Engineering Test Report No. 2201415-02		
Report Date	May 4, 2022	
Manufacturer Name	Astronics	
Manufacturer Address	One Corporate Drive Suite 110 Lake Zurich, IL 60047	
Test Item Name Model No.	Resideo Thermostat VisionPro	
Date Received	April 25, 2022	
Test Dates	April 25, 2022 to May 3, 2022	
Specifications	FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.247 Innovation, Science, and Economic Development Canada, RSS-GEN Innovation, Science, and Economic Development Canada, RSS-247 FCC 47 CFR Part 1.1310 RSS-102	
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		
Tested by	Javier Cardenas	
Signature		
Approved by	Raymond J. Klouda, Registered Professional Engineer of Illinois – 44894	
PO Number	46692	

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 C, Section 15.247 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 dates 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. This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

Table of Contents

1. Report Revision History

Revision	Date	Description
–	11 MAY 2022	Initial Release of Engineering Test Report No. 2201415-02

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 Resideo Thermostat (hereinafter referred to as the Equipment Under Test (EUT)). The EUT was manufactured and submitted for testing by Astronics located in Lake Zurich, IL.

2.2. Purpose

The test series was performed to determine if the EUT meets the Subpart C, §15.247 for a Digital Modulation intentional radiator operating within the 2400 – 2483.5MHz band.

The test series was also performed to determine if the EUT meets the RF emission requirements of the Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen and Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-247 for a Digital Modulation intentional radiator operating within the 2400 – 2483.5MHz 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	Resideo Thermostat
Model/Part No.	VisionPro
Serial No.	1430580 and 1430570
Size of EUT	11.5cm Height x 12.5cm Width x 3cm Depth
Software/Firmware Version	DuoXtr1_1_9.hex (main micro software) km0_km4_image2_rft_1_0_1_9.bin (Realtek radio software)
Device Type	Digitally Modulated Transmission Device
Band of Operation	2400 – 2483.5MHz
Modulation Type	BPSK, QPSK, CCK, QAM-16, QAM-64
Antenna Type	trace
Declared Antenna Gain (dBi) [1]	1.3
Peak Conducted Output Power	802.11b: Antenna A - 22dBm (158.5mW), Antenna B – 20.6dBm (114.8mW) 802.11g: Antenna A – 24.5dBm (281.8mW), Antenna B – 23.2dBm (208.9mW) 802.11n20: Antenna A – 22.9dBm (195mW), Antenna B – 23dBm (200mW)
Peak EIRP	802.11b: 20.5dBm (112.2mW) 802.11g: 23dBm (199.53mW) 802.11n20: 23.4dBm (173.78mW)
6dB Bandwidth	802.11b: 10.25MHz 802.11g: 16.4MHz 802.11n20: 17.25MHz
Occupied Bandwidth (99% CBW)	802.11b: 14.6MHz 802.11g: 16.6MHz 802.11n20: 17.7MHz
Emission Classification	802.11b: 14G6F1D 802.11g: 16G6F1D 802.11n20: 17G7F1D
Product FCC ID & ISED UPN Number	FCC ID: HS9 TH8321WF02 ISED UPN: 573R-TH8321WF02

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 24V 60Hz power through 2 leads from the secondary of a step-down transformer. The primary of this transformer received 115V 60Hz power through lowpass powerline filters on the wall of the shielded enclosure.

4. Grounding

The EUT was not connected to ground.

5. Support Equipment

No support equipment was used during the tests

6. Interconnect Leads

No interconnect leads were used during the tests.

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 'worst-case' modes:

Mode	Protocol	Description
Tx	802.11b 11Mbps	Antenna A - 2412MHz, Power Setting = 107 - 2437MHz, Power Setting = 107 - 2462MHz, Power Setting = 107 Antenna B - 2412MHz, Power Setting = 107 - 2437MHz, Power Setting = 107 - 2462MHz, Power Setting = 107
	802.11g 6Mbps	Antenna A - 2412MHz, Power Setting = 87 - 2437MHz, Power Setting = 87 - 2462MHz, Power Setting = 87 Antenna B - 2412MHz, Power Setting = 87 - 2437MHz, Power Setting = 87 - 2462MHz, Power Setting = 87
	802.11n20 MCS2	Antenna A - 2412MHz, Power Setting = 87 - 2437MHz, Power Setting = 87 - 2462MHz, Power Setting = 87 Antenna B - 2412MHz, Power Setting = 87 - 2437MHz, Power Setting = 87 - 2462MHz, Power Setting = 87

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
- ANSI C63.4-2014, “American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz”
- ANSI C63.10-2013, “American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”
- Federal Communications Commission Office of Engineering and Technology Laboratory Division, Guidance For Compliance Measurements On Digital Transmission Systems, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under Section 15.247 April 2, 2019 KDB 558074 D01v05r02
- 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”
- 47 CFR Parts 1.1310, 2.1091 and 2.1093 Code of Federal Regulations, Title 47, Telecommunications
- RSS-102, Issue 5 Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands
- ANSI/IEEE C95.1:1992 – "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,"

10. Test Plan

No test plan was provided. Instructions were provided by personnel from Astronics and used in conjunction with the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.247, Innovation, Science, and Economic Development Canada, RSS-247, and ANSI C63.4-2014 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	23°C
Relative Humidity	18%
Atmospheric Pressure	1007.5mbar

13. Summary

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

Test Description	Requirements	Test Method	S/N	Results
Transmitter Conducted Emissions (AC Mains)	FCC 15.207 ISED RSS-247	ANSI C63.10:2013	1430580	Conforms
6dB Bandwidth	FCC 15.247 ISED RSS-247	ANSI C63.10:2013	1430580	Conforms
Occupied Bandwidth (99%)	FCC 15.247 ISED RSS-247	ANSI C63.10:2013	1430580	Conforms
Maximum Peak Conducted Output Power	FCC 15.247 ISED RSS-247	ANSI C63.10:2013	1430580	Conforms
Effective Isotropic Radiated Power (EIRP)	FCC 15.247 ISED RSS-247	ANSI C63.10:2013	1430580	Conforms
Duty Cycle Factor Measurements	FCC 15.247 ISED RSS-247	ANSI C63.10:2013	1430580	—
Case Spurious Radiated Emissions	FCC 15.247 ISED RSS-247	ANSI C63.10:2013	1430580	Conforms
Band-Edge Compliance	FCC 15.247 ISED RSS-247	ANSI C63.10:2013	1430580	Conforms
Power Spectral Density	FCC 15.247 ISED RSS-247	ANSI C63.10:2013	1430580	Conforms
RF Exposure (MPE)	FCC 1.1310 ISED RSS-102	ANSI C95.1	1430580	See Section 29

14. Sample Calculations

For Powerline Conducted Emissions:

The resultant voltage level (VL) is a summation in decibels (dB) of the receiver meter reading (MTR) and the cable loss factor (CF).

Formula 1: VL (dBµV) = MTR (dBµV) + CF (dB).

For Radiated Emissions:

The resultant field strength (FS) is a summation in decibels (dB) of the receiver meter reading (MTR), the antenna correction factor (AF), and the cable loss factor (CF). If an external preamplifier is used, the total is reduced by its gain (-PA). If a distance correction (DC) is required, it is added to the total.

Formula 1: FS (dBµV/m) = MTR (dBµV) + AF (dB/m) + CF (dB) + (- PA (dB)) + DC (dB)

To convert the Field Strength dBµV/m term to µV/m, the dBµV/m is first divided by 20. The Base 10 AntiLog is taken of this quotient. The result is the Field Strength value in µV/m terms.

Formula 2: FS (µV/m) = AntiLog [(FS (dBµV/m))/20]

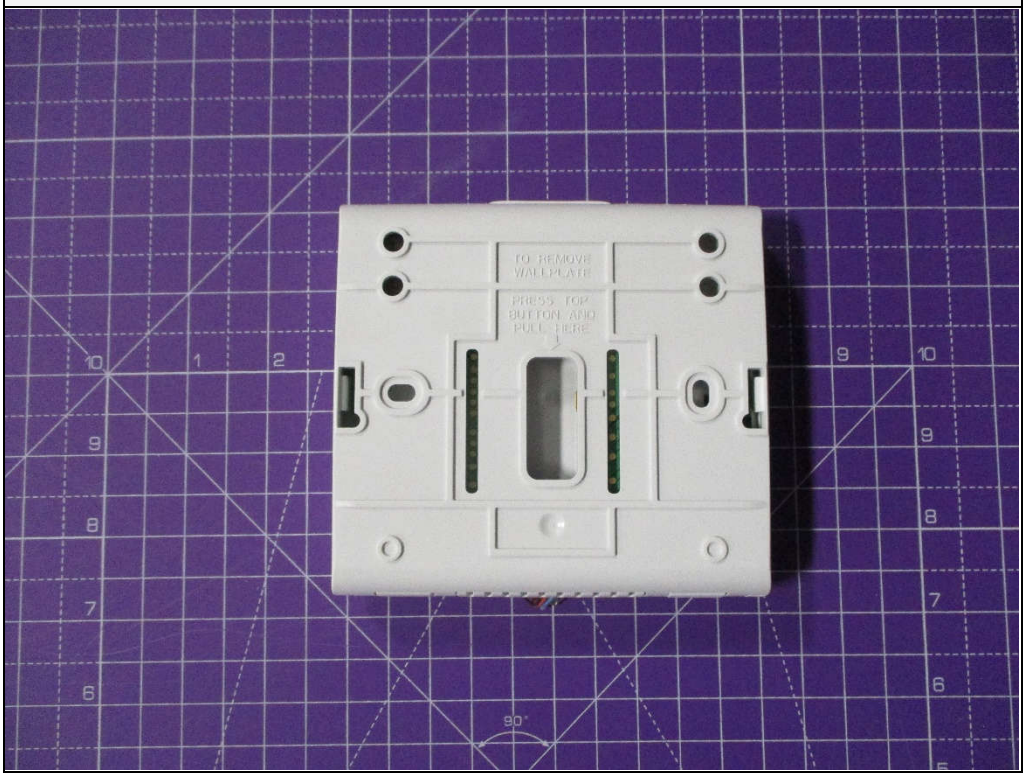
15. Statement of Conformity

The Astronics Resideo Thermostat, Model No. VisionPro, Serial No. 1430580 did fully conform to the selected requirements of FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.247 and Innovation, Science, and Economic Development Canada, RSS-247.

16. 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 C, Section 15.247 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.

17. Photographs of EUT

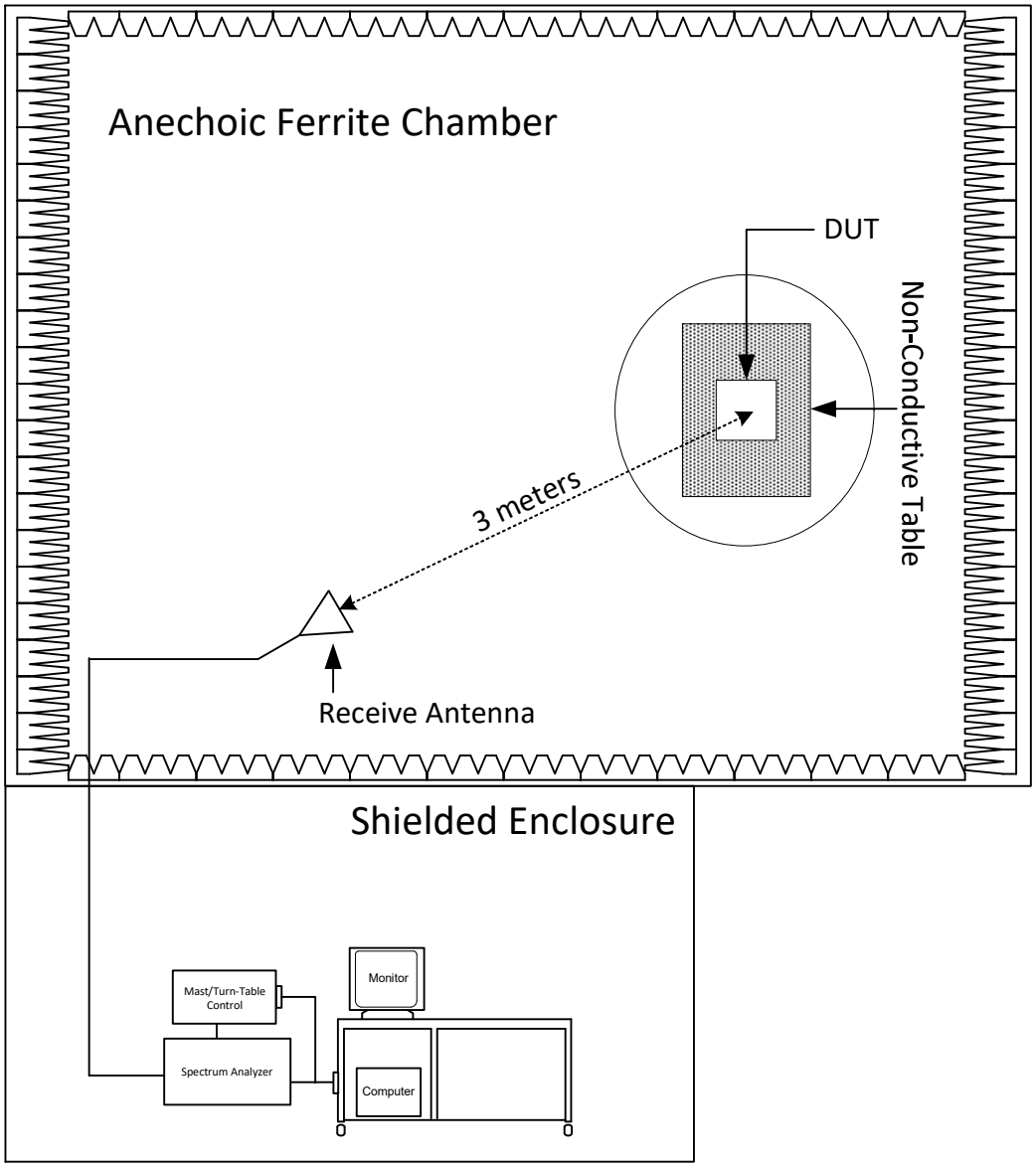


18. Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW0	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-30-20G20R6G	PL2926/0646	20GHZ-26.5GHZ	9/21/2021	9/21/2022
APW3	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-35-120-5R0-10-12	PL2924	1GHZ-20GHZ	3/9/2022	3/9/2023
CDW5	DESKTOP COMPUTER	ELITE	PENTIUM 4	006	3.8GHZ	N/A	
CDZ4	LAB WORKSTATION	ELITE	LWS-10		WINDOWS 10	CNR	
GRB0	1MHZ, LISN SIGNAL CHECKER	ELITE	LISNCHKR1M	1	1MHZ	6/17/2021	6/17/2023
GSFB	OSP120 BASE UNIT	ROHDE & SCHWARZ	OSP120	101246	---	5/11/2021	5/11/2023
GSFC	OSP130	ROHDE & SCHWARZ	OSP130	101195	---	NOTE 1	
GSFD	OSP150	ROHDE & SCHWARZ	OSP150	101024	---	NOTE 1	
GSFE	OSP120	ROHDE & SCHWARZ	OSP120	101288	.01-40GHZ	6/11/2021	6/11/2023
MEA3	MICRO-OHM METER	KEITHLEY	580	772667	10UOHM-200KOHM	6/3/2021	6/3/2022
MPE0	DUAL POWER METER	AGILENT	E4419B	GB39511351	0.1MHZ-50GHZ	8/17/2021	8/17/2022
NHG1	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ	NOTE 1	
NSA7	LOG PERIODIC ANTENNA	AMPLIFIER RESEARCH	AT1080	14239	80-1000MHZ	NOTE 1	
NTA4	BILOG ANTENNA	TESEQ	6112D	46660	20-2000GHZ	10/5/2020	10/5/2022
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/28/2020	5/28/2022
PLF2	CISPR16 50UH LISN	ELITE	CISPR16/70A	002	.15-30MHz	4/5/2022	4/5/2023
PLF4	CISPR16 50UH LISN	ELITE	CISPR16/70A	003	.15-30MHz	4/5/2022	4/5/2023
RBG3	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101592	2HZ-44GHZ	4/7/2022	4/7/2023
SHC2	Power Supplies	HENGFU	HF60W-SL-24	A11372702	24V	NOTE 1	
T1EJ	10DB 25W ATTENUATOR	WEINSCHEL	46-10-34	CD6790	DC-18GHZ	1/12/2022	1/12/2024
VBR8	CISPR EN FCC CE VOLTAGE.exe					N/A	
VBV2	CISPR EN FCC ICES RE.EXE	ELITE	CISPR EN FCC ICES RE.EXE	---	---	N/A	
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	
XLTK	5W, 50 OHM TERMINATION	JFW INDUSTRIES	50T-052	---	DC-2GHZ	1/5/2022	1/5/2024
XPR0	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000	001	4.8-20GHZ	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.

19. Block Diagram of Test Setup



Radiated Measurements Test Setup

20. Transmitter Conducted Emissions (AC Mains)

Test Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Type of Test Site	Reverberation Chamber
Test Site Used	Room 14
Notes	Tx – 802.11g 6Mbps Ch1

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Conducted disturbance (mains port) (150 kHz – 30 MHz)	2.7

Requirements
All radio frequency voltages on the power lines for any frequency or frequencies of an intentional radiator shall not exceed the limits in the following table:

Transmitter Conducted Emissions Limits		
Frequency of Emission (MHz)	Conducted Limits (dBµV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56-46*
0.5 – 5	56	46
5 – 30	60	50
* The lower limit shall apply at the transition frequencies.		

Procedure
The interference on each power lead of the EUT was measured by connecting the measuring equipment to the appropriate meter terminal of the Line Impedance Stabilization Network (LISN). The meter terminal of the LISN not under test was terminated with 50 ohms. 1) The EUT was operated in the Tx mode. 2) Measurements were first made on the 115V, 60Hz high line. 3) The frequency range from 150kHz to 30MHz was broken up into smaller frequency sub-bands. 4) Conducted emissions measurements were taken on the first frequency sub-band using a peak detector. 5) The data thus obtained was then searched by the computer for the highest levels. Any emissions levels that were within 10dB of the average limit were then measured again using both a quasi-peak detector and an average detector. (If no peak readings were within 10dB of the average limit, quasi-peak and average readings were taken on the highest emissions levels measured during the peak detector scan.) 6) Steps (4) and (5) were repeated for the remainder of the frequency sub-bands until the entire frequency range from 150kHz to 30MHz was investigated. The peak trace was automatically plotted. The plot also shows quasi-peak and average readings that were taken on discrete frequencies. A table showing the quasi-peak and average readings was also generated. This tabular data compares the quasi-peak and average conducted emissions to the applicable conducted emissions limits. The resultant voltage level (VL) is a summation in decibels (dB) of the receiver meter reading (MTR) and the cable loss factor (CF). Formula 1: VL (dBµV) = MTR (dBµV) + CF (dB) 7) Steps (3) through (6) were repeated on the neutral line.

Test Setup for RF Conducted Emissions (AC Mains)

Test Setup for RF Conducted Emissions (AC Mains)

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 05/14/2020

Manufacturer	:	Astronics
Model	:	VisionPro
DUT Revision	:	NA
Serial Number	:	1430580
DUT Mode	:	Tx – 802.11g 6Mbps Ch1
Line Tested	:	Line
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	None
Test Engineer	:	J. Cardenas
Limit	:	Class B
Test Date	:	Apr 27, 2022 09:14:12 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

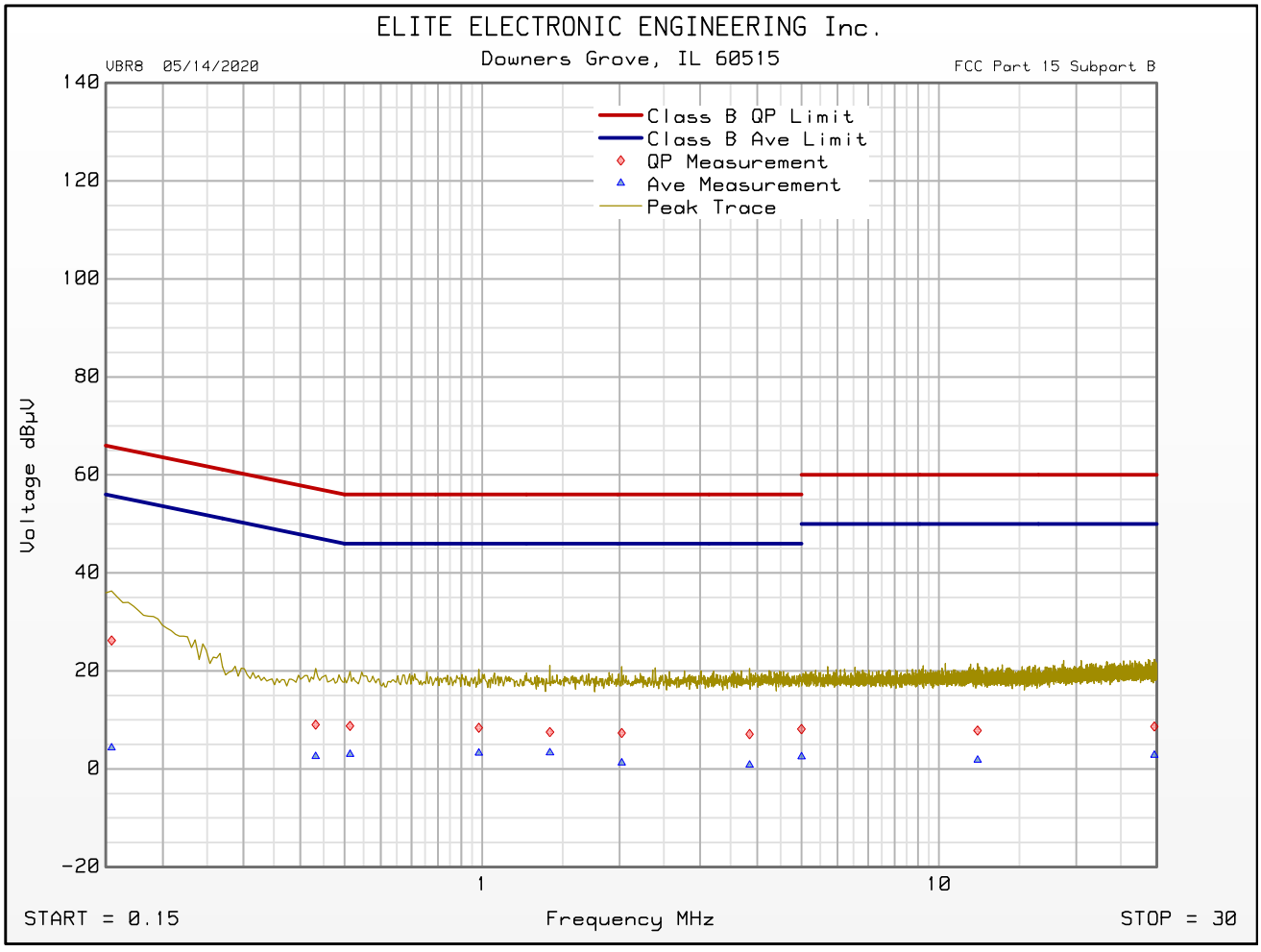
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.155	26.2	65.8		4.3	55.8	
0.432	9.0	57.2		2.6	47.2	
0.514	8.8	56.0		3.0	46.0	
0.984	8.4	56.0		3.3	46.0	
1.408	7.5	56.0		3.3	46.0	
2.021	7.3	56.0		1.2	46.0	
5.000	8.1	56.0		2.5	46.0	
12.150	7.8	60.0		1.8	50.0	
29.624	8.7	60.0		2.8	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 05/14/2020

Manufacturer	:	Astronics
Model	:	VisionPro
DUT Revision	:	NA
Serial Number	:	1430580
DUT Mode	:	Tx – 802.11g 6Mbps Ch1
Line Tested	:	Line
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	None
Test Engineer	:	J. Cardenas
Limit	:	Class B
Test Date	:	Apr 27, 2022 09:14:12 AM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 05/14/2020

Manufacturer	:	Astronics
Model	:	VisionPro
DUT Revision	:	NA
Serial Number	:	1430580
DUT Mode	:	Tx – 802.11g 6Mbps Ch1
Line Tested	:	Neutral
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	None
Test Engineer	:	J. Cardenas
Limit	:	Class B
Test Date	:	Apr 27, 2022 09:21:39 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

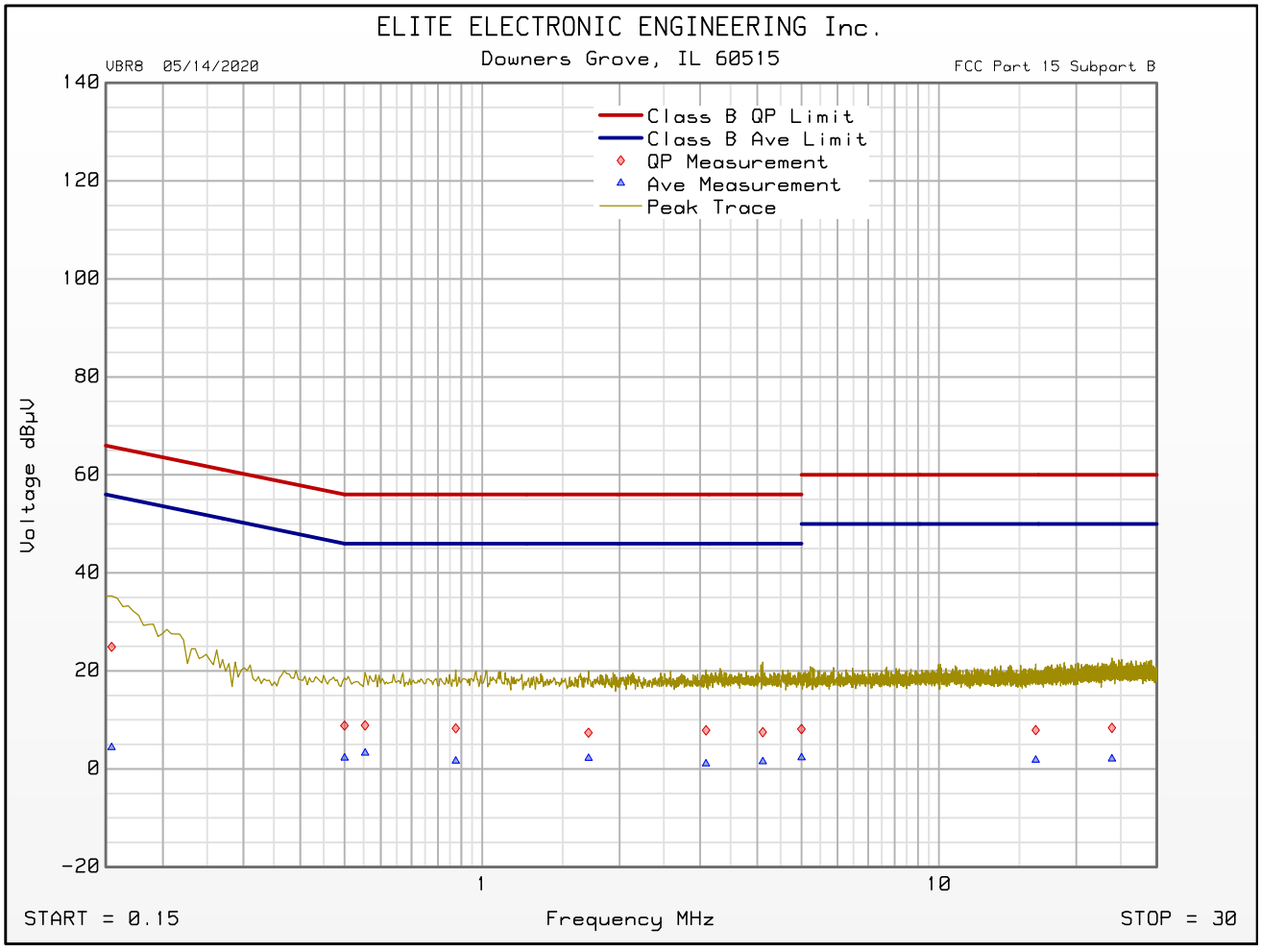
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.155	24.9	65.8		4.4	55.8	
0.500	8.8	56.0		2.3	46.0	
0.554	8.9	56.0		3.2	46.0	
0.876	8.3	56.0		1.6	46.0	
1.709	7.4	56.0		2.2	46.0	
3.092	7.9	56.0		1.1	46.0	
5.000	8.1	56.0		2.3	46.0	
16.295	7.9	60.0		1.8	50.0	
23.927	8.4	60.0		2.1	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 05/14/2020

Manufacturer	:	Astronics
Model	:	VisionPro
DUT Revision	:	NA
Serial Number	:	1430580
DUT Mode	:	Tx – 802.11g 6Mbps Ch1
Line Tested	:	Neutral
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	None
Test Engineer	:	J. Cardenas
Limit	:	Class B
Test Date	:	Apr 27, 2022 09:21:39 AM



Emissions Meet QP Limit
Emissions Meet Ave Limit

21. 6dB Bandwidth

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx

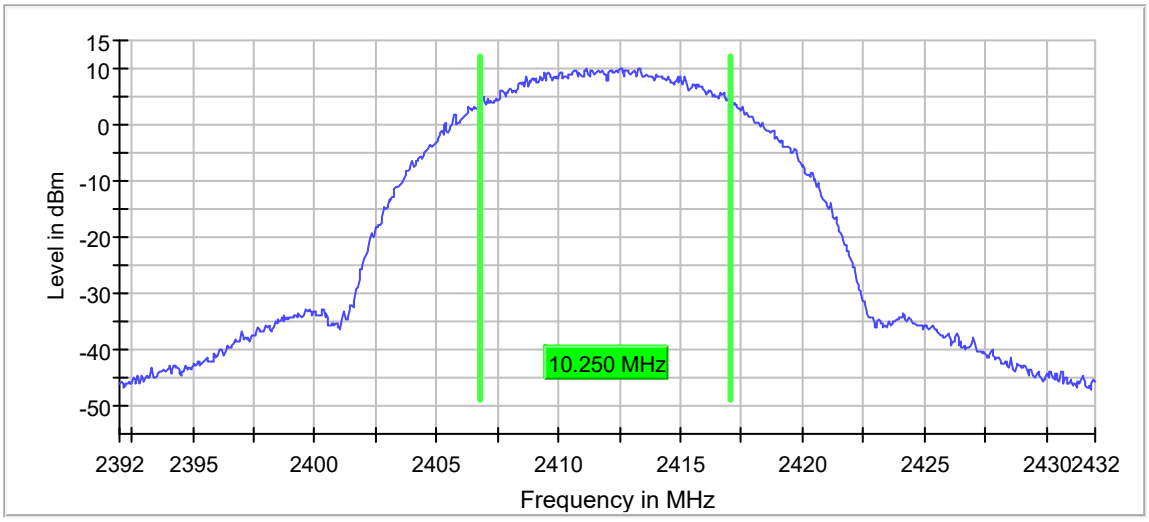
Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Measurement Method	Antenna Conducted
Type of Test Site	EMC Workbench
Test Site Used	N/A
Type of Antennas Used	N/A
Notes	None

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

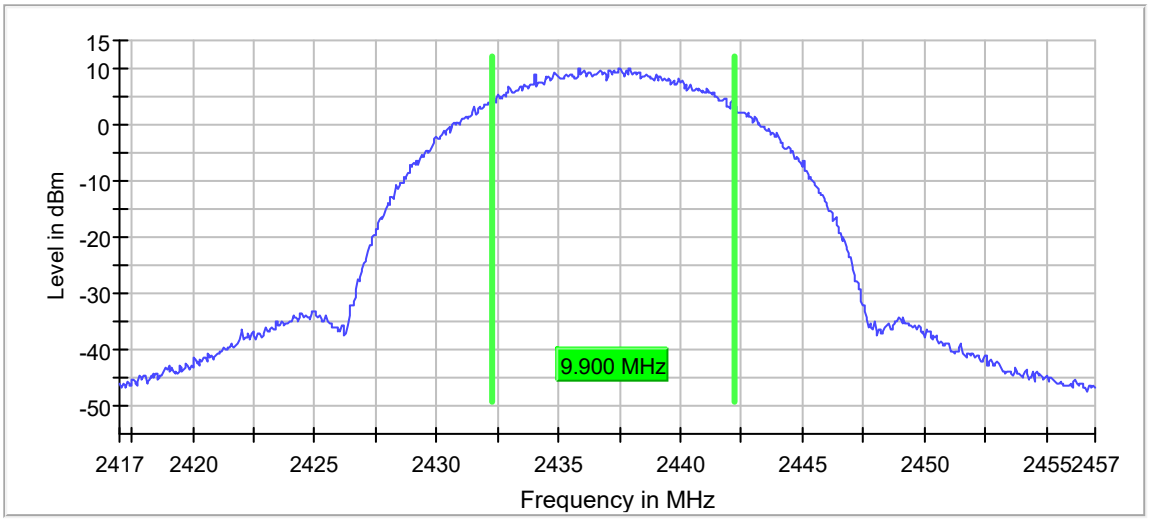
Requirements
Systems using digital modulation techniques shall have a minimum 6dB bandwidth of 500kHz

Procedure
The antenna port of the EUT was connected to the spectrum analyzer through an R&S OSP 120. The EUT was allowed to transmit continuously. The transmit channel was set separately to low, middle, and high channels. The resolution bandwidth (RBW) was set to 100kHz, the video bandwidth (VBW) was set to the same as or 3 times greater than the RBW, and the span was set to 3 times the RBW. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined. The analyzer's display was then screenshot and saved.

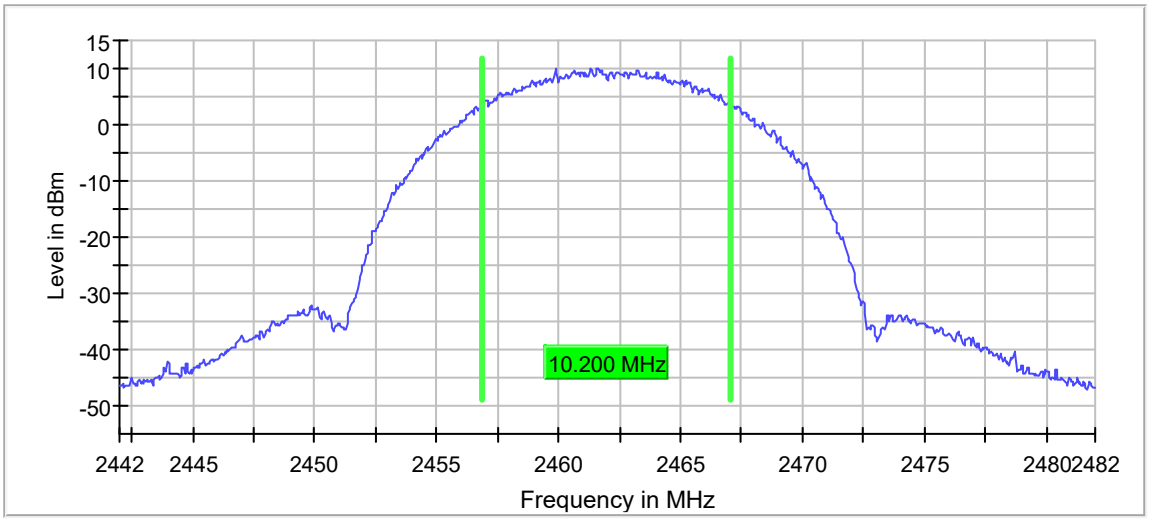
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b
Frequency Tested	2412MHz
Result	6dB BW = 10.250MHz
Notes	11Mbps, Antenna Port A



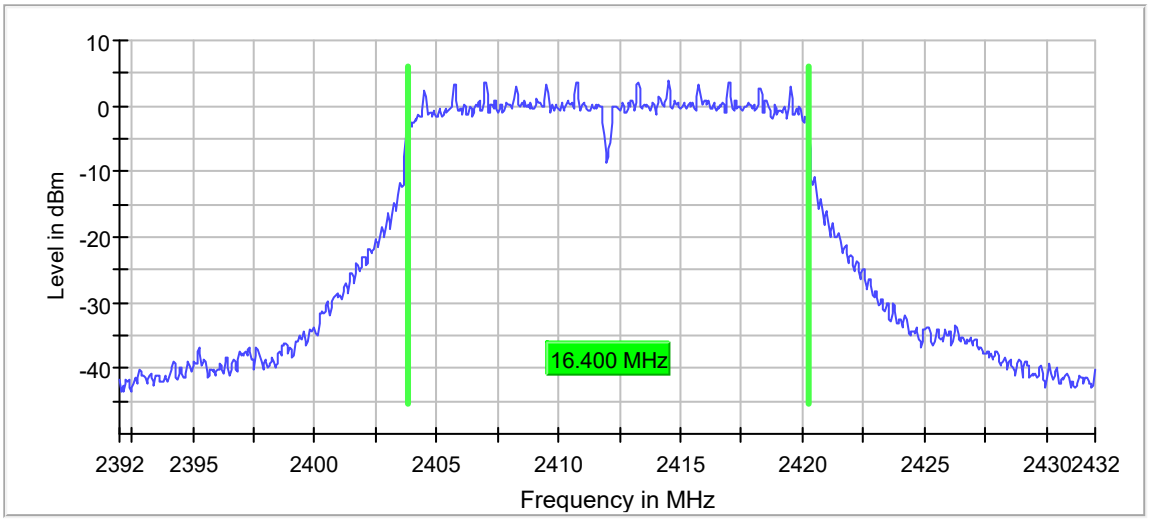
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b
Frequency Tested	2437MHz
Result	6dB BW = 9.900MHz
Notes	11Mbps, Antenna Port A



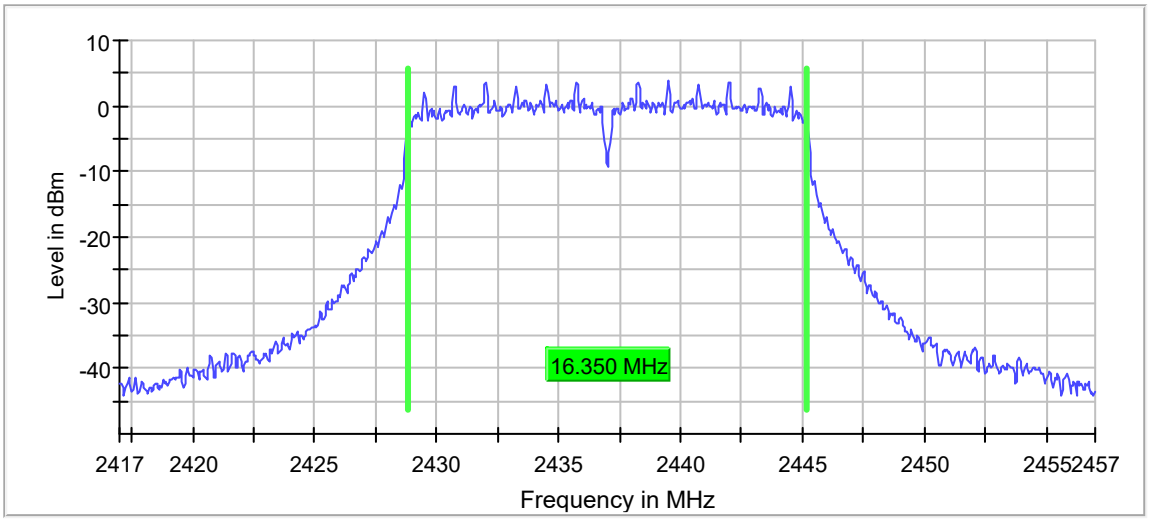
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b
Frequency Tested	2462MHz
Result	6dB BW = 10.200MHz
Notes	11Mbps, Antenna Port A



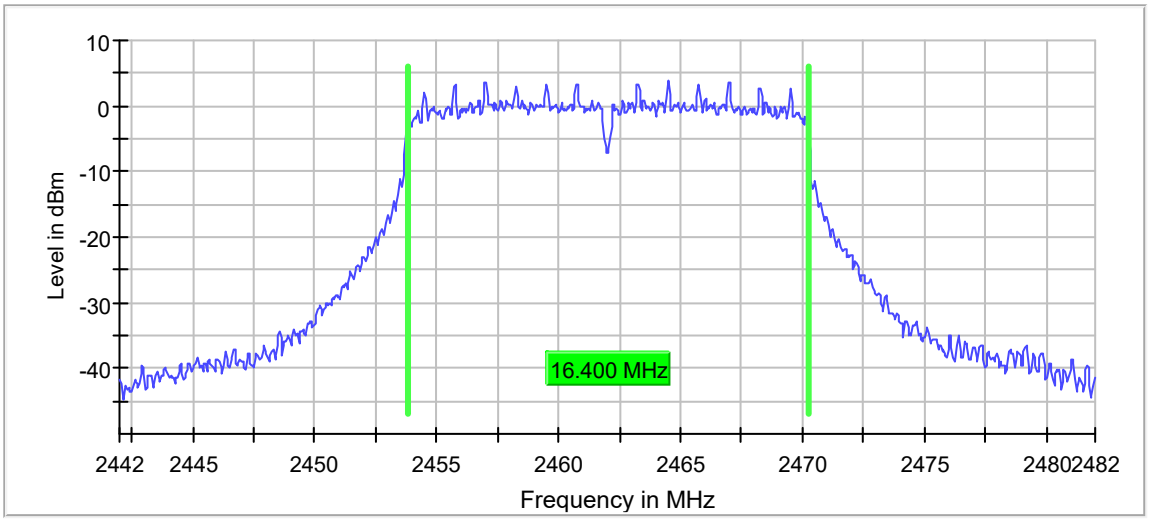
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g
Frequency Tested	2412MHz
Result	6dB BW = 16.400MHz
Notes	6Mbps, Antenna Port A



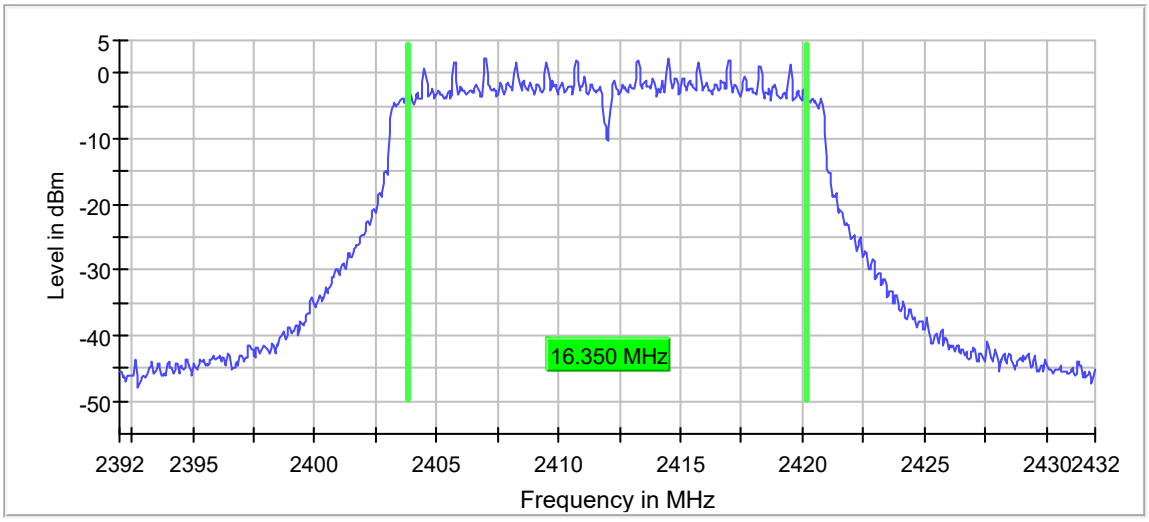
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g
Frequency Tested	2437MHz
Result	6dB BW = 16.350MHz
Notes	6Mbps, Antenna Port A



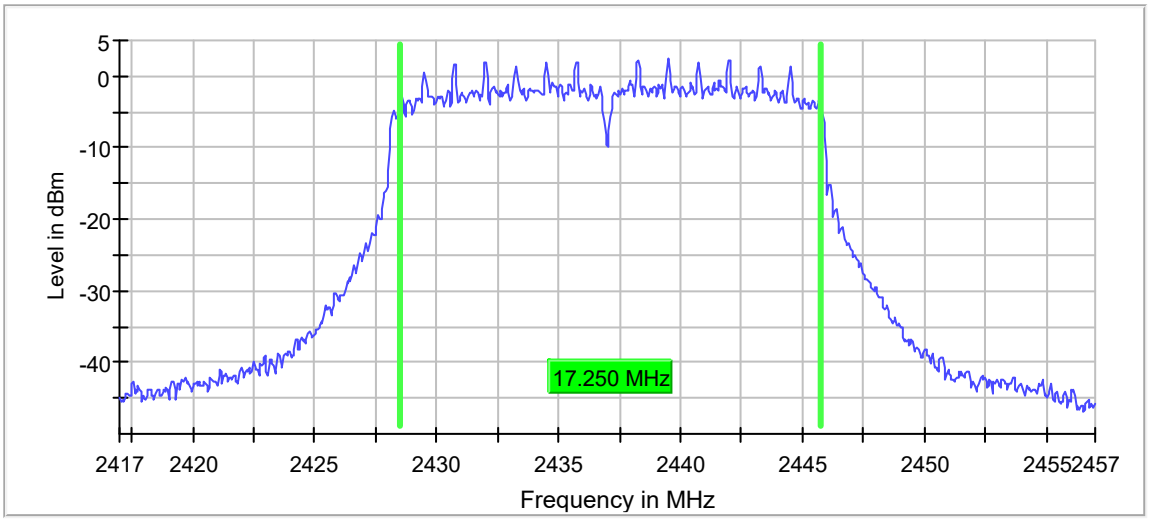
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g
Frequency Tested	2462MHz
Result	6dB BW = 16.400MHz
Notes	6Mbps, Antenna Port A



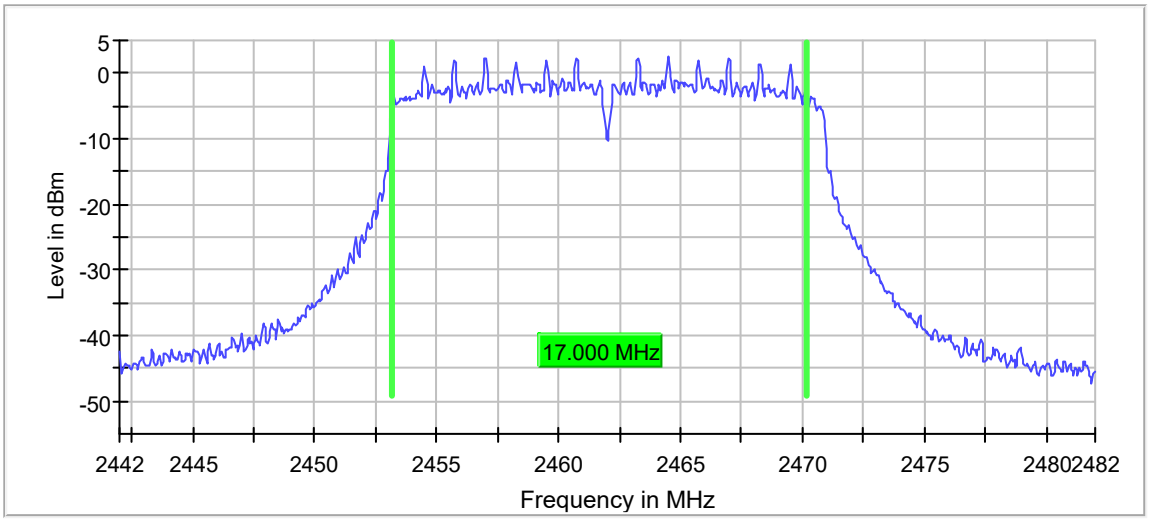
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20
Frequency Tested	2412MHz
Result	6dB BW = 16.350MHz
Notes	MCS2, Antenna Port A



Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20
Frequency Tested	2437MHz
Result	6dB BW = 17.250MHz
Notes	MCS2, Antenna Port A



Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20
Frequency Tested	2462MHz
Result	6dB BW = 17.000MHz
Notes	MCS2, Antenna Port A



22. Occupied Bandwidth (99%)

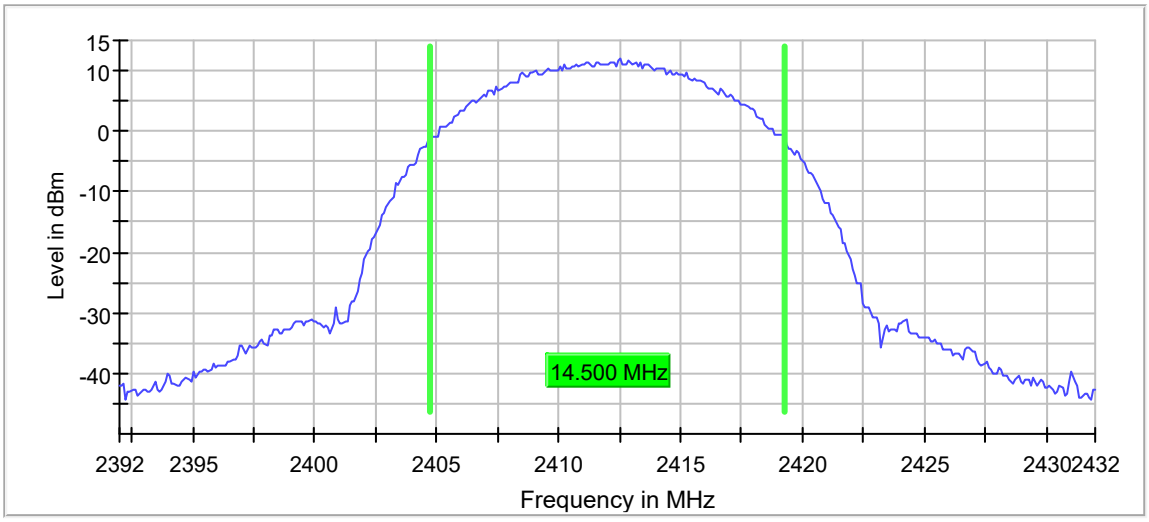
EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Measurement Method	Antenna Conducted
Type of Test Site	EMC Workbench
Test Site Used	N/A
Type of Antennas Used	N/A
Notes	None

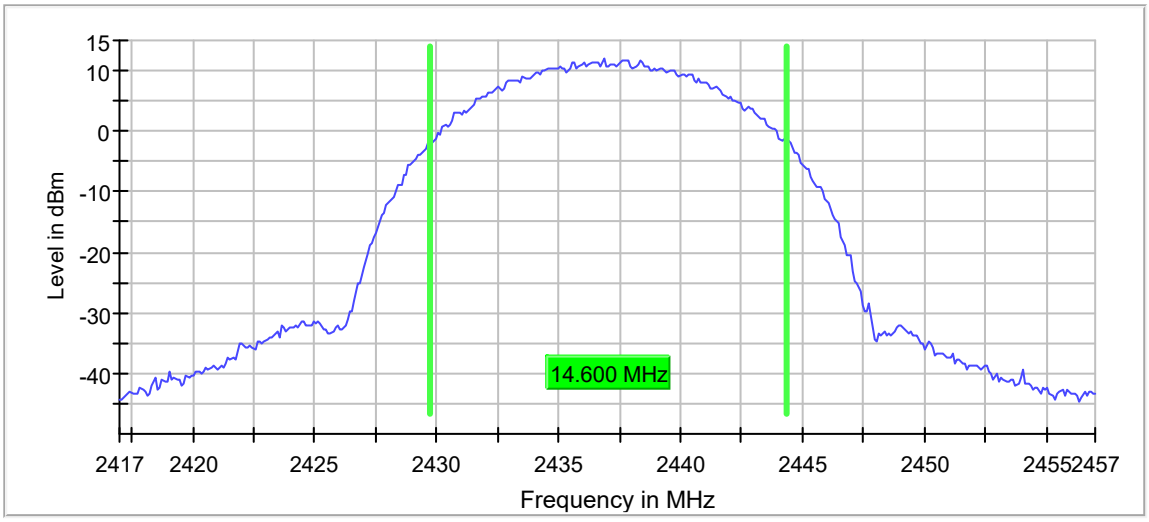
Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz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

Procedure
The antenna port of the EUT was connected to the spectrum analyzer through an R&S OSP 120. The EUT was allowed to transmit continuously. The EUT was allowed to transmit continuously. The transmit channel was set separately to low, middle, and high channels. The resolution bandwidth (RBW) was set to 1% to 5% of the actual occupied / x dB bandwidth, the video bandwidth (VBW) was set 3 times greater than the RBW, and the span was set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined. The analyzer's display was plotted using a 'screen dump' utility.

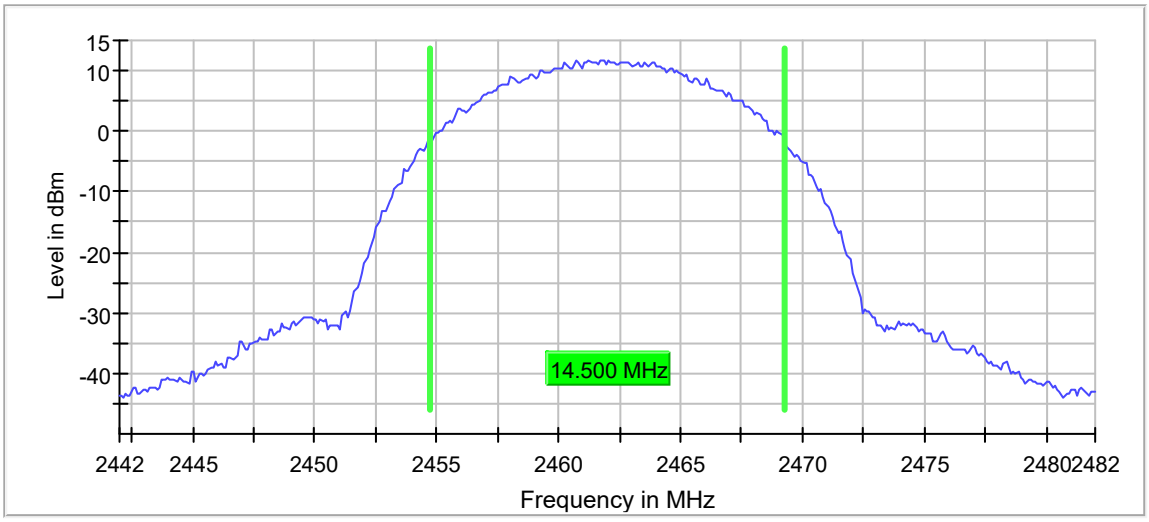
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b
Frequency Tested	2412MHz
Result	OCB 99% BW = 14.500MHz
Notes	11Mbps, Antenna Port A



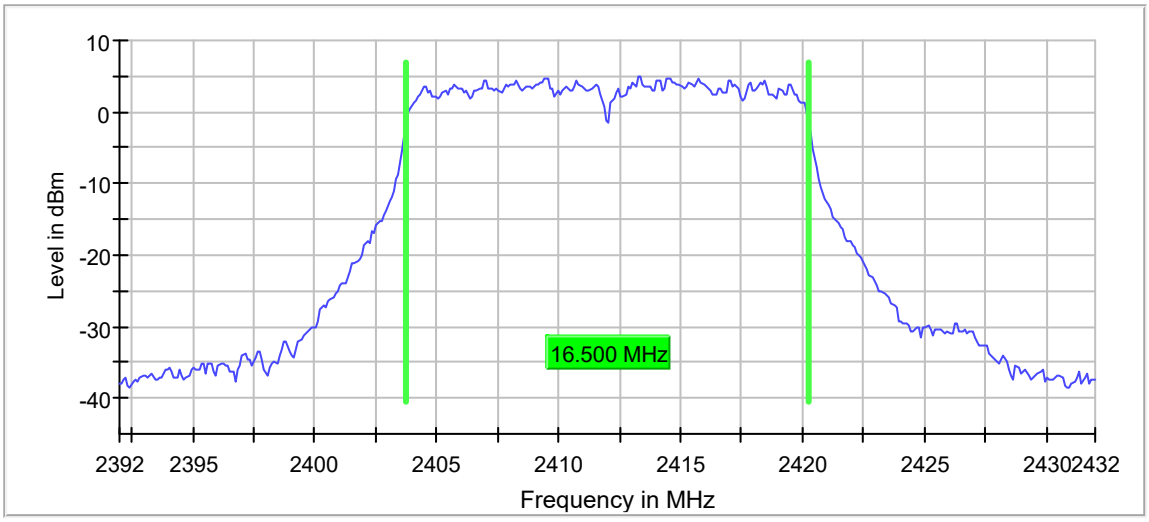
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b
Frequency Tested	2437MHz
Result	OCB 99% BW = 14.600MHz
Notes	11Mbps, Antenna Port A



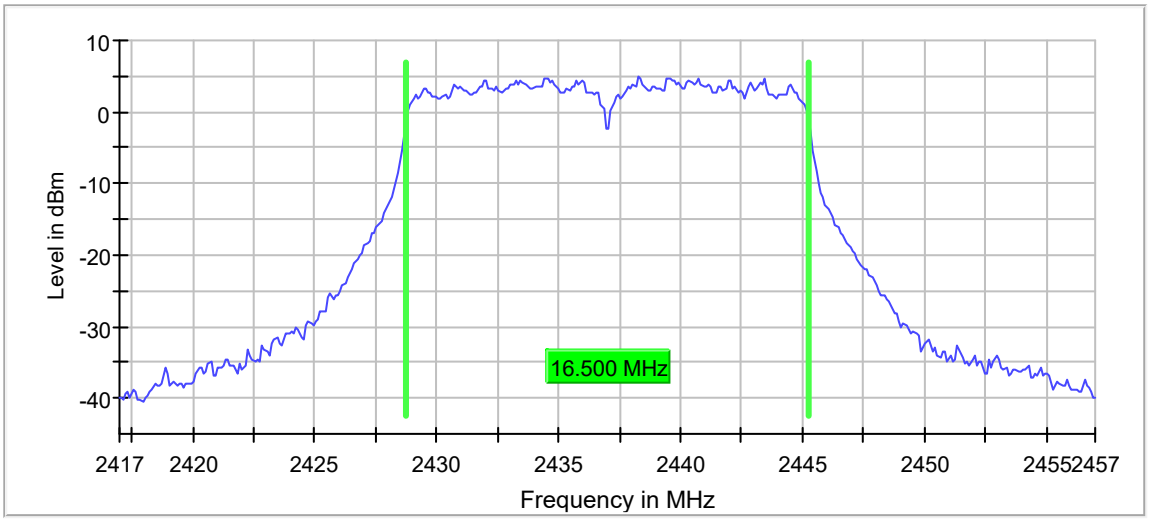
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b
Frequency Tested	2462MHz
Result	OCB 99% BW = 14.500MHz
Notes	11Mbps, Antenna Port A



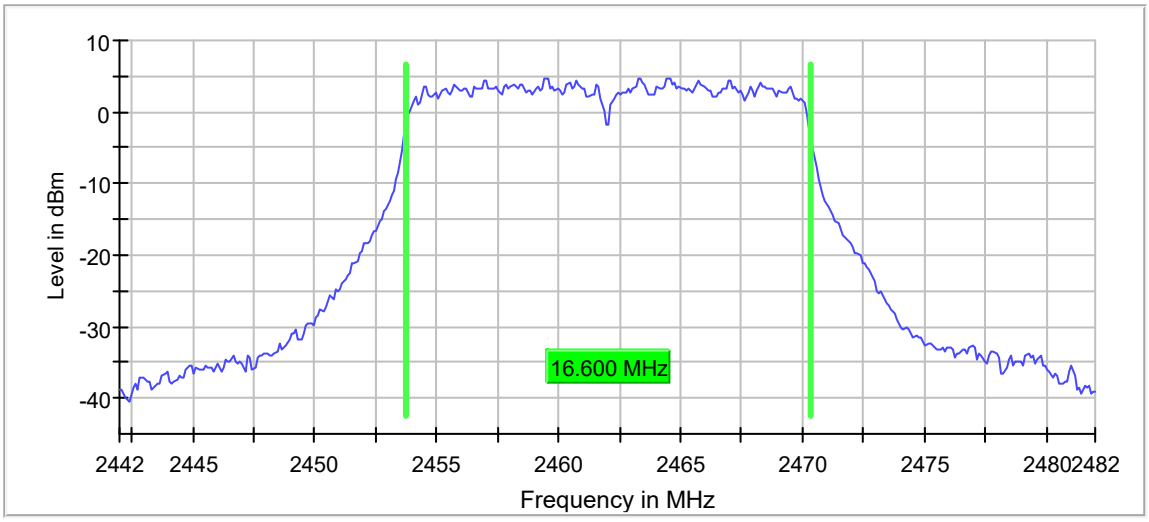
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g
Frequency Tested	2412MHz
Result	OCB 99% BW = 16.500MHz
Notes	6Mbps, Antenna Port A



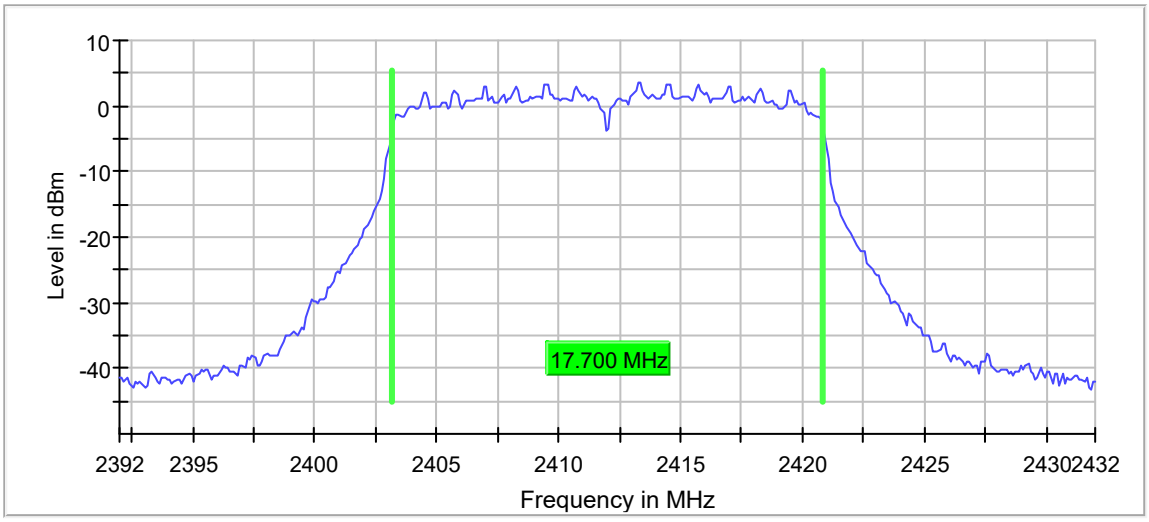
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g
Frequency Tested	2437MHz
Result	OCB 99% BW = 16.500MHz
Notes	6Mbps, Antenna Port A



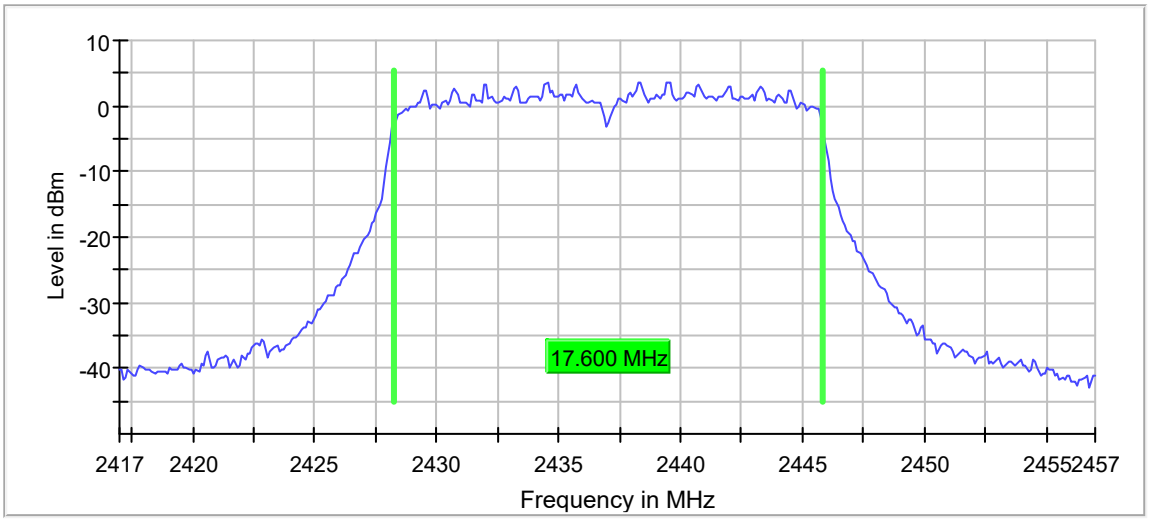
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g
Frequency Tested	2462MHz
Result	OCB 99% BW = 16.600MHz
Notes	6Mbps, Antenna Port A



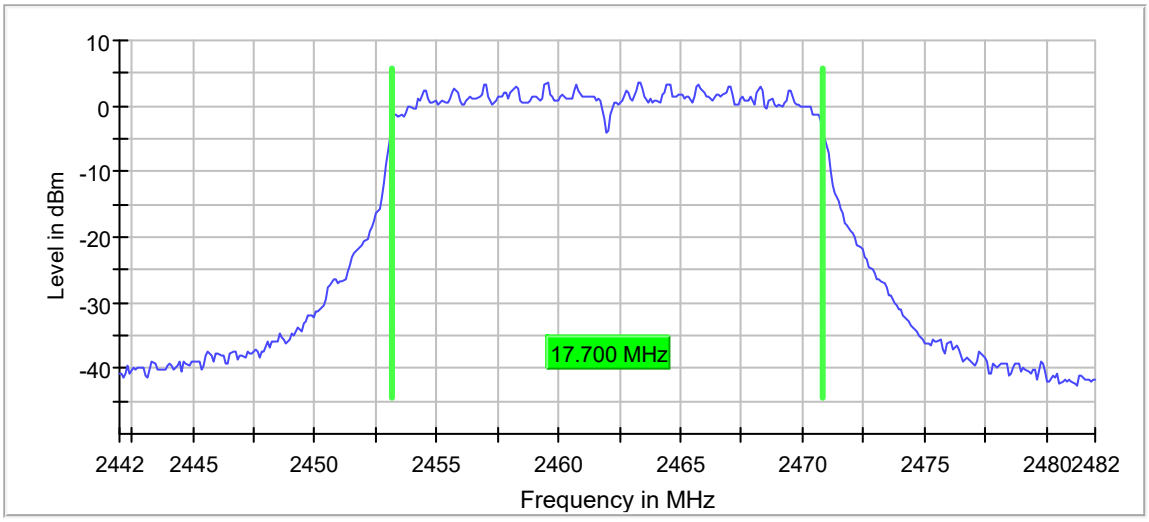
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20
Frequency Tested	2412MHz
Result	OCB 99% BW = 17.700MHz
Notes	MCS2, Antenna Port A



Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20
Frequency Tested	2437MHz
Result	OCB 99% BW = 17.600MHz
Notes	MCS2, Antenna Port A



Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20
Frequency Tested	2462MHz
Result	OCB 99% BW = 17.700MHz
Notes	MCS2, Antenna Port A



23. Maximum Peak Conducted Output Power

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Measurement Method	Antenna Conducted
Type of Test Site	Tabletop
Test Site Used	N/A
Notes	None

Requirements
The output power shall not exceed 1W (30dBm).

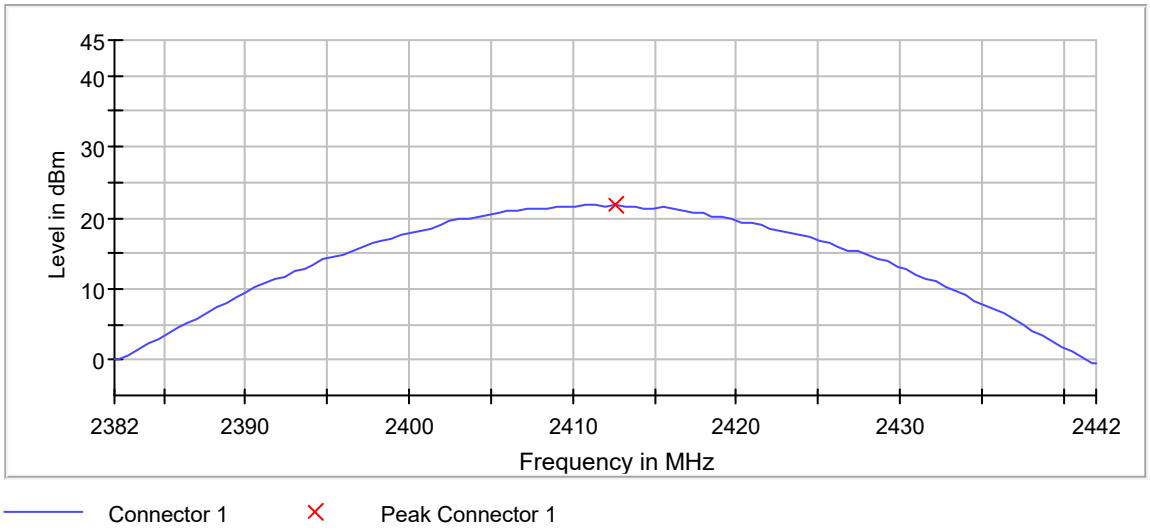
Procedure
The antenna port of the EUT was connected to the spectrum analyzer through an R&S OSP 120. The EUT was set to transmit separately at the low, middle, and high channels. The resolution bandwidth (RBW) was set to greater than the 6dB bandwidth. The span was set to greater than 3 times the RBW. The 'Max-Hold' function was engaged. The maximum meter reading was recorded. The peak power output was calculated for the low, middle, and high channels.

Protocol	Channel	Antenna	Data Rate	Power Level Setting	Measured Conducted Power (dBm)	Measured Conducted Power (mW)
802.11b	1	A	1	107	20	100.0
			2	107	19.9	97.7
			5.5	107	20	100.0
			11	107	22	158.5
	6	A	1	107	20.3	107.2
			2	107	19.9	97.7
			55	107	20.4	109.6
			11	107	21.5	141.3
	11	A	1	107	20.3	107.2
			2	107	19.9	97.7
			5.5	107	20.2	104.7
			11	107	21.4	138.0
	1	B	1	107	19.8	95.5
			2	107	19.4	87.1
			5.5	107	19.7	93.3
			11	107	20.4	109.6
	6	B	1	107	19.9	97.7
			2	107	20.1	102.3
			5.5	107	20.1	102.3
			11	107	20.2	104.7
	11	B	1	107	20.3	107.2
			2	107	19.9	97.7
			5.5	107	20.3	107.2
			11	107	20.6	114.8

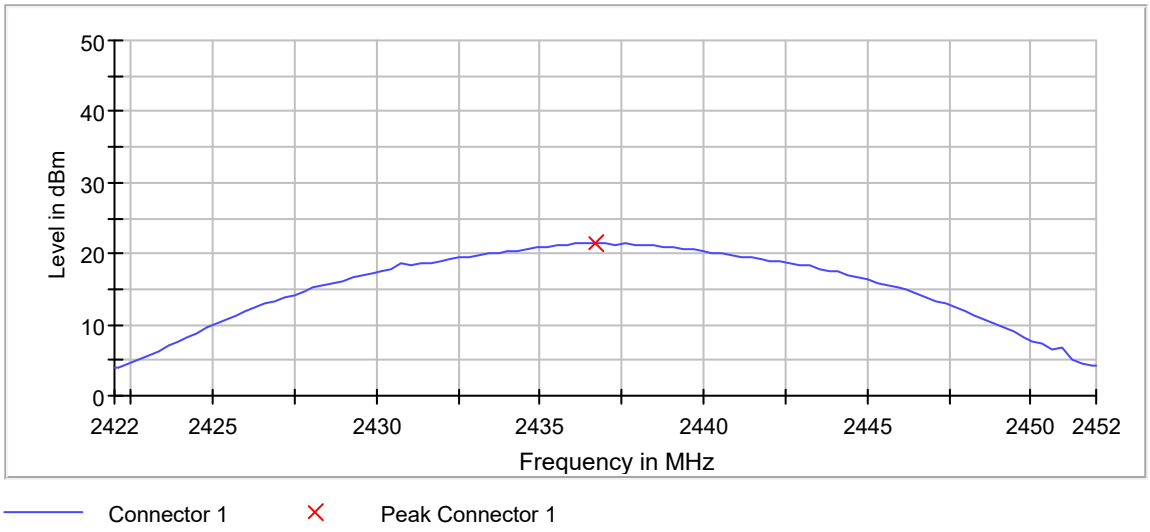
Protocol	Channel	Antenna	Data Rate	Power Level Setting	Measured Conducted Power (dBm)	Measured Conducted Power (mW)
802.11g	1	A	6	87	24.3	269.2
			9	87	23.3	213.8
			12	87	22.5	177.8
			18	87	22.8	190.5
			24	87	22.7	186.2
			36	87	22.4	173.8
			48	87	22	158.5
			54	87	22.3	169.8
	6	A	6	87	24.5	281.8
			9	87	23.3	213.8
			12	87	22.7	186.2
			18	87	22.7	186.2
			24	87	23	199.5
			36	87	22.2	166.0
			48	87	22.2	166.0
			54	87	22.6	182.0
	11	A	6	87	23.9	245.5
			9	87	23.2	208.9
			12	87	22.4	173.8
			18	87	22.4	173.8
			24	87	22.5	177.8
			36	87	22.3	169.8
			48	87	22	158.5
			54	87	22.3	169.8
	1	B	6	87	22.9	195.0
			9	87	22.9	195.0
			12	87	23	199.5
			18	87	22.8	190.5
			24	87	23.2	208.9
			36	87	22.4	173.8
			48	87	22.1	162.2
			54	87	21.6	144.5
	6	B	6	87	22.8	190.5
			9	87	22.5	177.8
			12	87	22.7	186.2
			18	87	22.9	195.0
			24	87	22.9	195.0
			36	87	22.3	169.8
			48	87	22.4	173.8
			54	87	21.9	154.9
	11	B	6	87	22.4	173.8
			9	87	22.8	190.5
			12	87	22.7	186.2
			18	87	22.5	177.8
			24	87	22.3	169.8
			36	87	22.3	169.8
			48	87	22.4	173.8
			54	87	22.7	186.2

Protocol	Channel	Antenna	Data Rate	Power Level Setting	Measured Conducted Power (dBm)	Measured Conducted Power (mW)
802.11n	1	A	MCS0	87	22.5	177.8
			MCS1	87	22.7	186.2
			MCS2	87	22.2	166.0
			MCS3	87	22.9	195.0
			MCS4	87	22.3	169.8
			MCS5	87	22.9	195.0
			MCS6	87	22.6	182.0
			MCS7	87	21.7	147.9
	6	A	MCS0	87	22.8	190.5
			MCS1	87	22.6	182.0
			MCS2	87	22.9	195.0
			MCS3	87	22.2	166.0
			MCS4	87	22.5	177.8
			MCS5	87	22.8	190.5
			MCS6	87	22.7	186.2
			MCS7	87	22.5	177.8
	11	A	MCS0	87	22.5	177.8
			MCS1	87	22.5	177.8
			MCS2	87	22.2	166.0
			MCS3	87	22.2	166.0
			MCS4	87	22.4	173.8
			MCS5	87	22.8	190.5
			MCS6	87	22	158.5
			MCS7	87	21.6	144.5
	1	B	MCS0	87	22.8	190.5
			MCS1	87	22.9	195.0
			MCS2	87	23	199.5
			MCS3	87	23	199.5
			MCS4	87	22.5	177.8
			MCS5	87	21.7	147.9
			MCS6	87	22.6	182.0
			MCS7	87	21.6	144.5
	6	B	MCS0	87	22.3	169.8
			MCS1	87	22.3	169.8
			MCS2	87	22.4	173.8
			MCS3	87	22.4	173.8
			MCS4	87	22.4	173.8
			MCS5	87	22.6	182.0
			MCS6	87	22.7	186.2
			MCS7	87	22.2	166.0
	11	B	MCS0	87	22.4	173.8
			MCS1	87	22.4	173.8
			MCS2	87	22.5	177.8
			MCS3	87	22.5	177.8
			MCS4	87	22.7	186.2
			MCS5	87	22.4	173.8
			MCS6	87	22	158.5
			MCS7	87	21.7	147.9

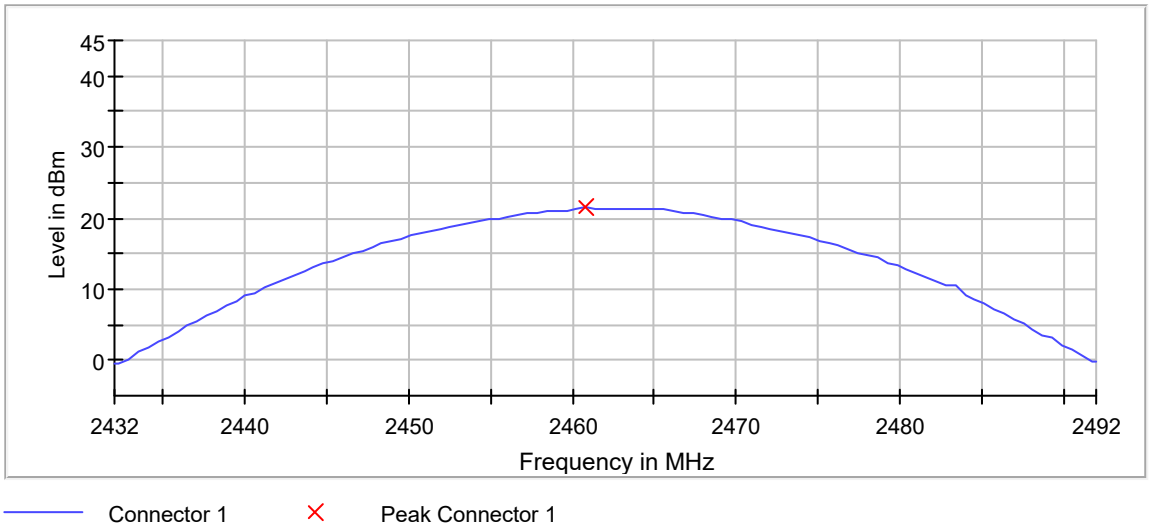
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz
Result	Peak Conducted Power = 22.0dBm
Notes	11Mbps Antenna A, Highest Power Mode



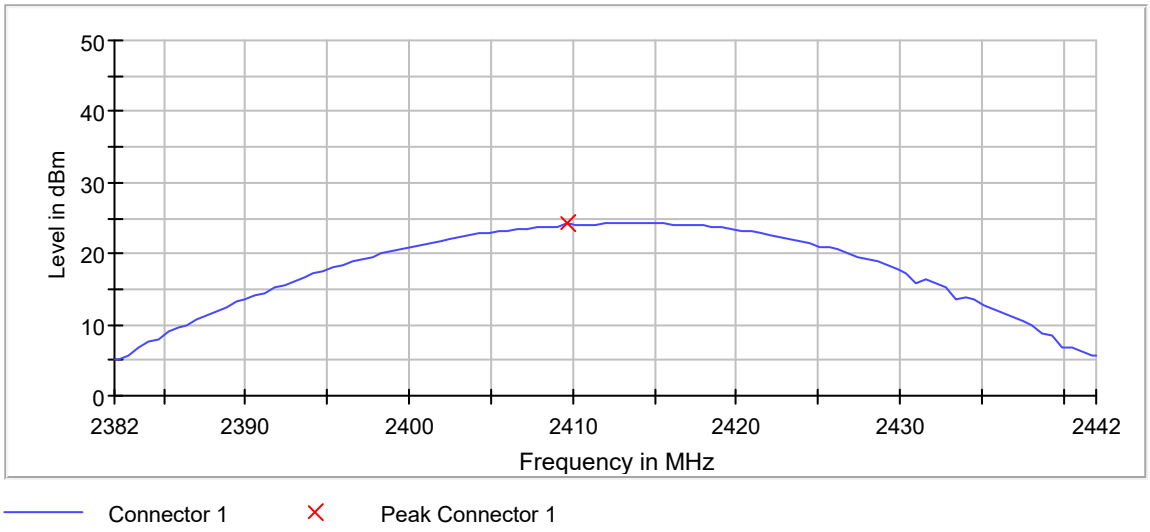
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2437MHz
Result	Peak Conducted Power = 21.5dBm
Notes	11Mbps Antenna A, Highest Power Mode



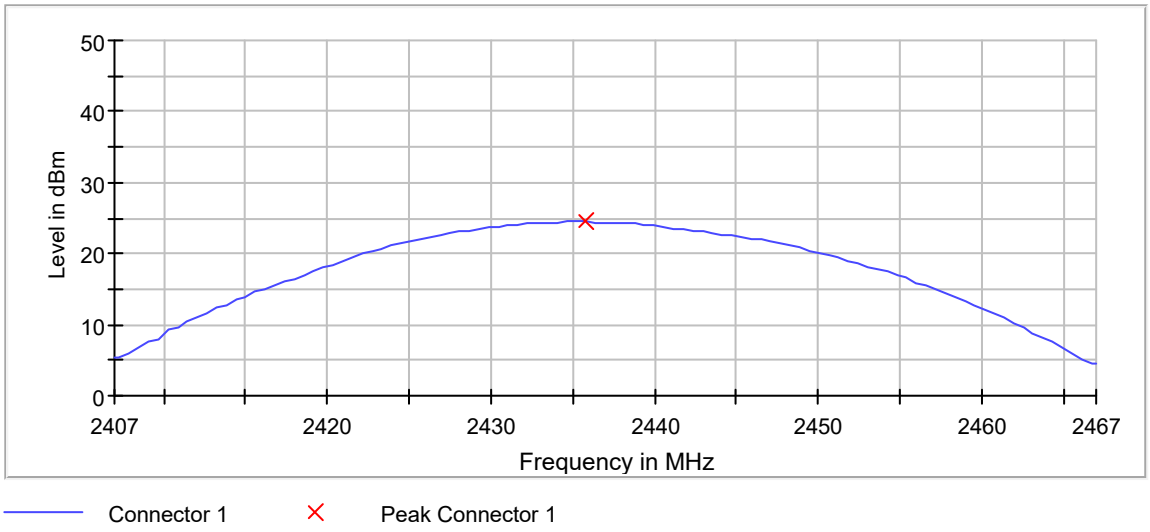
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz
Result	Peak Conducted Power = 21.4dBm
Notes	11Mbps Antenna A, Highest Power Mode



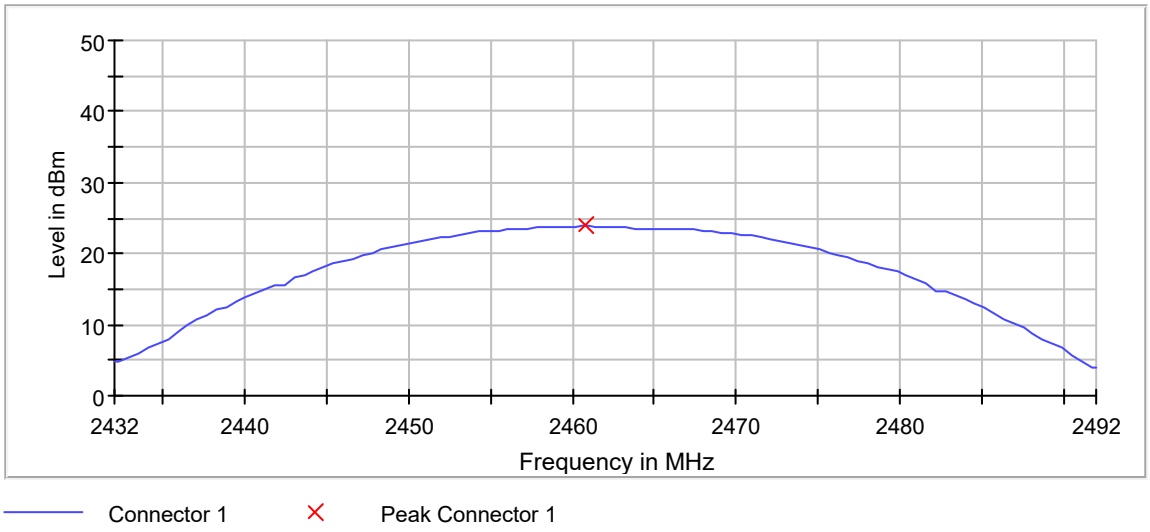
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz
Result	Peak Conducted Power = 24.3dBm
Notes	6Mbps Antenna A, Highest Power Mode



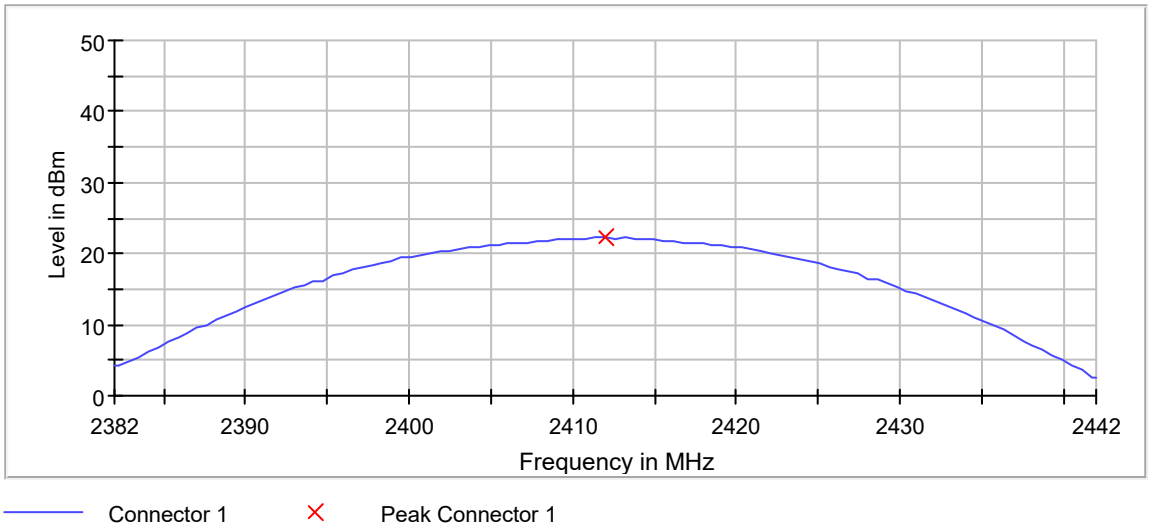
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2437MHz
Result	Peak Conducted Power = 24.5dBm
Notes	6Mbps Antenna A, Highest Power Mode



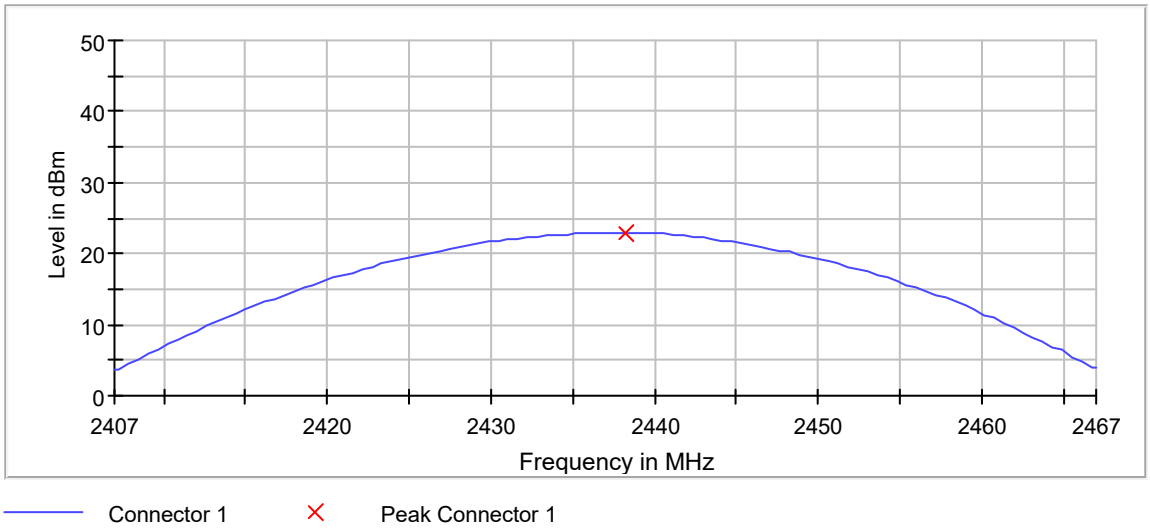
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz
Result	Peak Conducted Power = 23.9dBm
Notes	11Mbps Antenna A, Highest Power Mode



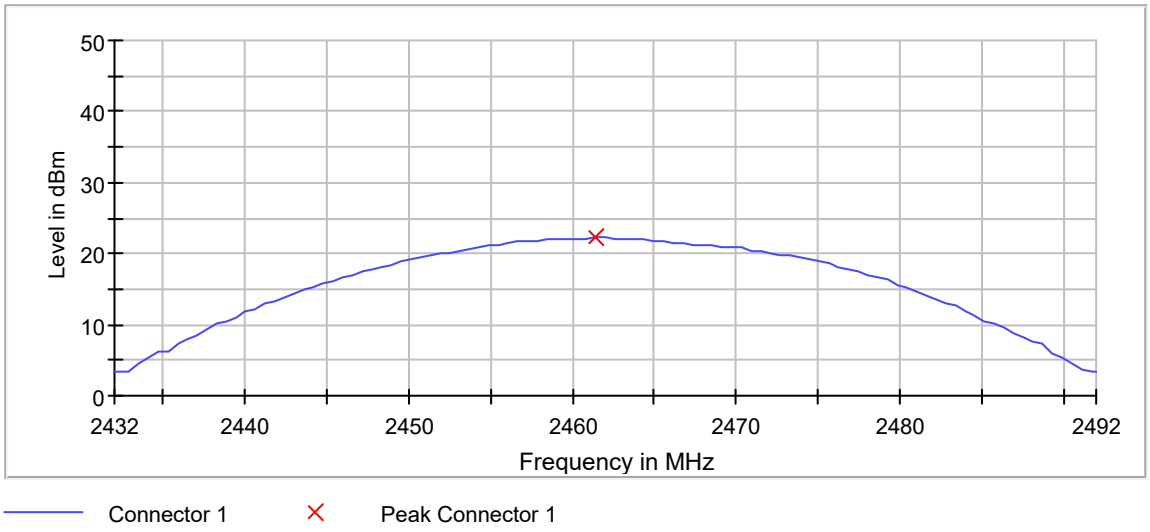
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz
Result	Peak Conducted Power = 22.2dBm
Notes	MCS2 Antenna A, Highest Power Mode



Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2437MHz
Result	Peak Conducted Power = 22.9dBm
Notes	MCS2 Antenna A, Highest Power Mode



Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz
Result	Peak Conducted Power = 22.2dBm
Notes	MCS2 Antenna A, Highest Power Mode



24. Effective Isotropic Radiated Power (EIRP)

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Measurement Method	Radiated
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	R21F
Type of Antennas Used	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

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
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Notes	Antenna A

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)
2412	H	74.7	3.4	32.3	0.0	110.4	15.1	36.0	-20.9
	V	75.4	3.4	32.3	0.0	111.1	15.8	36.0	-20.2
2437	H	79.1	3.5	32.5	0.0	115.0	19.7	36.0	-16.3
	V	79.9	3.5	32.5	0.0	115.8	20.5	36.0	-15.5
2462	H	79.6	3.5	32.6	0.0	115.6	20.3	36.0	-15.7
	V	77.1	3.5	32.6	0.0	113.2	17.9	36.0	-18.1

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Notes	Antenna A

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)
2412	H	81.9	3.4	32.3	0.0	117.6	22.3	36.0	-13.7
	V	81.7	3.4	32.3	0.0	117.4	22.1	36.0	-13.9
2437	H	81.9	3.5	32.5	0.0	117.9	22.6	36.0	-13.4
	V	82.4	3.5	32.5	0.0	118.3	23.0	36.0	-13.0
2462	H	82.1	3.5	32.6	0.0	118.1	22.8	36.0	-13.2
	V	81.6	3.5	32.6	0.0	117.7	22.4	36.0	-13.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Notes	Antenna A

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)
2412	H	81.6	3.4	32.3	0.0	117.3	22.0	36.0	-14.0
	V	80.5	3.4	32.3	0.0	116.2	20.9	36.0	-15.1
2437	H	80.8	3.5	32.5	0.0	116.7	21.4	36.0	-14.6
	V	80.6	3.5	32.5	0.0	116.5	21.2	36.0	-14.8
2462	H	80.8	3.5	32.6	0.0	116.9	21.6	36.0	-14.4
	V	81.6	3.5	32.6	0.0	117.7	22.4	36.0	-13.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Notes	Antenna B

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)
2412	H	75.4	3.4	32.3	0.0	111.1	15.8	36.0	-20.2
	V	75.5	3.4	32.3	0.0	111.2	15.9	36.0	-20.1
2437	H	77.7	3.5	32.5	0.0	113.6	18.3	36.0	-17.7
	V	78.9	3.5	32.5	0.0	114.9	19.6	36.0	-16.4
2462	H	79.0	3.5	32.6	0.0	115.1	19.8	36.0	-16.2
	V	76.1	3.5	32.6	0.0	112.1	16.8	36.0	-19.2

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Notes	Antenna B

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)
2412	H	79.3	3.4	32.3	0.0	115.0	19.7	36.0	-16.3
	V	79.6	3.4	32.3	0.0	115.3	20.0	36.0	-16.0
2437	H	79.5	3.5	32.5	0.0	115.5	20.2	36.0	-15.8
	V	79.2	3.5	32.5	0.0	115.2	19.9	36.0	-16.1
2462	H	78.8	3.5	32.6	0.0	114.8	19.5	36.0	-16.5
	V	81.0	3.5	32.6	0.0	117.1	21.8	36.0	-14.2

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Notes	Antenna B

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)
2412	H	76.6	3.4	32.3	0.0	112.4	17.1	36.0	-18.9
	V	79.0	3.4	32.3	0.0	114.7	19.4	36.0	-16.6
2437	H	79.6	3.5	32.5	0.0	115.6	20.3	36.0	-15.7
	V	81.9	3.5	32.5	0.0	117.8	22.5	36.0	-13.5
2462	H	80.6	3.5	32.6	0.0	116.6	21.3	36.0	-14.7
	V	82.4	3.5	32.6	0.0	118.4	23.1	36.0	-12.9

25. Duty Cycle Factor Measurements

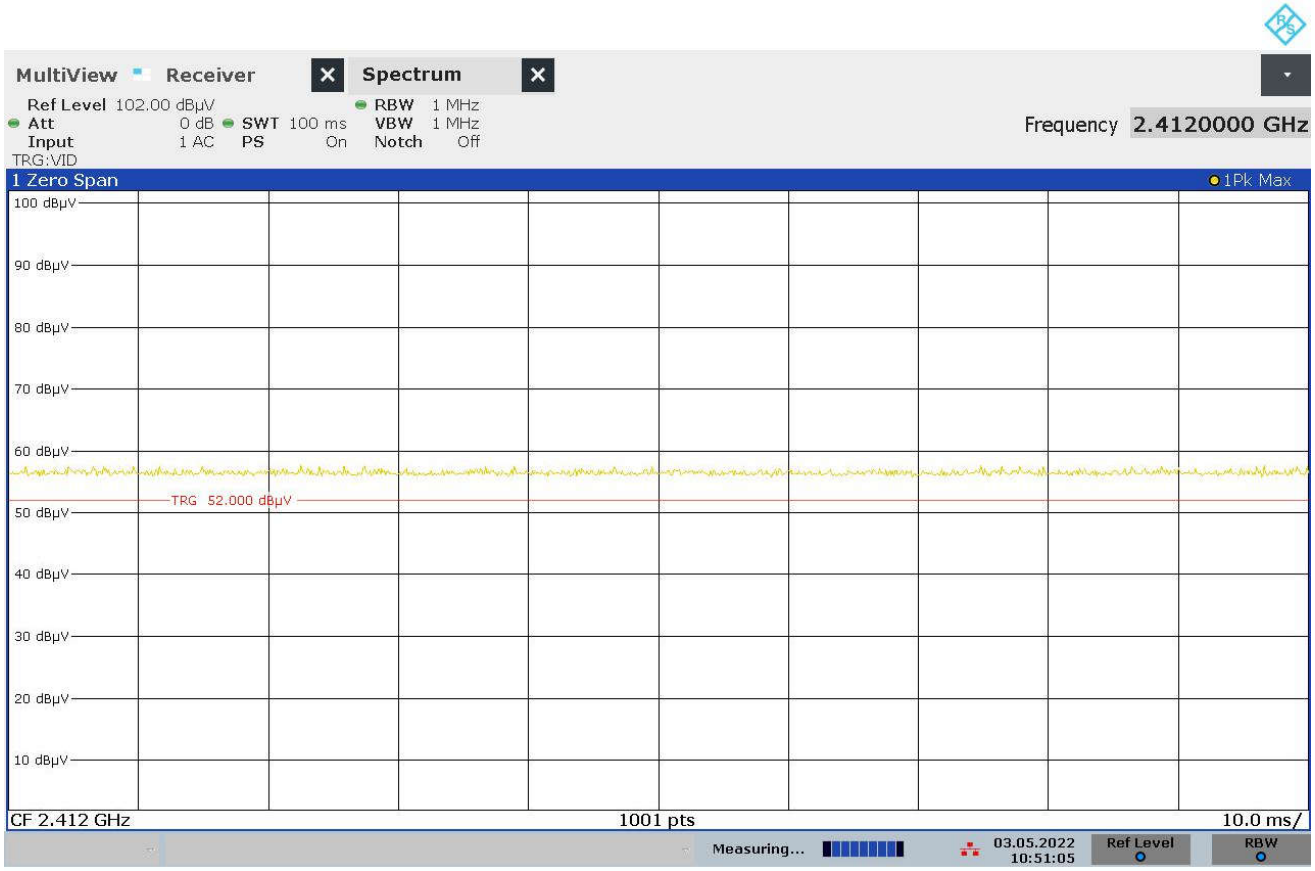
EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx

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	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

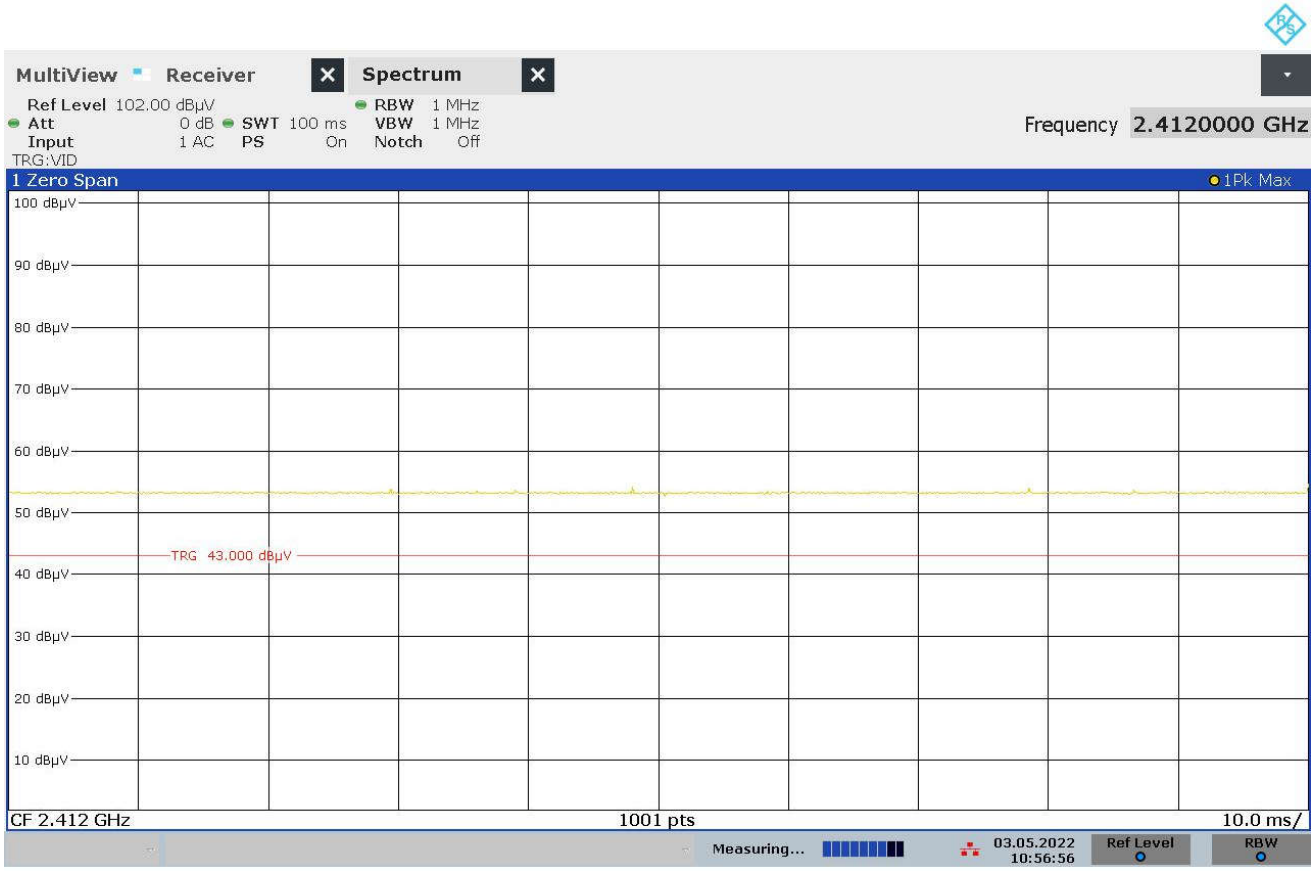
Procedure
The duty cycle factor is used to convert peak detected readings to average readings when pulsed modulation is employed. This factor is computed from the time domain trace of the pulse modulation signal. With the transmitter set up to transmit for maximum pulse density, the time domain trace is displayed on the spectrum analyzer. This trace is obtained by tuning center frequency to the transmitter frequency and then setting a zero-span width with 10msec/div. The amplitude settings are adjusted so that the on/off transitions clear the 4th division from the bottom of the display. The markers are set at the beginning and end of the "on-time". The trace is recorded. Next the spectrum analyzer center frequency is set to the transmitter frequency with a zero-span width and 10msec/div. This shows if the word is longer than 100msec or shorter than 100msec. If the word period is less than 100msec, the display is set to show at least one word. The on-time and off-time are then measured. The on-time is total time signal level exceeds the 4th division. Off-time is time under for the word period. The duty cycle is then computed as $\left(\frac{On\ Time}{Word\ Period}\right)$, where $Word\ Period\ =\ (On\ Time + Off\ Time)$.

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz
Result	Duty Cycle = 100%
Notes	None



10:51:05 03.05.2022

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz
Result	Duty Cycle = 100%
Notes	None



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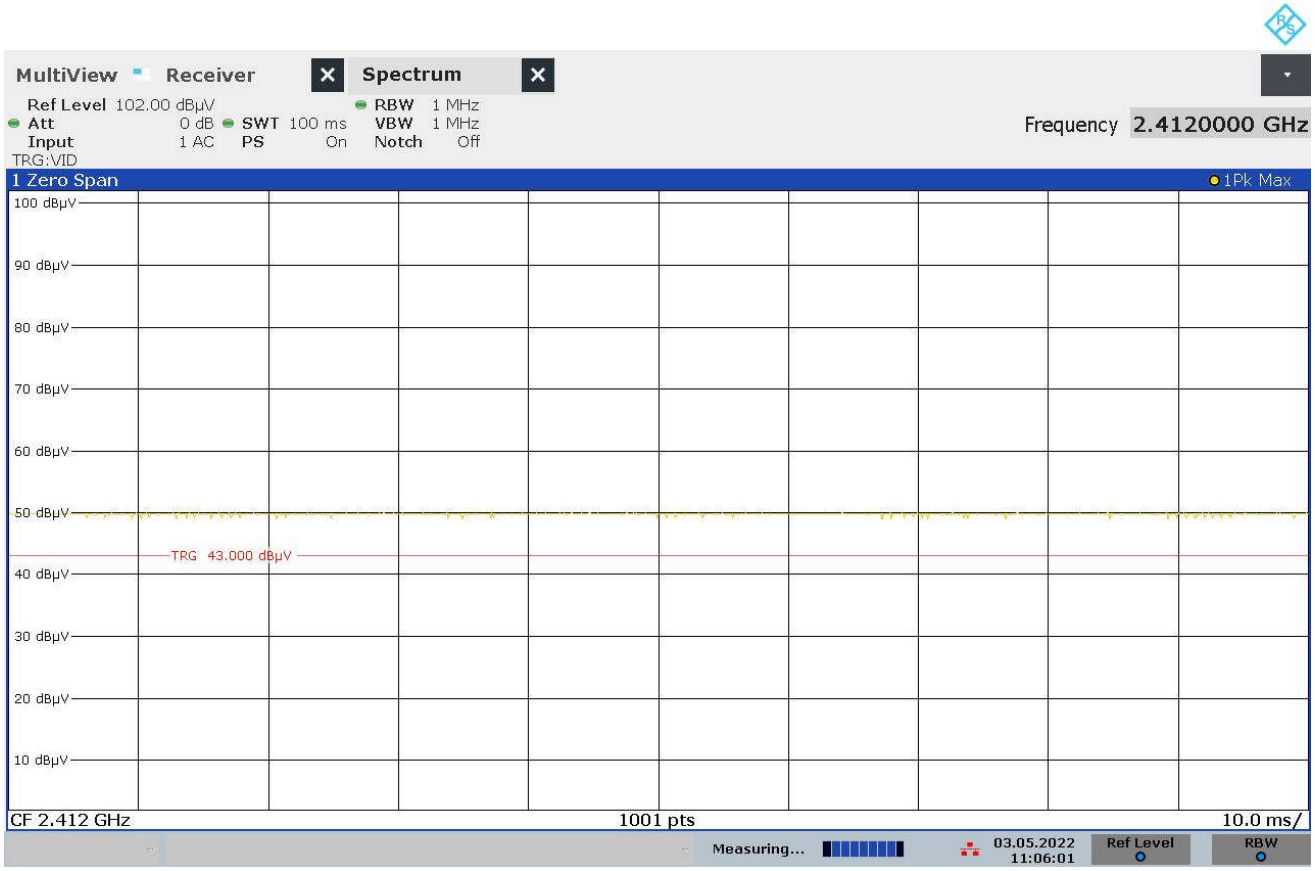
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz
Result	Duty Cycle = 100%
Notes	None



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26. Case Spurious Radiated Emissions

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	R21F
Type of Antennas Used	30MHz to 1GHz: Bilog (or equivalent) 1GHz to 18GHz: Double-Ridged Waveguide (or equivalent) Above 18GHz: Standard Gain Horn (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
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2
Radiated disturbance (electric field strength on an open area test site or alternative test site) (18 GHz – 26.5 GHz)	3.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (26.5 GHz – 40 GHz)	3.4

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 30MHz to 25GHz was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 25GHz.

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 100 kHz 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.
      iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer, the measuring antenna was not raised or lowered to ensure maximized readings. Instead, the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.
   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 below 1GHz were measured using a bi-log antenna. The bi-log antenna was positioned at a 3-meter distance from the EUT. The EUT was placed on an 80cm high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   b) 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.
   c) 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.

iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer, the measuring antenna was not raised or lowered to ensure maximized readings. Instead, the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.

d) For all radiated emissions measurements below 1GHz, if the peak reading is below the limits listed in §15.209(a), no further measurements are required. If, however, the peak readings exceed the limits listed in §15.209(a), then the emissions are remeasured using a quasi-peak detector.

e) 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).

f) 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 Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz – Antenna A
Notes	Peak 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)
4824.00	H	50.2		4.8	34.4	-40.2	49.3	290.9	5000.0	-24.7
	V	49.9		4.8	34.4	-40.2	48.9	280.0	5000.0	-25.0
12060.00	H	49.6	*	8.0	38.7	-39.7	56.6	676.1	5000.0	-17.4
	V	50.6	*	8.0	38.7	-39.7	57.6	762.1	5000.0	-16.3
14472.00	H	49.5	*	8.7	39.9	-40.0	58.1	801.2	5000.0	-15.9
	V	50.3	*	8.7	39.9	-40.0	58.9	877.5	5000.0	-15.1
19296.00	H	32.6	*	2.2	40.4	-27.9	47.3	231.4	5000.0	-26.7
	V	32.8	*	2.2	40.4	-27.9	47.5	238.2	5000.0	-26.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz – Antenna A
Notes	Average Measurements in the Restricted Bands

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)
4824.00	H	41.63		4.8	34.4	-40.2	0.0	40.7	108.2	500.0	-13.3
	V	40.81		4.8	34.4	-40.2	0.0	39.9	98.4	500.0	-14.1
12060.00	H	36.68	*	8.0	38.7	-39.7	0.0	43.7	152.9	500.0	-10.3
	V	36.70	*	8.0	38.7	-39.7	0.0	43.7	153.3	500.0	-10.3
14472.00	H	36.74	*	8.7	39.9	-40.0	0.0	45.4	185.2	500.0	-8.6
	V	36.56	*	8.7	39.9	-40.0	0.0	45.2	181.4	500.0	-8.8
19296.00	H	18.49	*	2.2	40.4	-27.9	0.0	33.2	45.8	500.0	-20.8
	V	18.60	*	2.2	40.4	-27.9	0.0	33.3	46.4	500.0	-20.7

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz – Antenna A
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)
2412.00	H	61.89		3.4	32.3	0.0	97.6	75998.1	NA	NA
	V	62.17		3.4	32.3	0.0	97.9	78487.9	NA	NA
7236.00	H	54.49		6.1	35.7	-40.1	56.2	648.2	7848.8	-21.7
	V	56.93		6.1	35.7	-40.1	58.7	858.5	7848.8	-19.2
9648.00	H	41.53		6.8	36.7	-39.6	45.5	188.2	7848.8	-32.4
	V	39.84		6.8	36.7	-39.6	43.8	154.9	7848.8	-34.1
16884.00	H	38.59	*	9.4	43.4	-38.8	52.6	428.3	7848.8	-25.3
	V	39.29	*	9.4	43.4	-38.8	53.3	464.3	7848.8	-24.6
21708.00	H	23.20	*	2.2	40.6	-28.7	37.3	73.4	7848.8	-40.6
	V	23.50	*	2.2	40.6	-28.7	37.6	76.0	7848.8	-40.3
24120.00	H	21.72	*	2.2	40.6	-29.4	35.2	57.7	7848.8	-42.7
	V	21.75	*	2.2	40.6	-29.4	35.2	57.9	7848.8	-42.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2437MHz – Antenna A
Notes	Peak 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)
4874.00	H	50.6		4.9	34.4	-40.3	49.6	300.4	5000.0	-24.4
	V	49.4		4.9	34.4	-40.3	48.4	263.1	5000.0	-25.6
7311.00	H	61.1		6.2	35.7	-40.1	62.9	1397.7	5000.0	-11.1
	V	65.1		6.2	35.7	-40.1	66.9	2215.2	5000.0	-7.1
12185.00	H	49.2	*	8.0	38.9	-39.6	56.5	664.7	5000.0	-17.5
	V	49.7	*	8.0	38.9	-39.6	56.9	700.8	5000.0	-17.1
19496.00	H	32.8	*	2.2	40.4	-27.7	47.6	240.8	5000.0	-26.3
	V	32.6	*	2.2	40.4	-27.7	47.5	235.8	5000.0	-26.5

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2437MHz – Antenna A
Notes	Average Measurements in the Restricted Bands

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)
4874.00	H	38.08		4.9	34.4	-40.3	0.0	37.1	71.4	500.0	-16.9
	V	38.18		4.9	34.4	-40.3	0.0	37.2	72.2	500.0	-16.8
7311.00	H	48.70		6.2	35.7	-40.1	0.0	50.5	334.9	500.0	-3.5
	V	51.30		6.2	35.7	-40.1	0.0	53.1	451.8	500.0	-0.9
12185.00	H	36.12	*	8.0	38.9	-39.6	0.0	43.4	147.1	500.0	-10.6
	V	36.17	*	8.0	38.9	-39.6	0.0	43.4	148.0	500.0	-10.6
19496.00	H	18.57	*	2.2	40.4	-27.7	0.0	33.4	46.9	500.0	-20.5
	V	17.87	*	2.2	40.4	-27.7	0.0	32.7	43.3	500.0	-21.2

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2437MHz – Antenna A
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)
2437.00	H	66.62		3.5	32.5	0.0	102.6	134582.6	NA	NA
	V	66.76		3.5	32.5	0.0	102.7	136769.4	NA	NA
9748.00	H	39.24		6.9	36.9	-39.6	43.4	148.1	13676.9	-39.3
	V	39.35		6.9	36.9	-39.6	43.5	150.0	13676.9	-39.2
14622.00	H	37.95	*	8.8	40.1	-40.2	46.7	217.3	13676.9	-36.0
	V	39.02	*	8.8	40.1	-40.2	47.8	245.7	13676.9	-34.9
17059.00	H	37.85	*	9.5	43.0	-38.8	51.6	382.0	13676.9	-31.1
	V	38.26	*	9.5	43.0	-38.8	52.1	400.5	13676.9	-30.7
21933.00	H	21.79	*	2.2	40.6	-28.9	35.7	60.8	13676.9	-47.0
	V	22.18	*	2.2	40.6	-28.9	36.1	63.6	13676.9	-46.7
24370.00	H	21.76	*	2.2	40.6	-29.4	35.3	57.9	13676.9	-47.5
	V	21.07	*	2.2	40.6	-29.4	34.6	53.5	13676.9	-48.2

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz – Antenna A
Notes	Peak 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)
4924.00	H	50.5		4.9	34.3	-40.3	49.4	296.1	5000.0	-24.6
	V	50.0		4.9	34.3	-40.3	48.9	279.8	5000.0	-25.0
7386.00	H	60.2		6.2	35.7	-40.1	62.0	1254.7	5000.0	-12.0
	V	64.6		6.2	35.7	-40.1	66.4	2091.9	5000.0	-7.6
12310.00	H	49.7	*	8.0	39.0	-39.6	57.1	713.1	5000.0	-16.9
	V	49.5	*	8.0	39.0	-39.6	56.8	694.4	5000.0	-17.1
19696.00	H	31.7	*	2.2	40.4	-28.0	46.3	205.7	5000.0	-27.7
	V	32.3	*	2.2	40.4	-28.0	46.9	220.9	5000.0	-27.1
22158.00	H	32.3	*	2.2	40.6	-28.7	46.4	208.1	5000.0	-27.6
	V	32.2	*	2.2	40.6	-28.7	46.3	206.6	5000.0	-27.7

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz – Antenna A
Notes	Average Measurements in the Restricted Bands

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)
4924.00	H	36.48		4.9	34.3	-40.3	0.0	35.4	59.2	500.0	-18.5
	V	36.56		4.9	34.3	-40.3	0.0	35.5	59.8	500.0	-18.5
7386.00	H	46.01		6.2	35.7	-40.1	0.0	47.8	246.1	500.0	-6.2
	V	50.20		6.2	35.7	-40.1	0.0	52.0	398.6	500.0	-2.0
12310.00	H	36.41	*	8.0	39.0	-39.6	0.0	43.8	154.7	500.0	-10.2
	V	36.53	*	8.0	39.0	-39.6	0.0	43.9	156.9	500.0	-10.1
19696.00	H	17.36	*	2.2	40.4	-28.0	0.0	31.9	39.6	500.0	-22.0
	V	17.34	*	2.2	40.4	-28.0	0.0	31.9	39.5	500.0	-22.1
22158.00	H	18.11	*	2.2	40.6	-28.7	0.0	32.2	40.6	500.0	-21.8
	V	18.15	*	2.2	40.6	-28.7	0.0	32.2	40.8	500.0	-21.8

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz – Antenna A
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)
2462.00	H	65.34		3.5	32.6	0.0	101.4	117511.0	NA	NA
	V	63.99		3.5	32.6	0.0	100.1	100595.5	NA	NA
9848.00	H	39.09		6.9	37.0	-39.5	43.5	148.8	11751.1	-37.9
	V	40.32		6.9	37.0	-39.5	44.7	171.5	11751.1	-36.7
14772.00	H	38.61	*	8.9	40.3	-40.3	47.5	237.7	11751.1	-33.9
	V	38.73	*	8.9	40.3	-40.3	47.6	241.0	11751.1	-33.8
17234.00	H	38.19	*	9.6	42.6	-39.0	51.4	372.6	11751.1	-30.0
	V	38.31	*	9.6	42.6	-39.0	51.5	377.8	11751.1	-29.9
24620.00	H	21.71	*	2.2	40.6	-29.0	35.6	59.9	11751.1	-45.8
	V	21.01	*	2.2	40.6	-29.0	34.9	55.3	11751.1	-46.5

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz – Antenna A
Notes	Peak 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)
4824.00	H	49.8		4.8	34.4	-40.2	48.9	277.8	5000.0	-25.1
	V	49.3		4.8	34.4	-40.2	48.4	262.8	5000.0	-25.6
12060.00	H	49.8	*	8.0	38.7	-39.7	56.8	691.9	5000.0	-17.2
	V	49.6	*	8.0	38.7	-39.7	56.6	676.1	5000.0	-17.4
14472.00	H	49.7	*	8.7	39.9	-40.0	58.3	820.8	5000.0	-15.7
	V	49.5	*	8.7	39.9	-40.0	58.1	803.0	5000.0	-15.9
19296.00	H	31.9	*	2.2	40.4	-27.9	46.7	215.2	5000.0	-27.3
	V	32.2	*	2.2	40.4	-27.9	46.9	222.5	5000.0	-27.0

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz – Antenna A
Notes	Average Measurements in the Restricted Bands

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)
4824.00	H	35.78		4.8	34.4	-40.2	0.0	34.8	55.2	500.0	-19.1
	V	35.70		4.8	34.4	-40.2	0.0	34.8	54.7	500.0	-19.2
12060.00	H	36.61	*	8.0	38.7	-39.7	0.0	43.6	151.7	500.0	-10.4
	V	36.66	*	8.0	38.7	-39.7	0.0	43.7	152.6	500.0	-10.3
14472.00	H	36.25	*	8.7	39.9	-40.0	0.0	44.9	175.1	500.0	-9.1
	V	36.42	*	8.7	39.9	-40.0	0.0	45.0	178.5	500.0	-8.9
19296.00	H	17.78	*	2.2	40.4	-27.9	0.0	32.5	42.2	500.0	-21.5
	V	17.87	*	2.2	40.4	-27.9	0.0	32.6	42.6	500.0	-21.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz – Antenna A
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)
2412.00	H	59.57		3.4	32.3	0.0	95.3	58183.9	NA	NA
	V	59.64		3.4	32.3	0.0	95.4	58654.7	NA	NA
7236.00	H	48.71		6.1	35.7	-40.1	50.5	333.2	5865.5	-24.9
	V	49.71		6.1	35.7	-40.1	51.5	373.9	5865.5	-23.9
9648.00	H	39.07		6.8	36.7	-39.6	43.0	141.8	5865.5	-32.3
	V	38.43		6.8	36.7	-39.6	42.4	131.7	5865.5	-33.0
16884.00	H	37.87	*	9.4	43.4	-38.8	51.9	394.2	5865.5	-23.5
	V	37.62	*	9.4	43.4	-38.8	51.7	383.1	5865.5	-23.7
21708.00	H	22.07	*	2.2	40.6	-28.7	36.2	64.4	5865.5	-39.2
	V	22.43	*	2.2	40.6	-28.7	36.5	67.2	5865.5	-38.8
24120.00	H	21.38	*	2.2	40.6	-29.4	34.9	55.4	5865.5	-40.5
	V	21.33	*	2.2	40.6	-29.4	34.8	55.1	5865.5	-40.5

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2437MHz – Antenna A
Notes	Peak 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)
4874.00	H	49.0		4.9	34.4	-40.3	48.0	251.0	5000.0	-26.0
	V	49.9		4.9	34.4	-40.3	48.9	277.5	5000.0	-25.1
7311.00	H	59.3		6.2	35.7	-40.1	61.1	1129.6	5000.0	-12.9
	V	62.5		6.2	35.7	-40.1	64.3	1642.2	5000.0	-9.7
12185.00	H	49.0	*	8.0	38.9	-39.6	56.2	646.6	5000.0	-17.8
	V	49.2	*	8.0	38.9	-39.6	56.4	663.9	5000.0	-17.5
19496.00	H	31.6	*	2.2	40.4	-27.7	46.4	209.5	5000.0	-27.6
	V	32.0	*	2.2	40.4	-27.7	46.9	220.6	5000.0	-27.1

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2437MHz – Antenna A
Notes	Average Measurements in the Restricted Bands

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)
4874.00	H	34.67		4.9	34.4	-40.3	0.0	33.7	48.2	500.0	-20.3
	V	34.75		4.9	34.4	-40.3	0.0	33.7	48.7	500.0	-20.2
7311.00	H	41.30		6.2	35.7	-40.1	0.0	43.1	142.9	500.0	-10.9
	V	44.16		6.2	35.7	-40.1	0.0	46.0	198.6	500.0	-8.0
12185.00	H	34.37	*	8.0	38.9	-39.6	0.0	41.6	120.3	500.0	-12.4
	V	34.33	*	8.0	38.9	-39.6	0.0	41.6	119.7	500.0	-12.4
19496.00	H	16.73	*	2.2	40.4	-27.7	0.0	31.6	38.0	500.0	-22.4
	V	16.82	*	2.2	40.4	-27.7	0.0	31.7	38.4	500.0	-22.3

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2437MHz – Antenna A
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)
2437.00	H	60.52		3.5	32.5	0.0	96.5	66679.0	NA	NA
	V	60.13		3.5	32.5	0.0	96.1	63751.3	NA	NA
9748.00	H	38.24		6.9	36.9	-39.6	42.4	132.0	6667.9	-34.1
	V	38.08		6.9	36.9	-39.6	42.3	129.6	6667.9	-34.2
14622.00	H	38.19	*	8.8	40.1	-40.2	47.0	223.3	6667.9	-29.5
	V	38.34	*	8.8	40.1	-40.2	47.1	227.2	6667.9	-29.4
17059.00	H	38.25	*	9.5	43.0	-38.8	52.0	400.0	6667.9	-24.4
	V	38.95	*	9.5	43.0	-38.8	52.7	433.6	6667.9	-23.7
21933.00	H	22.60	*	2.2	40.6	-28.9	36.5	66.7	6667.9	-40.0
	V	22.10	*	2.2	40.6	-28.9	36.0	63.0	6667.9	-40.5
24370.00	H	21.70	*	2.2	40.6	-29.4	35.2	57.5	6667.9	-41.3
	V	22.19	*	2.2	40.6	-29.4	35.7	60.9	6667.9	-40.8

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz – Antenna A
Notes	Peak 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)
4924.00	H	49.5		4.9	34.3	-40.3	48.5	266.3	5000.0	-25.5
	V	51.0		4.9	34.3	-40.3	49.9	314.3	5000.0	-24.0
7386.00	H	57.4		6.2	35.7	-40.1	59.2	916.3	5000.0	-14.7
	V	61.5		6.2	35.7	-40.1	63.3	1455.6	5000.0	-10.7
12310.00	H	49.6	*	8.0	39.0	-39.6	57.0	709.0	5000.0	-17.0
	V	49.7	*	8.0	39.0	-39.6	57.1	716.3	5000.0	-16.9
19696.00	H	32.5	*	2.2	40.4	-28.0	47.1	225.3	5000.0	-26.9
	V	32.1	*	2.2	40.4	-28.0	46.7	215.4	5000.0	-27.3
22158.00	H	36.0	*	2.2	40.6	-28.7	50.1	320.1	5000.0	-23.9
	V	36.9	*	2.2	40.6	-28.7	51.0	353.0	5000.0	-23.0

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz – Antenna A
Notes	Average Measurements in the Restricted Bands

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)
4924.00	H	34.64		4.9	34.3	-40.3	0.0	33.6	47.9	500.0	-20.4
	V	34.65		4.9	34.3	-40.3	0.0	33.6	48.0	500.0	-20.4
7386.00	H	41.65		6.2	35.7	-40.1	0.0	43.5	149.0	500.0	-10.5
	V	43.57		6.2	35.7	-40.1	0.0	45.4	185.8	500.0	-8.6
12310.00	H	34.84	*	8.0	39.0	-39.6	0.0	42.2	129.2	500.0	-11.8
	V	34.89	*	8.0	39.0	-39.6	0.0	42.3	129.9	500.0	-11.7
19696.00	H	17.92	*	2.2	40.4	-28.0	0.0	32.5	42.2	500.0	-21.5
	V	17.83	*	2.2	40.4	-28.0	0.0	32.4	41.8	500.0	-21.6
22158.00	H	23.31	*	2.2	40.6	-28.7	0.0	37.4	73.9	500.0	-16.6
	V	23.27	*	2.2	40.6	-28.7	0.0	37.3	73.6	500.0	-16.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz – Antenna A
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)
2462.00	H	59.88		3.5	32.6	0.0	95.9	62672.7	NA	NA
	V	59.86		3.5	32.6	0.0	95.9	62528.6	NA	NA
9848.00	H	39.46		6.9	37.0	-39.5	43.8	155.3	6267.3	-32.1
	V	40.70		6.9	37.0	-39.5	45.1	179.2	6267.3	-30.9
14772.00	H	39.65	*	8.9	40.3	-40.3	48.6	268.0	6267.3	-27.4
	V	40.03	*	8.9	40.3	-40.3	48.9	279.9	6267.3	-27.0
17234.00	H	38.12	*	9.6	42.6	-39.0	51.4	369.6	6267.3	-24.6
	V	38.54	*	9.6	42.6	-39.0	51.8	387.9	6267.3	-24.2
24620.00	H	22.20	*	2.2	40.6	-29.0	36.0	63.4	6267.3	-39.9
	V	22.28	*	2.2	40.6	-29.0	36.1	64.0	6267.3	-39.8

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz – Antenna A
Notes	Peak 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)
4824.00	H	49.0		4.8	34.4	-40.2	48.1	253.0	5000.0	-25.9
	V	49.9		4.8	34.4	-40.2	49.0	281.0	5000.0	-25.0
12060.00	H	50.3	*	8.0	38.7	-39.7	57.3	729.5	5000.0	-16.7
	V	49.5	*	8.0	38.7	-39.7	56.5	667.6	5000.0	-17.5
14472.00	H	47.4	*	8.7	39.9	-40.0	56.0	628.4	5000.0	-18.0
	V	49.5	*	8.7	39.9	-40.0	58.1	803.0	5000.0	-15.9
19296.00	H	32.3	*	2.2	40.4	-27.9	47.0	224.1	5000.0	-27.0
	V	32.8	*	2.2	40.4	-27.9	47.6	238.7	5000.0	-26.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz – Antenna A
Notes	Average Measurements in the Restricted Bands

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)
4824.00	H	34.70		4.8	34.4	-40.2	0.0	33.8	48.7	500.0	-20.2
	V	34.85		4.8	34.4	-40.2	0.0	33.9	49.6	500.0	-20.1
12060.00	H	34.47	*	8.0	38.7	-39.7	0.0	41.5	118.6	500.0	-12.5
	V	34.41	*	8.0	38.7	-39.7	0.0	41.4	117.8	500.0	-12.6
14472.00	H	34.51	*	8.7	39.9	-40.0	0.0	43.1	143.3	500.0	-10.9
	V	34.55	*	8.7	39.9	-40.0	0.0	43.2	144.0	500.0	-10.8
19296.00	H	17.75	*	2.2	40.4	-27.9	0.0	32.5	42.1	500.0	-21.5
	V	17.86	*	2.2	40.4	-27.9	0.0	32.6	42.6	500.0	-21.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz – Antenna A
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)
2412.00	H	60.91		3.4	32.3	0.0	96.6	67889.5	NA	NA
	V	59.33		3.4	32.3	0.0	95.1	56598.2	NA	NA
7236.00	H	47.63		6.1	35.7	-40.1	49.4	294.3	6788.9	-27.3
	V	49.18		6.1	35.7	-40.1	50.9	351.8	6788.9	-25.7
9648.00	H	41.20		6.8	36.7	-39.6	45.2	181.2	6788.9	-31.5
	V	39.71		6.8	36.7	-39.6	43.7	152.6	6788.9	-33.0
16884.00	H	39.38	*	9.4	43.4	-38.8	53.4	469.1	6788.9	-23.2
	V	39.54	*	9.4	43.4	-38.8	53.6	477.8	6788.9	-23.1
21708.00	H	22.70	*	2.2	40.6	-28.7	36.8	69.3	6788.9	-39.8
	V	22.54	*	2.2	40.6	-28.7	36.7	68.0	6788.9	-40.0
24120.00	H	22.77	*	2.2	40.6	-29.4	36.3	65.1	6788.9	-40.4
	V	21.80	*	2.2	40.6	-29.4	35.3	58.2	6788.9	-41.3

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2437MHz – Antenna A
Notes	Peak 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)
4874.00	H	49.4		4.9	34.4	-40.3	48.4	262.5	5000.0	-25.6
	V	50.1		4.9	34.4	-40.3	49.1	283.6	5000.0	-24.9
7311.00	H	57.9		6.2	35.7	-40.1	59.7	962.5	5000.0	-14.3
	V	60.7		6.2	35.7	-40.1	62.5	1333.3	5000.0	-11.5
12185.00	H	48.7	*	8.0	38.9	-39.6	55.9	626.1	5000.0	-18.0
	V	49.6	*	8.0	38.9	-39.6	56.9	696.0	5000.0	-17.1
19496.00	H	32.9	*	2.2	40.4	-27.7	47.8	245.3	5000.0	-26.2
	V	32.0	*	2.2	40.4	-27.7	46.9	220.4	5000.0	-27.1

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2437MHz – Antenna A
Notes	Average Measurements in the Restricted Bands

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)
4874.00	H	34.67		4.9	34.4	-40.3	0.0	33.7	48.2	500.0	-20.3
	V	34.74		4.9	34.4	-40.3	0.0	33.7	48.6	500.0	-20.2
7311.00	H	41.12		6.2	35.7	-40.1	0.0	42.9	139.9	500.0	-11.1
	V	44.43		6.2	35.7	-40.1	0.0	46.2	204.8	500.0	-7.8
12185.00	H	34.23	*	8.0	38.9	-39.6	0.0	41.5	118.3	500.0	-12.5
	V	34.27	*	8.0	38.9	-39.6	0.0	41.5	118.9	500.0	-12.5
19496.00	H	18.58	*	2.2	40.4	-27.7	0.0	33.4	47.0	500.0	-20.5
	V	17.84	*	2.2	40.4	-27.7	0.0	32.7	43.2	500.0	-21.3

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2437MHz – Antenna A
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)
2437.00	H	59.59		3.5	32.5	0.0	95.5	59908.6	NA	NA
	V	60.04		3.5	32.5	0.0	96.0	63094.1	NA	NA
9748.00	H	39.23		6.9	36.9	-39.6	43.4	148.0	6309.4	-32.6
	V	39.93		6.9	36.9	-39.6	44.1	160.4	6309.4	-31.9
14622.00	H	37.83	*	8.8	40.1	-40.2	46.6	214.3	6309.4	-29.4
	V	38.81	*	8.8	40.1	-40.2	47.6	239.9	6309.4	-28.4
17059.00	H	38.21	*	9.5	43.0	-38.8	52.0	398.2	6309.4	-24.0
	V	38.77	*	9.5	43.0	-38.8	52.6	424.7	6309.4	-23.4
21933.00	H	22.17	*	2.2	40.6	-28.9	36.1	63.5	6309.4	-39.9
	V	22.09	*	2.2	40.6	-28.9	36.0	62.9	6309.4	-40.0
24370.00	H	21.27	*	2.2	40.6	-29.4	34.8	54.7	6309.4	-41.2
	V	21.10	*	2.2	40.6	-29.4	34.6	53.7	6309.4	-41.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz – Antenna A
Notes	Peak 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)
4924.00	H	49.7		4.9	34.3	-40.3	48.6	270.0	5000.0	-25.4
	V	49.6		4.9	34.3	-40.3	48.6	268.1	5000.0	-25.4
7386.00	H	55.6		6.2	35.7	-40.1	57.4	743.1	5000.0	-16.6
	V	59.2		6.2	35.7	-40.1	61.0	1126.0	5000.0	-12.9
12310.00	H	49.4	*	8.0	39.0	-39.6	56.7	686.5	5000.0	-17.2
	V	47.7	*	8.0	39.0	-39.6	55.1	566.4	5000.0	-18.9
19696.00	H	31.8	*	2.2	40.4	-28.0	46.4	209.0	5000.0	-27.6
	V	32.2	*	2.2	40.4	-28.0	46.8	217.6	5000.0	-27.2
22158.00	H	32.5	*	2.2	40.6	-28.7	46.6	213.2	5000.0	-27.4
	V	32.7	*	2.2	40.6	-28.7	46.8	218.1	5000.0	-27.2

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz – Antenna A
Notes	Average Measurements in the Restricted Bands

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)
4924.00	H	34.81		4.9	34.3	-40.3	0.0	33.8	48.9	500.0	-20.2
	V	34.76		4.9	34.3	-40.3	0.0	33.7	48.6	500.0	-20.3
7386.00	H	40.52		6.2	35.7	-40.1	0.0	42.3	130.8	500.0	-11.6
	V	44.89		6.2	35.7	-40.1	0.0	46.7	216.3	500.0	-7.3
12310.00	H	34.86	*	8.0	39.0	-39.6	0.0	42.2	129.5	500.0	-11.7
	V	34.83	*	8.0	39.0	-39.6	0.0	42.2	129.0	500.0	-11.8
19696.00	H	17.32	*	2.2	40.4	-28.0	0.0	31.9	39.4	500.0	-22.1
	V	17.38	*	2.2	40.4	-28.0	0.0	32.0	39.6	500.0	-22.0
22158.00	H	18.30	*	2.2	40.6	-28.7	0.0	32.4	41.5	500.0	-21.6
	V	18.39	*	2.2	40.6	-28.7	0.0	32.5	41.9	500.0	-21.5

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz – Antenna A
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)
2462.00	H	60.82		3.5	32.6	0.0	96.9	69835.9	NA	NA
	V	59.97		3.5	32.6	0.0	96.0	63325.5	NA	NA
9848.00	H	38.55		6.9	37.0	-39.5	42.9	139.9	6983.6	-34.0
	V	39.25		6.9	37.0	-39.5	43.6	151.6	6983.6	-33.3
14772.00	H	38.28	*	8.9	40.3	-40.3	47.2	228.9	6983.6	-29.7
	V	38.80	*	8.9	40.3	-40.3	47.7	243.0	6983.6	-29.2
17234.00	H	38.02	*	9.6	42.6	-39.0	51.3	365.4	6983.6	-25.6
	V	38.11	*	9.6	42.6	-39.0	51.3	369.2	6983.6	-25.5
24620.00	H	22.05	*	2.2	40.6	-29.0	35.9	62.3	6983.6	-41.0
	V	21.54	*	2.2	40.6	-29.0	35.4	58.8	6983.6	-41.5

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz – Antenna B
Notes	Peak 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)
4824.00	H	50.4		4.8	34.4	-40.2	49.4	295.6	5000.0	-24.6
	V	50.0		4.8	34.4	-40.2	49.0	282.0	5000.0	-25.0
12060.00	H	49.9	*	8.0	38.7	-39.7	56.9	696.7	5000.0	-17.1
	V	50.0	*	8.0	38.7	-39.7	57.0	708.8	5000.0	-17.0
14472.00	H	50.4	*	8.7	39.9	-40.0	59.0	887.6	5000.0	-15.0
	V	50.1	*	8.7	39.9	-40.0	58.7	860.5	5000.0	-15.3
19296.00	H	32.0	*	2.2	40.4	-27.9	46.7	216.5	5000.0	-27.3
	V	32.5	*	2.2	40.4	-27.9	47.2	229.0	5000.0	-26.8

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz – Antenna B
Notes	Average Measurements in the Restricted Bands

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)
4824.00	H	37.43		4.8	34.4	-40.2	0.0	36.5	66.7	500.0	-17.5
	V	36.66		4.8	34.4	-40.2	0.0	35.7	61.0	500.0	-18.3
12060.00	H	36.72	*	8.0	38.7	-39.7	0.0	43.7	153.6	500.0	-10.2
	V	36.69	*	8.0	38.7	-39.7	0.0	43.7	153.1	500.0	-10.3
14472.00	H	36.50	*	8.7	39.9	-40.0	0.0	45.1	180.2	500.0	-8.9
	V	36.55	*	8.7	39.9	-40.0	0.0	45.2	181.2	500.0	-8.8
19296.00	H	17.66	*	2.2	40.4	-27.9	0.0	32.4	41.6	500.0	-21.6
	V	17.81	*	2.2	40.4	-27.9	0.0	32.5	42.4	500.0	-21.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz – Antenna B
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)
2412.00	H	62.57		3.4	32.3	0.0	98.3	82186.9	NA	NA
	V	63.15		3.4	32.3	0.0	98.9	87862.3	NA	NA
7236.00	H	52.02		6.1	35.7	-40.1	53.8	487.8	8786.2	-25.1
	V	55.90		6.1	35.7	-40.1	57.6	762.5	8786.2	-21.2
9648.00	H	40.51		6.8	36.7	-39.6	44.5	167.4	8786.2	-34.4
	V	39.13		6.8	36.7	-39.6	43.1	142.8	8786.2	-35.8
16884.00	H	38.06	*	9.4	43.4	-38.8	52.1	403.0	8786.2	-26.8
	V	38.39	*	9.4	43.4	-38.8	52.4	418.6	8786.2	-26.4
21708.00	H	22.14	*	2.2	40.6	-28.7	36.3	64.9	8786.2	-42.6
	V	21.91	*	2.2	40.6	-28.7	36.0	63.2	8786.2	-42.9
24120.00	H	21.63	*	2.2	40.6	-29.4	35.1	57.1	8786.2	-43.7
	V	21.77	*	2.2	40.6	-29.4	35.3	58.0	8786.2	-43.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2437MHz – Antenna B
Notes	Peak 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)
4874.00	H	50.2		4.9	34.4	-40.3	49.2	288.2	5000.0	-24.8
	V	50.4		4.9	34.4	-40.3	49.4	295.9	5000.0	-24.6
7311.00	H	60.7		6.2	35.7	-40.1	62.5	1327.1	5000.0	-11.5
	V	65.4		6.2	35.7	-40.1	67.2	2290.4	5000.0	-6.8
12185.00	H	48.8	*	8.0	38.9	-39.6	56.0	631.9	5000.0	-18.0
	V	49.4	*	8.0	38.9	-39.6	56.6	675.5	5000.0	-17.4
19496.00	H	32.7	*	2.2	40.4	-27.7	47.6	239.1	5000.0	-26.4
	V	32.4	*	2.2	40.4	-27.7	47.2	229.4	5000.0	-26.8

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2437MHz – Antenna B
Notes	Average Measurements in the Restricted Bands

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)
4874.00	H	36.48		4.9	34.4	-40.3	0.0	35.5	59.4	500.0	-18.5
	V	36.60		4.9	34.4	-40.3	0.0	35.6	60.2	500.0	-18.4
7311.00	H	46.85		6.2	35.7	-40.1	0.0	48.6	270.7	500.0	-5.3
	V	51.20		6.2	35.7	-40.1	0.0	53.0	446.6	500.0	-1.0
12185.00	H	36.17	*	8.0	38.9	-39.6	0.0	43.4	148.0	500.0	-10.6
	V	36.19	*	8.0	38.9	-39.6	0.0	43.4	148.3	500.0	-10.6
19496.00	H	17.83	*	2.2	40.4	-27.7	0.0	32.7	43.1	500.0	-21.3
	V	17.91	*	2.2	40.4	-27.7	0.0	32.8	43.5	500.0	-21.2

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2437MHz – Antenna B
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)
2437.00	H	66.32		3.5	32.5	0.0	102.3	130013.6	NA	NA
	V	66.04		3.5	32.5	0.0	102.0	125889.3	NA	NA
9748.00	H	39.17		6.9	36.9	-39.6	43.3	146.9	13001.4	-38.9
	V	38.62		6.9	36.9	-39.6	42.8	137.9	13001.4	-39.5
14622.00	H	39.15	*	8.8	40.1	-40.2	47.9	249.4	13001.4	-34.3
	V	38.79	*	8.8	40.1	-40.2	47.6	239.3	13001.4	-34.7
17059.00	H	37.98	*	9.5	43.0	-38.8	51.8	387.8	13001.4	-30.5
	V	38.35	*	9.5	43.0	-38.8	52.1	404.7	13001.4	-30.1
21933.00	H	21.49	*	2.2	40.6	-28.9	35.4	58.7	13001.4	-46.9
	V	22.85	*	2.2	40.6	-28.9	36.7	68.7	13001.4	-45.5
24370.00	H	21.75	*	2.2	40.6	-29.4	35.2	57.8	13001.4	-47.0
	V	21.23	*	2.2	40.6	-29.4	34.7	54.5	13001.4	-47.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz – Antenna B
Notes	Peak 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)
4924.00	H	49.4		4.9	34.3	-40.3	48.3	261.1	5000.0	-25.6
	V	49.9		4.9	34.3	-40.3	48.9	278.5	5000.0	-25.1
7386.00	H	61.8		6.2	35.7	-40.1	63.7	1522.5	5000.0	-10.3
	V	65.1		6.2	35.7	-40.1	66.9	2218.4	5000.0	-7.1
12310.00	H	49.5	*	8.0	39.0	-39.6	56.9	696.8	5000.0	-17.1
	V	49.8	*	8.0	39.0	-39.6	57.2	720.5	5000.0	-16.8
19696.00	H	32.8	*	2.2	40.4	-28.0	47.3	232.7	5000.0	-26.6
	V	32.9	*	2.2	40.4	-28.0	47.4	235.6	5000.0	-26.5
22158.00	H	32.3	*	2.2	40.6	-28.7	46.4	209.0	5000.0	-27.6
	V	32.5	*	2.2	40.6	-28.7	46.6	213.2	5000.0	-27.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz – Antenna B
Notes	Average Measurements in the Restricted Bands

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)
4924.00	H	36.39		4.9	34.3	-40.3	0.0	35.4	58.6	500.0	-18.6
	V	36.44		4.9	34.3	-40.3	0.0	35.4	58.9	500.0	-18.6
7386.00	H	45.89		6.2	35.7	-40.1	0.0	47.7	242.7	500.0	-6.3
	V	50.05		6.2	35.7	-40.1	0.0	51.9	391.8	500.0	-2.1
12310.00	H	0.00	*	8.0	39.0	-39.6	0.0	7.4	2.3	500.0	-46.6
	V	0.00	*	8.0	39.0	-39.6	0.0	7.4	2.3	500.0	-46.6
19696.00	H	17.34	*	2.2	40.4	-28.0	0.0	31.9	39.5	500.0	-22.1
	V	17.74	*	2.2	40.4	-28.0	0.0	32.3	41.3	500.0	-21.7
22158.00	H	18.37	*	2.2	40.6	-28.7	0.0	32.4	41.9	500.0	-21.5
	V	18.34	*	2.2	40.6	-28.7	0.0	32.4	41.7	500.0	-21.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz – Antenna B
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)
2462.00	H	63.62		3.5	32.6	0.0	99.7	96400.4	NA	NA
	V	63.22		3.5	32.6	0.0	99.3	92061.6	NA	NA
9848.00	H	38.76		6.9	37.0	-39.5	43.1	143.3	9640.0	-36.6
	V	38.92		6.9	37.0	-39.5	43.3	146.0	9640.0	-36.4
14772.00	H	38.54	*	8.9	40.3	-40.3	47.5	235.8	9640.0	-32.2
	V	39.97	*	8.9	40.3	-40.3	48.9	278.0	9640.0	-30.8
17234.00	H	37.55	*	9.6	42.6	-39.0	50.8	346.2	9640.0	-28.9
	V	37.85	*	9.6	42.6	-39.0	51.1	358.3	9640.0	-28.6
24620.00	H	21.22	*	2.2	40.6	-29.0	35.1	56.7	9640.0	-44.6
	V	21.40	*	2.2	40.6	-29.0	35.2	57.8	9640.0	-44.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz – Antenna B
Notes	Peak 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)
4824.00	H	49.1		4.8	34.4	-40.2	48.2	256.3	5000.0	-25.8
	V	49.6		4.8	34.4	-40.2	48.6	269.3	5000.0	-25.4
12060.00	H	50.6	*	8.0	38.7	-39.7	57.6	759.5	5000.0	-16.4
	V	49.3	*	8.0	38.7	-39.7	56.3	651.7	5000.0	-17.7
14472.00	H	49.7	*	8.7	39.9	-40.0	58.3	825.5	5000.0	-15.6
	V	49.4	*	8.7	39.9	-40.0	58.0	798.4	5000.0	-15.9
19296.00	H	32.4	*	2.2	40.4	-27.9	47.1	227.5	5000.0	-26.8
	V	34.1	*	2.2	40.4	-27.9	48.8	276.0	5000.0	-25.2

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz – Antenna B
Notes	Average Measurements in the Restricted Bands

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)
4824.00	H	36.32		4.8	34.4	-40.2	0.0	35.4	58.7	500.0	-18.6
	V	36.48		4.8	34.4	-40.2	0.0	35.5	59.8	500.0	-18.4
12060.00	H	34.21	*	8.0	38.7	-39.7	0.0	41.2	115.1	500.0	-12.8
	V	34.39	*	8.0	38.7	-39.7	0.0	41.4	117.5	500.0	-12.6
14472.00	H	34.42	*	8.7	39.9	-40.0	0.0	43.0	141.8	500.0	-10.9
	V	34.49	*	8.7	39.9	-40.0	0.0	43.1	143.0	500.0	-10.9
19296.00	H	17.80	*	2.2	40.4	-27.9	0.0	32.5	42.3	500.0	-21.5
	V	19.12	*	2.2	40.4	-27.9	0.0	33.8	49.3	500.0	-20.1

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz – Antenna B
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)
2412.00	H	58.24		3.4	32.3	0.0	94.0	49923.2	NA	NA
	V	58.29		3.4	32.3	0.0	94.0	50211.4	NA	NA
7236.00	H	44.42		6.1	35.7	-40.1	46.2	203.3	5021.1	-27.9
	V	48.15		6.1	35.7	-40.1	49.9	312.4	5021.1	-24.1
9648.00	H	40.37		6.8	36.7	-39.6	44.3	164.7	5021.1	-29.7
	V	41.21		6.8	36.7	-39.6	45.2	181.4	5021.1	-28.8
16884.00	H	39.29	*	9.4	43.4	-38.8	53.3	464.3	5021.1	-20.7
	V	38.25	*	9.4	43.4	-38.8	52.3	411.9	5021.1	-21.7
21708.00	H	22.03	*	2.2	40.6	-28.7	36.1	64.1	5021.1	-37.9
	V	22.75	*	2.2	40.6	-28.7	36.9	69.7	5021.1	-37.2
24120.00	H	22.04	*	2.2	40.6	-29.4	35.5	59.8	5021.1	-38.5
	V	21.42	*	2.2	40.6	-29.4	34.9	55.7	5021.1	-39.1

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2437MHz – Antenna B
Notes	Peak 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)
4874.00	H	49.6		4.9	34.4	-40.3	48.6	269.6	5000.0	-25.4
	V	49.5		4.9	34.4	-40.3	48.5	266.8	5000.0	-25.5
7311.00	H	56.9		6.2	35.7	-40.1	58.7	863.8	5000.0	-15.3
	V	61.6		6.2	35.7	-40.1	63.4	1473.7	5000.0	-10.6
12185.00	H	48.6	*	8.0	38.9	-39.6	55.8	616.8	5000.0	-18.2
	V	48.4	*	8.0	38.9	-39.6	55.6	602.7	5000.0	-18.4
19496.00	H	31.2	*	2.2	40.4	-27.7	46.0	200.5	5000.0	-27.9
	V	31.5	*	2.2	40.4	-27.7	46.4	207.8	5000.0	-27.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2437MHz – Antenna B
Notes	Average Measurements in the Restricted Bands

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)
4874.00	H	34.63		4.9	34.4	-40.3	0.0	33.6	48.0	500.0	-20.4
	V	34.74		4.9	34.4	-40.3	0.0	33.7	48.6	500.0	-20.2
7311.00	H	40.41		6.2	35.7	-40.1	0.0	42.2	128.9	500.0	-11.8
	V	43.99		6.2	35.7	-40.1	0.0	45.8	194.7	500.0	-8.2
12185.00	H	34.33	*	8.0	38.9	-39.6	0.0	41.6	119.7	500.0	-12.4
	V	34.29	*	8.0	38.9	-39.6	0.0	41.5	119.2	500.0	-12.5
19496.00	H	16.64	*	2.2	40.4	-27.7	0.0	31.5	37.6	500.0	-22.5
	V	16.71	*	2.2	40.4	-27.7	0.0	31.6	37.9	500.0	-22.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2437MHz – Antenna B
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)
2437.00	H	57.79		3.5	32.5	0.0	93.7	48695.5	NA	NA
	V	58.75		3.5	32.5	0.0	94.7	54386.2	NA	NA
9748.00	H	38.33		6.9	36.9	-39.6	42.5	133.4	5438.6	-32.2
	V	39.06		6.9	36.9	-39.6	43.2	145.1	5438.6	-31.5
14622.00	H	38.24	*	8.8	40.1	-40.2	47.0	224.6	5438.6	-27.7
	V	38.99	*	8.8	40.1	-40.2	47.8	244.9	5438.6	-26.9
17059.00	H	38.31	*	9.5	43.0	-38.8	52.1	402.8	5438.6	-22.6
	V	38.23	*	9.5	43.0	-38.8	52.0	399.1	5438.6	-22.7
21933.00	H	22.74	*	2.2	40.6	-28.9	36.6	67.8	5438.6	-38.1
	V	22.82	*	2.2	40.6	-28.9	36.7	68.4	5438.6	-38.0
24370.00	H	22.19	*	2.2	40.6	-29.4	35.7	60.9	5438.6	-39.0
	V	22.38	*	2.2	40.6	-29.4	35.9	62.2	5438.6	-38.8

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz – Antenna B
Notes	Peak 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)
4924.00	H	50.4		4.9	34.3	-40.3	49.3	292.3	5000.0	-24.7
	V	49.3		4.9	34.3	-40.3	48.3	260.2	5000.0	-25.7
7386.00	H	57.8		6.2	35.7	-40.1	59.6	956.2	5000.0	-14.4
	V	62.1		6.2	35.7	-40.1	64.0	1576.0	5000.0	-10.0
12310.00	H	49.0	*	8.0	39.0	-39.6	56.4	658.6	5000.0	-17.6
	V	48.9	*	8.0	39.0	-39.6	56.3	652.6	5000.0	-17.7
19696.00	H	32.0	*	2.2	40.4	-28.0	46.6	214.2	5000.0	-27.4
	V	33.1	*	2.2	40.4	-28.0	47.6	240.8	5000.0	-26.3
22158.00	H	36.9	*	2.2	40.6	-28.7	50.9	351.3	5000.0	-23.1
	V	35.6	*	2.2	40.6	-28.7	49.7	305.0	5000.0	-24.3

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz – Antenna B
Notes	Average Measurements in the Restricted Bands

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)
4924.00	H	0.00		4.9	34.3	-40.3	0.0	-1.0	0.9	500.0	-55.0
	V	0.00		4.9	34.3	-40.3	0.0	-1.0	0.9	500.0	-55.0
7386.00	H	40.61		6.2	35.7	-40.1	0.0	42.4	132.1	500.0	-11.6
	V	43.81		6.2	35.7	-40.1	0.0	45.6	191.0	500.0	-8.4
12310.00	H	34.63	*	8.0	39.0	-39.6	0.0	42.0	126.1	500.0	-12.0
	V	34.81	*	8.0	39.0	-39.6	0.0	42.2	128.7	500.0	-11.8
19696.00	H	17.90	*	2.2	40.4	-28.0	0.0	32.5	42.1	500.0	-21.5
	V	17.93	*	2.2	40.4	-28.0	0.0	32.5	42.2	500.0	-21.5
22158.00	H	23.23	*	2.2	40.6	-28.7	0.0	37.3	73.2	500.0	-16.7
	V	23.31	*	2.2	40.6	-28.7	0.0	37.4	73.9	500.0	-16.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz – Antenna B
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)
2462.00	H	58.20		3.5	32.6	0.0	94.3	51651.0	NA	NA
	V	59.69		3.5	32.6	0.0	95.8	61316.7	NA	NA
9848.00	H	38.48		6.9	37.0	-39.5	42.8	138.8	6131.7	-32.9
	V	39.19		6.9	37.0	-39.5	43.6	150.6	6131.7	-32.2
14772.00	H	39.73	*	8.9	40.3	-40.3	48.6	270.4	6131.7	-27.1
	V	39.47	*	8.9	40.3	-40.3	48.4	262.5	6131.7	-27.4
17234.00	H	39.56	*	9.6	42.6	-39.0	52.8	436.3	6131.7	-23.0
	V	39.24	*	9.6	42.6	-39.0	52.5	420.5	6131.7	-23.3
24620.00	H	21.58	*	2.2	40.6	-29.0	35.4	59.1	6131.7	-40.3
	V	21.14	*	2.2	40.6	-29.0	35.0	56.1	6131.7	-40.8

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz – Antenna B
Notes	Peak 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)
4824.00	H	49.6		4.8	34.4	-40.2	48.6	269.3	5000.0	-25.4
	V	49.8		4.8	34.4	-40.2	48.8	276.8	5000.0	-25.1
12060.00	H	50.2	*	8.0	38.7	-39.7	57.2	721.1	5000.0	-16.8
	V	49.9	*	8.0	38.7	-39.7	56.9	697.5	5000.0	-17.1
14472.00	H	50.2	*	8.7	39.9	-40.0	58.8	869.4	5000.0	-15.2
	V	49.3	*	8.7	39.9	-40.0	57.9	789.3	5000.0	-16.0
19296.00	H	32.3	*	2.2	40.4	-27.9	47.0	223.8	5000.0	-27.0
	V	32.0	*	2.2	40.4	-27.9	46.7	216.5	5000.0	-27.3

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz – Antenna B
Notes	Average Measurements in the Restricted Bands

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)
4824.00	H	34.74		4.8	34.4	-40.2	0.0	33.8	48.9	500.0	-20.2
	V	34.75		4.8	34.4	-40.2	0.0	33.8	49.0	500.0	-20.2
12060.00	H	34.39	*	8.0	38.7	-39.7	0.0	41.4	117.5	500.0	-12.6
	V	34.33	*	8.0	38.7	-39.7	0.0	41.3	116.7	500.0	-12.6
14472.00	H	34.52	*	8.7	39.9	-40.0	0.0	43.1	143.5	500.0	-10.8
	V	34.49	*	8.7	39.9	-40.0	0.0	43.1	143.0	500.0	-10.9
19296.00	H	17.82	*	2.2	40.4	-27.9	0.0	32.5	42.4	500.0	-21.4
	V	17.90	*	2.2	40.4	-27.9	0.0	32.6	42.8	500.0	-21.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz – Antenna B
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)
2412.00	H	56.09		3.4	32.3	0.0	91.8	38976.5	NA	NA
	V	59.08		3.4	32.3	0.0	94.8	54992.4	NA	NA
7236.00	H	43.84		6.1	35.7	-40.1	45.6	190.2	5499.2	-29.2
	V	47.24		6.1	35.7	-40.1	49.0	281.3	5499.2	-25.8
9648.00	H	39.57		6.8	36.7	-39.6	43.5	150.2	5499.2	-31.3
	V	40.61		6.8	36.7	-39.6	44.6	169.3	5499.2	-30.2
16884.00	H	37.22	*	9.4	43.4	-38.8	51.3	365.8	5499.2	-23.5
	V	38.90	*	9.4	43.4	-38.8	52.9	443.9	5499.2	-21.9
21708.00	H	22.51	*	2.2	40.6	-28.7	36.6	67.8	5499.2	-38.2
	V	22.18	*	2.2	40.6	-28.7	36.3	65.2	5499.2	-38.5
24120.00	H	21.94	*	2.2	40.6	-29.4	35.4	59.1	5499.2	-39.4
	V	22.68	*	2.2	40.6	-29.4	36.2	64.4	5499.2	-38.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2437MHz – Antenna B
Notes	Peak 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)
4874.00	H	49.9		4.9	34.4	-40.3	48.9	279.7	5000.0	-25.0
	V	49.8		4.9	34.4	-40.3	48.8	274.9	5000.0	-25.2
7311.00	H	55.3		6.2	35.7	-40.1	57.1	717.7	5000.0	-16.9
	V	59.9		6.2	35.7	-40.1	61.7	1218.8	5000.0	-12.3
12185.00	H	49.2	*	8.0	38.9	-39.6	56.4	660.9	5000.0	-17.6
	V	49.6	*	8.0	38.9	-39.6	56.8	694.4	5000.0	-17.1
19496.00	H	32.4	*	2.2	40.4	-27.7	47.3	231.5	5000.0	-26.7
	V	32.3	*	2.2	40.4	-27.7	47.2	228.9	5000.0	-26.8

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2437MHz – Antenna B
Notes	Average Measurements in the Restricted Bands

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)
4874.00	H	34.70		4.9	34.4	-40.3	0.0	33.7	48.4	500.0	-20.3
	V	34.72		4.9	34.4	-40.3	0.0	33.7	48.5	500.0	-20.3
7311.00	H	41.29		6.2	35.7	-40.1	0.0	43.1	142.7	500.0	-10.9
	V	43.50		6.2	35.7	-40.1	0.0	45.3	184.0	500.0	-8.7
12185.00	H	34.21	*	8.0	38.9	-39.6	0.0	41.4	118.1	500.0	-12.5
	V	34.11	*	8.0	38.9	-39.6	0.0	41.3	116.7	500.0	-12.6
19496.00	H	17.94	*	2.2	40.4	-27.7	0.0	32.8	43.7	500.0	-21.2
	V	17.91	*	2.2	40.4	-27.7	0.0	32.8	43.5	500.0	-21.2

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2437MHz – Antenna B
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)
2437.00	H	59.41		3.5	32.5	0.0	95.4	58679.8	NA	NA
	V	61.00		3.5	32.5	0.0	97.0	70467.5	NA	NA
9748.00	H	38.64		6.9	36.9	-39.6	42.8	138.2	7046.8	-34.1
	V	39.22		6.9	36.9	-39.6	43.4	147.8	7046.8	-33.6
14622.00	H	38.19	*	8.8	40.1	-40.2	47.0	223.3	7046.8	-30.0
	V	38.33	*	8.8	40.1	-40.2	47.1	227.0	7046.8	-29.8
17059.00	H	38.05	*	9.5	43.0	-38.8	51.8	390.9	7046.8	-25.1
	V	38.67	*	9.5	43.0	-38.8	52.5	419.8	7046.8	-24.5
21933.00	H	21.46	*	2.2	40.6	-28.9	35.3	58.5	7046.8	-41.6
	V	21.72	*	2.2	40.6	-28.9	35.6	60.3	7046.8	-41.4
24370.00	H	21.76	*	2.2	40.6	-29.4	35.3	57.9	7046.8	-41.7
	V	21.48	*	2.2	40.6	-29.4	35.0	56.1	7046.8	-42.0

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz – Antenna B
Notes	Peak 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)
4924.00	H	49.4		4.9	34.3	-40.3	48.4	262.0	5000.0	-25.6
	V	49.9		4.9	34.3	-40.3	48.9	277.6	5000.0	-25.1
7386.00	H	55.4		6.2	35.7	-40.1	57.2	724.5	5000.0	-16.8
	V	59.0		6.2	35.7	-40.1	60.8	1100.4	5000.0	-13.1
12310.00	H	49.1	*	8.0	39.0	-39.6	56.5	667.8	5000.0	-17.5
	V	49.3	*	8.0	39.0	-39.6	56.6	679.4	5000.0	-17.3
19696.00	H	33.2	*	2.2	40.4	-28.0	47.8	244.2	5000.0	-26.2
	V	32.7	*	2.2	40.4	-28.0	47.3	232.1	5000.0	-26.7
22158.00	H	32.2	*	2.2	40.6	-28.7	46.2	204.5	5000.0	-27.8
	V	32.6	*	2.2	40.6	-28.7	46.7	216.4	5000.0	-27.3

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz – Antenna B
Notes	Average Measurements in the Restricted Bands

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)
4924.00	H	34.74		4.9	34.3	-40.3	0.0	33.7	48.5	500.0	-20.3
	V	34.81		4.9	34.3	-40.3	0.0	33.8	48.9	500.0	-20.2
7386.00	H	40.09		6.2	35.7	-40.1	0.0	41.9	124.5	500.0	-12.1
	V	44.42		6.2	35.7	-40.1	0.0	46.2	204.9	500.0	-7.7
12310.00	H	34.89	*	8.0	39.0	-39.6	0.0	42.3	129.9	500.0	-11.7
	V	34.92	*	8.0	39.0	-39.6	0.0	42.3	130.4	500.0	-11.7
19696.00	H	17.43	*	2.2	40.4	-28.0	0.0	32.0	39.9	500.0	-22.0
	V	17.46	*	2.2	40.4	-28.0	0.0	32.0	40.0	500.0	-21.9
22158.00	H	18.41	*	2.2	40.6	-28.7	0.0	32.5	42.0	500.0	-21.5
	V	18.33	*	2.2	40.6	-28.7	0.0	32.4	41.7	500.0	-21.6

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz – Antenna B
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)
2462.00	H	60.35		3.5	32.6	0.0	96.4	66157.4	NA	NA
	V	61.55		3.5	32.6	0.0	97.6	75958.9	NA	NA
9848.00	H	39.66		6.9	37.0	-39.5	44.0	158.9	7595.9	-33.6
	V	39.45		6.9	37.0	-39.5	43.8	155.1	7595.9	-33.8
14772.00	H	38.00	*	8.9	40.3	-40.3	46.9	221.6	7595.9	-30.7
	V	39.45	*	8.9	40.3	-40.3	48.4	261.9	7595.9	-29.2
17234.00	H	38.28	*	9.6	42.6	-39.0	51.5	376.5	7595.9	-26.1
	V	38.42	*	9.6	42.6	-39.0	51.7	382.6	7595.9	-26.0
24620.00	H	21.62	*	2.2	40.6	-29.0	35.5	59.3	7595.9	-42.1
	V	21.19	*	2.2	40.6	-29.0	35.0	56.5	7595.9	-42.6

27. Band-Edge Compliance

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580 & 1430570
Mode	Tx

Test Setup Details	
Setup Format	Tabletop
Height of Support	N/A
Measurement Method	Radiated Antenna Conducted
Type of Test Site	Semi-Anechoic Chamber EMC Test Bench
Type of Antennas Used	Below 1GHz: Bilog (or equivalent) 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 antenna port of the EUT was connected to the spectrum analyzer through an R&S OSP 120.
   b) The EUT was set to transmit continuously at the channel closest to the low band-edge.
   c) To determine the band edge compliance, the following spectrum analyzer settings were used:
      - Center Frequency = 2400MHz (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.
   d) The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.
   e) 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.)
   f) 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 set to transmit continuously at the channel closest to the high band-edge.

b) A broadband measuring antenna was placed at a test distance of 3 meters from the EUT. The antenna was connected to the input of a spectrum analyzer.

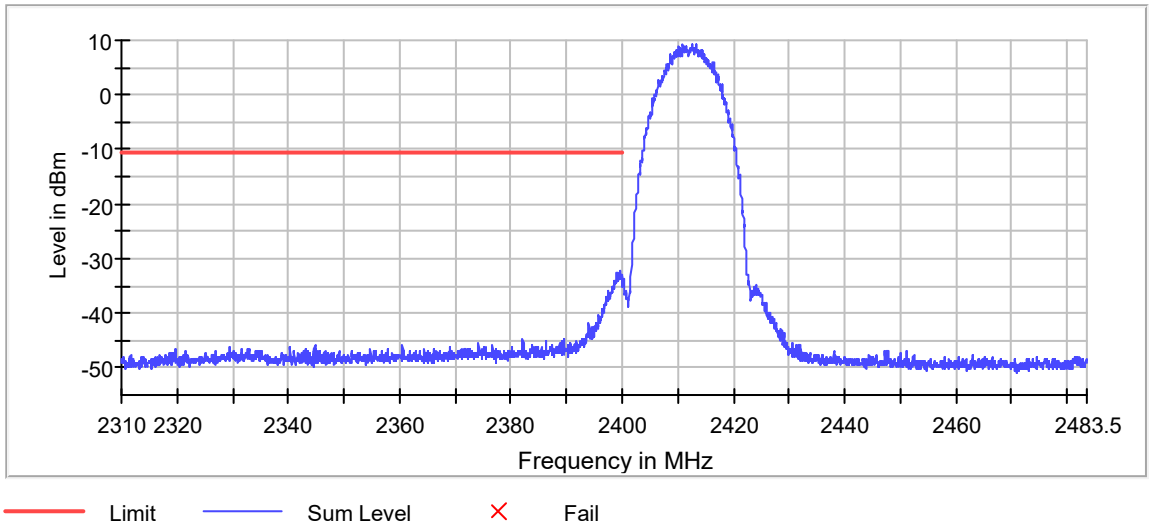
c) The center frequency of the analyzer was set to the high band edge (2483.5MHz).

d) The Resolution Bandwidth was set to 1MHz.

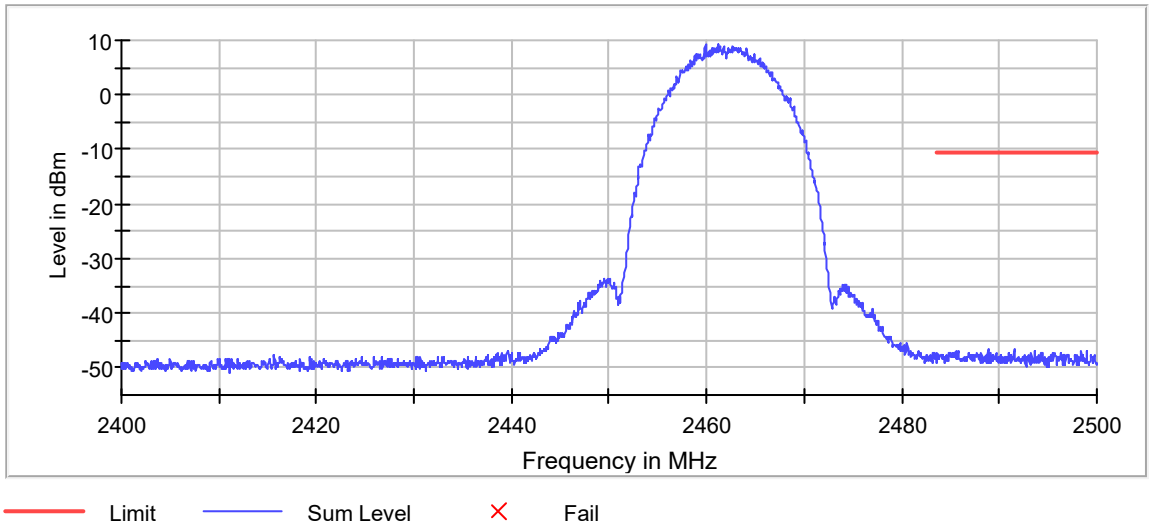
e) To ensure that the maximum or worst-case emission level was measured, the following steps were taken:

- The EUT was rotated so that all of its sides were exposed to the receiving antenna.
- Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
- The EUT was rotated so that all of its sides were exposed to the receiving antenna.
- The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
- The highest measured peak reading and the highest measured average reading were recorded.

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz – Antenna A
Notes	Low Band Edge



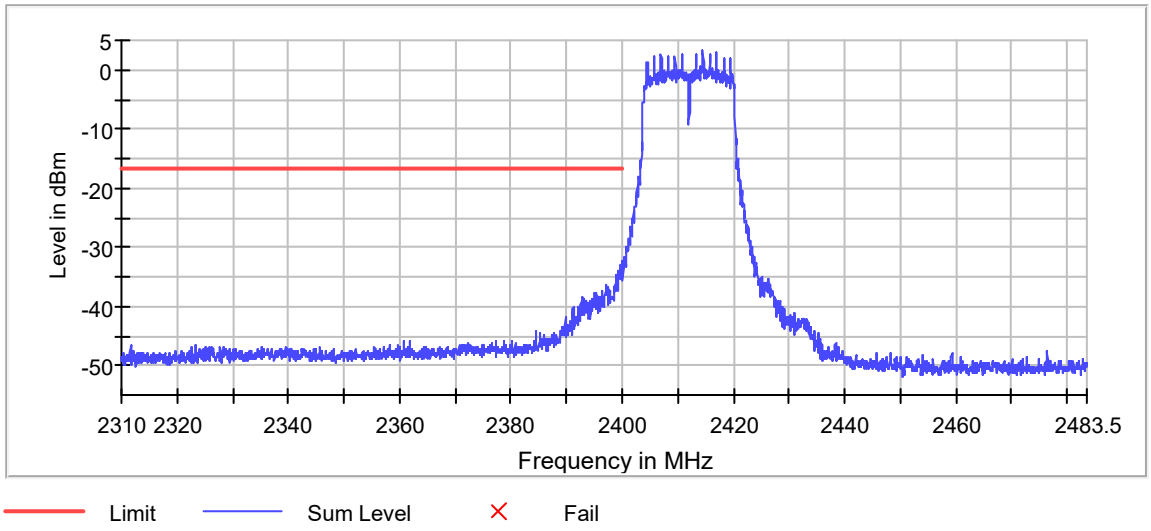
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz – Antenna A
Notes	High Band Edge – Peak and Average Measurements



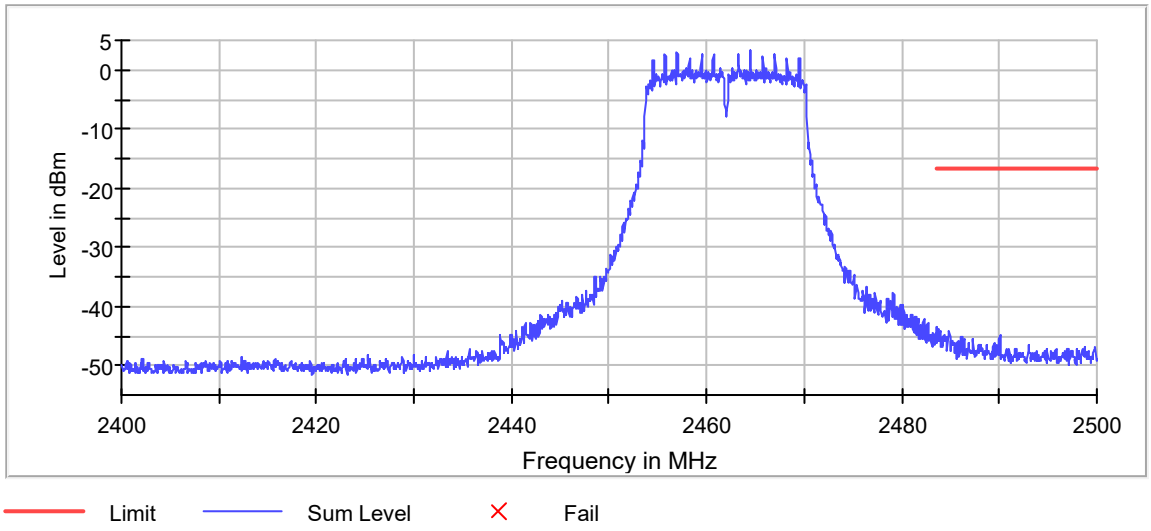
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
2483.50	H	31.5		3.5	32.5	0.0	67.6	2390.0	5000.0	-6.4
	V	29.3		3.5	32.5	0.0	65.3	1840.4	5000.0	-8.7

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)
2483.50	H	16.41		3.5	32.5	0.0	0.0	52.4	418.7	500.0	-1.5
	V	15.79		3.5	32.5	0.0	0.0	51.8	389.9	500.0	-2.2

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz – Antenna A
Notes	Low Band Edge



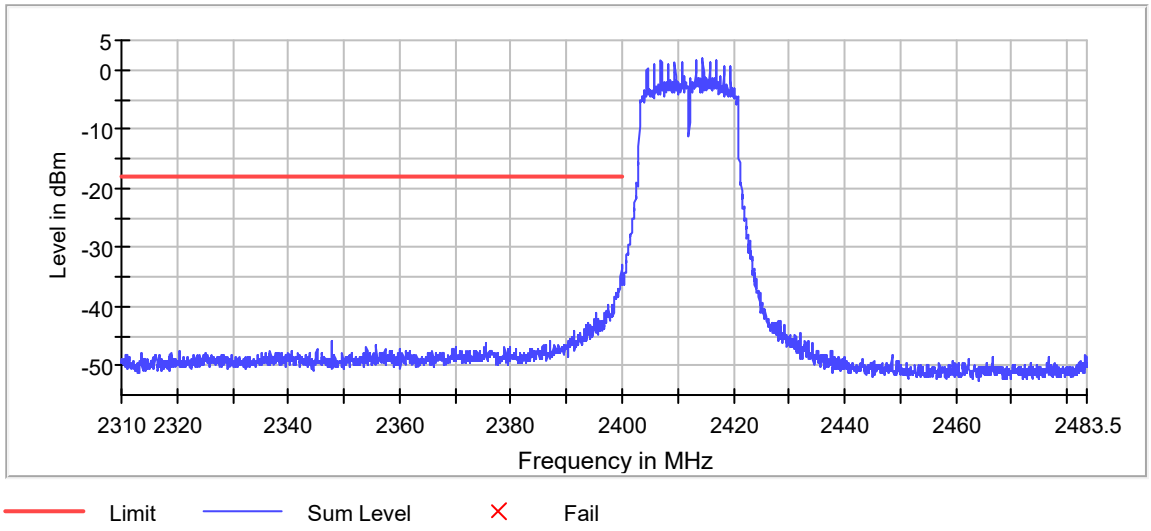
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz – Antenna A
Notes	High Band Edge – Peak and Average Measurements



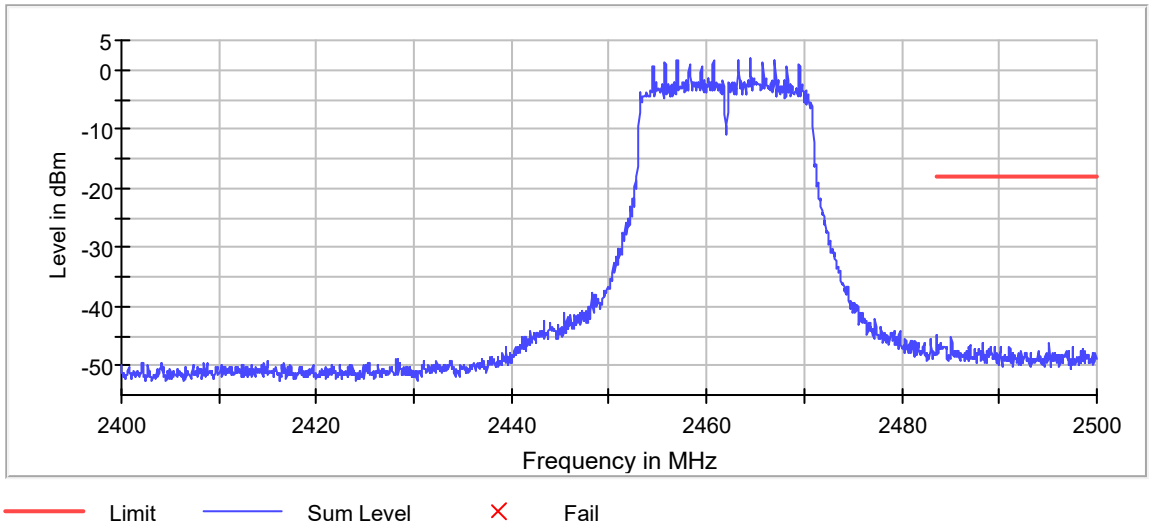
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)
2483.50	H	34.7		3.5	32.5	0.0	70.7	3438.8	5000.0
	V	35.0		3.5	32.5	0.0	71.0	3539.2	5000.0

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)
2483.50	H	16.88		3.5	32.5	0.0	0.0	52.9	442.0
	V	16.71		3.5	32.5	0.0	0.0	52.7	433.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz – Antenna A
Notes	Low Band Edge



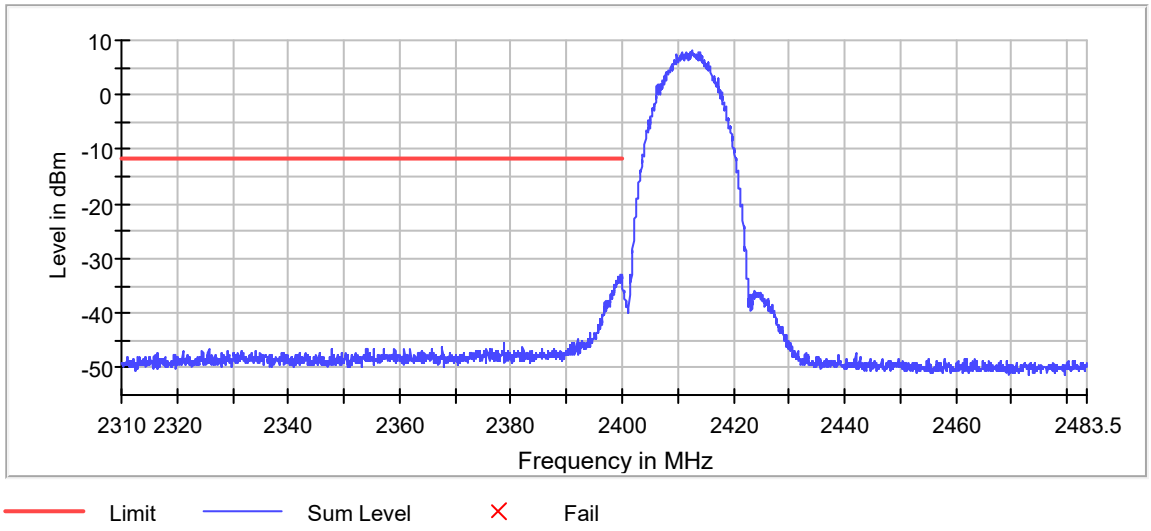
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz – Antenna A
Notes	High Band Edge – Peak and Average Measurements



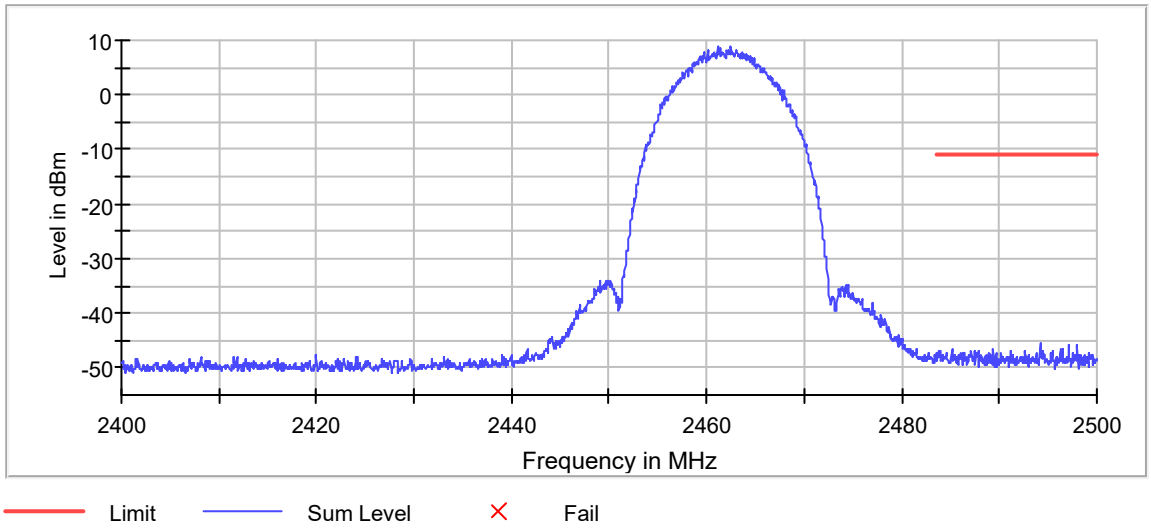
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
2483.50	H	27.0		3.5	32.5	0.0	63.0	1410.6	5000.0	-11.0
	V	26.7		3.5	32.5	0.0	62.7	1365.9	5000.0	-11.3

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)
2483.50	H	16.92		3.5	32.5	0.0	0.0	52.9	444.0	500.0	-1.0
	V	16.97		3.5	32.5	0.0	0.0	53.0	446.6	500.0	-1.0

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz – Antenna B
Notes	Low Band Edge



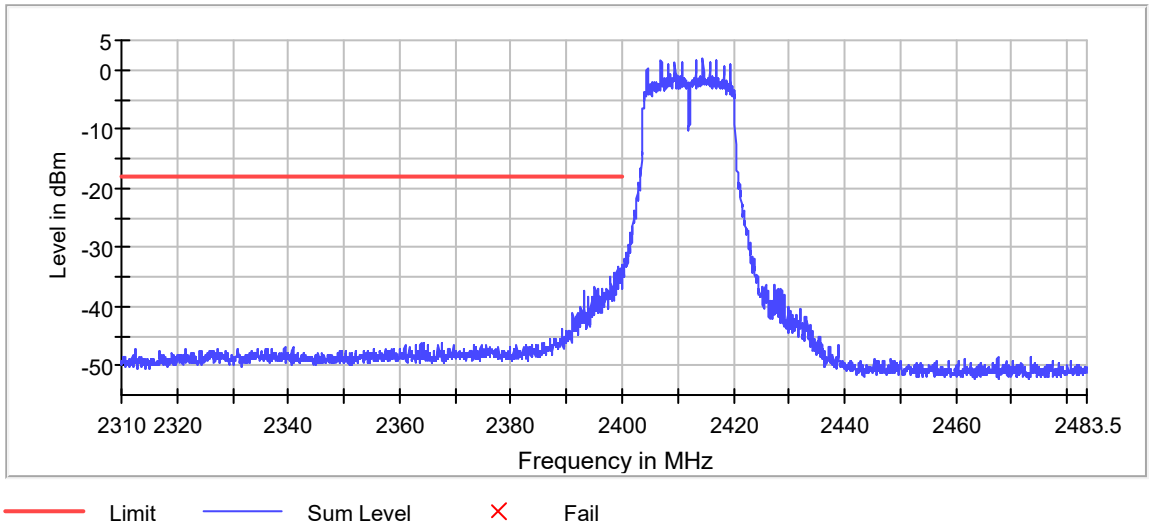
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz – Antenna B
Notes	High Band Edge – Peak and Average Measurements



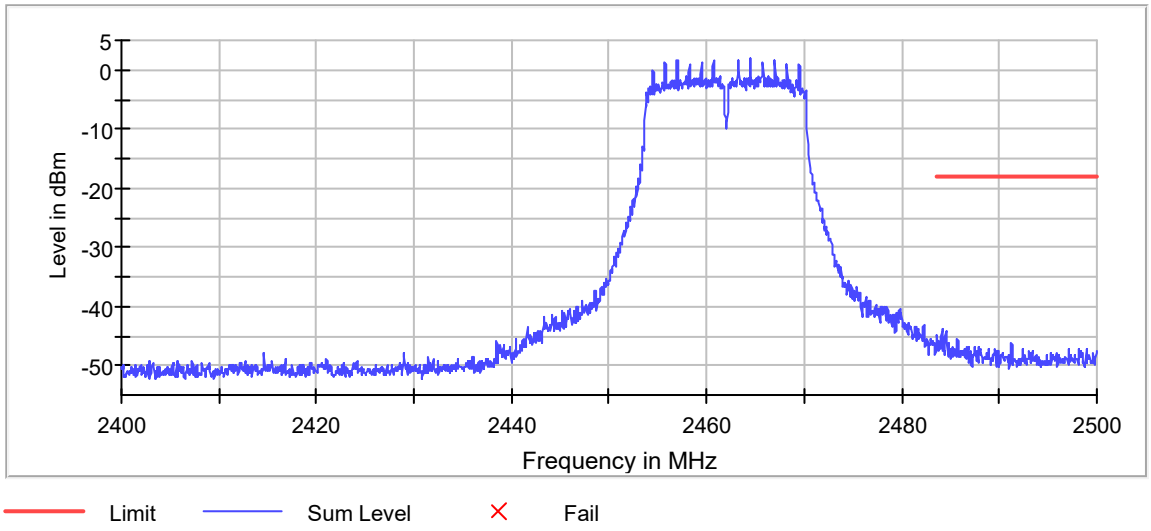
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
2483.50	H	28.4		3.5	32.5	0.0	64.4	1665.0	5000.0	-9.6
	V	31.3		3.5	32.5	0.0	67.3	2316.9	5000.0	-6.7

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)
2483.50	H	16.11		3.5	32.5	0.0	0.0	52.1	404.5	500.0	-1.8
	V	16.04		3.5	32.5	0.0	0.0	52.1	401.2	500.0	-1.9

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz – Antenna B
Notes	Low Band Edge



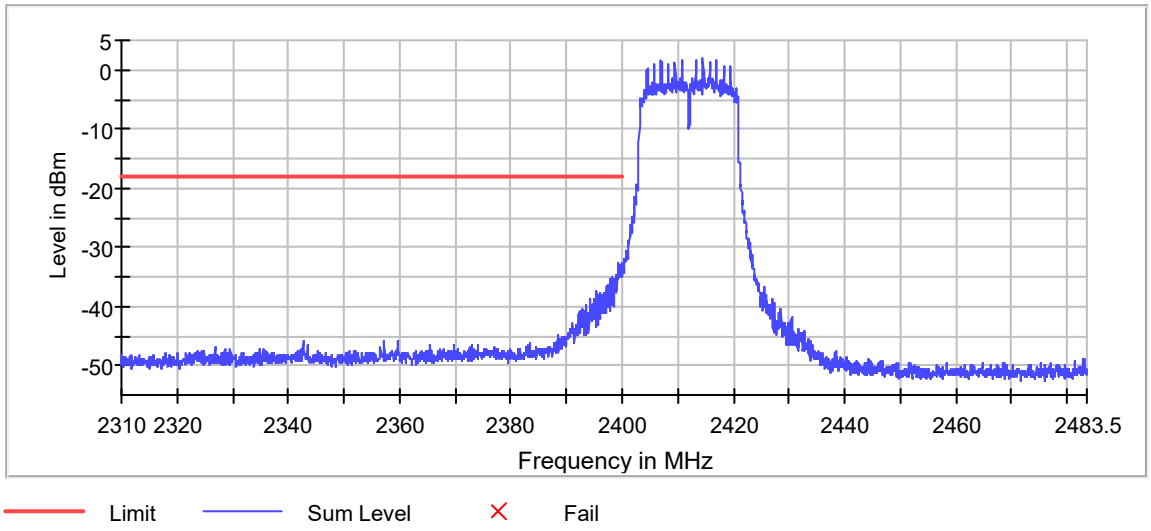
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz – Antenna B
Notes	High Band Edge – Peak and Average Measurements



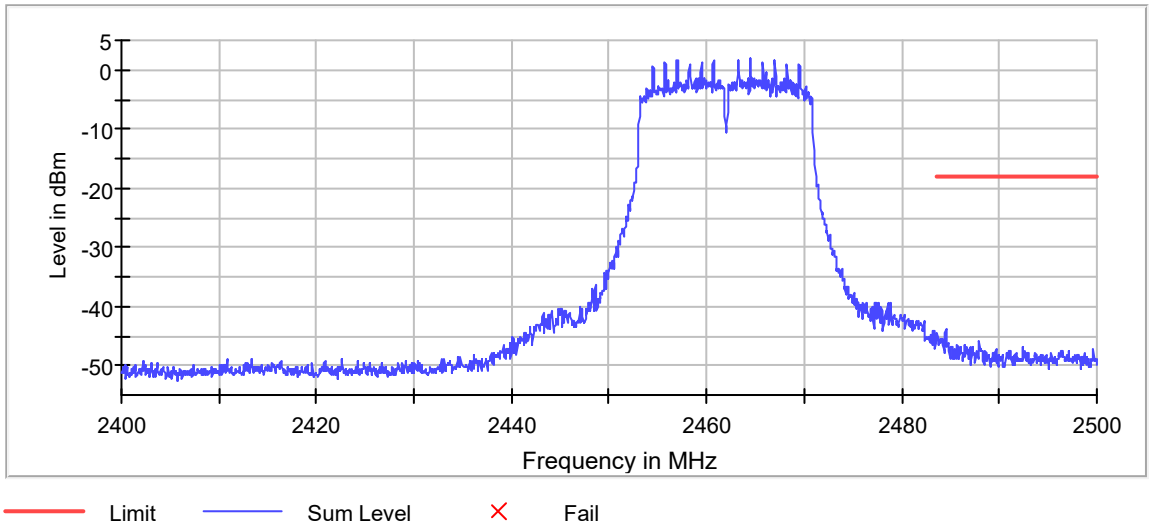
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dBm)
2483.50	H	28.1		3.5	32.5	0.0	64.1	1604.7	5000.0	-9.9
	V	24.5		3.5	32.5	0.0	60.5	1057.8	5000.0	-13.5

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)
2483.50	H	15.84		3.5	32.5	0.0	0.0	51.9	392.1	500.0	-2.1
	V	15.63		3.5	32.5	0.0	0.0	51.7	382.7	500.0	-2.3

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz – Antenna B
Notes	Low Band Edge



Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430580
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz – Antenna B
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)
2483.50	H	27.6		3.5	32.5	0.0	63.6	1515.0	5000.0	-10.4
	V	27.3		3.5	32.5	0.0	63.4	1473.7	5000.0	-10.6

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)
2483.50	H	16.17		3.5	32.5	0.0	0.0	52.2	407.3	500.0	-1.8
	V	16.08		3.5	32.5	0.0	0.0	52.1	403.1	500.0	-1.9

28. Power Spectral Density

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx

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

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

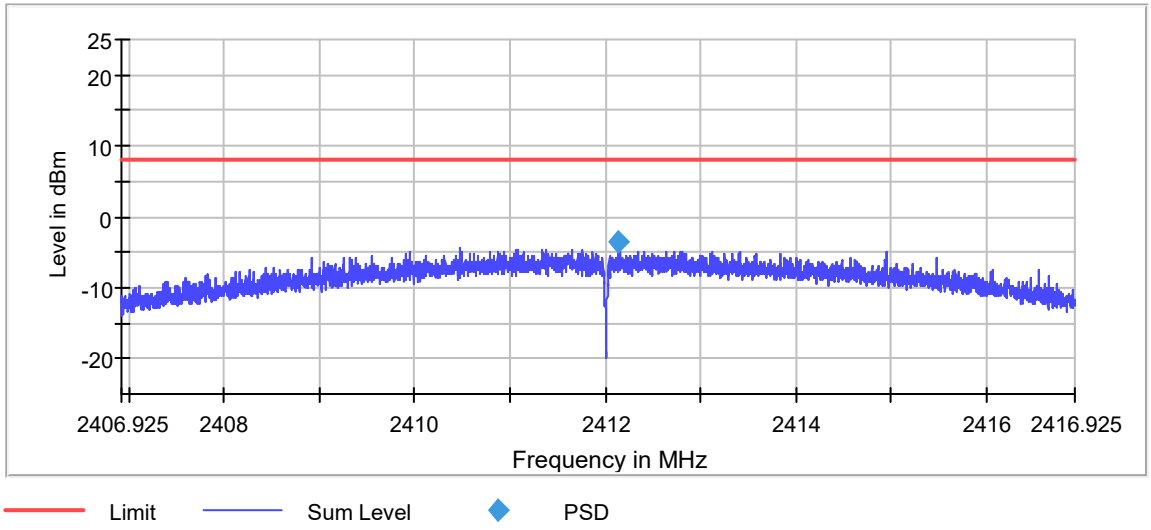
Requirement
The power spectral density from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

Procedure

1) The antenna port of the EUT was connected to the spectrum analyzer through through an R&S OSP 120.
2) The EUT was then configured to transmit continuously.
3) To determine the power spectral density, the following spectrum analyzer settings were used:
    a) Center Frequency = Transmit Frequency
    b) Span = 1.5× the DTS (6dB) bandwidth
    c) Resolution Bandwidth (RBW) = 3kHz ≤ RBW ≤ 100kHz
    d) Sweep time = Auto
    e) Detector = Peak
    f) Trace Function = Max-Hold
4) A display line was then placed on the corresponding +8dBm level.
5) The analyzers display was then screenshot and saved.

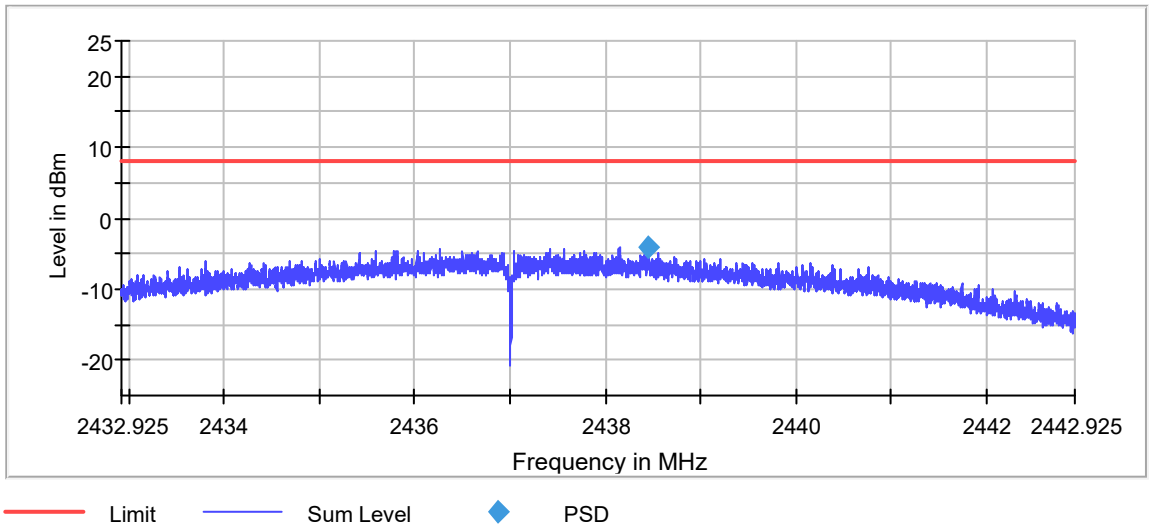
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz
Result	PSD = -3.509dBm
Notes	Antenna A

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2412.131990	-3.509	8.0	PASS



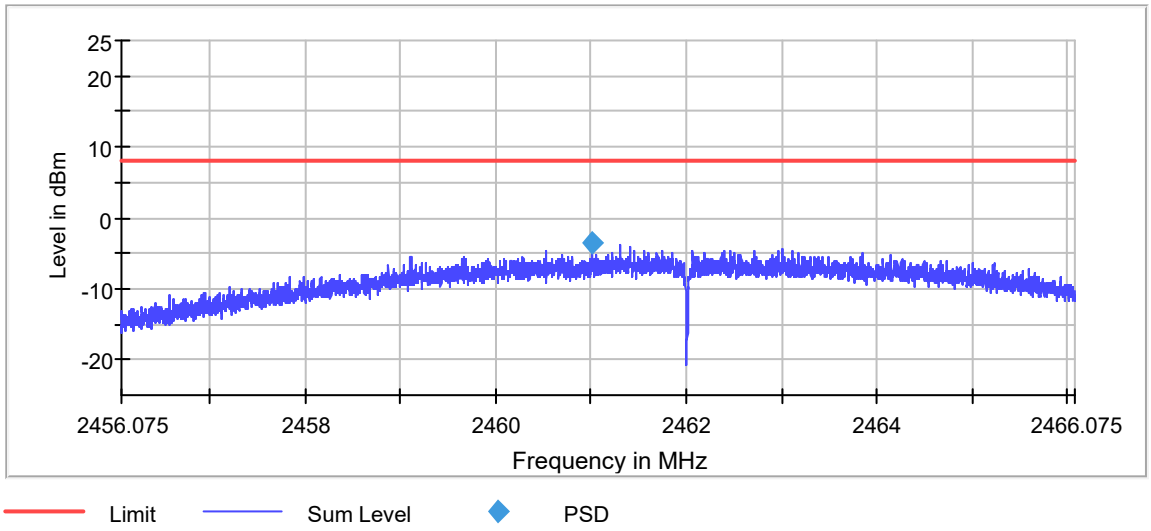
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2437MHz
Result	PSD = -4.06dBm
Notes	Antenna A

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2438.457473	-4.060	8.0	PASS



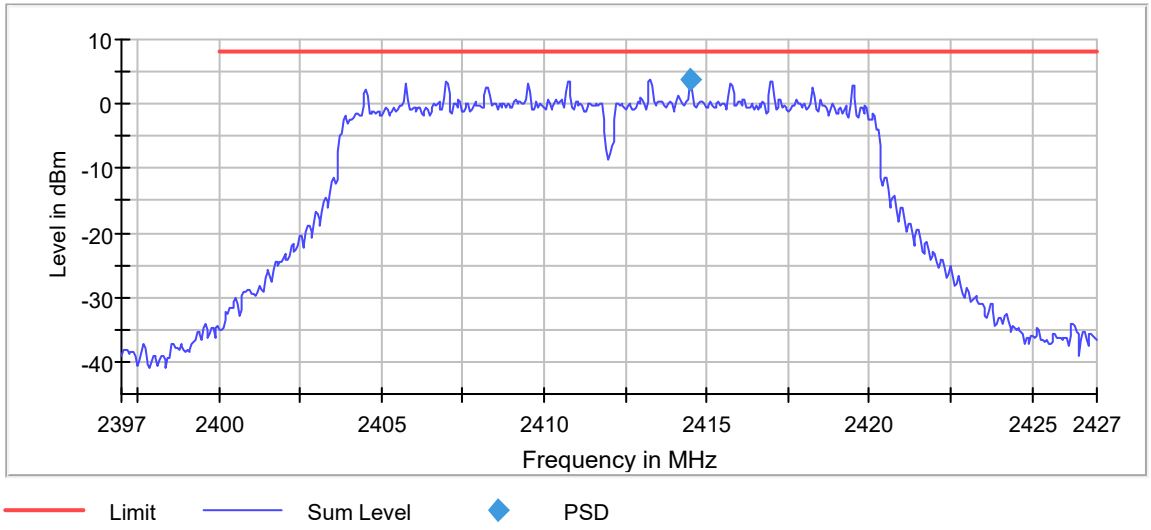
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz
Result	PSD = -3.672dBm
Notes	Antenna A

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2461.016503	-3.672	8.0	PASS



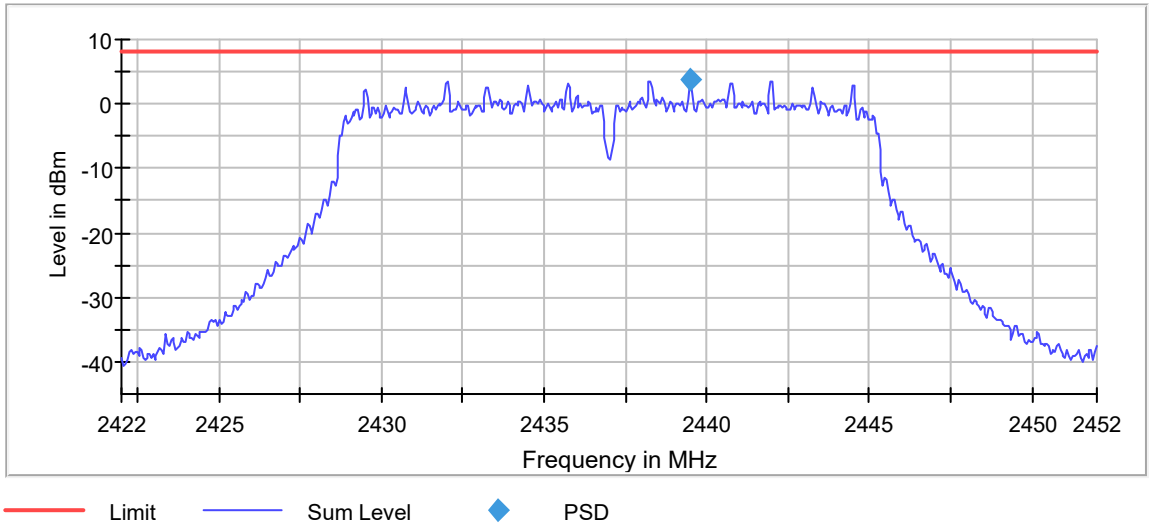
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz
Result	PSD = 3.825dBm
Notes	Antenna A

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2414.525000	3.825	8.0	PASS



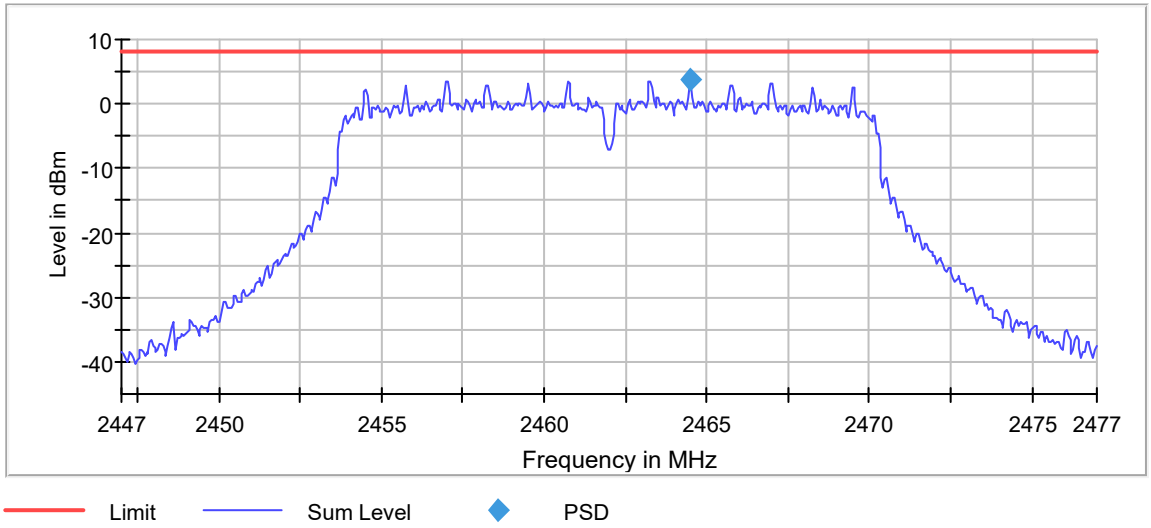
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2437MHz
Result	PSD = 3.762dBm
Notes	Antenna A

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2439.525000	3.762	8.0	PASS



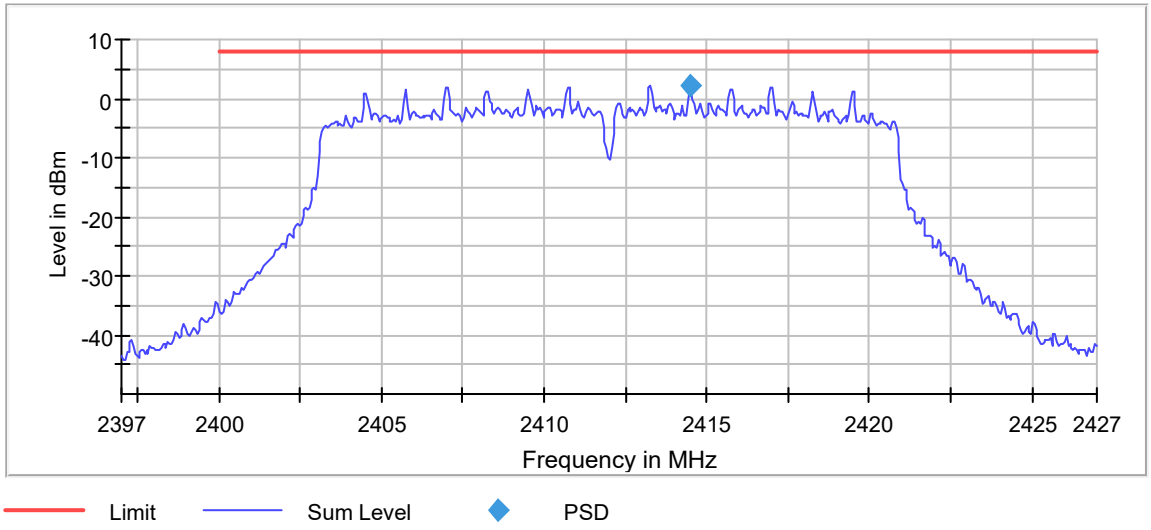
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz
Result	PSD = 3.783dBm
Notes	Antenna A

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2464.525000	3.783	8.0	PASS



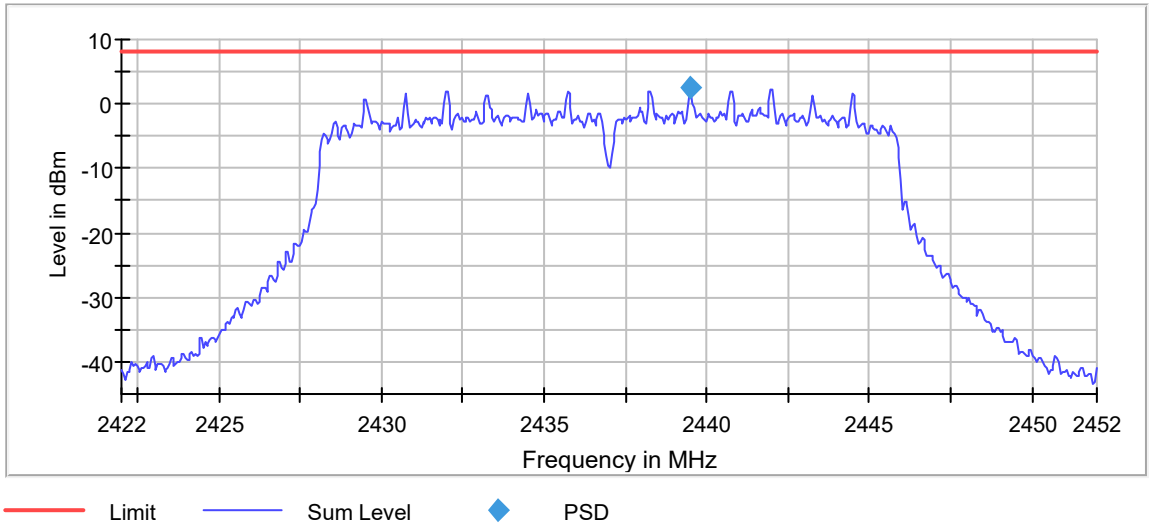
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz
Result	PSD = 2.34dBm
Notes	Antenna A

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2414.475000	2.340	8.0	PASS



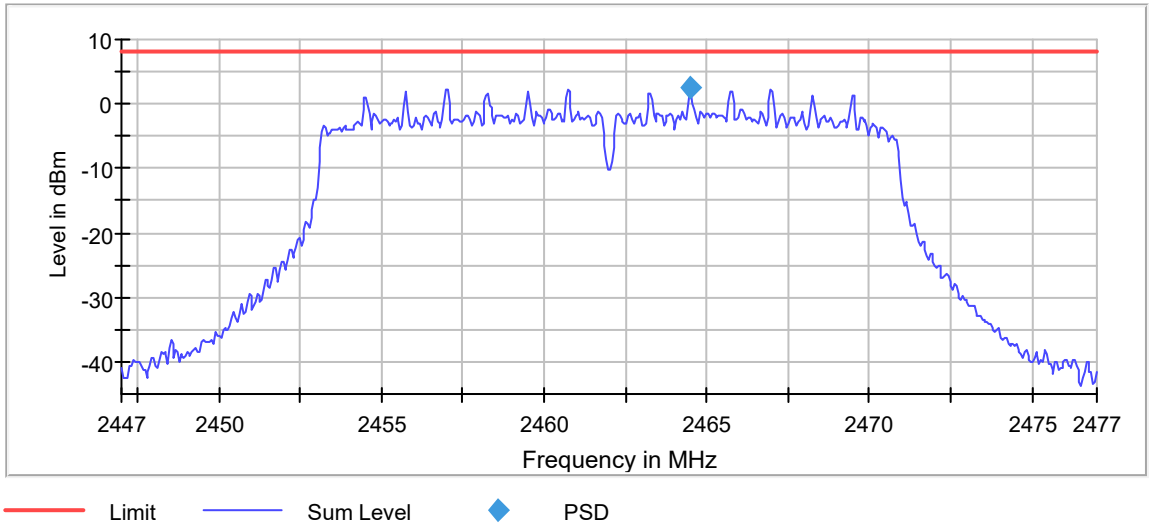
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2437MHz
Result	PSD = 2.485dBm
Notes	Antenna A

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2439.475000	2.485	8.0	PASS



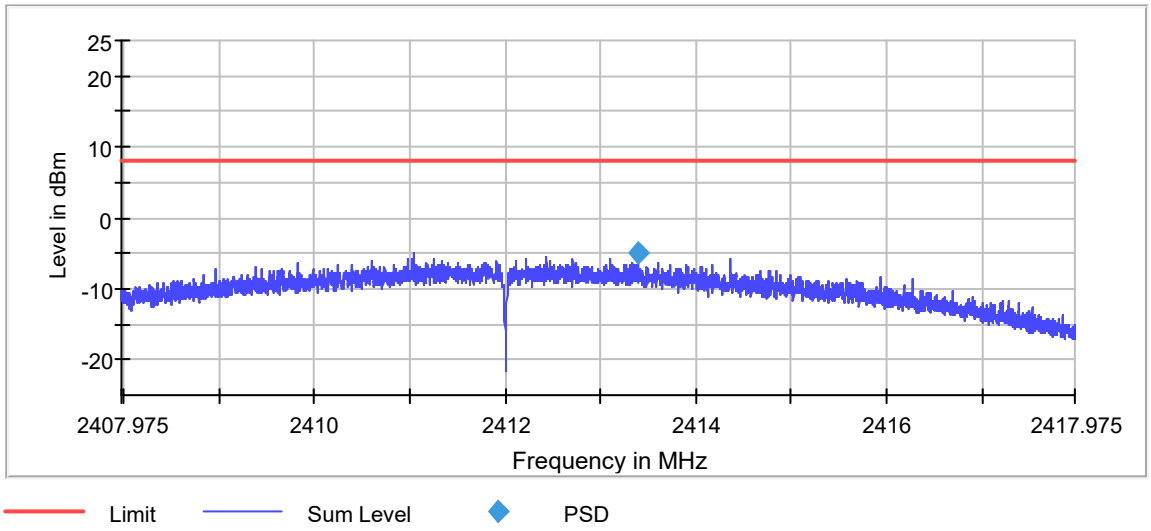
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz
Result	PSD = 2.507dBm
Notes	Antenna A

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2464.475000	2.507	8.0	PASS



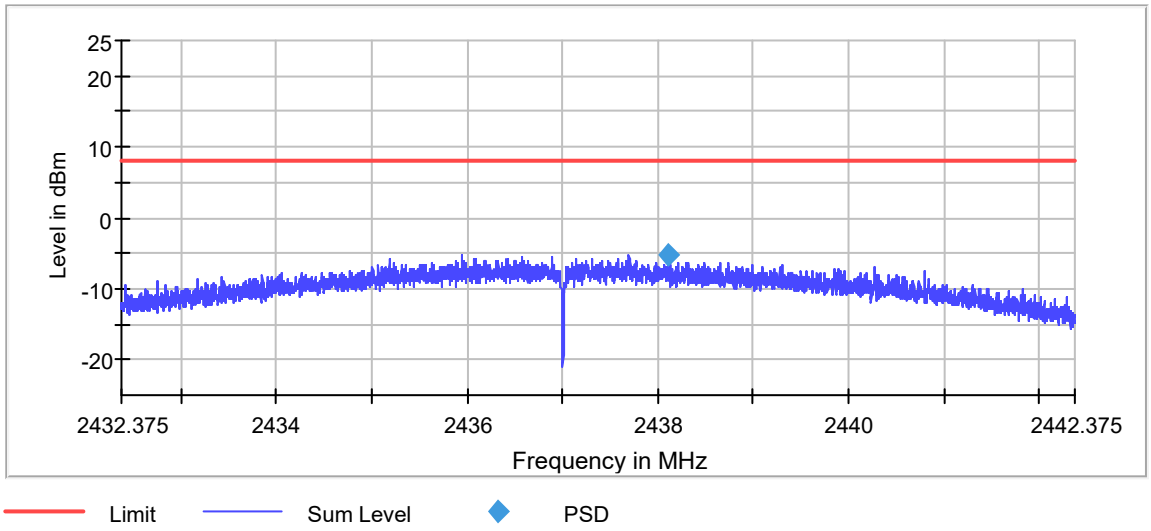
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2412MHz
Result	PSD = -4.977dBm
Notes	Antenna B

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2413.394979	-4.977	8.0	PASS



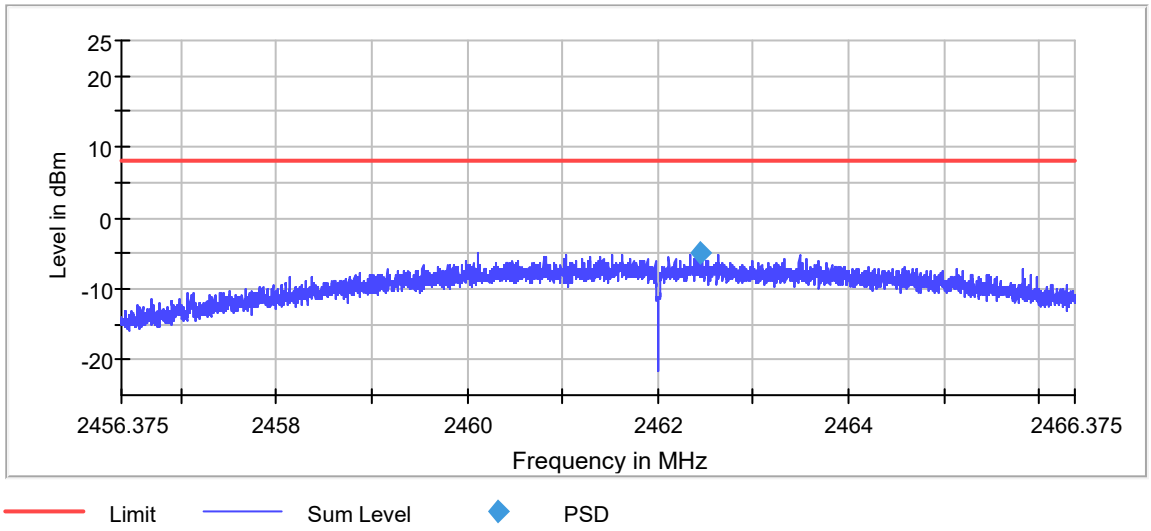
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2437MHz
Result	PSD = -5.266dBm
Notes	Antenna B

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2438.120463	-5.266	8.0	PASS



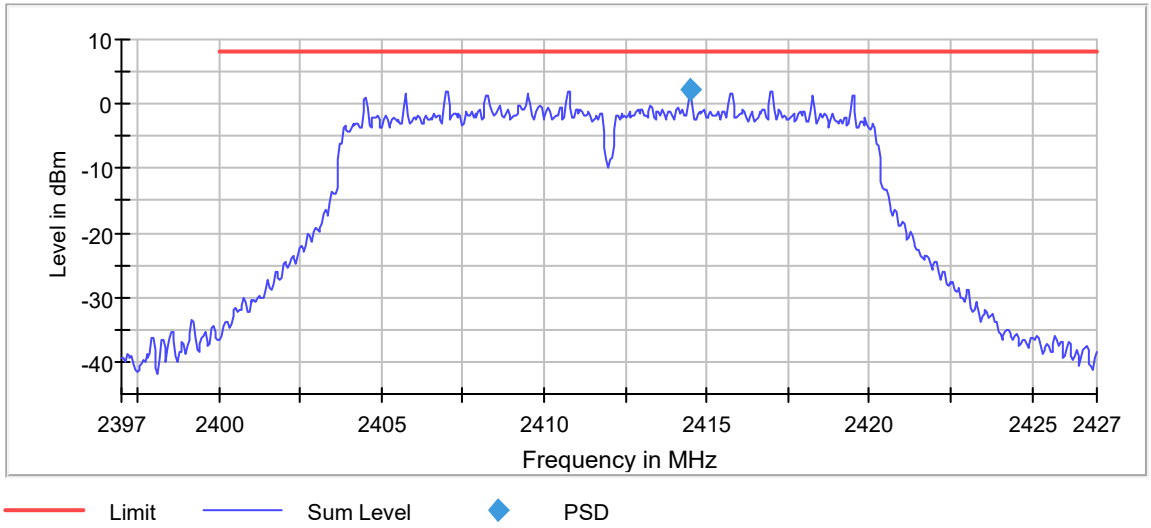
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11b 11Mbps
Frequency Tested	2462MHz
Result	PSD = -4.826dBm
Notes	Antenna B

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2462.451946	-4.826	8.0	PASS



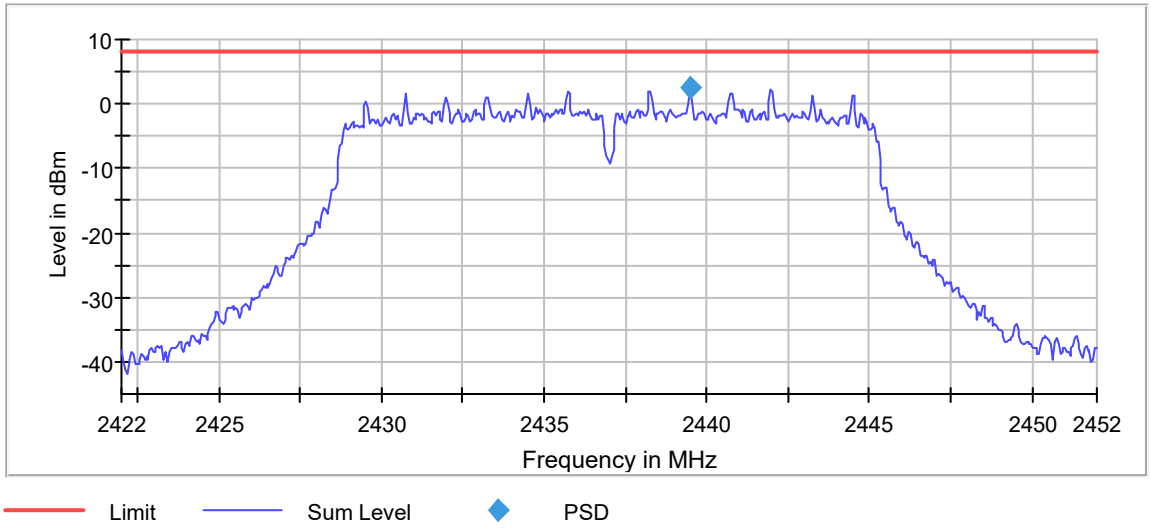
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2412MHz
Result	PSD = 2.103dBm
Notes	Antenna B

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2414.525000	2.103	8.0	PASS



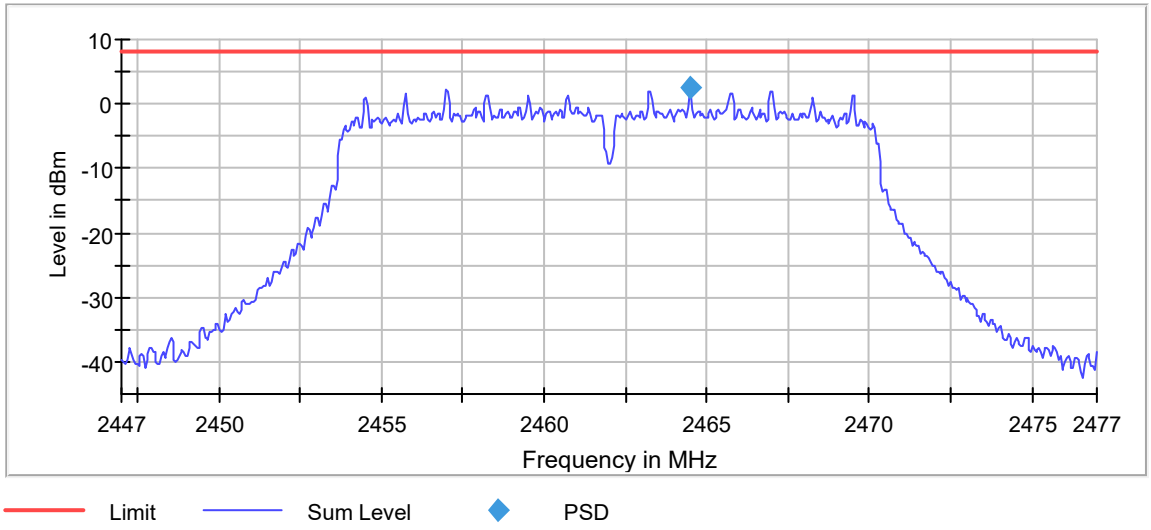
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2437MHz
Result	PSD = 2.413dBm
Notes	Antenna B

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2439.475000	2.413	8.0	PASS



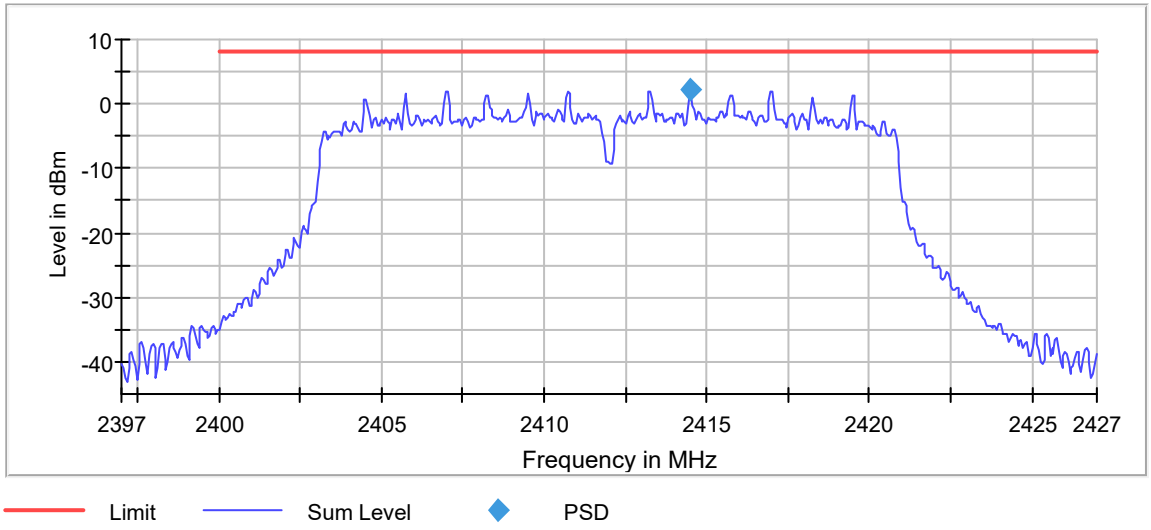
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11g 6Mbps
Frequency Tested	2462MHz
Result	PSD = 2.455dBm
Notes	Antenna B

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2464.525000	2.455	8.0	PASS



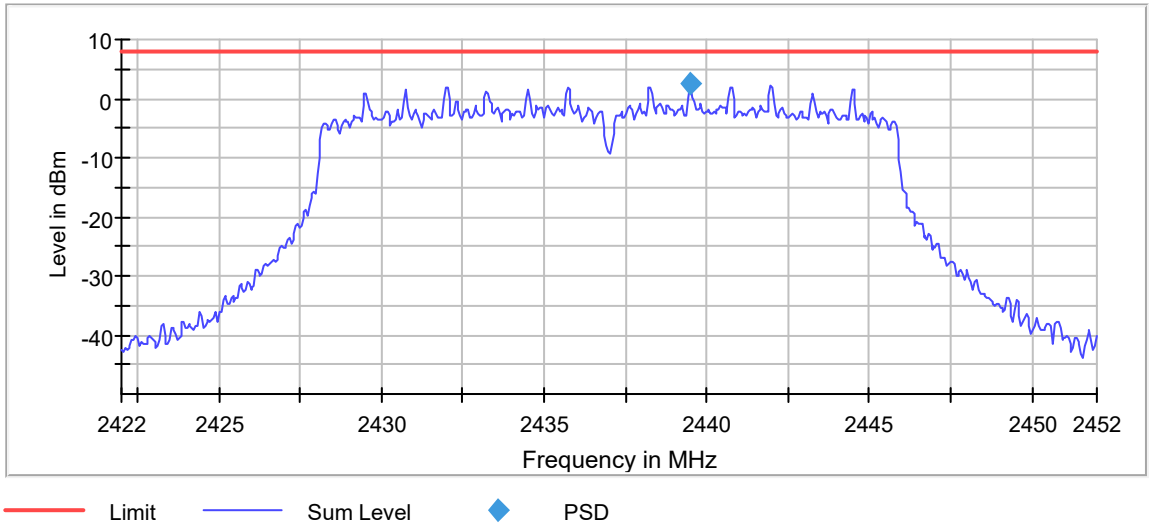
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2412MHz
Result	PSD = 2.337dBm
Notes	Antenna B

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2414.475000	2.337	8.0	PASS



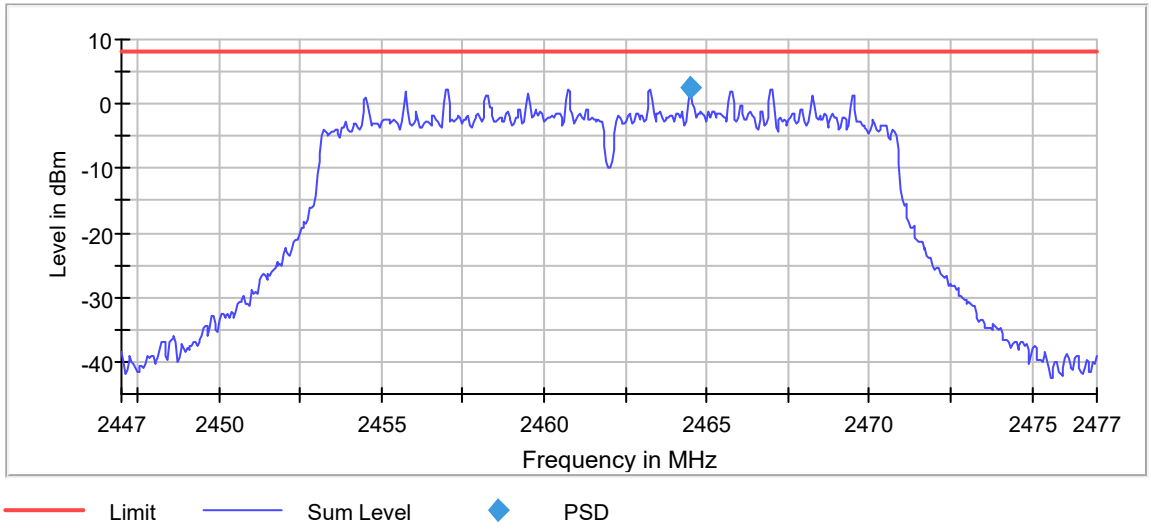
Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2437MHz
Result	PSD = 2.425dBm
Notes	Antenna B

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2439.525000	2.425	8.0	PASS



Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx – 802.11n20 MCS2
Frequency Tested	2462MHz
Result	PSD = 2.474dBm
Notes	Antenna B

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2464.525000	2.474	8.0	PASS



29. RF Exposure (MPE)

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	VisionPro
Serial No.	1430570
Mode	Tx

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

Requirement

FCC:
Equipment pursuing compliance to the requirements with respect to the limits of human exposure to RF provided in FCC 1.1310, need follow the criteria in FCC 1.1307(b)(1). Equipment exemption qualification must be demonstrated pursuant to FCC 1.1307(b)(3).

For single RF sources (i.e., any single portable device, mobile device, or fixed RF source): A single RF source is exempt if:

- Exemption A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance.

- Exemption B) The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

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

With

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

Where f is in GHz, and

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

Exemption C) Using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least λ/2π, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

ISED:
The RF exposure level is determined by either measurement or by calculating the power density at an evaluation distance of 0.2m, as specified by ANSI/IEEE C95.1-1992.

If it is found that the product meets the low power exclusion level criteria listed in RSS 102 Section 2.5.2, no further RF exposure evaluation is required. The low power exclusion level criteria are given in the following table (f is given in MHz):

RF Source Frequency (MHz)	Threshold ERP (watts)
$f < 20\ MHz$	$x \leq 1$
$20\ MHz \leq f < 48\ MHz$	$x \leq \frac{4.49}{f^{0.5}}$
$48\ MHz \leq f < 300\ MHz$	$x \leq 0.6$
$300\ MHz \leq f < 6\ GHz$	$x \leq (1.31 * 10^{-2}) * f^{0.6834}$
$6\ GHz \leq f$	$x \leq 5$

If it is determined that the measured or calculated power density does not meet the basic restrictions, a separation distance must be measured or calculated such that the basic restrictions are met.

FCC Limits for Occupational/Controlled Exposure			
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)
0.3 - 3.0	614	1.63	*100
3.0 – 30	1842 / f	4.89 / f	*900 / f^2
30 – 300	61.4	0.163	1.0
300 – 1,500	—	—	f / 300
1,500 – 100,000	—	—	5
FCC Limits for General/Uncontrolled Exposure			
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)
0.3 – 1.34	614	1.63	*100
1.34 – 30	842 / f	2.19 / f	*180 / f^2
30 – 300	27.5	0.073	0.2
300 – 1,500	—	—	f / 1500
1,500 – 100,000	—	—	1.0
f – Frequency in MHz * – Plane wave Equivalent Power Density			

ISED Limits for Occupational/Controlled Exposure			
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (W/m^2)
0.003 – 10*	170	180	—
0.1 – 10*	—	1.6 / f	—
1.29 – 10*	193 / $f^{0.5}$	—	—
10 – 20	61.4	0.163	10
20 – 48	129.8 / $f^{0.25}$	0.3444 / $f^{0.25}$	44.72 / $f^{0.5}$
48 – 100	49.33	0.1309	6.455
100 – 6000	15.60 $f^{0.25}$	0.04138 $f^{0.25}$	0.6455 $f^{0.5}$
6000 – 15000	137	0.364	50
15000 – 150000	137	0.364	50
150000 – 300000	0.354 $f^{0.5}$	9.40x10^{-4} $f^{0.5}$	3.33x10^{-4} f
ISEDLimits for General/Uncontrolled Exposure			
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (W/m^2)
0.003 – 10*	83	90	—
0.1 – 10*	—	0.73 / f	—
1.1 – 10*	87 / $f^{0.5}$	—	—
10 – 20	27.46	0.0728	2
20 – 48	58.07 / $f^{0.25}$	0.1540 / $f^{0.25}$	8.944 / $f^{.05}$
48 – 300	22.06	0.05852	1.291
300 – 6000	3.142 $f^{0.3417}$	0.008335 $f^{0.3417}$	0.02619 $f^{0.6834}$
6000 – 15000	61.4	0.163	10
15000 – 150000	61.4	0.163	10
150000 – 300000	0.158 $f^{0.5}$	4.21x10^{-4} $f^{0.5}$	6.67x10^{-5} f
f – Frequency in MHz			

FCC:

Radio Access Technology	*f* Transmit Frequency (MHz)	ERP/P (dBm)	ERP/P (mW)	ERP/P Exemption Threshold (mW)	Exempt/Not Exempt
802.11g	2412	23	200	3060	Exempt - Option B

Evaluated at 20cm.

ISED:

Radio Access Technology	*f* Transmit Frequency (MHz)	EIRP (dBm)	EIRP (W)	EIRP Exemption Threshold (W)	Exempt/Not Exempt
802.11g	2412	23	0.200	2.684	Exempt

Evaluated at 20cm.

30. Scope of Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELITE ELECTRONIC ENGINEERING, INC.
1516 Centre Circle
Downers Grove, IL 60515
Robert Bugielski (QA Manager) Phone: 630 495 9770 ext. 168
Email: rbugielski@elitetest.com
Craig Fanning (EMC Lab Manager) Phone: 630 495 9770 ext. 112
Email: cfanning@elitetest.com
Brandon Lugo (Automotive Team Leader) Phone: 630 495 9770 ext. 163
Email: blugo@elitetest.com
Richard King (FCC/Commercial Team Leader) Phone: 630 495 9770 ext. 123
Email: reking@elitetest.com
Website: www.elitetest.com

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)

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8515 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

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-248; 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	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
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	
Electrical Measurements and Simulation	
AC Voltage / Current	
(1mV to 5kV) 60 Hz	FAA AC 150/5345-10H
(0.1V to 250V) up to 500 MHz	FAA AC 150/5345-43J
(1µA to 150A) 60 Hz	FAA AC 150/5345-44K
DC Voltage / Current	FAA AC 150/5345-46E
(1mV to 15-kV) / (1µA to 10A)	FAA AC 150/5345-47C
Power Factor / Efficiency / Crest Factor	FAA EB 67D
(Power to 30kW)	
Resistance	
(1mΩ to 4000MΩ)	
Surge	
(Up to 10 kV / 5 kA) (Combination Wave and Ring Wave)	

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.