\Engineering Test Report No. 2104193-02		
Report Date	August 2, 2022	
Manufacturer Name	Astronics CSC	
Manufacturer Address	804 S Northpoint Blvd, Dock 26-29 Waukegan, IL 60087	
Product Name Model No.	Cabin Wireless Access Point CabinAXe 700-00016-000	
Date Received	May 31, 2022	
Test Dates	May 31 – June 24, 2022	
Specifications	FCC “Code of Federal Regulations” Title 47, Part 15, Subpart B FCC "Code of Federal Regulations" Title 47 Part 15, Subpart E, Section 15.407 Innovation, Science, and Economic Development Canada, RSS-GEN Innovation, Science, and Economic Development Canada, RSS-247	
Test Facility	Elite Electronic Engineering, Inc. 1516 Centre Circle, Downers Grove, IL 60515	FCC Reg. Number: 269750 IC Reg. Number: 2987A CAB Identifier: US0107
Signature	Tylar Jozefczyk	
Tested by	Tylar Jozefczyk	
Signature	Raymond J Klouda	
Approved by	Raymond J. Klouda, Registered Professional Engineer of Illinois – 44894	
PO Number	47106	

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1. Report Revision History

Revision	Date	Description
–	2 AUG 2022	Initial Release of Engineering Test Report No. 2104193-02

2. Introduction

2.1. Scope of Tests

This document presents the results of a series of RF emissions tests that were performed on the Astronics CSC Cabin Wireless Access Point Cabin Axe (hereinafter referred to as the Equipment Under Test (EUT)). The EUT was manufactured and submitted for testing by Astronics CSC located in Waukegan, IL.

2.2. Purpose

The test series was performed to determine if the Astronics CSC Cabin Wireless Access Point CabinAXe (FCC ID: 2AL4H-70000016) meets the Class II Permissive Change requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart E, §15.407.

The test series was also performed to determine if the Astronics CSC Cabin Wireless Access Point CabinAXe (ISED UPN: 22737-70000016) meets the Class II Permissive Change requirements of the Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen and RSS-247 for Transmitters. The following modifications have been made to the original equipment:

- The EUT housing has changed.

The EUT is equipped with the following pre-certified radio module:

- Aruba Networks IAP-635 (FCC ID Q9DAPIN0635, IC ID 4675A-APIN0635), operating in the 5GHz band.

Testing was performed in accordance with ANSI C63.10-2013.

2.3. Identification of the EUT

The EUT was identified as follows:

EUT Identification	
Product Description	Cabin Wireless Access Point CabinAXe
Model/Part No.	700-00016-000
Serial No.	000005
Size of EUT	9.5” x 9.0” x 2.85”
Software/Firmware Version	1.0.0BL1
Device Type	Digitally Modulated Transmission Device
Band of Operation	5150 – 5850MHz
Modulation Type	OFDM (802.11a/ac) OFDMA (802.11ax)
Antenna Type	Integrated downtilt omni-directional
Antenna Gain (dBi) [1]	7.0
Rated Output Power	0.0006W (-2.07dBm)
FCC ID & ISED UPN Number	FCC ID: 2AL4H-70000016 ISED UPN: 22737-70000016
Note 1 – Antenna gain is supplied by the manufacturer and Elite is not responsible for the accuracy of the antenna gain.	

The EUT listed above was used throughout the test series.

3. Power Input

The EUT obtained 120VAC 60Hz power via a 3 wire, 1 meter, unshielded power cord.

4. Grounding

The EUT was connected to ground through the third wire of its input power cord.

5. Support Equipment

The EUT was submitted for testing along with the following support equipment:

Description	Model #	S/N
Dell Laptop	7490	---
Serial Terminator - 9-Pin	E54-345	---

6. Interconnect Leads

The following interconnect cables were submitted with the test item:

Description	Model #	S/N
Mini USB Cable	B00NH11N5A	---
Ethernet Cable (5ft)	N201-005-WH	---
Micro USB to USB A cable	B0723M876	---
J1 (LAN1 UUT cable)	E54-331	---
USB to RJ45 Serial Rollover Cable	U209-006-RJ45-X	---

7. Modifications Made to the EUT

No modifications were made to the EUT during the testing.

8. Modes of Operation

The EUT and all peripheral equipment were energized. The unit was programmed to transmit in one of the following modes:

Mode	Description
802.11a 6Mbps	- 5180MHz, Power Setting = 16.5dBm - 5220MHz, Power Setting = 18dBm - 5240MHz, Power Setting = 18dBm - 5260MHz, Power Setting = 16dBm - 5300MHz, Power Setting = 16dBm - 5320MHz, Power Setting = 16dBm - 5500MHz, Power Setting = 16.5dBm - 5580MHz, Power Setting = 16dBm - 5700MHz, Power Setting = 16dBm - 5720MHz, Power Setting = 16dBm - 5745MHz, Power Setting = 18dBm - 5785MHz, Power Setting = 18dBm - 5825MHz, Power Setting = 18dBm
802.11ac-VHT20 MCS0	- 5180MHz, Power Setting = 16.5dBm - 5320MHz, Power Setting = 16.5dBm - 5500MHz, Power Setting = 16dBm
802.11ac-VHT40 MCS0	- 5190MHz, Power Setting = 14dBm - 5310MHz, Power Setting = 16.5dBm - 5510MHz, Power Setting = 16.5dBm
802.11ac-VHT80 MCS0	- 5210MHz, Power Setting = 13dBm - 529MHz, Power Setting = 17dBm - 5530MHz, Power Setting = 15.5dBm
802.11ax-HE20 MCS0	- 5180MHz, Power Setting = 16dBm - 5320MHz, Power Setting = 16.5dBm - 5500MHz, Power Setting = 16dBm
802.11ax-HE40 MCS0	- 5190MHz, Power Setting = 15dBm - 5310MHz, Power Setting = 15.5dBm - 5510MHz, Power Setting = 14dBm
802.11ax-HE80 MCS0	- 5290MHz, Power Setting = 16dBm - 5530MHz, Power Setting = 15dBm

9. Test Specifications

The tests were performed to selected portions of, and in accordance with, the test specifications.

- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter A, Part 15, Subpart C
- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter A, Part 15, Subpart E
- ANSI C63.10-2013, “American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”
- KDB 905462 D02 – “Federal Communications Commission Office of Engineering Technology Laboratory Division, Compliance Measurement Procedures for Unlicensed-National Information Infrastructure Devices Operating in the 5250-535MHz and 5470-5725MHz Bands Incorporating Dynamic Frequency Selection”
- RSS-Gen Issue 5, February 2020, Amendment 2, Innovation, Science, and Economic Development Canada, “General Requirements for Compliance of Radio Apparatus”
- RSS-247 Issue 2, February 2017, “Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices”

10. Test Plan

No test plan was provided. Instructions were provided by personnel from Astronics CSC and used in conjunction with the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart E, Section 15.407, Innovation, Science, and Economic Development Canada, RSS-247, KDB 905462, and ANSI C63.10-2013 specifications.

11. Deviation, Additions to, or Exclusions from Test Specifications

There were no deviations, additions to, or exclusions from the test specifications during this test series.

12. Laboratory Conditions

The ambient parameters of the laboratory during testing were as follows:

Ambient Parameters	Value
Temperature	24.4°C
Relative Humidity	31%
Atmospheric Pressure	1013.2mb

13. Summary

The following EMC tests were performed and the results are shown below:

Test Description	Requirements	Test Method	Result
Effective Isotropic Radiated Power (EIRP)	FCC 15.407 ISED RSS-247	ANSI C63.10:2013	Conforms
Case Spurious Radiated Emissions	FCC 15.407 ISED RSS-247	ANSI C63.10:2013	Conforms
Band-Edge Compliance	FCC 15.407 ISED RSS-247	ANSI C63.10:2013	Conforms
Dynamic Frequency Selection (DFS	FCC 15.407 ISED RSS-247	KDB 905462 D02	Conforms

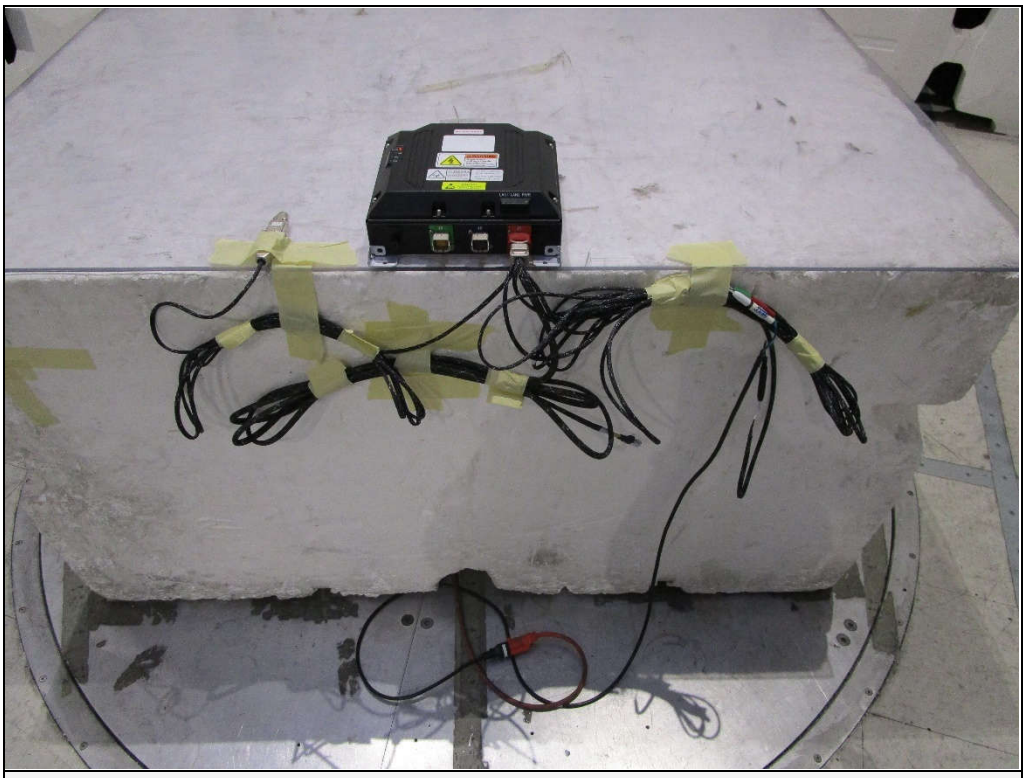
14. Statement of Conformity

The Astronics CSC Cabin Wireless Access Point CabinAXe (Model No. 700-00016-000, Serial No. 000005) did fully conform to the selected requirements of FCC "Code of Federal Regulations" Title 47 Part 15, Subpart E, Section 15.407 and Innovation, Science, and Economic Development Canada, RSS-247.

15. Certification

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart E, Section 15.407 and Innovation, Science, and Economic Development Canada, RSS-247 test specifications. The data presented in this test report pertains to the EUT on the test date specified. Any electrical or mechanical modifications made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

16. Photograph of EUT

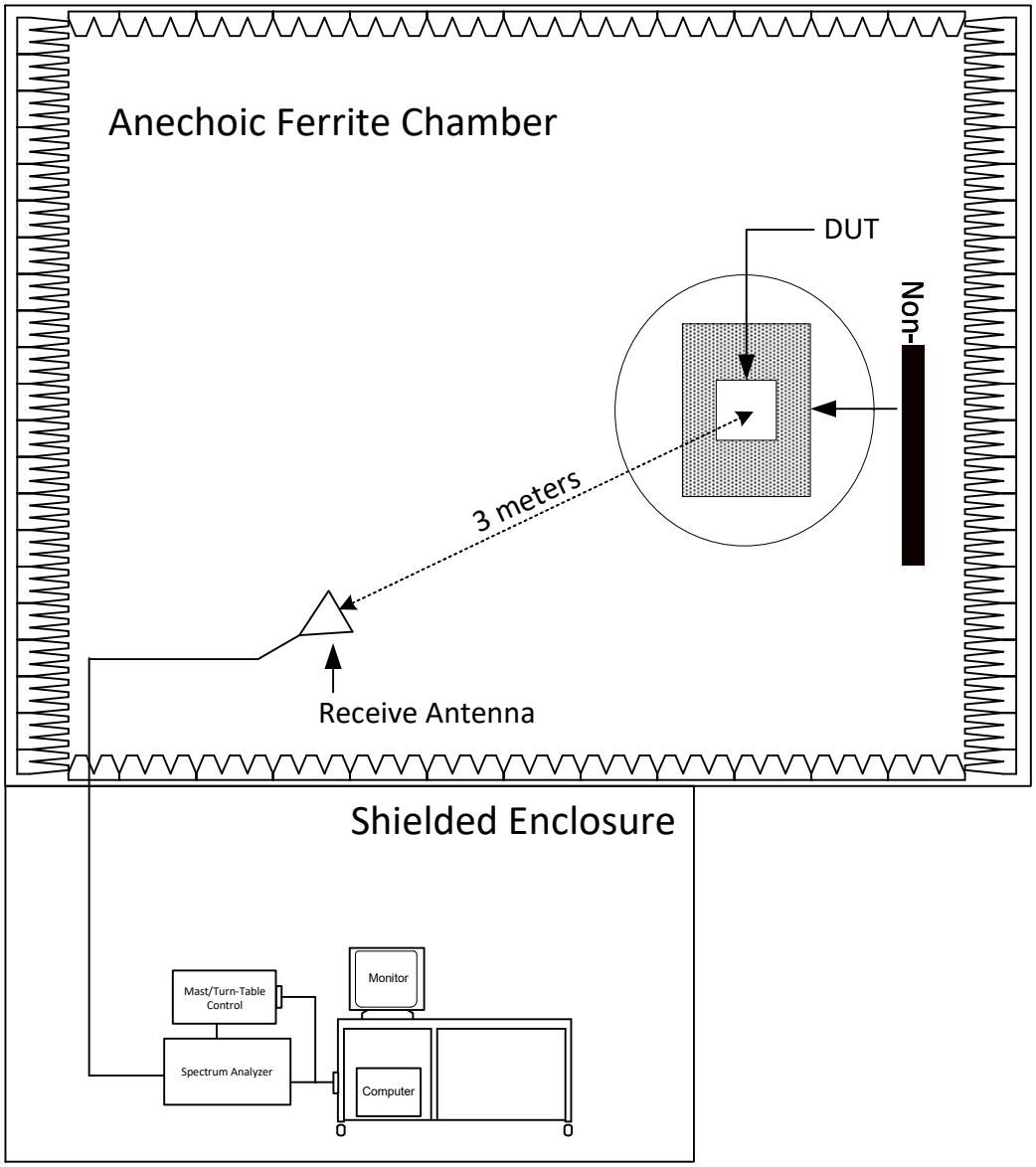


17. Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW14	PREAMPLIFIER	PLANAR	PE2-35-120-5R0-10-12-SFF	PL22671	1-20GHz	9/21/2021	9/21/2022
CDZ3	LAB WORKSTATION	ELITE	LWS-10		WINDOWS 10	CNR	
NWQ2	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66659	1GHZ-18GHZ	4/27/2022	4/27/2024
RBG2	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101591	2HZ-44GHZ	3/31/2022	3/31/2023
SES0	24VDC POWER SUPPLY	P-TRANS	FS-32024-1M	001	18-27VDC	NOTE 1	
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	
XPQ5	FILTER	K&L MICROWAVE	11SH10-9000/U2000-O/O	1	5000-5800 MHZ	9/7/2021	9/7/2023

N/A: Not Applicable I/O: Initial Only CNR: Calibration Not Required
NOTE 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

18. Block Diagram of Test Setup



Radiated Measurements Test Setup

19. Effective Isotropic Radiated Power (EIRP)

EUT Information	
Manufacturer	Astronics CSC
Product	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Measurement Method	Radiated
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	Room 29
Type of Antennas Used	Above 1GHz: Double-ridged waveguide (or equivalent)
Notes	

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1

Requirements
The output power shall not exceed 4W (36dBm).

Procedure
The EUT was placed on the non-conductive stand and set to transmit. A double ridged waveguide antenna was placed at a test distance of 3 meters from the EUT. The resolution bandwidth (RBW) of the spectrum analyzer was set to greater than the 6dB bandwidth. The EUT was maximized for worst case emissions (or maximum output power) at the measuring antenna. The maximum meter reading was recorded. The peak power output was measured for the low, middle, and high channels. The equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power, a dipole antenna (double ridged waveguide antenna for all measurements above 1GHz) was then set in place of the EUT and connected to a calibrated signal generator. The output of the signal generator was adjusted to match the received level at the spectrum analyzer. The signal level was recorded. The reading was then corrected to compensate for cable loss (and antenna gain for all measurements above 1GHz), as required. The peak power output was calculated for low, middle, and high hopping frequencies.

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Result	Max EIRP = 0.0006W (-2.07dBm)
Notes	802.11a only

Freq (MHz)	Ant Pol	Wide BW Meter Reading (dBµV)	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total (dBµV/m)	EIRP (dBm)	Limit (dBm)	Margin (dB)
5180.00	H	73.93	5.22	37.34	0.00	116.49	21.19	36.00	-14.81
	V	84.65	5.22	37.34	0.00	127.21	31.91	36.00	-4.09
5220.00	H	73.05	5.20	37.42	0.00	115.67	20.37	36.00	-15.63
	V	86.23	5.20	37.42	0.00	128.85	33.55	36.00	-2.45
5240.00	H	74.47	5.19	37.45	0.00	117.11	21.81	36.00	-14.19
	V	86.06	5.19	37.45	0.00	128.70	33.40	36.00	-2.60
5260.00	H	72.22	5.18	37.46	0.00	114.86	19.56	36.00	-16.44
	V	84.43	5.18	37.46	0.00	127.07	31.77	36.00	-4.23
5300.00	H	72.68	5.16	37.47	0.00	115.31	20.01	36.00	-15.99
	V	84.84	5.16	37.47	0.00	127.47	32.17	36.00	-3.83
5320.00	H	71.23	5.15	37.37	0.00	113.76	18.46	36.00	-17.54
	V	83.70	5.15	37.37	0.00	126.23	30.93	36.00	-5.07
5500.00	H	73.00	5.07	36.70	0.00	114.77	19.47	36.00	-16.53
	V	85.72	5.07	36.70	0.00	127.49	32.19	36.00	-3.81
5580.00	H	72.91	5.12	37.01	0.00	115.05	19.75	36.00	-16.25
	V	84.98	5.12	37.01	0.00	127.12	31.82	36.00	-4.18
5700.00	H	68.81	5.20	37.65	0.00	111.66	16.36	36.00	-19.64
	V	84.95	5.20	37.65	0.00	127.80	32.50	36.00	-3.50
5720.00	H	69.80	5.21	37.70	0.00	112.72	17.42	36.00	-18.58
	V	84.98	5.21	37.70	0.00	127.90	32.60	36.00	-3.40
5745.00	H	71.74	5.23	37.77	0.00	114.74	19.44	36.00	-16.56
	V	86.11	5.23	37.77	0.00	129.11	33.81	36.00	-2.19
5785.00	H	73.31	5.26	37.82	0.00	116.38	21.08	36.00	-14.92
	V	85.86	5.26	37.82	0.00	128.93	33.63	36.00	-2.37
5825.00	H	70.87	5.28	37.74	0.00	113.89	18.59	36.00	-17.41
	V	86.21	5.28	37.74	0.00	129.23	33.93	36.00	-2.07

20. Case Spurious Radiated Emissions

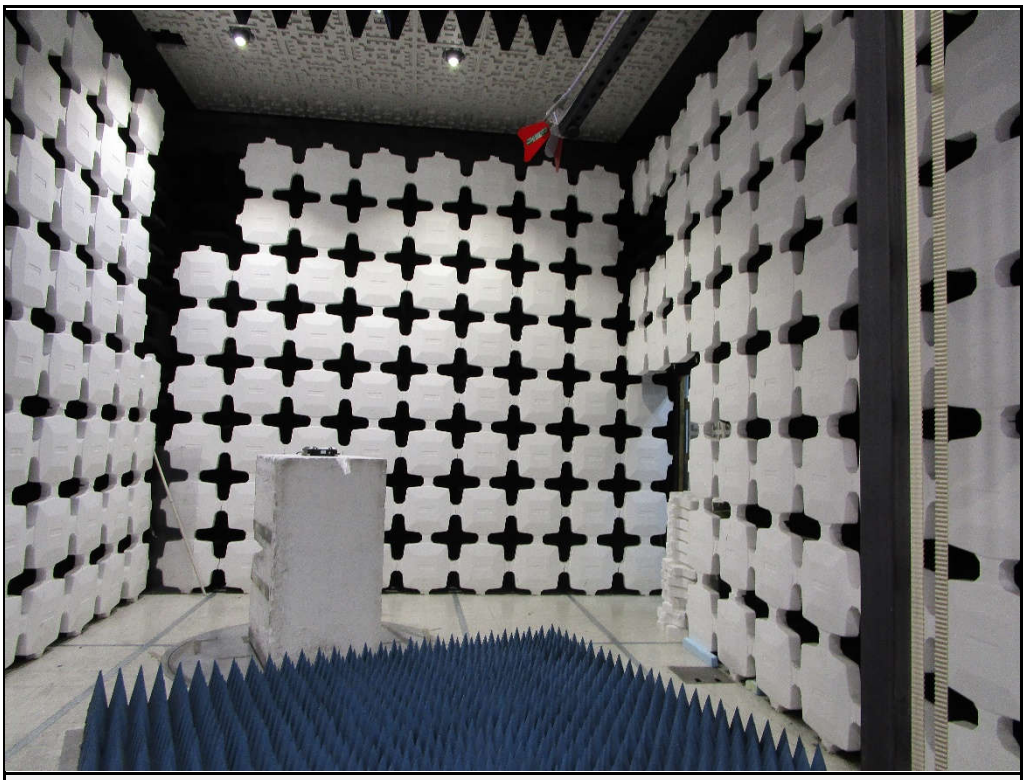
EUT Information	
Manufacturer	Astronics CSC
Product	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	Room 29
Type of Antennas Used	1 – 18GHz: Double-Ridged Waveguide (or equivalent)
Notes	Only 1 – 18GHz of 802.11a was investigated.

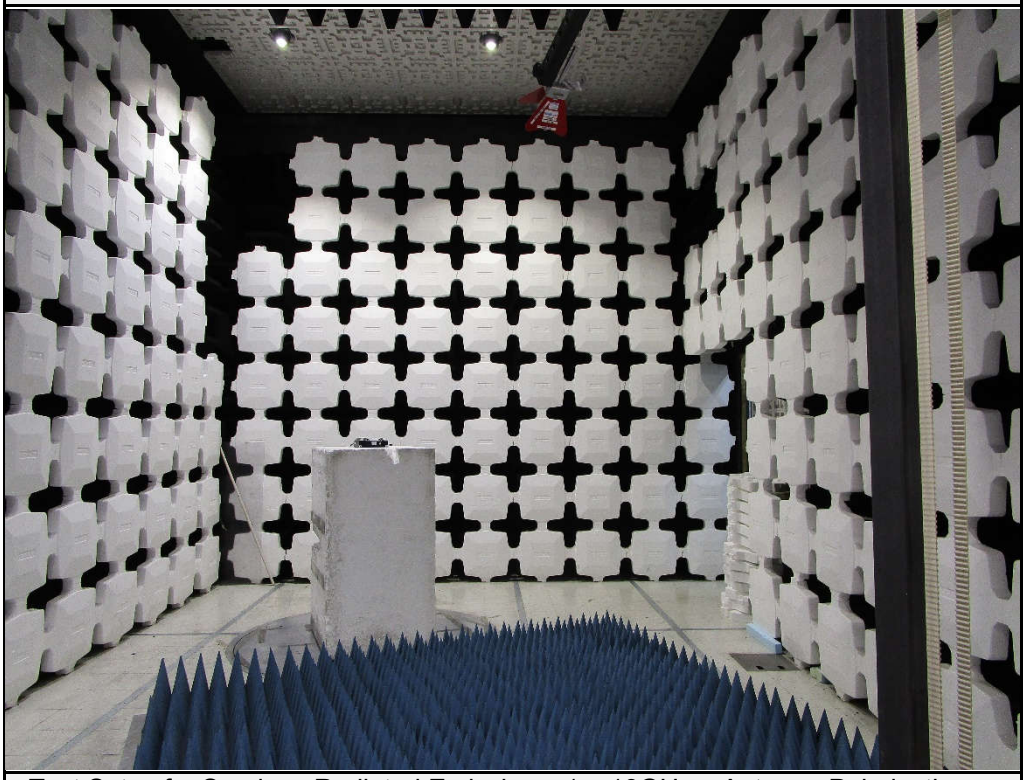
Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2

Procedure
Radiated measurements were performed in a 32ft. x 20ft. x 14ft. high shielded enclosure. The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads. Preliminary radiated emissions tests were performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 1 to 18GHz was investigated using a peak detector function. The final open field emission tests were then manually performed over the frequency range of 1 to 18GHz. 1) For all harmonics not in the restricted bands, the following procedure was used: a) The field strength of the fundamental was measured using a double ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer. b) The field strengths of all of the harmonics not in the restricted band were then measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer. c) To ensure that maximum or worst case emission levels at the fundamental and harmonics were measured, the following steps were taken when measuring the fundamental emissions and the spurious emissions: i) The EUT was rotated so that all of its sides were exposed to the receiving antenna. ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured. iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings. d) All harmonics not in the restricted bands must be at least 20dB below levels measured at the fundamental. However, attenuation below the general limits specified in §15.209(a) is not required. 2) For all emissions in the restricted bands, the following procedure was used: a) The field strengths of all emissions above 1GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1MHz was used on the spectrum analyzer. b) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements: i) The EUT was rotated so that all of its sides were exposed to the receiving antenna. ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured. iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings. c) For all radiated emissions measurements above 1GHz, the peak readings must comply with the §15.35(b) limits. §15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1GHz must be no greater than 20dB above the limits specified in §15.209(a).

d) Next, for all radiated emissions measurements above 1GHz, the resolution bandwidth was set to 1MHz. The analyzer was set to linear mode with a 10Hz video bandwidth in order to simulate an average detector. An average reading was taken.



Test Setup for Spurious Radiated Emissions, 1 – 18GHz – Antenna Polarization Horizontal



Test Setup for Spurious Radiated Emissions, 1 – 18GHz – Antenna Polarization Vertical

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5180MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
15540.00	H	46.89	Ambient	7.56	43.05	-38.29	59.22	913.67	5000.00	-14.76
	V	46.90	Ambient	7.56	43.05	-38.29	59.23	914.72	5000.00	-14.75

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
15540.00	H	32.59	Ambient	7.56	43.05	-38.29	0.00	44.92	176.11	500.00	-9.06
	V	32.56	Ambient	7.56	43.05	-38.29	0.00	44.89	175.51	500.00	-9.09

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5180MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5180.00	H	55.95		5.22	37.34	0.00	98.51	84198.43		
	V	66.16		5.22	37.34	0.00	108.72	272774.63		
10360.00	H	39.53		6.63	40.02	-39.07	47.11	226.66	27277.46	-41.61
	V	40.98		6.63	40.02	-39.07	48.56	267.84	27277.46	-40.16

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5220MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
15660.00	H	47.27	Ambient	7.51	43.17	-38.23	59.71	967.27	5000.00	-14.27
	V	46.96	Ambient	7.51	43.17	-38.23	59.40	933.35	5000.00	-14.58

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
15660.00	H	32.72	Ambient	7.51	43.17	-38.23	0.00	45.16	181.15	500.00	-8.82
	V	32.87	Ambient	7.51	43.17	-38.23	0.00	45.31	184.31	500.00	-8.67

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5220MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5220.00	H	55.17		5.20	37.42	0.00	97.79	77545.51		
	V	68.50		5.20	37.42	0.00	111.12	359796.26		
10440.00	H	39.81		6.64	40.10	-39.03	47.53	237.92	35979.63	-43.59
	V	41.37		6.64	40.10	-39.03	49.09	284.73	35979.63	-42.03

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5240MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
15720.00	H	47.46	Ambient	7.48	43.25	-38.20	59.99	998.87	5000.00	-13.99
	V	47.19	Ambient	7.48	43.25	-38.20	59.72	968.30	5000.00	-14.26

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
15720.00	H	32.57	Ambient	7.48	43.25	-38.20	0.00	45.10	179.89	500.00	-8.88
	V	32.56	Ambient	7.48	43.25	-38.20	0.00	45.09	179.68	500.00	-8.89

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5240MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5240.00	H	56.47		5.19	37.45	0.00	99.11	90228.55		
	V	67.65		5.19	37.45	0.00	110.29	326846.60		
10480.00	H	36.48	Ambient	6.64	40.14	-39.00	44.27	163.42	32684.66	-46.02
	V	39.85	Ambient	6.64	40.14	-39.00	47.64	240.89	32684.66	-42.65

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5260MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
15780.00	H	46.93	Ambient	7.45	43.35	-38.16	59.57	951.48	5000.00	-14.41
	V	47.35	Ambient	7.45	43.35	-38.16	59.99	998.62	5000.00	-13.99

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
15780.00	H	32.82	Ambient	7.45	43.35	-38.16	0.00	45.46	187.46	500.00	-8.52
	V	32.84	Ambient	7.45	43.35	-38.16	0.00	45.48	187.89	500.00	-8.50

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5260MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5260.00	H	53.13		5.18	37.46	0.00	95.77	61458.68		
	V	66.11		5.18	37.46	0.00	108.75	273894.44		
10520.00	H	39.17		6.65	40.17	-38.98	47.02	224.31	27389.44	-41.73
	V	42.52		6.65	40.17	-38.98	50.37	329.87	27389.44	-38.38

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5300MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
10600.00	H	45.90	Ambient	6.66	40.22	-38.95	53.83	491.37	5000.00	-20.15
	V	46.27	Ambient	6.66	40.22	-38.95	54.20	512.75	5000.00	-19.78
15900.00	H	47.00	Ambient	7.61	43.50	-38.09	60.02	1002.75	5000.00	-13.96
	V	46.78	Ambient	7.61	43.50	-38.09	59.80	977.67	5000.00	-14.18

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
10600.00	H	34.25	Ambient	6.66	40.22	-38.95	0.00	42.18	128.50	500.00	-11.80
	V	34.21	Ambient	6.66	40.22	-38.95	0.00	42.14	127.91	500.00	-11.84
15900.00	H	32.54	Ambient	7.61	43.50	-38.09	0.00	45.56	189.75	500.00	-8.42
	V	32.40	Ambient	7.61	43.50	-38.09	0.00	45.42	186.72	500.00	-8.56

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5300MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5300.00	H	54.02		5.16	37.47	0.00	96.65	67994.37		
	V	66.58		5.16	37.47	0.00	109.21	288717.39		

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5320MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
10640.00	H	48.17		6.66	40.23	-38.96	56.10	638.10	5000.00	-17.88
	V	48.81		6.66	40.23	-38.96	56.74	686.90	5000.00	-17.24
15960.00	H	46.65	Ambient	8.88	43.54	-38.05	61.01	1123.25	5000.00	-12.97
	V	46.74	Ambient	8.88	43.54	-38.05	61.10	1134.95	5000.00	-12.88

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
10640.00	H	36.39		6.66	40.23	-38.96	0.00	44.32	164.40	500.00	-9.66
	V	37.58		6.66	40.23	-38.96	0.00	45.51	188.53	500.00	-8.47
15960.00	H	33.00	Ambient	8.88	43.54	-38.05	0.00	47.36	233.33	500.00	-6.62
	V	33.06	Ambient	8.88	43.54	-38.05	0.00	47.42	234.95	500.00	-6.56

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5320MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5320.00	H	53.08		5.15	37.37	0.00	95.61	60293.75		
	V	64.94		5.15	37.37	0.00	107.47	236195.86		

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5500MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
11000.00	H	47.86		6.60	40.58	-39.03	56.01	631.33	5000.00	-17.97
	V	49.14		6.60	40.58	-39.03	57.29	731.58	5000.00	-16.69

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
11000.00	H	36.06		6.60	40.58	-39.03	0.00	44.21	162.28	500.00	-9.77
	V	39.14		6.60	40.58	-39.03	0.00	47.29	231.34	500.00	-6.69

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5500MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5500.00	H	55.32		5.07	36.70	0.00	97.09	71536.09		
	V	67.75		5.07	36.70	0.00	109.52	299243.85		
16500.00	H	36.99	Ambient	7.66	44.12	-37.52	51.25	365.35	29924.38	-38.27
	V	36.81	Ambient	7.66	44.12	-37.52	51.07	357.85	29924.38	-38.45

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5580MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
11160.00	H	48.81		6.48	40.55	-39.05	56.78	690.53	5000.00	-17.20
	V	49.66		6.48	40.55	-39.05	57.63	761.53	5000.00	-16.35

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
11160.00	H	36.29		6.48	40.55	-39.05	0.00	44.26	163.37	500.00	-9.72
	V	39.26		6.48	40.55	-39.05	0.00	47.23	229.98	500.00	-6.75

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5580MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5580.00	H	54.56		5.12	37.01	0.00	96.70	68361.17		
	V	66.34		5.12	37.01	0.00	108.48	265344.12		
16740.00	H	36.49	Ambient	7.67	44.67	-37.40	51.43	372.89	26534.41	-37.04
	V	36.46	Ambient	7.67	44.67	-37.40	51.40	371.61	26534.41	-37.07

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5700MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
11400.00	H	47.31		6.75	40.58	-38.90	55.74	612.17	5000.00	-18.24
	V	49.15		6.75	40.58	-38.90	57.58	756.61	5000.00	-16.40

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
11400.00	H	35.73		6.75	40.58	-38.90	0.00	44.16	161.39	500.00	-9.82
	V	36.52		6.75	40.58	-38.90	0.00	44.95	176.75	500.00	-9.03

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5700MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5700.00	H	50.07		5.20	37.65	0.00	92.92	44274.98		
	V	66.75		5.20	37.65	0.00	109.60	302105.30		
17100.00	H	37.17	Ambient	7.63	44.44	-37.37	51.86	391.95	30210.53	-37.74
	V	37.75	Ambient	7.63	44.44	-37.37	52.44	419.02	30210.53	-37.16

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5720MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
11440.00	H	48.27		6.79	40.63	-38.92	56.77	689.71	5000.00	-17.21
	V	49.52		6.79	40.63	-38.92	58.02	796.46	5000.00	-15.96

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
11440.00	H	34.05		6.79	40.63	-38.92	0.00	42.55	134.17	500.00	-11.43
	V	36.25		6.79	40.63	-38.92	0.00	44.75	172.85	500.00	-9.23

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5720MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5720.00	H	51.42		5.21	37.70	0.00	94.34	52097.96		
	V	66.85		5.21	37.70	0.00	109.77	307836.91		
17160.00	H	36.45	Ambient	7.57	44.29	-37.37	50.94	352.29	30783.69	-38.83
	V	36.08	Ambient	7.57	44.29	-37.37	50.57	337.59	30783.69	-39.20

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5745MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
11490.00	H	48.10		6.84	40.70	-38.95	56.69	683.27	5000.00	-17.29
	V	50.22		6.84	40.70	-38.95	58.81	872.15	5000.00	-15.17

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
11490.00	H	34.64		6.84	40.70	-38.95	0.00	43.23	145.07	500.00	-10.75
	V	39.19		6.84	40.70	-38.95	0.00	47.78	244.96	500.00	-6.20

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5745MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5745.00	H	54.51		5.23	37.77	0.00	97.51	75034.01		
	V	69.49		5.23	37.77	0.00	112.49	420976.77		
17235.00	H	36.93	Ambient	7.52	44.13	-37.38	51.20	363.14	42097.68	-41.28
	V	36.50	Ambient	7.52	44.13	-37.38	50.77	345.60	42097.68	-41.71

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5785MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
11570.00	H	48.55		6.93	40.85	-38.99	57.34	735.98	5000.00	-16.64
	V	51.35		6.93	40.85	-38.99	60.14	1015.94	5000.00	-13.84

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
11570.00	H	34.71		6.93	40.85	-38.99	0.00	43.50	149.58	500.00	-10.48
	V	38.82		6.93	40.85	-38.99	0.00	47.61	240.09	500.00	-6.37

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5785MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5785.00	H	56.44		5.26	37.82	0.00	99.51	94530.29		
	V	69.45		5.26	37.82	0.00	112.52	422737.72		
17355.00	H	35.87	Ambient	7.64	43.89	-37.42	49.98	315.44	42273.77	-42.54
	V	36.26	Ambient	7.64	43.89	-37.42	50.37	329.93	42273.77	-42.15

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5825MHz
Notes	Peak and Average Measurements in the Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
11650.00	H	49.06		6.92	40.99	-39.04	57.93	787.84	5000.00	-16.05
	V	53.82		6.92	40.99	-39.04	62.69	1362.81	5000.00	-11.29

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
11650.00	H	34.01		6.92	40.99	-39.04	0.00	42.88	139.30	500.00	-11.10
	V	41.77		6.92	40.99	-39.04	0.00	50.64	340.36	500.00	-3.34

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	5825MHz
Notes	Peak Measurements in Non-Restricted Bands

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5825.00	H	54.07		5.28	37.74	0.00	97.09	71527.47		
	V	70.22		5.28	37.74	0.00	113.24	459169.35		
17475.00	H	39.48		7.58	43.60	-37.48	53.18	456.17	45916.93	-40.06
	V	45.81		7.58	43.60	-37.48	59.51	945.43	45916.93	-33.73

21. Band-Edge Compliance

EUT Information	
Manufacturer	Astronics CSC
Product	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Measurement Method	Radiated
Type of Test Site	Semi-Anechoic Chamber
Type of Antennas Used	Above 1GHz: Double-Ridged Waveguide (or equivalent)
Notes	None

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1

Procedure

1) Low Band Edge:
   a) The EUT was setup inside the test chamber on a non-conductive stand and a broadband measuring antenna was placed at a test distance of 3 meters from the EUT.
   b) The EUT was set to transmit continuously at the channel closest to the low band-edge.
   c) The EUT was maximized for worst case emissions at the measuring antenna and the maximum meter reading was recorded.
   d) To determine the band edge compliance, the following spectrum analyzer settings were used:
      - Center Frequency = Low band-edge frequency
      - Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
      - Resolution Bandwidth (RBW) = ≥ 1% of the span.
      - ‘Max-Hold' function was engaged.
   e) The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.
   f) The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the left of the center frequency (band-edge) must be below the display line.)
   g) The analyzer's display was then screenshot and saved.
2) High Band Edge:

a) The EUT was setup inside the test chamber on a non-conductive stand and a broadband measuring antenna was placed at a test distance of 3 meters from the EUT.

b) The EUT was set to transmit continuously at the channel closest to the high band-edge.

c) The EUT was maximized for worst case emissions at the measuring antenna and the maximum meter reading was recorded.

d) To determine the band edge compliance, the following spectrum analyzer settings were used:

- Center Frequency = High band-edge frequency
- Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
- Resolution Bandwidth (RBW) = ≥ 1% of the span.
- ‘Max-Hold' function was engaged.

e) The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.

f) The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the left of the center frequency (band-edge) must be below the display line.)

g) The analyzer's display was then screenshot and saved.

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11a – 5180MHz
Notes	Low Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5150.00	H	22.49		5.23	37.25	0.00	64.97	1772.53	5000.00	-9.01
	V	25.52		5.23	37.25	0.00	68.00	2512.42	5000.00	-5.98

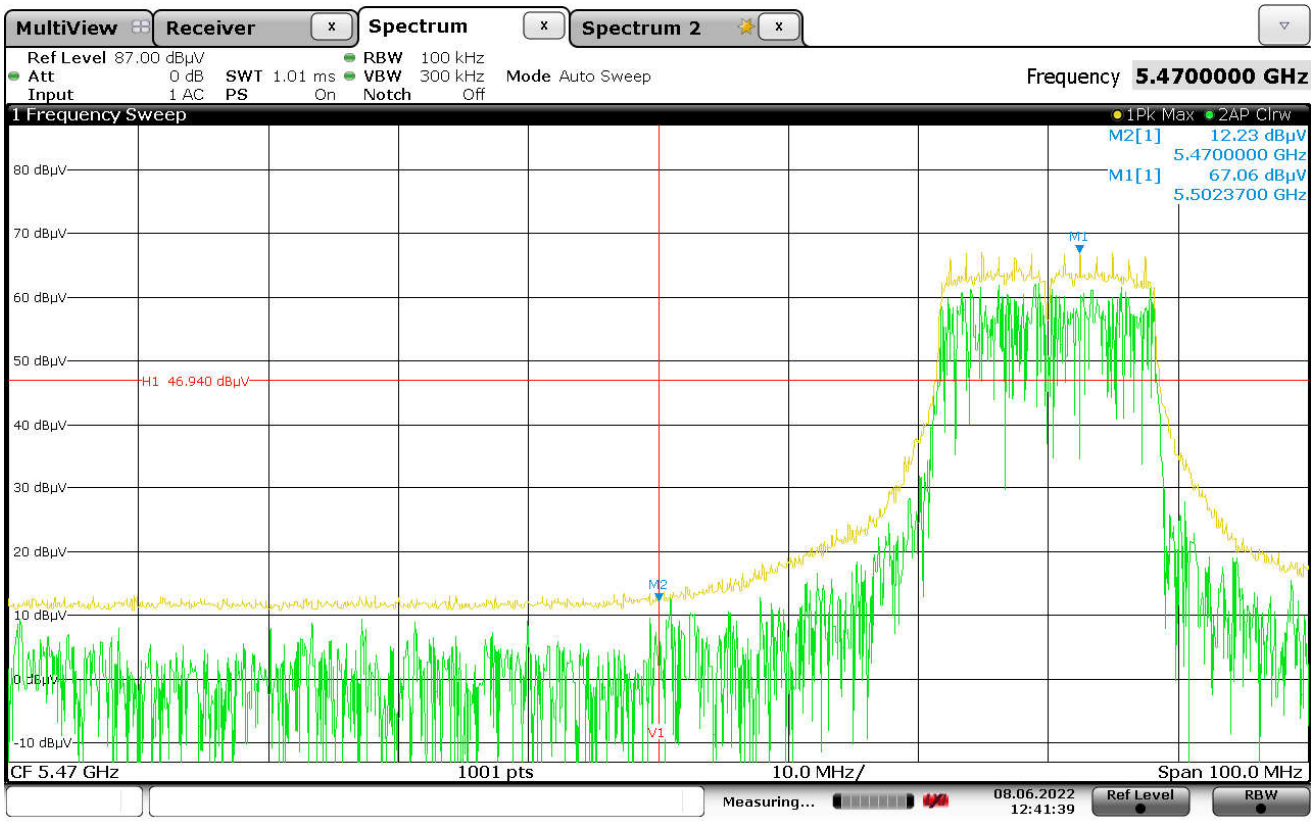
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5150.00	H	10.13		5.23	37.25	0.00	0.00	52.61	427.16	500.00	-1.37
	V	10.61		5.23	37.25	0.00	0.00	53.09	451.43	500.00	-0.89

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11a – 5320MHz
Notes	High Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5350.00	H	25.91		5.14	37.23	0.00	68.28	2594.23	5000.00	-5.70
	V	25.01		5.14	37.23	0.00	67.38	2338.88	5000.00	-6.60

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5350.00	H	10.23		5.14	37.23	0.00	0.00	52.60	426.59	500.00	-1.38
	V	10.46		5.14	37.23	0.00	0.00	52.83	438.03	500.00	-1.15

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11a – 5500MHz
Notes	Low Band Edge



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Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ac-VHT20 – 5190MHz
Notes	Low Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5150.00	H	26.06		5.23	37.25	0.00	68.54	2673.58	5000.00	-5.44
	V	29.35		5.23	37.25	0.00	71.83	3904.74	5000.00	-2.15

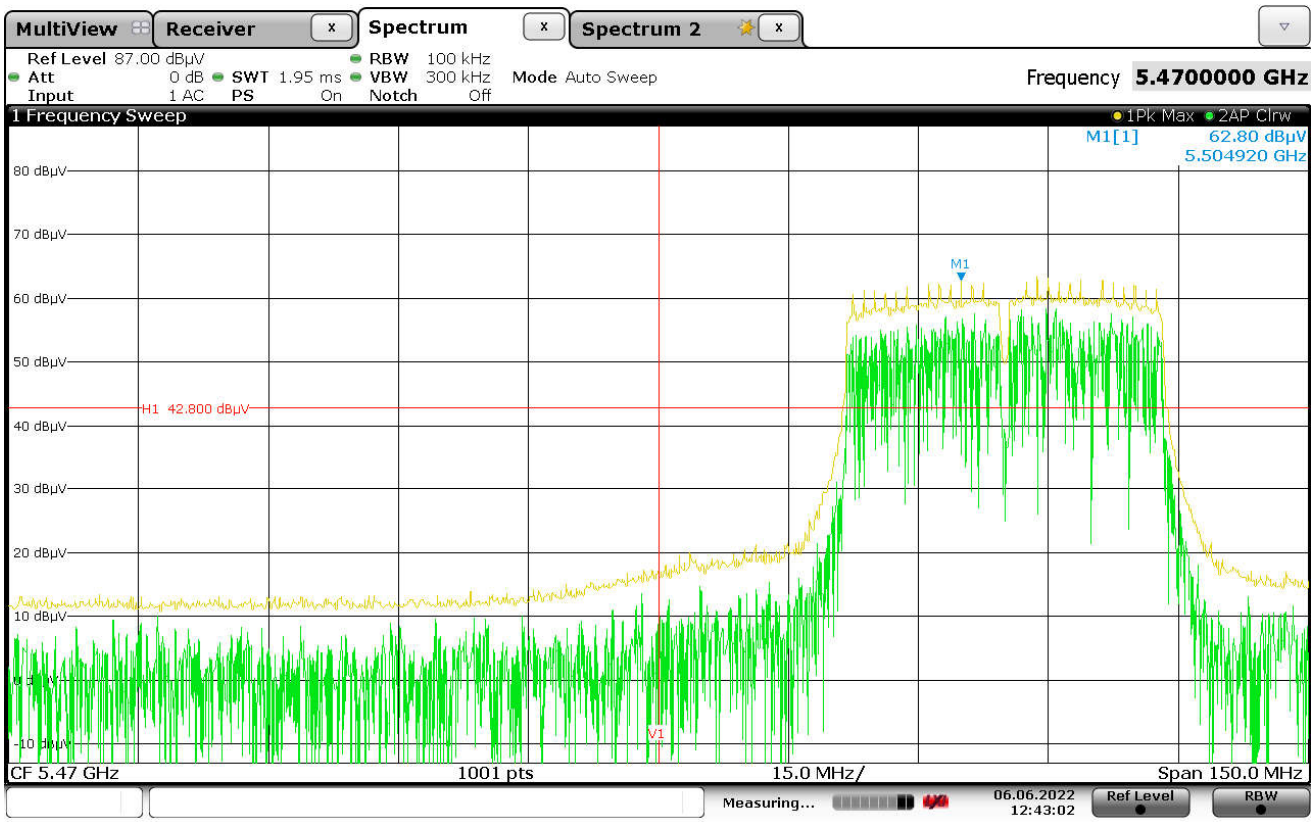
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5150.00	H	9.88		5.23	37.25	0.00	0.00	52.36	415.04	500.00	-1.62
	V	11.11		5.23	37.25	0.00	0.00	53.59	478.18	500.00	-0.39

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ac-VHT20 – 5320MHz
Notes	High Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5350.00	H	23.70		5.14	37.23	0.00	66.07	2011.44	5000.00	-7.91
	V	27.28		5.14	37.23	0.00	69.65	3037.44	5000.00	-4.33

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5350.00	H	9.56		5.14	37.23	0.00	0.00	51.93	394.92	500.00	-2.05
	V	10.24		5.14	37.23	0.00	0.00	52.61	427.08	500.00	-1.37

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ac-VHT20 – 5500MHz
Notes	Low Band Edge



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Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ac-VHT40 – 5210MHz
Notes	Low Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5150.00	H	25.01		5.23	37.25	0.00	67.49	2369.15	5000.00	-6.49
	V	26.86		5.23	37.25	0.00	69.34	2931.52	5000.00	-4.64

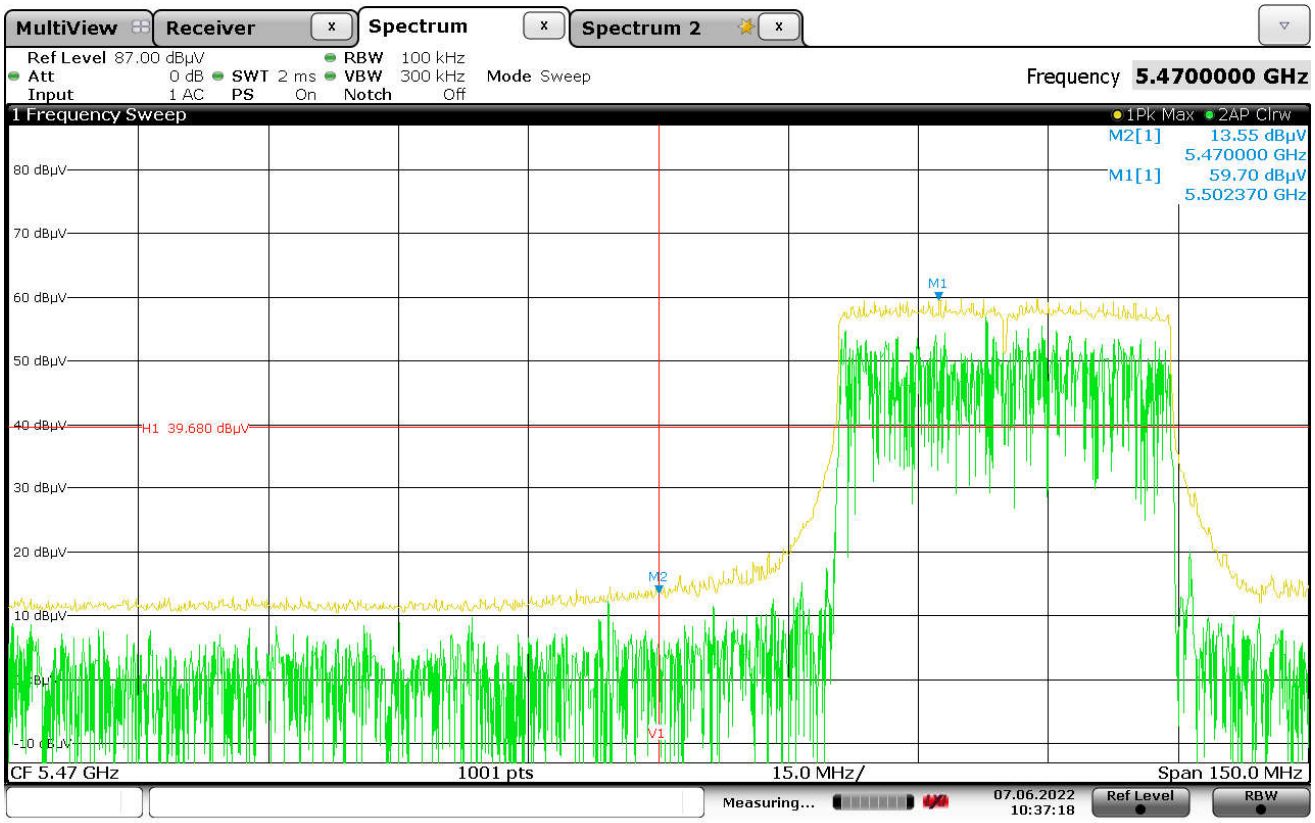
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5150.00	H	10.45		5.23	37.25	0.00	0.00	52.93	443.19	500.00	-1.05
	V	11.11		5.23	37.25	0.00	0.00	53.59	478.18	500.00	-0.39

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ac-VHT40 – 5310MHz
Notes	High Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5350.00	H	25.50		5.14	37.23	0.00	67.87	2474.62	5000.00	-6.11
	V	24.93		5.14	37.23	0.00	67.30	2317.44	5000.00	-6.68

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5350.00	H	9.65		5.14	37.23	0.00	0.00	52.02	399.03	500.00	-1.96
	V	10.59		5.14	37.23	0.00	0.00	52.96	444.64	500.00	-1.02

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ac-VHT40 – 5510MHz
Notes	Low Band Edge



Date: 7.JUN.2022 10:37:19

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ac-VHT80 – 5210MHz
Notes	High Band Edge – Plot Low Band Edge – Peak and Average Measurements

Date: 6.JUN.2022 14:21:39

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5150.00	H	23.31		5.23	37.25	0.00	65.79	1948.02	5000.00	-8.19
	V	26.72		5.23	37.25	0.00	69.20	2884.65	5000.00	-4.78

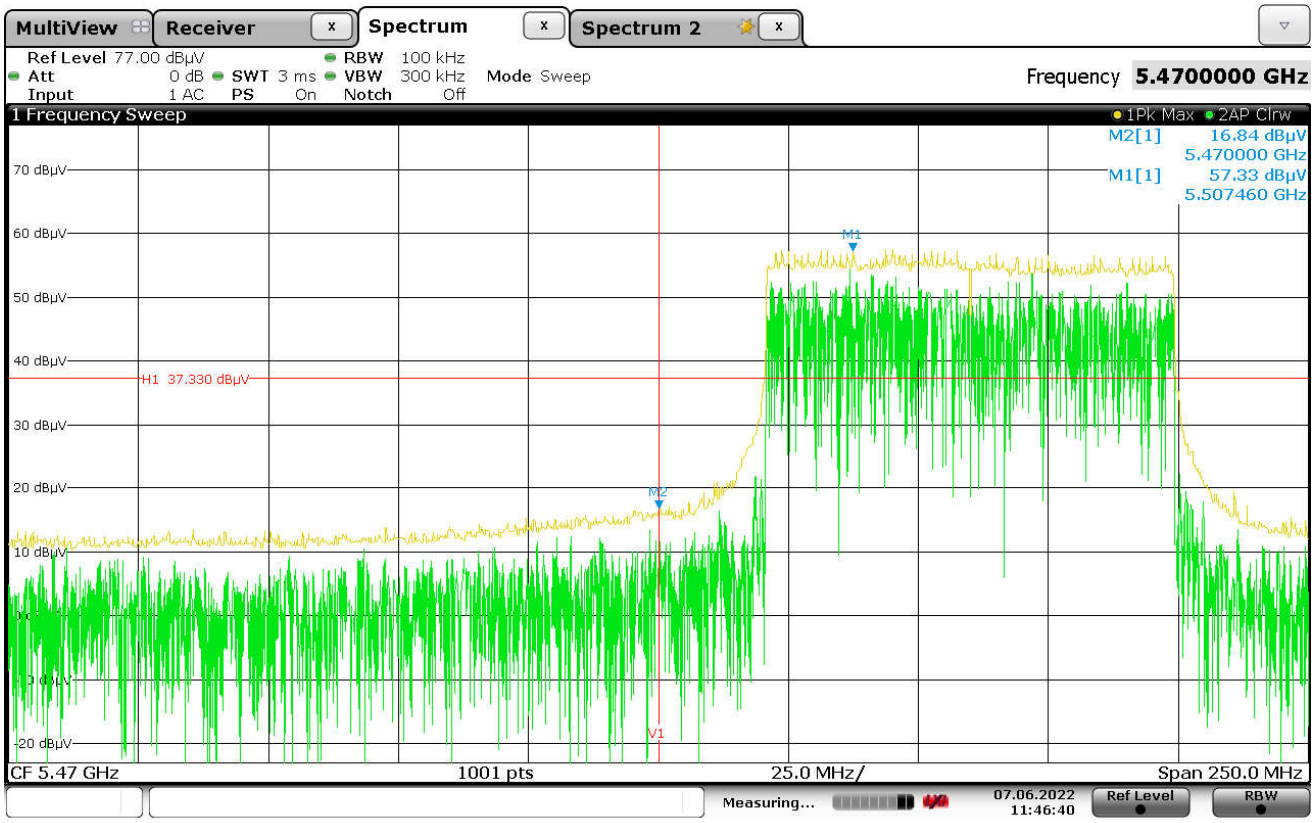
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5150.00	H	9.94		5.23	37.25	0.00	0.00	52.42	417.92	500.00	-1.56
	V	11.06		5.23	37.25	0.00	0.00	53.54	475.44	500.00	-0.44

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ac-VHT80 – 5290MHz
Notes	High Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5350.00	H	23.77		5.14	37.23	0.00	66.14	2027.72	5000.00	-7.84
	V	30.24		5.14	37.23	0.00	72.61	4270.79	5000.00	-1.37

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5350.00	H	9.47		5.14	37.23	0.00	0.00	51.84	390.85	500.00	-2.14
	V	11.42		5.14	37.23	0.00	0.00	53.79	489.22	500.00	-0.19

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ac-VHT80 – 5530MHz
Notes	Low Band Edge



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Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ax-HE20 – 5180MHz
Notes	Low Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5150.00	H	25.42		5.23	37.25	0.00	67.90	2483.66	5000.00	-6.08
	V	25.83		5.23	37.25	0.00	68.31	2603.71	5000.00	-5.67

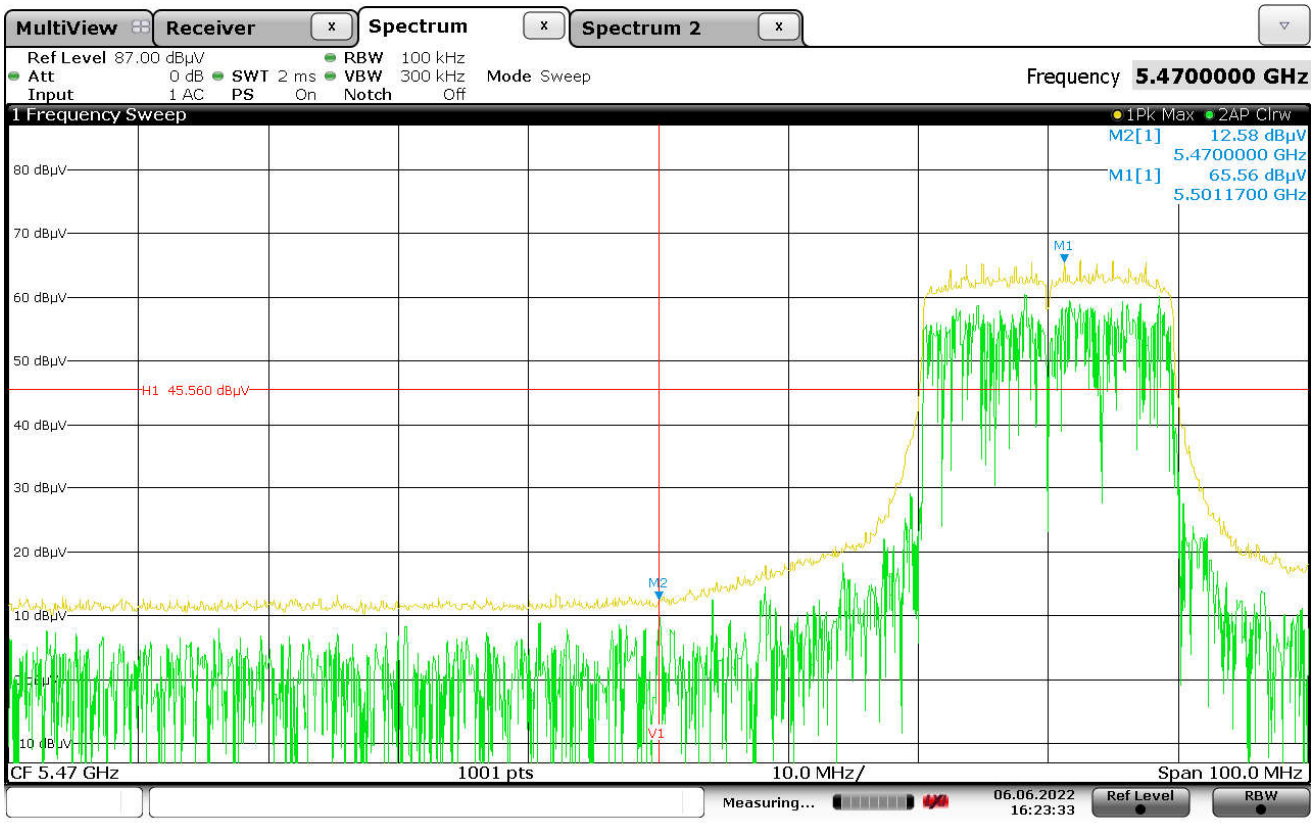
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5150.00	H	9.84		5.23	37.25	0.00	0.00	52.32	413.14	500.00	-1.66
	V	10.30		5.23	37.25	0.00	0.00	52.78	435.60	500.00	-1.20

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ax-HE20 – 5320MHz
Notes	High Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5350.00	H	25.36		5.14	37.23	0.00	67.73	2435.05	5000.00	-6.25
	V	25.09		5.14	37.23	0.00	67.46	2360.52	5000.00	-6.52

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5350.00	H	9.24		5.14	37.23	0.00	0.00	51.61	380.63	500.00	-2.37
	V	9.62		5.14	37.23	0.00	0.00	51.99	397.66	500.00	-1.99

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ax-HE20 – 5500MHz
Notes	Low Band Edge



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Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ax-HE40 – 5190MHz
Notes	Low Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5150.00	H	26.93		5.23	37.25	0.00	69.41	2955.24	5000.00	-4.57
	V	27.58		5.23	37.25	0.00	70.06	3184.88	5000.00	-3.92

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5150.00	H	9.96		5.23	37.25	0.00	0.00	52.44	418.88	500.00	-1.54
	V	11.42		5.23	37.25	0.00	0.00	53.90	495.56	500.00	-0.08

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ax-HE40 – 5310MHz
Notes	High Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5350.00	H	24.91		5.14	37.23	0.00	67.28	2312.11	5000.00	-6.70
	V	26.31		5.14	37.23	0.00	68.68	2716.49	5000.00	-5.30

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5350.00	H	9.28		5.14	37.23	0.00	0.00	51.65	382.39	500.00	-2.33
	V	10.13		5.14	37.23	0.00	0.00	52.50	421.70	500.00	-1.48

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ax-HE40 – 5510MHz
Notes	Low Band Edge

Date: 7.JUN.2022 10:37:19

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ax-HE80 – 5290MHz
Notes	Low Band Edge

Date: 7.JUN.2022 11:08:18

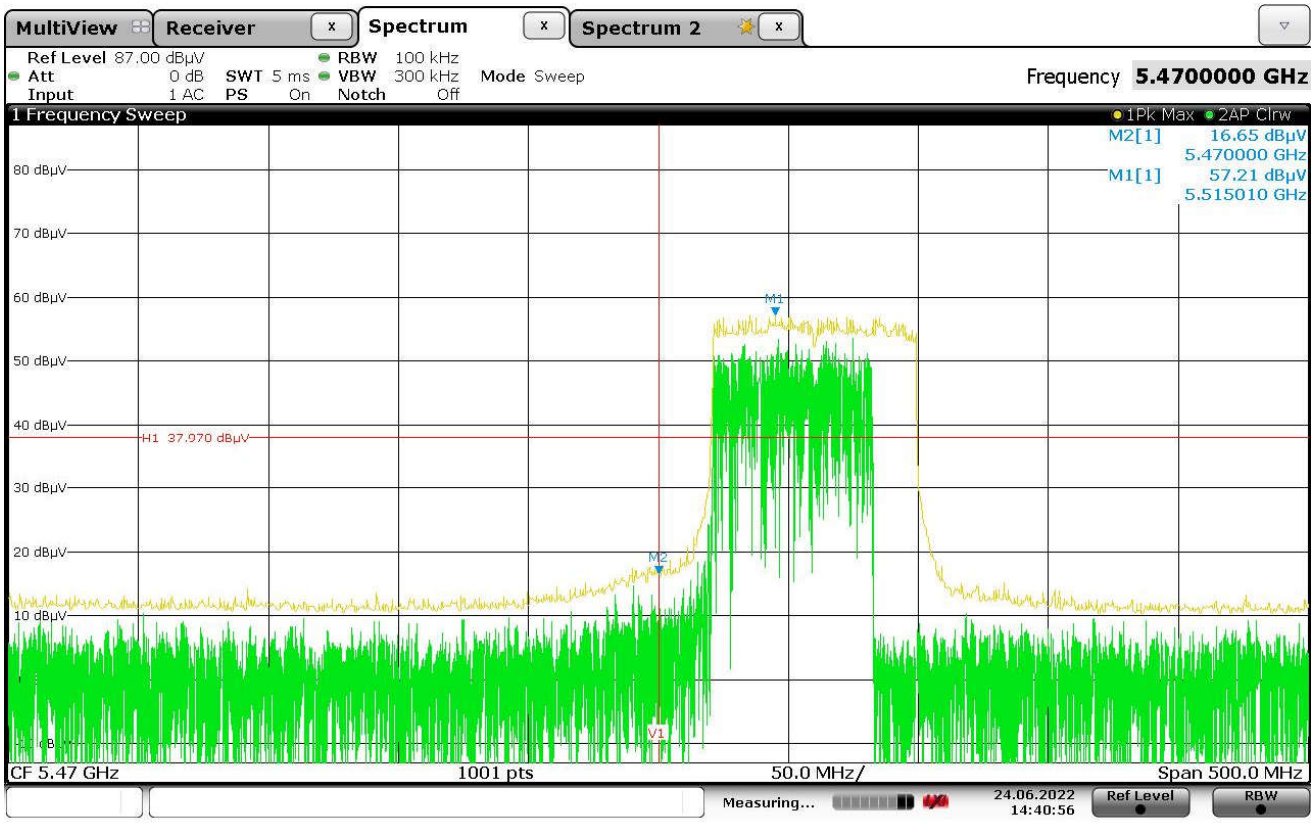
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5250.00	V	34.05	0.00	5.18	37.46	0.00	76.69	6834.97	12179.38	-5.02

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ax-HE80 – 5290MHz
Notes	High Band Edge – Peak and Average Measurements

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
5350.00	H	22.01		5.14	37.23	0.00	64.38	1655.80	5000.00	-9.60
	V	31.39		5.14	37.23	0.00	73.76	4875.37	5000.00	-0.22

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
5350.00	H	9.48		5.14	37.23	0.00	0.00	51.85	391.30	500.00	-2.13
	V	11.32		5.14	37.23	0.00	0.00	53.69	483.62	500.00	-0.29

Test Details	
Manufacturer	Astronics CSC
EUT	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi
Frequency Tested	802.11ax-HE80 – 5530MHz
Notes	Low Band Edge



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22. Dynamic Frequency Selection (DFS)

EUT Information	
Manufacturer	Astronics CSC
Product	Cabin Wireless Access Point CabinAXe
Model No.	700-00016-000
Serial No.	000005
Mode	Wi-Fi

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Measurement Method	Antenna Conducted
Type of Test Site	Elite Test Bench
Notes	N/A

Requirements
UNII Detection Bandwidth The minimum U-NII detection bandwidth in which it detects 100% of the radar waveforms shall be at least as wide as the 99% transmission power bandwidth.
Initial Channel Availability Check Time A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it must move to a new channel. The U-NII device may start using the channel if no radar is detected within 60 seconds.
Radar Burst at the Beginning of the Channel Availability Check Time At the beginning of the Channel Availability Check (CAC) Time, when a radar burst is detected on the test channel, the EUT must avoid operating on that channel.
Radar Burst at the End of the Channel Availability Check Time At the end of the Channel Availability Check (CAC) Time, when a radar burst is detected on the test channel, the EUT must avoid operating on that channel.
In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time, and Non-Occupancy Period After a radar pulse is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel. A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

Procedures
UNII Detection Bandwidth 1) The vector signal generator was set up to produce the short pulse radar Type 0 at the appropriate power level. The EUT was set up as a stand-alone device. 2) The frequency of the vector signal generator was set to the center frequency of the EUT. A single short radar pulse was generated and the response of the EUT was noted. This was repeated for a minimum of 10 times. 3) The center frequency of the vector signal generator was increased in 5MHz steps, and the single short radar pulse was generated 10 times until the detection rate of the EUT fell below 90%. The sequence was repeated in 1MHz steps at frequencies 5MHz below where the detection rate began to fail. 4) The highest frequency (FH) at which detection was greater than 90% was recorded. 5) Starting at the center frequency of the EUT, the center frequency of the vector signal generator was decreased in 5MHz steps, and the single short radar pulse was generated 10 times until the detection rate of the EUT fell below 90%. The sequence was repeated in 1MHz steps at frequencies 5MHz above where the detection rate began to fail. 6) The lowest frequency (FL) at which detection was greater than 90% was recorded 7) The U-NII detection bandwidth was then calculated as: $$\mathrm{U-NII\ Detection\ Bandwidth = FH - FL}$$
Initial Channel Availability Check Time 1) The EUT was powered on and instructed to operate on the appropriate channel that incorporates DFS functions. 2) At the same time the EUT was powered on, the spectrum analyzer was set to zero span mode with a 3MHz RBW and 3MHz VBW on the channel occupied by the radar with a 2.5-minute sweep time. 3) The spectrum analyzer's sweep was started at the same time power was applied to the EUT.
Radar Burst at the Beginning of the Channel Availability Check Time 1) The EUT was powered on at time T_0. T_1 was the instant when the EUT had completed its power-up sequence. 2) The Channel Availability Check (CAC) Time began at time T_1 and ended at time T_1 + 60 seconds. 3) A single burst of one of the Short Pulse Radar Types 0 – 4 began within a 6 second window starting at T_1. An additional 1dB was added to the radar test signal to ensure it was at or above the DFS detection threshold. 4) Visual indication on the EUT of successful detection of the radar burst was recorded. Observation of the EUT emissions continued for 2.5 minutes after the radar burst had been generated.
Radar Burst at the End of the Channel Availability Check Time 1) The EUT was powered on at time T_0. T_1 was the instant when the EUT had completed its power-up sequence. 2) The Channel Availability Check (CAC) Time began at time T_1 and ended at time T_1 + 60 seconds. 3) A single burst of one of the Short Pulse Radar Types 0 – 4 began within a 6 second window starting at T_1 + 54 seconds. An additional 1dB was added to the radar test signal to ensure it was at or above the DFS detection threshold. 4) Visual indication on the EUT of successful detection of the radar burst was recorded. Observation of the EUT emissions continued for 2.5 minutes after the radar burst had been generated.

In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time, and Non-Occupancy Period

1) At time T_0, the vector signal generator sent a burst of pulses for one of the Radar Type 0 on the operational channel. An additional 1dB was added to the radar test signal.
2) The transmissions of the EUT were observed at the end of the radar burst on the operating channel for a duration of greater than 10 seconds. The transmissions from the EUT during the observation time (channel move time) were measured and recorded.
3) The Channel Move Time and Channel Closing Time were measured and recorded.
4) In addition, the EUT was monitored for more than 30 minutes following instant T_2 to verify that that the EUT did not resume any transmissions on this channel.

DFS U-NII Detection Bandwidth (5500 MHz; 16dBm Power; 20 MHz)

Test according to FCC title 47 part 15 §15.407(h), KDB 905462 D02 U-NII DFS Compliance Procedures New Rules v02

Measurement Summary

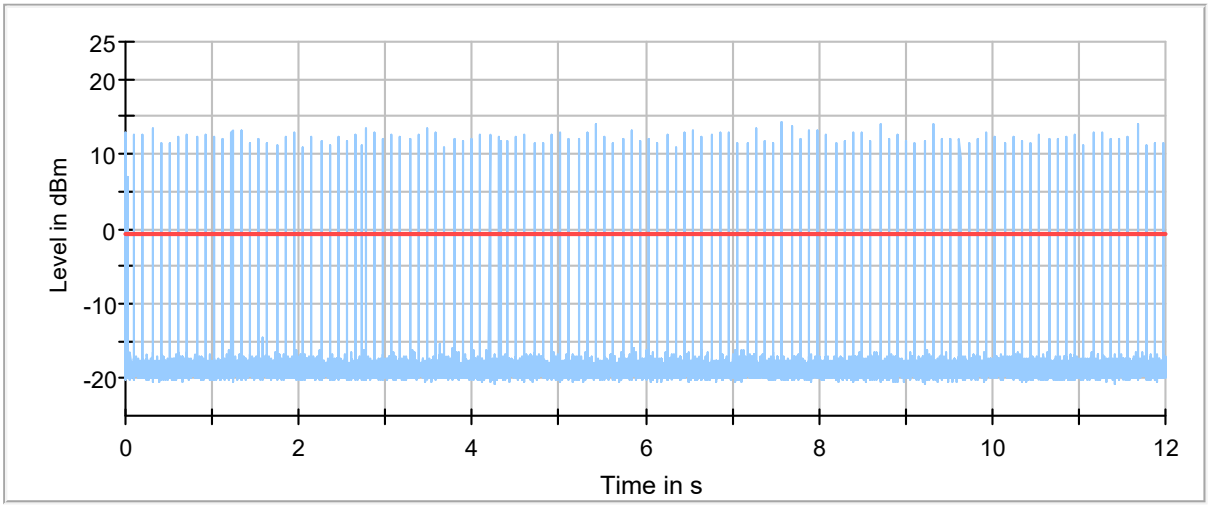
DUT Frequency (MHz)	Radar Type No.	Measured Detection Bandwidth (MHz)	99% Transmission power Bandwidth (MHz)	Overall Result
5500.000000	0	25.000000	20.000000	PASS

Detection Bandwidth Detailed Results

Check Frequency (MHz)	Detection count	Percentage of Detection	Minimum Limit	Single Measurement Result	Single Measurement Comment
5485.000000	3 of 10	30 %	90%	FAIL	
5489.000000	0 of 10	0 %	90%	FAIL	
5490.000000	10 of 10	100 %	90%	PASS	Lower Limit
5495.000000	10 of 10	100 %	90%	PASS	
5500.000000	10 of 10	100 %	90%	PASS	
5505.000000	10 of 10	100 %	90%	PASS	
5510.000000	10 of 10	100 %	90%	PASS	
5515.000000	10 of 10	100 %	90%	PASS	Upper Limit
5516.000000	0 of 10	0 %	90%	FAIL	
5520.000000	3 of 10	30 %	90%	FAIL	

Radar Level Verification

Description	Value	Unit
IF(({DFS Mode(0/1/2)}=0)or({DFS Mode(0/1/2)}=1) , IF((dBm2W({Nominal Power[dBm]})>0.2) , -64 , IF(({Configured PSD[dBm]}<10) , -62 , -64))+{Attenuation Vector Generator to DUT[dB]} , -50+ {Attenuation Vector Generator to COMP[dB]})+{Radar Signal Level Offset[dB]}	Given setting / formula to calculate Vector Generator level	--
Configured DUT EIRP:	39.81	mW
Configured DUT PSD:	5.30	dBm/MHz
Requirement of the Detection threshold value for these given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	-0.35	dBm
Configured overall pathloss from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	60.65	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-61.00	dBm



U-NII Detection Bandwidth Sweep — Threshold

DFS Channel Availability Check (5500 MHz; 16dBm Power; 20 MHz)

Test according to FCC title 47 part 15 §15.407(h), KDB 905462 D02 U-NII DFS Compliance Procedures New Rules v02.

Measurement Summary

DUT Frequency (MHz)	Radar Waveform Filename Used	CAC Type	Overall Result
5500.000000	FCC15407_2014-Type4-seg1.wv	Begin of CAC Phase	PASS
5500.000000	FCC15407_2014-Type4-seg1.wv	End of CAC Phase	PASS

Measurement Detailed Results

DUT Frequency (MHz)	Radar Type No.	CAC Type	Measured Startup time (s)	Configured Startup time (s)	Kind of Measurement	Time of Tx Start (s)	Limit (s)	Result	Comment
5500.00	4	Begin of CAC Phase	199.960	---	Before Radar Injection	0.000	0.00	PASS	No emissions detected; OK
5500.00	4	Begin of CAC Phase	199.960	---	After Radar Injection	>150.0	>150.0	PASS	Note 1.
5500.00	4	End of CAC Phase	199.960	---	Before Radar Injection	0.000	0.00	PASS	No emissions detected; OK
5500.00	4	End of CAC Phase	199.960	---	After Radar Injection	>150.0	>150.0	PASS	Note 1.

Radar Pulse Verification Summary

Radar Type No.	No. of Pulses	Required No. of Pulses	Min. Pulse Width (µs)	Max. Pulse Width (µs)	Required Pulse Width (us)	Measured Min. PRI (µs)	Measured Max. PRI (µs)	Required PRI (us)	Result	Comment
4	13	13	15.900	16.000	15.9	409.900	410.100	410	PASS	Note 3
4	13	13	15.900	16.000	15.9	409.900	410.000	410	PASS	Note 3

Radar Level Verification

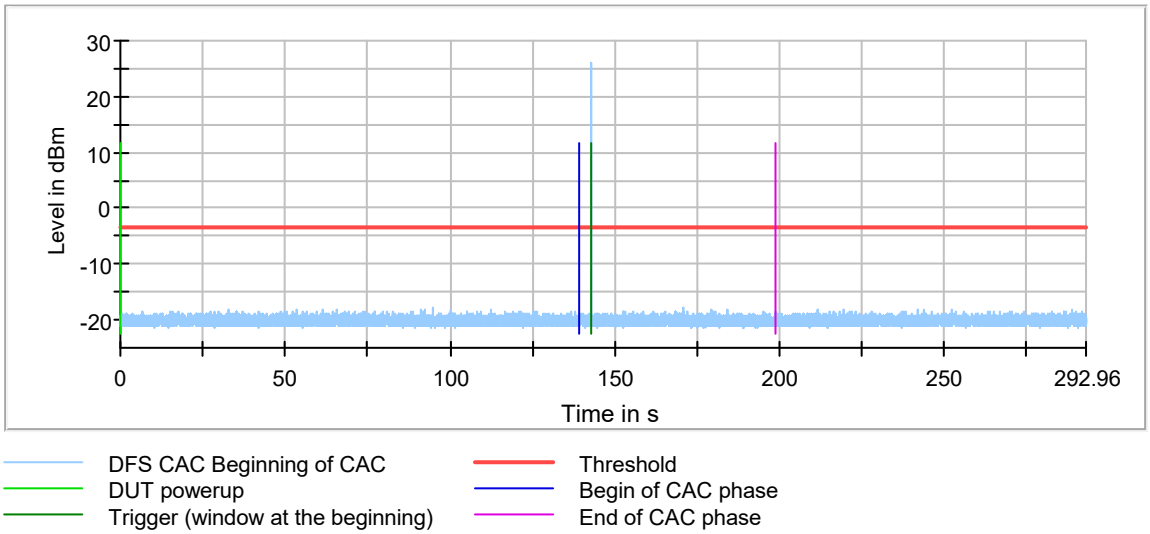
Description	Value	Unit
IF(({DFS Mode(0/1/2)}=0)or({DFS Mode(0/1/2)}=1) , IF((dBm2W({Nominal Power[dBm]})>0.2) , -64 , IF(({Configured PSD[dBm]}<10) , -62 , -64))+{Attenuation Vector Generator to DUT[dB]} , -50+ {Attenuation Vector Generator to COMP[dB]})+{Radar Signal Level Offset[dB]}	Given setting / formula to calculate Vector Generator level	--
Configured DUT EIRP:	39.81	mW
Configured DUT PSD:	1.78	dBm/MHz
Requirement of the Detection threshold value for these given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	-3.39	dBm
Configured overall pathloss from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	57.61	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-61.00	dBm

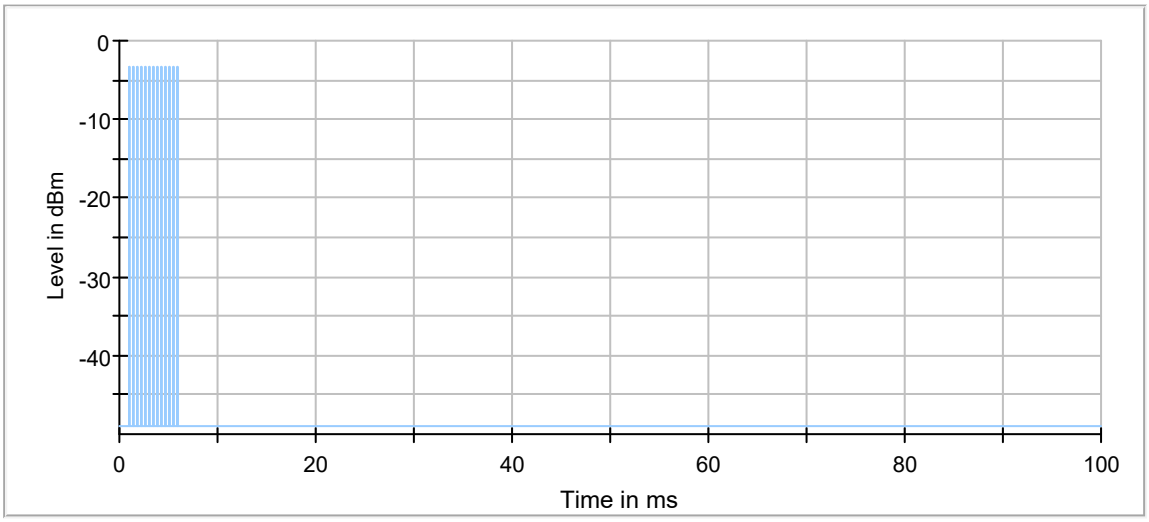
Additional Information

Note	Description
1	Sweep of Analyzer and Radar pulse waveform are triggered at the same time. Therefore, the radar pulses can maybe seen at the trigger point of the trace. Analysis of the Sweeps excludes the covered time for the radar pulses.
2	The radar signal is simultaneously evaluated as the analyzer sweep after radar injection.
3	Measurement uncertainty due to sampling rate of 10MHz is 200ns (2 samples).
4	If user defined waveform is configured (myARB.wv), then no additional limits are available and measured values cannot be checked.

Radar Pulse Verification Detail (Begin of CAC Phase)

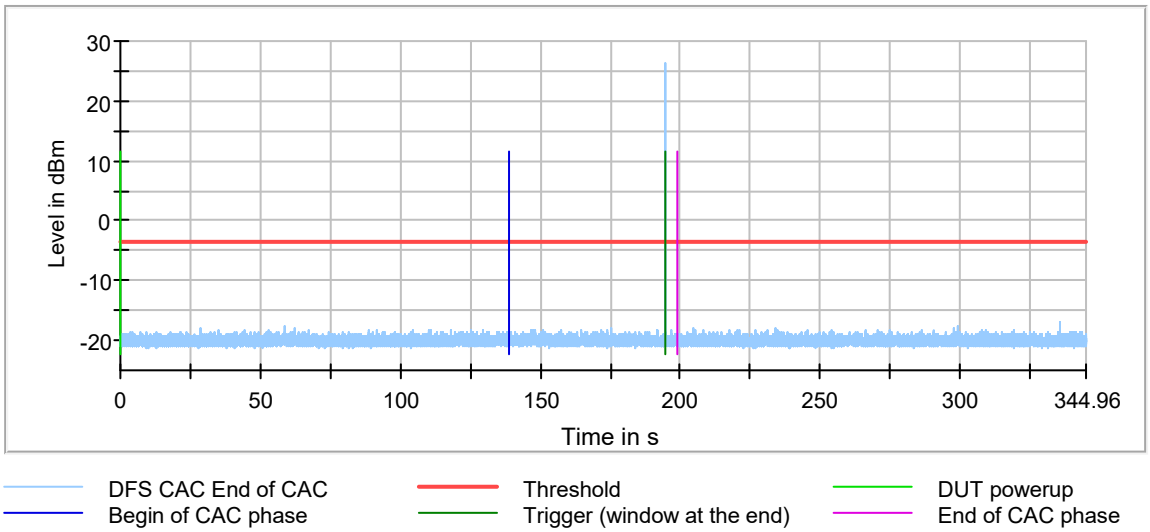
Radar Type No.	Pulse No.	Pulse Width (µs)	Required Pulse Width (µs)
4	1	15.900	15.900
4	2	15.900	15.900
4	3	15.900	15.900
4	4	15.900	15.900
4	5	15.900	15.900
4	6	15.900	15.900
4	7	15.900	15.900
4	8	16.000	15.900
4	9	15.900	15.900
4	10	15.900	15.900
4	11	15.900	15.900
4	12	15.900	15.900
4	13	15.900	15.900

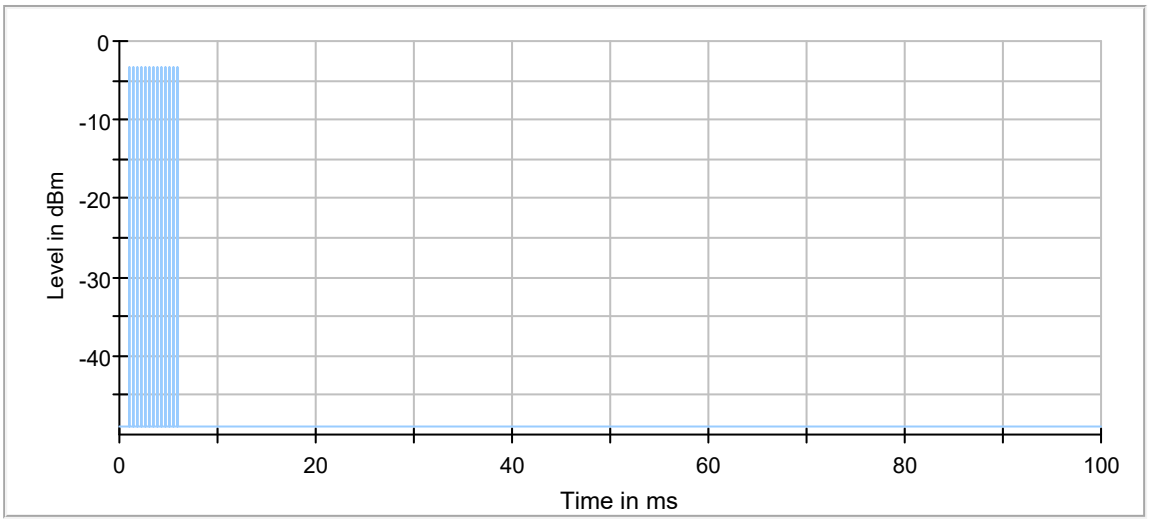




Radar Pulse Verification Detail (End of CAC Phase)

Radar Type No.	Pulse No.	Pulse Width (µs)	Required Pulse Width (µs)
4	1	15.900	15.900
4	2	15.900	15.900
4	3	15.900	15.900
4	4	15.900	15.900
4	5	15.900	15.900
4	6	15.900	15.900
4	7	15.900	15.900
4	8	15.900	15.900
4	9	16.000	15.900
4	10	15.900	15.900
4	11	15.900	15.900
4	12	15.900	15.900
4	13	15.900	15.900





DFS In-Service Monitoring (5500 MHz; 16dBm Power; 20 MHz)

Test according to FCC title 47 part 15 §15.407(h), KDB 905462 D02 U-NII DFS Compliance Procedures New Rules v02

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result
5500.000000	0	First of all, Transmit Test	---
5500.000000	0	Channel Move Time	PASS
5500.000000	0	Channel Closing Transmission Time	PASS
5500.000000	0	Non-occupancy period	PASS

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result	CMT Comment
5500.000000	0	0.000	10.000	PASS	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

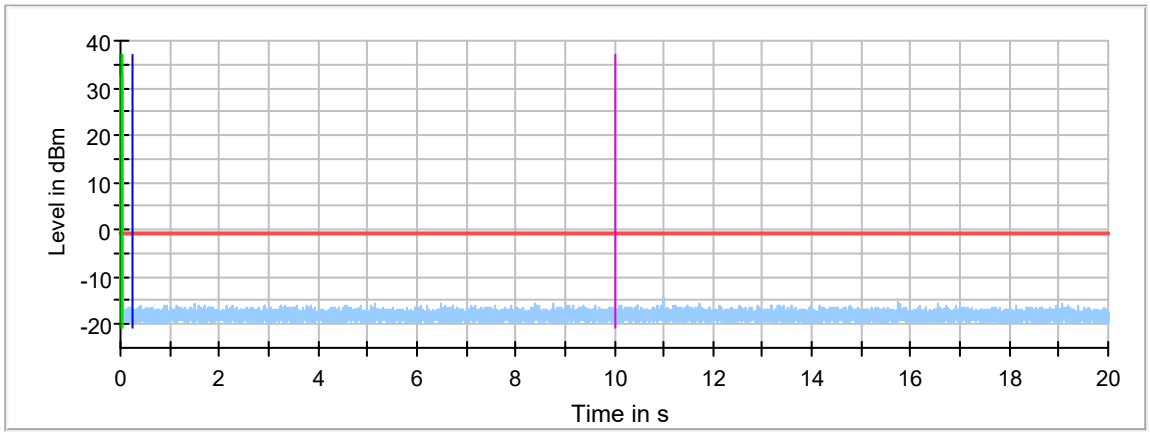
DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)	CCTT Tx Time Limit (ms)	CCTT Result	CCTT Comment
5500.00	0	first 200ms	0	0.000	200.000	PASS	Note 1.
5500.00	0	remaining 10.0 second(s) period	0	0.000	60.000	PASS	Note 1.

Non-Occupancy Period Detailed Results

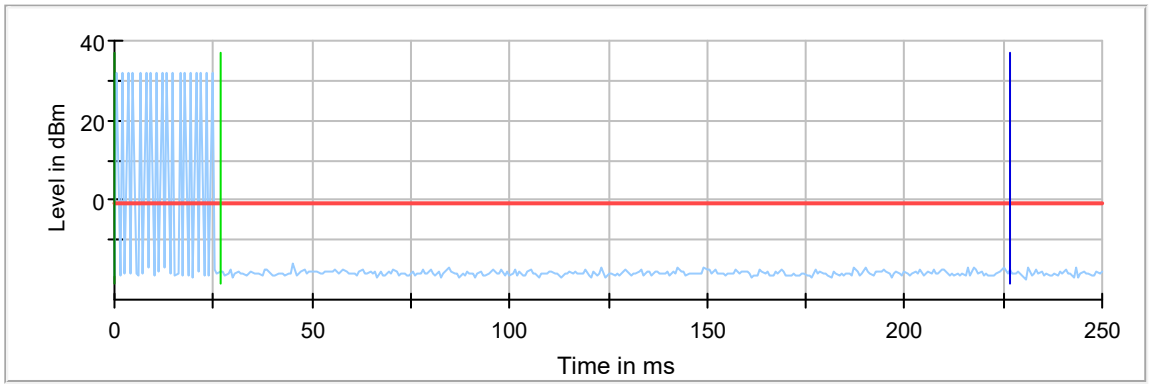
DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)	NOP Result
5500.000000	0	0	0	0.000	0.000	PASS

Transmitting Test Detailed Results

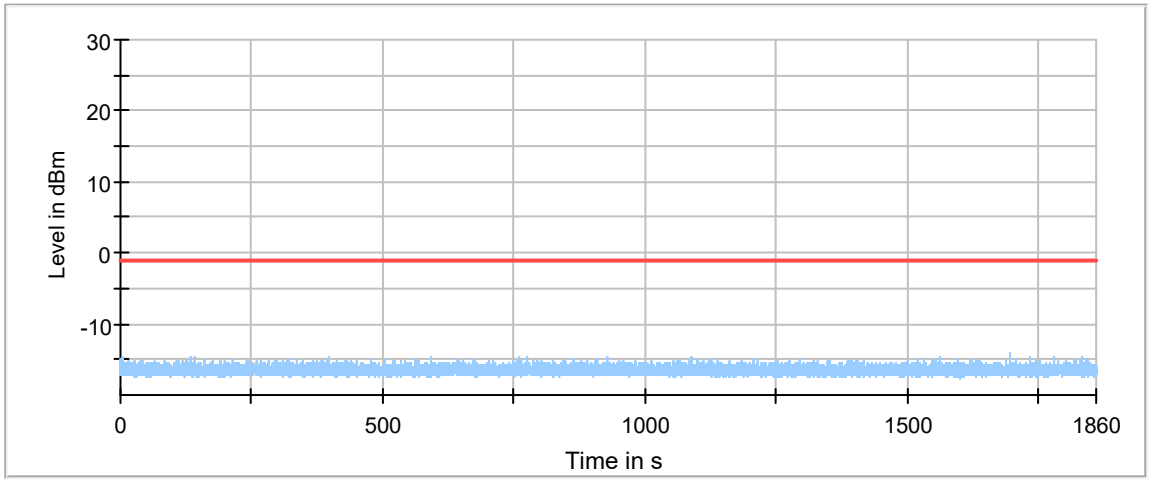
DUT Frequency (MHz)	Tx-Test Result	Tx-Test Comment
5500.000000	---	not performed / not finished



In-Service Monitoring Channel Move Time
Start of Radar
First 200ms of Channel Closing Tx Time
Threshold
Trigger at end of Radar
10sec Channel Move Time Limit



In-Service Monitoring Channel Move Time first 200ms
Threshold
Start of Radar
Trigger at end of Radar
First 200ms of Channel Closing Tx Time



In-Service Monitoring Non-occupancy period
Threshold

Radar Level Verification

Description	Value	Unit
IF(({DFS Mode(0/1/2)}=0)or({DFS Mode(0/1/2)}=1) , IF((dBm2W({Nominal Power[dBm]})>0.2) , -64 , IF(({Configured PSD[dBm]}<10) , -62 , -64))+{Attenuation Vector Generator to DUT[dB]} , -50+ {Attenuation Vector Generator to COMP[dB]})+{Radar Signal Level Offset[dB]}	Given setting / formula to calculate Vector Generator level	--
Configured DUT EIRP:	39.81	mW
Configured DUT PSD:	-2.29	dBm/MHz
Requirement of the Detection threshold value for these given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	-0.35	dBm
Configured overall pathloss from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	60.65	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-61.00	dBm

Additional Information

Note	Description
1	Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 26.7ms conforming to the end of the Radar burst.
2	Channel move time (CMT) / channel closing transmission time (CCTT) measurement was made with high resolution video sweep using OSP DAQ channel.
3	Because of the substantially high sampling rate of the video signal, the results for CCTT and CMT are more accurate than in the graphics visible. Reached timing accuracy of the video trace: approximately 4 µs.
4	The Non-Occupancy Period trace starts at the end of the Channel move time trace (20.000 secs.). Labeling of the x-axis (time) is relative to its beginning (0 secs.).

DFS In-Service Monitoring (5530 MHz; 15dBm Power; 80 MHz)

Test according to FCC title 47 part 15 §15.407(h), KDB 905462 D02 U-NII DFS Compliance Procedures New Rules v02

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result
5530.000000	0	First of all, Transmit Test	---
5530.000000	0	Channel Move Time	PASS
5530.000000	0	Channel Closing Transmission Time	PASS
5530.000000	0	Non-occupancy period	PASS

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result	CMT Comment
5530.000000	0	0.000	10.000	PASS	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

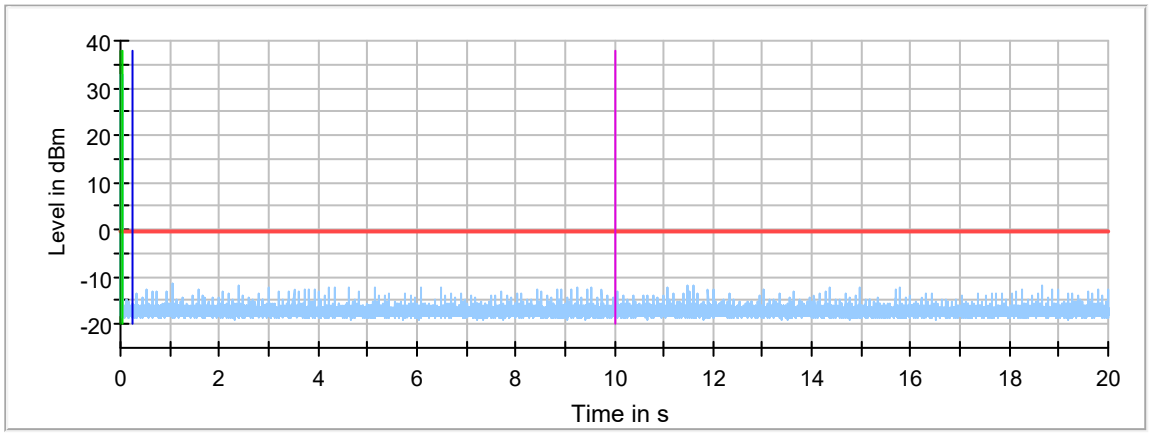
DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)	CCTT Tx Time Limit (ms)	CCTT Result	CCTT Comment
5530.000000	0	first 200ms	0	0.000	200.000	PASS	Note 1.
5530.000000	0	remaining 10.0 second(s) period	0	0.000	60.000	PASS	Note 1.

Non-Occupancy Period Detailed Results

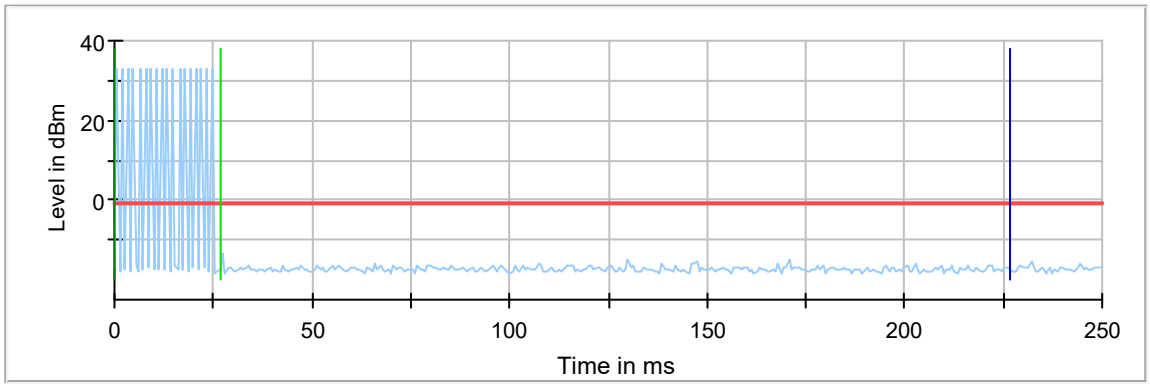
DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)	NOP Result
5530.000000	0	0	0	0.000	0.000	PASS

Transmitting Test Detailed Results

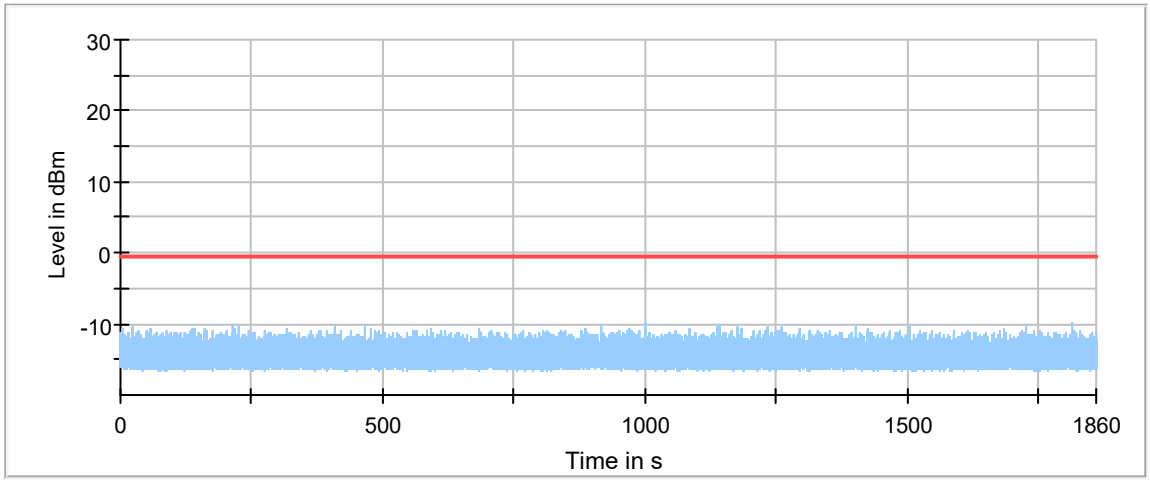
DUT Frequency (MHz)	Tx-Test Result	Tx-Test Comment
5530.000000	---	not performed / not finished



In-Service Monitoring Channel Move Time
Start of Radar
First 200ms of Channel Closing Tx Time
Threshold
Trigger at end of Radar
10sec Channel Move Time Limit



In-Service Monitoring Channel Move Time first 200ms
Threshold
Start of Radar
Trigger at end of Radar
First 200ms of Channel Closing Tx Time



In-Service Monitoring Non-occupancy period
Threshold

Radar Level Verification

Description	Value	Unit
IF(({DFS Mode(0/1/2)}=0)or({DFS Mode(0/1/2)}=1) , IF((dBm2W({Nominal Power[dBm]})>0.2) , -64 , IF(({Configured PSD[dBm]}<10) , -62 , -64))+{Attenuation Vector Generator to DUT[dB]} , -50+ {Attenuation Vector Generator to COMP[dB]})+{Radar Signal Level Offset[dB]}	Given setting / formula to calculate Vector Generator level	--
Configured DUT EIRP:	31.62	mW
Configured DUT PSD:	-2.29	dBm/MHz
Requirement of the Detection threshold value for these given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	0.03	dBm
Configured overall pathloss from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	61.03	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-61.00	dBm

Additional Information

Note	Description
1	Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 26.7ms conforming to the end of the Radar burst.
2	Channel move time (CMT) / channel closing transmission time (CCTT) measurement was made with high resolution video sweep using OSP DAQ channel.
3	Because of the substantially higher sampling rate of the video signal, the results for CCTT and CMT are more accurate than in the graphics visible. Reached timing accuracy of the video trace: approximately 4 µs.
4	The Non-Occupancy Period trace starts at the end of the Channel move time trace (20.000 secs.). Labeling of the x-axis (time) is relative to its beginning (0 secs.).

23. Scope of Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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ELECTRICAL

Valid To: June 30, 2023 Certificate Number: 1786.01

In recognition of the successful completion of the A2LA Accreditation Program evaluation process, accreditation is granted to this laboratory to perform the following automotive electromagnetic compatibility and other electrical tests:

Test Technology:	Test Method(s) [1]:
Transient Immunity	ISO 7637-2 (including emissions); ISO 7637-3; ISO 16750-2:2012, Sections 4.6.3 and 4.6.4; CS-11979, Section 6.4; CS.00054, Section 5.9; EMC-CS-2009.1 (CI220); FMC1278 (CI220, CI221, CI222); GMW 3097, Section 3.5; SAE J1113-11; SAE J1113-12; ECE Regulation 10.06 Annex 10
Electrostatic Discharge (ESD)	ISO 10605 (2001, 2008); CS-11979 Section 7.0; CS.00054, Section 5.10; EMC-CS-2009.1 (CI 280); FMC1278 (CI280); SAE J1113-13; GMW 3097 Section 3.6
Conducted Emissions	CISPR 25 (2002, 2008), Sections 6.2 and 6.3; CISPR 25 (2016), Sections 6.3 and 6.4; CS-11979, Section 5.1; CS.00054, Sections 5.6.1 and 5.6.2; GMW 3097, Section 3.3.2; EMC-CS-2009.1 (CE 420); FMC1278 (CE420, CE421)
Radiated Emissions Anechoic	CISPR 25 (2002, 2008), Section 6.4; CISPR 25 (2016), Section 6.5; CS-11979, Section 5.3; CS.00054, Section 5.6.3; GMW 3097, Section 3.3.1; EMC-CS-2009.1 (RE 310); FMC1278 (RE310); ECE Regulation 10.06 Annex 7 (Broadband) ECE Regulation 10.06 Annex 8 (Narrowband)

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Test Technology:	Test Method(s) [1]:
Vehicle Radiated Emissions	CISPR 12; CISPR 36; ICES-002; ECE Regulation 10.06 Annex 5
Bulk Current Injection (BCI)	ISO 11452-4; CS-11979, Section 6.1; CS.00054, Section 5.8.1; GMW 3097, Section 3.4.1; SAE J1113-4; EMC-CS-2009.1 (RI112); FMC1278 (RI112); ECE Regulation 10.06 Annex 9
Radiated Immunity Anechoic *(Including Radar Pulse)*	ISO 11452-2; ISO 11452-5; CS-11979, Section 6.2; CS.00054, Section 5.8.2; GMW 3097, Section 3.4.2; EMC-CS-2009.1 (RI114); FMC1278 (RI114); SAE J1113-21; ECE Regulation 10.06 Annex 9
Radiated Immunity Magnetic Field	ISO 11452-8
Radiated Immunity Reverb	ISO/IEC 61000-4-21; GMW 3097, Section 3.4.3; EMC-CS-2009.1 (RI114); FMC1278 (RI114); ISO 11452-11
Radiated Immunity *(Portable Transmitters)*	ISO 11452-9; EMC-CS-2009.1 (RI115); FMC1278 (RI115)
Vehicle Radiated Immunity (ALSE)	ISO 11451-2; ECE Regulation 10.06 Annex 6
Vehicle Product Specific EMC Standards	EN 14982; EN ISO 13309, ISO 13766; EN 50498; EC Regulation No. 2015/208; EN 55012
Electrical Loads	ISO 16750-2
Emissions Radiated and Conducted (3m Semi-anechoic chamber, up to 40 GHz)	47 CFR, FCC Part 15 B (using ANSI C63.4:2014); 47 CFR, FCC Part 18 (using FCC MP-5:1986); ICES-001; ICES-003; ICES-005; IEC/CISPR 11, Ed. 4.1 (2004-06); AS/NZS CISPR 11 (2004); IEC/CISPR 11 Ed 5 (2009-05) + A1 (2010); KN 11 (2008-5) with RRL Notice No. 2008-3 (May 20, 2008); CISPR 11; EN 55011; KS C 9811; CNS 13803 (1997, 2003); CISPR 14-1; EN 55014-1; AS/NZS CISPR 14.1; KS C 9814-1; KN 14-1; IEC/CISPR 22 (1997); EN 55022 (1998) + A1(2000); EN 55022 (1998) + A1(2000) + A2(2003); EN 55022 (2006); IEC/CISPR 22 (2008-09); AS/NZS CISPR 22 (2004); AS/NZS CISPR 22, 3rd Edition (2006); KN 22 (up to 6 GHz); CNS 13438 (up to 6 GHz); VCCI V-3 (up to 6 GHz); CISPR 32; EN 55032; KS C 9832; KN 32; ECE Regulation 10.06 Annex 14
Cellular Radiated Spurious Emissions	ETSI TS 151 010-1 GSM; 3GPP TS 51.010-1, Sec 12; ETSI TS 134 124 UMTS; 3GPP TS 34.124; ETSI TS 136 124 LTE; E-UTRA; 3GPP TS 36.124

Test Technology:	Test Method(s) [1]:
Emissions (cont'd)	
Current Harmonics	IEC 61000-3-2; EN 61000-3-2; KN 61000-3-2; KS C 9610-3-2; ECE Regulation 10.06 Annex 11
Flicker and Fluctuations	IEC 61000-3-3; EN 61000-3-3; KN 61000-3-3; KS C 9610-3-3; ECE Regulation 10.06 Annex 12
Immunity	
Electrostatic Discharge	IEC 61000-4-2, Ed. 1.2 (2001); IEC 61000-4-2 (1995) + A1(1998) + A2(2000); EN 61000-4-2 (1995); EN 61000-4-2 (2009-05); KN 61000-4-2 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-2; EN 61000-4-2; KN 61000-4-2; KS C 9610-4-2; IEEE C37.90.3 2001
Radiated Immunity	IEC 61000-4-3 (1995) + A1(1998) + A2(2000); IEC 61000-4-3, Ed. 3.0 (2006-02); IEC 61000-4-3, Ed. 3.2 (2010); KN 61000-4-3 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-3; EN 61000-4-3; KN 61000-4-3; KS C 9610-4-3; IEEE C37.90.2 2004
Electrical Fast Transient/Burst	IEC 61000-4-4, Ed. 2.0 (2004-07); IEC 61000-4-4, Ed. 2.1 (2011); IEC 61000-4-4 (1995) + A1(2000) + A2(2001); KN 61000-4-4 (2008-5); RRL Notice No. 2008-5 (May 20, 2008); IEC 61000-4-4; EN 61000-4-4; KN 61000-4-4; KS C 9610-4-4; ECE Regulation 10.06 Annex 15
Surge	IEC 61000-4-5 (1995) + A1(2000); IEC 61000-4-5, Ed 1.1 (2005-11); EN 61000-4-5 (1995) + A1(2001); KN 61000-4-5 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-5; EN 61000-4-5; KN 61000-4-5; KS C 9610-4-5; IEEE C37.90.1 2012; IEEE STD C62.41.2 2002; ECE Regulation 10.06 Annex 16
Conducted Immunity	IEC 61000-4-6 (1996) + A1(2000); IEC 61000-4-6, Ed 2.0 (2006-05); IEC 61000-4-6 Ed. 3.0 (2008); KN 61000-4-6 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); EN 61000-4-6 (1996) + A1(2001); IEC 61000-4-6; EN 61000-4-6; KN 61000-4-6; KS C 9610-4-6

Test Technology:	Test Method(s) [1]:
Immunity (cont'd)	
Power Frequency Magnetic Field Immunity (*Down to 3 A/m*)	IEC 61000-4-8 (1993) + A1(2000); IEC 61000-4-8 (2009); EN 61000-4-8 (1994) + A1(2000); KN 61000-4-8 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8; KS C 9610-4-8
Voltage Dips, Short Interrupts, and Line Voltage Variations	IEC 61000-4-11, Ed. 2 (2004-03); KN 61000-4-11 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-11; EN 61000-4-11; KN 61000-4-11; KS C 9610-4-11
Ring Wave	IEC 61000-4-12, Ed. 2 (2006-09); EN 61000-4-12:2006; IEC 61000-4-12; EN 61000-4-12; KN 61000-4-12; IEEE STD C62.41.2 2002
Generic and Product Specific EMC Standards	IEC/EN 61000-6-1; AS/NZS 61000-6-1; KN 61000-6-1; KS C 9610-6-1; IEC/EN 61000-6-2; AS/NZS 61000-6-2; KN 61000-6-2; KS C 9610-6-2; IEC/EN 61000-6-3; AS/NZS 61000-6-3; KN 61000-6-3; KS C 9610-6-3; IEC/EN 61000-6-4; AS/NZS 61000-6-4; KN 61000-6-4; KS C 9610-6-4; EN 50130-4; EN 61326-1; EN 50121-3-2; EN 12895; EN 50270; EN 50491-1; EN 50491-2; EN 50491-3; EN 55015; EN 60730-1; EN 60945; IEC 60533; EN 61326-2-6; EN 61800-3; IEC/CISPR 14-2; EN 55014-2; AS/NZS CISPR 14.2; KN 14-2; KS C 9814-2; IEC/CISPR 24; AS/NZS CISPR 24; EN 55024; KN 24; IEC/CISPR 35; AS/NZS CISPR 35; EN 55035; KN 35; KS C 9835; IEC 60601-1-2; JIS T0601-1-2
TxRx EMC Requirements	EN 301 489-1; EN 301 489-3; EN 301 489-9; EN 301 489-17; EN 301 489-19; EN 301 489-20
European Radio Test Standards	ETSI EN 300 086-1; ETSI EN 300 086-2; ETSI EN 300 113-1; ETSI EN 300 113-2; ETSI EN 300 220-1; ETSI EN 300 220-2; ETSI EN 300 220-3-1; ETSI EN 300 220-3-2; ETSI EN 300 330-1; ETSI EN 300 330-2; ETSI EN 300 440-1; ETSI EN 300 440-2; ETSI EN 300 422-1; ETSI EN 300 422-2; ETSI EN 300 328; ETSI EN 301 893; ETSI EN 301 511; ETSI EN 301 908-1; ETSI EN 908-2; ETSI EN 908-13; ETSI EN 303 413; ETSI EN 302 502; EN 303 340; EN 303 345-2; EN 303 345-3; EN 303 345-4

Test Technology:	Test Method(s) [1]:
Canadian Radio Tests	RSS-102 (RF Exposure Evaluation only); RSS-111; RSS-112; RSS-117; RSS-119; RSS-123; RSS-125; RSS-127; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-137; RSS-139; RSS-140; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-191; RSS-192; RSS-194; RSS-195; RSS-196; RSS-197; RSS-199; RSS-210; RSS-211; RSS-213; RSS-215; RSS-216; RSS-220; RSS-222; RSS-236; RSS-238; RSS-243; RSS-244; RSS-247; RSS-251; RSS-252; RSS-287; RSS-288; RSS-310; RSS-GEN
Mexico Radio Tests	IFT-008-2015; NOM-208-SCFI-2016
Japan Radio Tests	Radio Law No. 131, Ordinance of MPT No. 37, 1981, MIC Notification No. 88:2004, Table No. 22-11; ARIB STD-T66, Regulation 18
Taiwan Radio Tests	LP-0002 (July 15, 2020)
Australia/New Zealand Radio Tests	AS/NZS 4268; Radiocommunications (Short Range Devices) Standard (2014)
Hong Kong Radio Tests	HKCA 1039 Issue 6; HKCA 1042; HKCA 1033 Issue 7; HKCA 1061; HKCA 1008; HKCA 1043; HKCA 1057; HKCA 1073
Korean Radio Test Standards	KN 301 489-1; KN 301 489-3; KN 301 489-9; KN 301 489-17; KN 301 489-52; KS X 3124; KS X 3125; KS X 3130; KS X 3126; KS X 3129
Vietnam Radio Test Standards	QCVN 47:2015/BTTTT; QCVN 54:2020/BTTTT; QCVN 55:2011/BTTTT; QCVN 65:2013/BTTTT; QCVN 73:2013/BTTTT; QCVN 74:2020/BTTTT; QCVN 112:2017/BTTTT; QCVN 117:2020//BTTTT
Vietnam EMC Test Standards	QCVN 18:2014/BTTTT; QCVN 86:2019/BTTTT; QCVN 96:2015/BTTTT; QCVN 118:2018/BTTTT
Unlicensed Radio Frequency Devices *(3 Meter Semi-Anechoic Room)*	47 CFR FCC Part 15C, 15D, 15E, 15F, 15G, 15H (using ANSI C63.10:2013, ANSI C63.17:2013 and FCC KDB 905462 D02 (v02))
Licensed Radio Service Equipment	47 CFR FCC Parts 20, 22, 24, 25, 27, 30, 73, 74, 80, 87, 90, 95, 96, 97, 101 (using ANSI/TIA-603-E, TIA-102.CAAA-E, ANSI C63.26:2015)

Test Technology:	Test Method(s) [1]:
OTA (Over the Air) Performance GSM, GPRS, EGPRS UMTS (W-CDMA) LTE including CAT M1 A-GPS for UMTS/GSM LTS A-GPS, A-GLONASS, SIB8/SIB16 Large Device/Laptop/Tablet Testing Integrated Device Testing WiFi 802.11 a/b/g/n/a	CTIA Test Plan for Wireless Device Over-the-Air Performance (Method for Measurement for Radiated Power and Receiver Performance) V3.8.2; CTIA Test Plan for RF Performance Evaluation of WiFi Mobile Converged Devices V2.1.0
Electrical Measurements and Simulation AC Voltage / Current (1mV to 5kV) 60 Hz (0.1V to 250V) up to 500 MHz (1μA to 150A) 60 Hz DC Voltage / Current (1mV to 15-kV) / (1μA to 10A) Power Factor / Efficiency / Crest Factor (Power to 30kW) Resistance (1mΩ to 4000MΩ) Surge (Up to 10 kV / 5 kA) (Combination Wave and Ring Wave)	 FAA AC 150/5345-10H FAA AC 150/5345-43J FAA AC 150/5345-44K FAA AC 150/5345-46E FAA AC 150/5345-47C FAA EB 67D

On the following products and materials:
Telecommunications Terminal Equipment (TTE), Radio Equipment, Network Equipment, Information Technology Equipment (ITE), Automotive Electronic Equipment, Automotive Hybrid Electronic Devices, Maritime Navigation and Radio Communication Equipment and Systems, Vehicles, Boats and Internal Combustion Engine Driven Devices, Automotive, Aviation, and General Lighting Products, Medical Electrical Equipment, Motors, Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment, Household Appliances, Electric Tools, Low-voltage Switchgear and Control gear, Programmable Controllers, Electrical Equipment for Measurement, Control and Laboratory Use, Base Materials, Power and Data Transmission Cables and Connectors

[1] When the date, edition, version, etc. is not identified in the scope of accreditation, laboratories may use the version that immediately precedes the current version for a period of one year from the date of publication of the standard measurement method, per part C., Section 1 of A2LA *R101 - General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Unintentional Radiators Part 15B	ANSI C63.4:2014	40000

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Industrial, Scientific, and Medical Equipment Part 18	FCC MP-5 (February 1986)	40000
Intentional Radiators Part 15C	ANSI C63.10:2013	40000
Unlicensed Personal Communication Systems Devices Part 15D	ANSI C63.17:2013	40000
U-NII without DFS Intentional Radiators Part 15E	ANSI C63.10:2013	40000
U-NII with DFS Intentional Radiators Part 15E	FCC KDB 905462 D02 (v02)	40000
UWB Intentional Radiators Part 15F	ANSI C63.10:2013	40000
BPL Intentional Radiators Part 15G	ANSI C63.10:2013	40000
White Space Device Intentional Radiators Part 15H	ANSI C63.10:2013	40000
Commercial Mobile Services (FCC Licensed Radio Service Equipment) Parts 22 (cellular), 24, 25 (below 3 GHz), and 27	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
General Mobile Radio Services (FCC Licensed Radio Service Equipment) Parts 22 (non-cellular), 90 (below 3 GHz), 95, 97, and 101 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment) Part 96	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Maritime and Aviation Radio Services		
Parts 80 and 87	ANSI/TIA-603-E; ANSI C63.26:2015	40000
Microwave and Millimeter Bands Radio Services		
Parts 25, 30, 74, 90 (above 3 GHz), 97 (above 3 GHz), and 101	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Broadcast Radio Services		
Parts 73 and 74 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Signal Boosters		
Part 20 (Wideband Consumer Signal Boosters, Provider-specific signal boosters, and Industrial Signal Boosters) Section 90.219	ANSI C63.26:2015	40000

[2] Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (https://apps.fcc.gov/oetcf/eas/) for a listing of FCC approved laboratories.

Accredited Laboratory

A2LA has accredited

ELITE ELECTRONIC ENGINEERING INC.

Downers Grove, IL

for technical competence in the field of

Electrical Testing

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

Presented this 19th day of May 2021.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1786.01
Valid to June 30, 2023

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