FCC PART 15.407
ISEDC RSS-247, ISSUE 3, AUGUST 2023

TEST REPORT

For

Cisco Systems Inc.

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San Jose, CA 95134-1706
IC: 170 W. Tasman Drive, Building P & 7
San Jose, CA 95134, United States of America (Excluding The State of Alaska)

FCC ID: LDKIW9165DH
IC: 2461A-IW9165DH

Report Type:	**Product Type:**
Class 2 Permissive Change	Wi-Fi 6E Outdoor Access Point

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ACCREDITED
CERTIFICATE #3297.02

TABLE OF CONTENTS

1 GENERAL DESCRIPTION 4

1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 4
1.2 MECHANICAL DESCRIPTION OF EUT 4
1.3 OBJECTIVE 4
1.4 RELATED SUBMITTAL(S)/GRANT(S) 5
1.5 TEST METHODOLOGY 5
1.6 MEASUREMENT UNCERTAINTY 5
1.7 TEST FACILITY REGISTRATIONS 5
1.8 TEST FACILITY ACCREDITATIONS 6

2 SYSTEM TEST CONFIGURATION 8

2.1 JUSTIFICATION 8
2.2 EUT EXERCISE SOFTWARE 8
2.3 EQUIPMENT MODIFICATION 8
2.4 LOCAL SUPPORT EQUIPMENT 8
2.5 REMOTE SUPPORT EQUIPMENT 8
2.6 POWER SUPPLY AND LINE FILTERS 8
2.7 INTERFACE PORTS AND CABLING 8

3 SUMMARY OF TEST RESULTS 9

4 FCC §15.203 & ISEDC RSS-GEN §6.8 - ANTENNA REQUIREMENTS 10

4.1 APPLICABLE STANDARDS 10
4.2 ANTENNA DESCRIPTION 11

5 FCC §2.1091, FCC §15.407(F) & ISEDC RSS-102 – RF EXPOSURE 12

5.1 APPLICABLE STANDARDS 12
5.2 MPE PREDICTION 13
5.3 RF EXPOSURE EVALUATION EXEMPTION FOR FCC 14
5.4 RF EXPOSURE EVALUATION EXEMPTION FOR IC 15
5.5 CALCULATIONS WITH ADDITIONAL TRANSMITTERS 16

6 FCC §407(A)– MAXIMUM EIRP AT ELEVATION ANGLE ABOVE 30 DEGREES 17

6.1 APPLICABLE STANDARDS 17
6.2 TEST RESULTS 17

7 APPENDIX A (NORMATIVE) – EUT EXTERNAL PHOTOGRAPHS 20

8 APPENDIX B (NORMATIVE) – EUT INTERNAL PHOTOGRAPHS 21

9 APPENDIX C (NORMATIVE) – A2LA ELECTRICAL TESTING CERTIFICATE 22

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R2404256-407	Class 2 Permissive Change	2024-06-21

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test report was prepared on behalf of *Cisco Systems, Inc.*, and their product model: *IW9165DH-B (USA), IW9165DH-A (Canada),* FCC ID: LDKIW9165DH and IC: 2461A-IW9165DH, or the "EUT" as referred to in this report. It is a Wi-Fi 6E Outdoor Access Point.

1.2 Mechanical Description of EUT

Dimensions (mm): 200 mm (L) x 190 mm (W) x 80 mm (H), Weight = 1.95kg.
Serial Number: FOC2638BL91 assigned by manufacturer.

The data gathered was from a production sample provided by Cisco Systems Inc.

1.3 Objective

This report is prepared on behalf of *Cisco Systems Inc.* in accordance with FCC CFR47 §15.407 and ISEDC RSS-247

The objective is to determine compliance with FCC Part 15.407 for Maximum EIRP at elevation angle above 30 degrees and with FCC Part 407/RSS-247 for RF Exposure for evaluating new antennas to be used with the device.

In order to determine compliance, the manufacturer or a contracted laboratory makes measurements and takes the necessary steps to ensure that the equipment complies with the appropriate technical standards.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the immunity should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing and/or I/O cable changes, etc.).

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.10-2013, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz, and FCC KDB 789033 D02 General UNII Test Procedure New Rules v02r01.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Parameter	Measurement uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.57 dB
Power Spectral Density, conducted	±1.48dB
Unwanted Emissions, conducted	±1.57dB
All emissions, radiated	±4.0 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2 ^{o} C
Humidity	±5 %
DC and low frequency voltages	±1.0 %
Time	±2 %
Duty Cycle	±3 %

1.7 Test Facility Registrations

BACLs test facilities that are used to perform Radiated and Conducted Emissions tests are currently recognized by the Federal Communications Commission as Accredited with NIST Designation Number US1129.

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Industry Canada under Registration Numbers: 3062A-1, 3062A-2, and 3062A-3.

BACL is a Chinese Taipei Bureau of Standards Metrology and Inspection (BSMI) validated Conformity Assessment Body (CAB), under Appendix B, Phase I Procedures of the APEC Mutual Recognition Arrangement (MRA). BACL's BSMI Lab Code Number is: SL2-IN-E-1002R

BACL's test facilities that are used to perform AC Line Conducted Emissions, Telecommunications Line Conducted Emissions, Radiated Emissions from 30 MHz to 1 GHz, and Radiated Emissions from 1 GHz to 6 GHz are currently recognized as Accredited in accordance with the Voluntary Control Council for Interference [VCCI] Article 15 procedures under Registration Number A-0027.

1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2017 by A2LA (Test Laboratory Accreditation Certificate Number 3297.02),*** in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report.

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.03)*** to certify

- For the USA (Federal Communications Commission):
  - 1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
  - 2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
  - 3- All Telephone Terminal Equipment within FCC Scope C.
- For the Canada (Industry Canada):
  - 1 All Scope 1-Licence-Exempt Radio Frequency Devices;
  - 2 All Scope 2-Licensed Personal Mobile Radio Services;
  - 3 All Scope 3-Licensed General Mobile & Fixed Radio Services;
  - 4 All Scope 4-Licensed Maritime & Aviation Radio Services;
  - 5 All Scope 5-Licensed Fixed Microwave Radio Services
  - 6 All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.
- For Singapore (Info-Communications Development Authority (IDA)):
  - 1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2
  - 2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2
- For the Hong Kong Special Administrative Region:
  - 1 All Radio Equipment, per KHCA 10XX-series Specifications;
  - 2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
  - 3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.
- For Japan:
  - 1 MIC Telecommunication Business Law (Terminal Equipment):
    - All Scope A1 - Terminal Equipment for the Purpose of Calls;
    - All Scope A2 - Other Terminal Equipment
  - 2 Radio Law (Radio Equipment):
    - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
    - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
    - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

C- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.01)*** to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

1 Electronics and Office Equipment:
- for Telephony (ver. 3.0)
- for Audio/Video (ver. 3.0)
- for Battery Charging Systems (ver. 1.1)
- for Set-top Boxes & Cable Boxes (ver. 4.1)
- for Televisions (ver. 6.1)
- for Computers (ver. 6.0)
- for Displays (ver. 6.0)
- for Imaging Equipment (ver. 2.0)
- for Computer Servers (ver. 2.0)

2 Commercial Food Service Equipment
- for Commercial Dishwashers (ver. 2.0)
- for Commercial Ice Machines (ver. 2.0)
- for Commercial Ovens (ver. 2.1)
- for Commercial Refrigerators and Freezers

3 Lighting Products
- For Decorative Light Strings (ver. 1.5)
- For Luminaires (including sub-components) and Lamps (ver. 1.2)
- For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
- For Integral LED Lamps (ver. 1.4)

4 Heating, Ventilation, and AC Products
- for Residential Ceiling Fans (ver. 3.0)
- for Residential Ventilating Fans (ver. 3.2)

5 Other
- For Water Coolers (ver. 3.0)

D- ***A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:***

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;
- Canada: (Innovation, Science and Economic development Canada - ISEDC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
  - BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
  - NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
  - EMC Directive 2014/30/EU US-EU EMC & Telecom MRA CAB (NB)
  - Radio Equipment (RE) Directive 2014/53/EU US-EU EMC & Telecom MRA CAB (NB)
  - Low Voltage Directive (LVD) 2014/35/EU
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA) APEC Tel MRA -Phase I & Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA -Phase I
- Singapore: (Infocomm Media Development Authority - IMDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter-
- USA:
  - ENERGY STAR Recognized Test Laboratory – US EPA
  - Telecommunications Certification Body (TCB) – US FCC;
  - Nationally Recognized Test Laboratory (NRTL) – US OSHA

Vietnam: APEC Tel MRA -Phase I;

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.10-2013 and FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

The test used TeraTerm and test commands, provided by *Cisco Systems Inc.*, the software is compliant with the standard requirements being tested against.

2.3 Equipment Modification

No modifications were made to the EUT during testing.

2.4 Local Support Equipment

N/A

2.5 Remote Support Equipment

N/A

2.6 Power Supply and Line Filters

N/A

2.7 Interface Ports and Cabling

N/A

3 Summary of Test Results

FCC & ISEDC Rules	Description of Test	Results
FCC §15.203 ISEDC RSS-Gen §6.8	Antenna Requirements	Compliant
FCC §2.1091, §15.407(f) ISED RSS-102 §2.5	RF Exposure	Compliant
FCC §407(a)(1)(i)	Maximum EIRP at elevation angle above 30 degrees	Compliant

BACL is responsible for all the information provided in this report, except when information is provided by the customer as identified in this report. Information provided by the customer, e.g., antenna gain, can affect the validity of results.

4 FCC §15.203 & ISEDC RSS-Gen §6.8 - Antenna Requirements

4.1 Applicable Standards

According to FCC §15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to FCC §15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to ISEDC RSS-Gen §6.8: Transmitter Antenna

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For license-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

4.2 Antenna Description

The following antennas are added to the supported antenna list in this CIIPC application.

Product ID	Description	Peak Gain 2.4 GHz (dBi)	Peak Gain 4.9 GHz (dBi)	Peak Gain 5 GHz (dBi)	Gain >30°Elevation UNII-1 (dBi)
IW-ANT-PNL-5615-NS	15 dBi Panel Antenna	-	15	15	3
IW-ANT-SS9-516-N	Dual Polarization Based Station Antenna	-	15	15	-1
IW-ANT-DS9-516-N	Dual Slant Polarization Base Station Antenna	-	15	15	5
IW-ANT-H90-510-N	Symmetrical Horn CC Antenna	-	-	9.6	8

Antenna gain is information provided by customer.

5 FCC §2.1091, FCC §15.407(f) & ISEDC RSS-102 – RF Exposure

5.1 Applicable Standards

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW.

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= Pth.

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right)$$ and f is in GHz;

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance R between the person and the antenna / radiating structure, where R > λ / 2 TT.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	**Threshold ERP (watts)**
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.
Note: R is in meters, f is in MHz.	

According to ISED RSS-102 Issue 5:

2.5.2 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz[6] and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

5.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

5.3 RF exposure evaluation exemption for FCC

Radio 1: 15dBi antenna gain

Prediction frequency (MHz)	5745
Maximum Output Power (dBm) – Antenna 1	15.1dBm
Maximum Output Power (dBm) – Antenna 2	14.1dBm
Duty Cycle	0.22dB
Tolerances	0.50dB
Max antenna gain	15dBi
EIRP (dBm)	33.3dBm
ERP (W)	1.306
Prediction distance (cm)	40
	MPE-based Exemption Threshold
	P_{th} (W)
1500 MHz ≤ f < 100000 MHz	$19.2R^2 = 3.072W$

Radio 2: 15dBi antenna gain

Prediction frequency (MHz)	5745
Maximum Output Power (dBm) – Antenna 1	17.8dBm
Maximum Output Power (dBm) – Antenna 2	17.4dBm
Duty Cycle	0.36dB
Tolerances	0.50dB
Max antenna gain	15dBi
EIRP (dBm)	35.97dBm
ERP (W)	2.415
Prediction distance (cm)	40
	MPE-based Exemption Threshold
	P_{th} (W)
1500 MHz ≤ f < 100000 MHz	$19.2R^2 = 3.072W$

5.4 RF exposure evaluation exemption for IC

Radio 1: 15dBi antenna gain

Prediction frequency (MHz)	5745
Maximum Output Power (dBm) – Antenna 1	15.1dBm
Maximum Output Power (dBm) – Antenna 2	14.1dBm
Duty Cycle	0.22dB
Tolerances	0.50dB
Max antenna gain	15dBi
EIRP (dBm)	33.3dBm
EIRP (W)	2.13
Prediction distance (cm)	40
300MHz ≤ f < 6GHz	MPE-based Exemption Threshold
	P_{th} (W)
	1.31 x 10-2 *f*0.6834 W = 4.857 watt.

The routine evaluation is exempted because 2.13 < 4.857 watt.

Radio 2: 15dBi antenna gain

Prediction frequency (MHz)	5745
Maximum Output Power (dBm) – Antenna 1	17.8dBm
Maximum Output Power (dBm) – Antenna 2	17.4dBm
Duty Cycle	0.36dB
Tolerances	0.50dB
Max antenna gain	15dBi
EIRP (dBm)	35.97dBm
ERP (W)	3.95
Prediction distance (cm)	40
300MHz ≤ f < 6GHz	Exemption Limits for Routine Evaluation
	(W)
	1.31 x 10-2 *f*0.6834 W = 4.857 watt.

The routine evaluation is exempted because 3.95W < 4.857 watt.

5.5 Calculations with additional Transmitters

The FCC's MPE limits vary with frequency. Therefore, in mixed or broadband RF fields where several sources and frequencies are involved, the fraction of the recommended limit (in terms of power density or square of the electric or magnetic field strength) incurred within each frequency interval should be determined, and the sum of all fractional contributions should not exceed 1.0, or 100% in terms of percentage.

Worst Case Scenario:
BLE (Highest power) – 13dBm
5GHz Radio 1 – 34.50dBm
5GHz Radio 2 – 35.50dBm

Total Power Densities (Percentages) = 5GHz Radio 1 Power Density % + 5GHz Radio 2 Power Density % +

BLE Power Density % + 4.9GHz Radio 1

Total Relative Power Densities (Percentages) = (0.106/1.0) *100 + (0.197/1.0) *100 + (0.001/1)*100 +
(0.056/1.0)*100=
= 10.6 % + 19.7 % + 1% + 5.6 %
= 36.9%

6 FCC §407(a)– Maximum EIRP at elevation angle above 30 degrees

6.1 Applicable Standards

According to FCC §15.407(a)(1)(i):

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

6.2 Test Results

Antenna IW-ANT-PNL-5615-NS is identical with antenna IW-ANT-PNL-515-N=, which was certified in the original filing. Therefore, IW-ANT-PNL-5615-NS is not evaluated in this CIIPC application.

Note: The data for Tx conducted power is referenced from the previous reports with report number: EDCS # 24696724, EDCS # 24347167, EDCS # 24346977, EDCS # 24677304 and EDCS # 24339527. Issued by Cisco Systems Inc.
Note: The corrected Antenna gain information is provided by Cisco Systems Inc.
Note: Margin (dB) = Total EIRP (dBm) – Limit (dBm)

Cobalt
160 MHz

IW-ANT-H90-510-N

Mode	TX Path	Corrected Antenna Gain(dBi)	Tx A Conducted Max Power (dBm)	Tx B Conducted Max Power (dBm)	Duty Cycle (dB)	Total EIRP (dBm)	Limit (dBm)	Margin (dB)
5250 MHz Worst Case Mode								
HE160, M0 to M11 1ss	2	8	8.7	8.6	1.02	20.69	21	-0.31

IW-ANT-DS9-516-N

Mode	TX Path	Corrected Antenna Gain(dBi)	Tx A Conducted Max Power (dBm)	Tx B Conducted Max Power (dBm)	Duty Cycle (dB)	Total EIRP (dBm)	Limit (dBm)	Margin (dB)
5250 MHz Worst Case Mode								
HE160, M0 to M11 1ss	2	5	8.7	8.6	1.02	17.69	21	-3.31

IW-ANT-SS9-516-N

Mode	TX Path	Corrected Antenna Gain(dBi)	Tx A Conducted Max Power (dBm)	Tx B Conducted Max Power (dBm)	Duty Cycle (dB)	Total EIRP (dBm)	Limit (dBm)	Margin (dB)
5250 MHz Worst Case Mode								
HE160, M0 to M11 1ss	2	-1	8.7	8.6	1.02	11.68	21	-9.32

Cobalt Radio

IW-ANT-H90-510-N

Mode	TX Path	Corrected Antenna Gain(dBi)	Tx A Conducted Max Power (dBm)	Tx B Conducted Max Power (dBm)	Duty Cycle (dB)	Total EIRP (dBm)	Limit (dBm)	Margin (dB)
5180 MHz Worst Case Mode								
HE20, M0 to M11 1ss	2	8	9.7	9.4	0.28	20.84	21	-0.16
5190 MHz Worst Case Mode								
HE40, M0 to M11 1ss	1	8	12.6	-	0.27	20.87	21	-0.13
5210 MHz Worst Case Mode								
HE80, M0 to M11 1ss	1	8	12.6	-	0.29	20.89	21	-0.11
5220 MHz Worst Case Mode								
HE20, M0 to M11 1ss	1	8	12.6	-	0.28	20.88	21	-0.12
5230 MHz Worst Case Mode								
Non HT40, 6 to 54 Mbps	1	8	12.7	-	0.17	20.77	21	-0.23
5240 MHz Worst Case Mode								
HE20, M0 to M11 1ss	2	8	9.8	9.3	0.28	20.85	21	-0.15

IW-ANT-DS9-516-N

Mode	TX Path	Corrected Antenna Gain(dBi)	Tx A Conducted Max Power (dBm)	Tx B Conducted Max Power (dBm)	Duty Cycle (dB)	Total EIRP (dBm)	Limit (dBm)	Margin (dB)
5180 MHz Worst Case Mode								
HE20, M0 to M11 1ss	2	5	9.7	9.4	0.28	17.84	21	-3.16
5190 MHz Worst Case Mode								
HE40, M0 to M11 1ss	1	5	12.6	-	0.27	17.87	21	-3.13
5210 MHz Worst Case Mode								
HE80, M0 to M11 1ss	1	5	12.6	-	0.29	17.89	21	-3.11
5220 MHz Worst Case Mode								
HE20, M0 to M11 1ss	1	5	12.6	-	0.28	17.88	21	-3.12
5230 MHz Worst Case Mode								
Non HT40, 6 to 54 Mbps	1	5	12.7	-	0.17	17.87	21	-3.13
5240 MHz Worst Case Mode								
HE20, M0 to M11 1ss	2	5	9.8	9.3	0.28	17.85	21	-3.15

IW-ANT-SS9-516-N

Mode	TX Path	Corrected Antenna Gain(dBi)	Tx A Conducted Max Power (dBm)	Tx B Conducted Max Power (dBm)	Duty Cycle (dB)	Total EIRP (dBm)	Limit (dBm)	Margin (dB)
5180 MHz Worst Case Mode								
Non HT20, 6 to 54 Mbps	2	-1	12.2	11.8	0.26	14.3	21	-6.7
5190 MHz Worst Case Mode								
HE40, M0 to M11 1ss	2	-1	9.8	9.4	0.27	11.9	21	-9.11
5210 MHz Worst Case Mode								
VHT80, M0 to M11 1ss	2	-1	10.1	9.4	0.33	12.1	21	-8.9
5220 MHz Worst Case Mode								
Non HT20, 6 to 54 Mbps	1	-1	17.5	-	0.26	16.8	21	-4.2
5230 MHz Worst Case Mode								
Non HT40, 6 to 54 Mbps	1	-1	17.8	-	0.17	17	21	-4.01
5240 MHz Worst Case Mode								
HE20, M0 to M11 1ss	1	-1	17.5	-	0.28	16.8	21	-4.19

Note: EIRP [dBm] = Conducted Output Power [dBm] + Antenna Gain [dBi].
*Note: Ant. A+B [dBm] = 10*log((10^(Ant. A [dBm]/10)) + (10^(Ant. B [dBm]/10)))*
Note: Pine radio supported by device only utilizes internal antenna and thus will not utilize the new external antennas.

7 Appendix A (Normative) – EUT External Photographs

Please refer to the attachment.

8 Appendix B (Normative) – EUT Internal Photographs

Please refer to the attachment.

9 Appendix C (Normative) – A2LA Electrical Testing Certificate

Accredited Laboratory

A2LA has accredited

BAY AREA COMPLIACE LABORATORIES CORP.

Sunnyvale, 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 laboratory also meets A2LA R222 - Specific Requirements EPA ENERGY STAR Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 21st day of December 2022.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2024

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

Please follow the web link below for a full ISO 17025 scope

https://www.a2la.org/scopepdf/3297-02.pdf

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