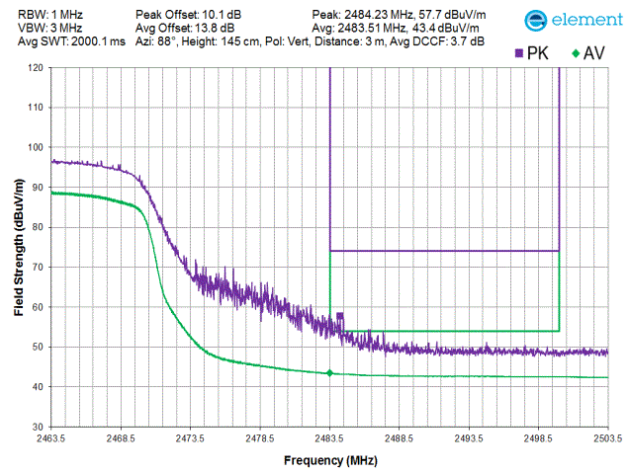
**SISO - Port 1, 20 MHz BW
802.11(g) 6 Mbps
Low Channel 1, 2412 MHz**



**SISO - Port 1, 20 MHz BW
802.11(g) 6 Mbps
Low Channel 1, 2412 MHz**

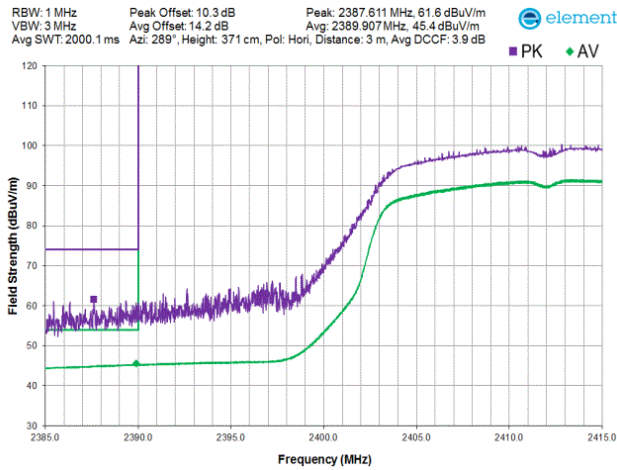


**SISO - Port 1, 20 MHz BW
802.11(g) 6 Mbps
High Channel 11, 2462 MHz**

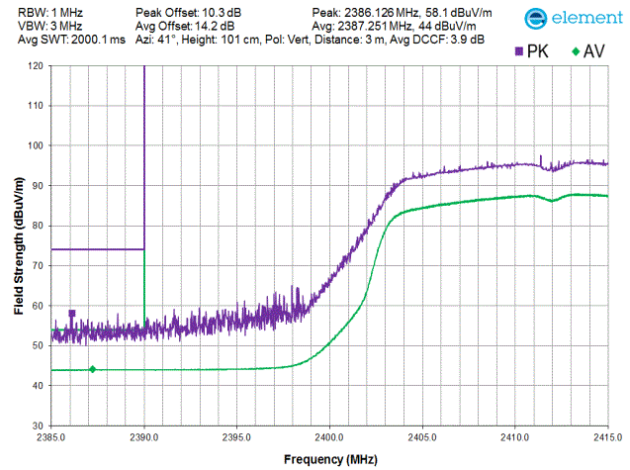


**SISO - Port 1, 20 MHz BW
802.11(g) 6 Mbps
High Channel 11, 2462 MHz**

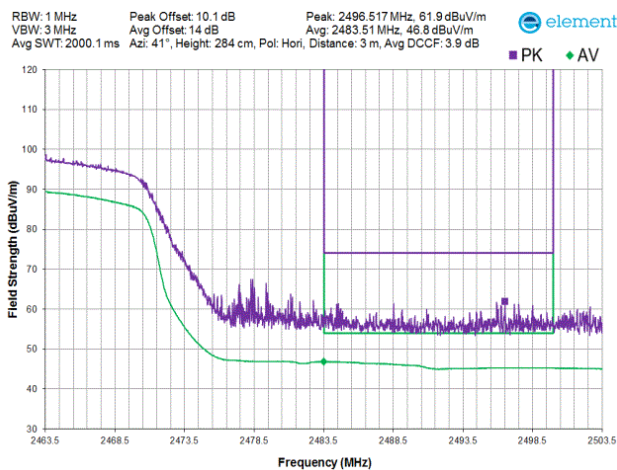
RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE – SISO



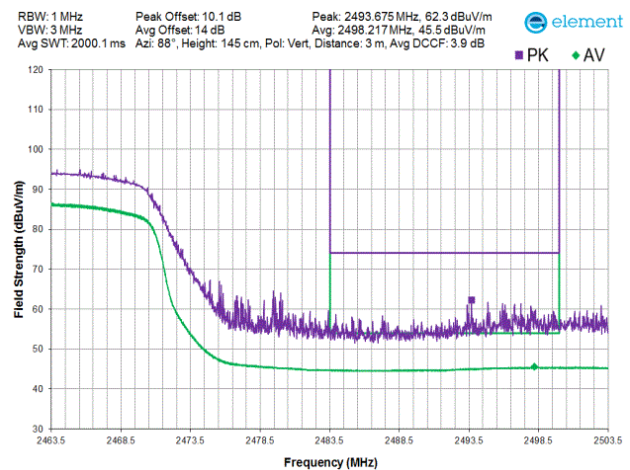
**SISO - Port 1, 20 MHz BW
802.11(n) MCS0
Low Channel 1, 2412 MHz**



**SISO - Port 1, 20 MHz BW
802.11(n) MCS0
Low Channel 1, 2412 MHz**

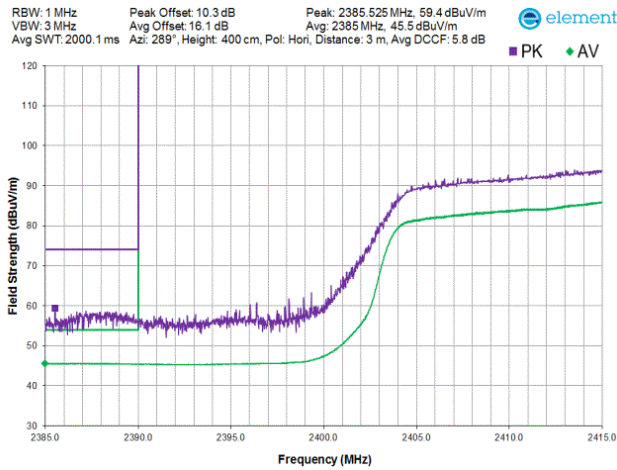


**SISO - Port 1, 20 MHz BW
802.11(n) MCS0
High Channel 11, 2462 MHz**

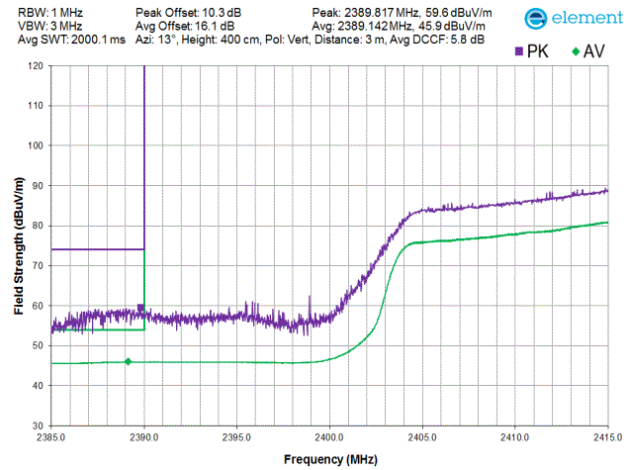


**SISO - Port 1, 20 MHz BW
802.11(n) MCS0
High Channel 11, 2462 MHz**

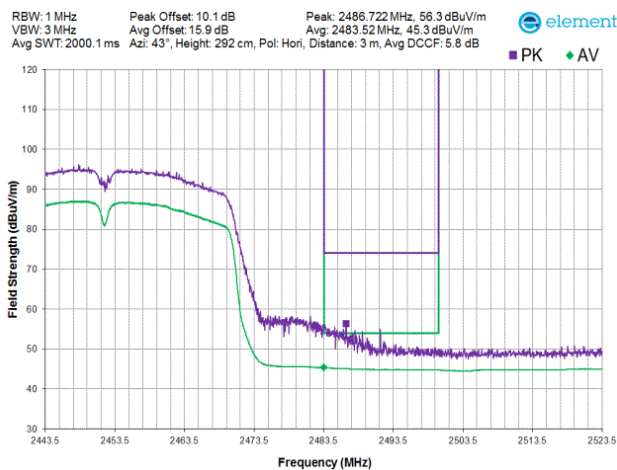
RADIATED SPURIOUS EMISSIONS RESTRICTED BAND EDGE – SISO



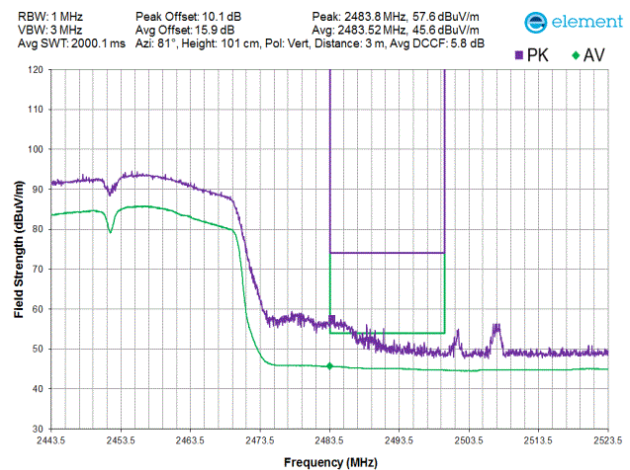
**SISO - Port 1, 40 MHz BW
802.11(n) MCS0
Low Channel 1/5, 2422 MHz**



**SISO - Port 1, 40 MHz BW
802.11(n) MCS0
Low Channel 1/5, 2422 MHz**



**SISO - Port 1, 40 MHz BW
802.11(n) MCS0
High Channel 7/11, 2452 MHz**



**SISO - Port 1, 40 MHz BW
802.11(n) MCS0
High Channel 7/11, 2452 MHz**

End of Test Report