

**Engineering Test Report No. 1904265-02 Rev. A**

Report Date	January 23, 2020
Manufacturer Name	Chamberlain Group, Inc.
Manufacturer Address	300 Windsor Dr Oak Brook, IL 60523
Product Name Brand/Model No.	001D9586
Date Received	December 12 th 2019
Test Dates	December 12 th , 2019 through January 9 th , 2020
Specifications	FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Digital Modulation Intentional Radiators Operating within the band 2400-2483.5MHz FCC "Code of Federal Regulations" Title 47, Part 15, Subpart 15B, Section 15.107 and 15.109 for Receivers Innovation, Science, and Economic Development Canada RSS-247 Innovation, Science, and Economic Development Canada RSS-GEN
Test Facility	Elite Electronic Engineering, Inc. 1516 Centre Circle, Downers Grove, IL 60515
Signature	<i>RICHARD E. KING</i>
Tested by	Richard E. King
Signature	<i>Raymond J. Klouda</i>
Approved by	Raymond J. Klouda, Registered Professional Engineer of Illinois – 44894

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

This report shall not be reproduced, except in full, without the written approval of Elite Electronic Engineering Inc.

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 15.247 for transceivers and RSS-247 For Transceivers test specification(s). The data presented in this test report pertains to the EUT on the test date(s) 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	3
2.	Introduction	4
3.	Technical Information.....	4
4.	Test Specification(s)	4
5.	Laboratory Conditions.....	5
6.	Summary.....	5
7.	Test Plan	5
8.	Grounding	5
9.	Firmware/Software.....	5
10.	Modifications Made to EUT.....	5
11.	Deviations from Specification(s)	5
12.	Modes of Operation	5
12.1.	Transmit	5
13.	Test Method	6
14.	Sample Calculations	6
15.	Statement of Conformity	6
16.	Certification	6
17.	Photographs of EUT	7
18.	Equipment List	8
19.	Antenna Port Conducted Emissions Tests	9
20.	Scope of Accreditation	87

**This report shall not be reproduced, except in full,
without the written approval of Elite Electronic Engineering Inc.**

1. Report Revision History

Revision	Date	Description
–	27 Jan 2020	Initial Release of Engineering Test Report No. 1904265-02
A	3 Feb 2020 By Rick King	- Changed 194265-02 to 194265-02 Rev. A throughout report. - Changed the model number from 001D9586 WIFI to 001D9586 throughout report - Section 12.1: Added the output power setting. - Page 25: Removed references to 18dBm power.

2. Introduction

This document presents the results of a series of electromagnetic compatibility (EMC) tests that were performed on one (1) Phoenix Transceiver 001D9586 (hereinafter referred to as the Equipment Under Test (EUT)). The EUT was identified as follows:

Description	Part #	S/N
Phoenix Transceiver	001D9586	None given

The EUT listed above was used throughout the test series.

3. Technical Information

This document presents the technical information of the EUT as tested to a series of electromagnetic compatibility (EMC) tests. This information is listed as follows:

Applicant FCC FRN Company number (If known)	N/A
Applicant IC company number (If known)	N/A
FCC ID Number (If known)	N/A
IC UPN number (If Known)	N/A
FCC test site(s) Reg. number	2987-1
IC test site(s) Reg. number	2987A
FCC Test Speciation	FCC 15.247
RSS number and Issue number	RSS-247 Issue 2, Feb 2017
Frequency band	2400–2480 MHz
Frequency Min (MHz)	2412(20 MHz)
Frequency Max (MHz)	2462(20 MHz)
RF power Max (W), Conducted	74.1.1 mW (18.7 dBm)
Field strength, Units @ distance	N/A
Measured BW (kHz)	17700
Calculated BW (kHz), as per TRC-43	N/A
Type of modulation	802.11 b, g, n 20 MHz
Transmitter spurious, dBuV/m @ 3 m	41.1 dBuV/m @ 3Meters
Emission classification (F1D, G1D, D1D)	G1D (802.11 b) W7D (802.11 g n)
Power requirements	120VAC 60Hz

4. Test Specification(s)

The tests were performed to selected portions of, and in accordance with the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within the 2400-2483.5 MHz band test specification(s):

Federal Communications Commission "Code of Federal Regulations", Title 47, 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 9 kHz to 40 GHz"
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 System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under Section 15.247 of the FCC Rules" April 2, 2019, KDB 558074 D01 DTS Meas Guidance v05
RSS-Gen Issue 5, March 2019, Amendment 1, Innovation, Science, and Economic Development Canada, "Spectrum Management and Telecommunications, Radio Standards Specification, General Requirements for Compliance of Radio Apparatus"
RSS-247 Issue 2, February 2017, Innovation, Science, and Economic Development Canada, "Spectrum Management and Telecommunications, Radio Standards Specification, Digital Transmission Systems"

(DTSS), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices”

5. Laboratory Conditions

The temperature at the time of the test was 22.6°C, and the relative humidity was 17%.

6. Summary

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

Test Description	Results
Transmitter RF Conducted Emissions Test (AC Mains)	Conforms
Transmitter 6dB Bandwidth Test	Conforms
Transmitter 99% Bandwidth Test	Conforms
Transmitter Average Conducted Output Power Test	Conforms
Transmitter Power Spectral Density Test	Conforms
Transmitter Low Band Edge Test	Conforms
Transmitter EIRP Test	Conforms
Transmitter Duty Cycle Correction Factor Test	N/A
Transmitter Spurious Radiated Emissions Test	Conforms
Transmitter High Band Edge Test	Conforms

7. Test Plan

No test plan was provided. Instructions were provided by personnel from Chamberlain Group, Inc. and used in conjunction with the FCC 15.247 for transceivers and RSS-247 For Transceivers specification(s).

8. Grounding

The EUT was ungrounded during the test.

9. Firmware/Software

For all tests, the EUT had Firmware Version 6.2 loaded onto the device to provide correct load characteristics. The EUT requires Software RTLBTAPP Version 5.22.40 to control the device during testing.

10. Modifications Made to EUT

No modifications were made to the EUT during the testing.

11. Deviations from Specification(s)

No deviations from the specification(s) were made during the testing.

12. Modes of Operation

The EMC tests were performed with the EUT(s) operating in one or more of the test modes described below. See the specific test section for the applicable test modes.

12.1. Transmit

The EUT was energized. The EUT was programmed to continuously transmit separately at each of the following channels:

- Transmit at 2412MHz; 802.11 b 11 MB_s; 11MB_s; 20MHz; 18dBm
- Transmit at 2437MHz; 802.11 b 11 MB_s; 11MB_s; 20MHz; 18dBm
- Transmit at 2462MHz; 802.11 b 11 MB_s; 11MB_s; 20MHz; 18dBm
- Transmit at 2412MHz; 802.11 g 54 MB_s; 54MB_s; 20MHz; 17dBm
- Transmit at 2437MHz; 802.11 g 54 MB_s; 54MB_s; 20MHz; 17dBm

- Transmit at 2462MHz; 802.11 g 54 MB_s; 54MB_s; 20MHz; 17dBm
- Transmit at 2412MHz; 802.11 n MCS 7; MCS7; 20MHz; 16dBm
- Transmit at 2437MHz; 802.11 n MCS 7; MCS7; 20MHz; 16dBm
- Transmit at 2462MHz; 802.11 n MCS 7; MCS7; 20MHz; 16dBm

13. Test Method

The tests were performed using the referenced methods described in the FCC 15.247 for transceivers and RSS-247 For Transceivers test specification(s). The specific test sections and specification references are called out in the individual test sections.

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).

$$\text{Formula 1: VL (dBuV) = MTR (dBuV) + CF (dB)}$$

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 pre-amplifier is used, the total is reduced by its gain (-PA). If a distance correction (DC) is required, it is added to the total.

$$\text{Formula 1: FS (dBuV/m) = MTR (dBuV) + AF (dB/m) + CF (dB) + (- PA (dB)) + DC (dB)}$$

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

$$\text{Formula 2: FS (uV/m) = AntiLog [(FS (dBuV/m))/20]}$$

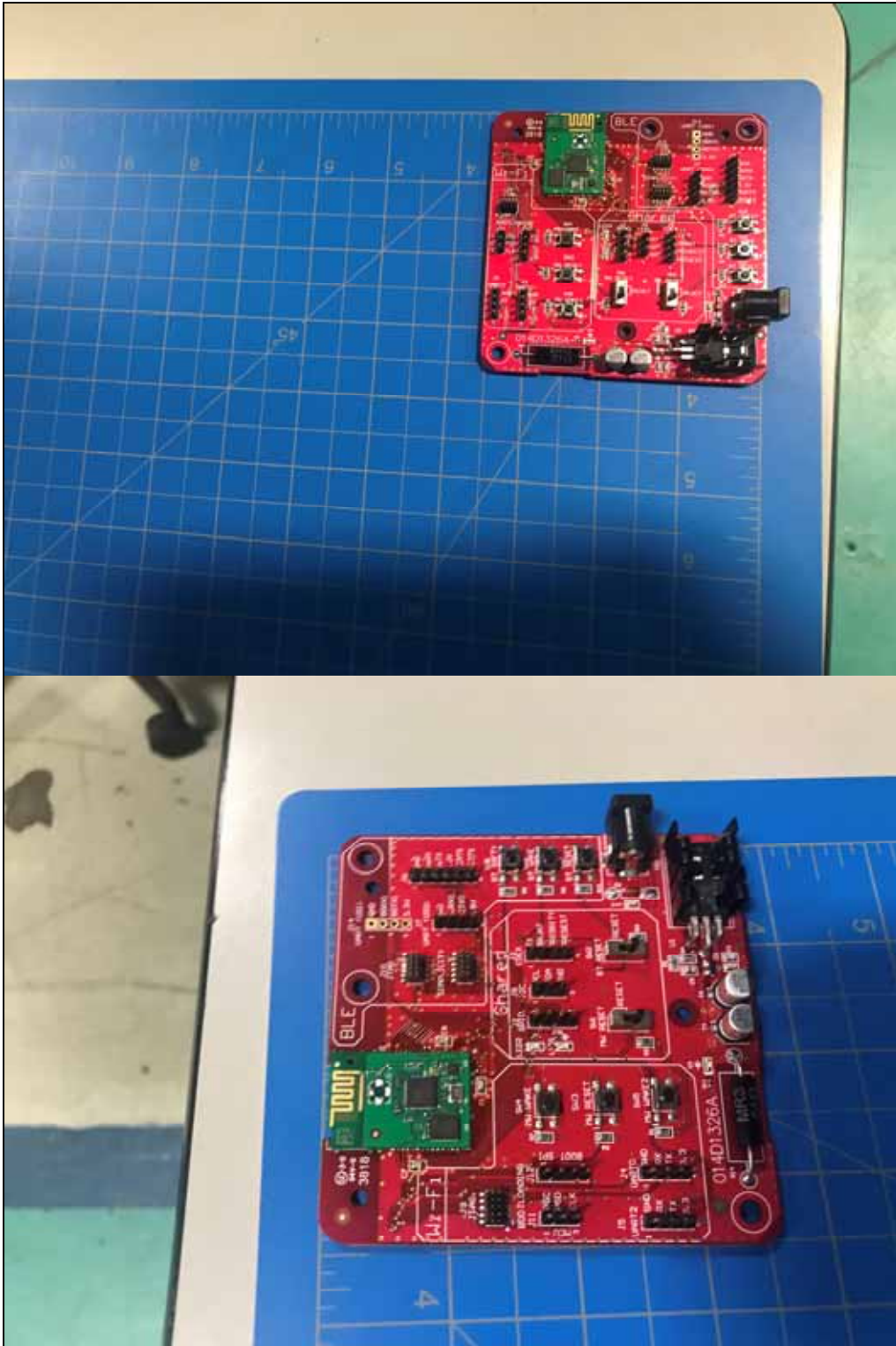
15. Statement of Conformity

The Chamberlain Group, Inc. Phoenix Transceiver, Model No. 001D9586, No Serial No. assigned, did fully conform to the selected requirements of FCC 15.247 for transceivers and RSS-247 For Transceivers.

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 15.247 for transceivers and RSS-247 For Transceivers test specification(s). 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	10/2/2019	10/2/2020
APW11	PREAMPLIFIER	PMI	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1GHZ-20GHZ	4/8/2019	4/8/2020
GSFB	OSP120 BASE UNIT	ROHDE & SCHWARZ	OSP120	101246	---	4/1/2019	4/1/2020
GSFE	OSP120	ROHDE & SCHWARZ	OSP120	101288	.01-40GHZ	5/2/2019	5/2/2020
NHG1	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ	NOTE 1	
NTA4	BILOG ANTENNA	TESEQ	6112D	46660	20-2000GHZ	9/23/2019	9/23/2020
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/10/2018	4/10/2020
PLF2	CISPR16 50UH LISN	ELITE	CISPR16/70A	002	.15-30MHz	4/23/2019	4/23/2020
PLF4	CISPR16 50UH LISN	ELITE	CISPR16/70A	003	.15-30MHz	4/23/2019	4/23/2020
RBG0	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101533	10HZ-44GHZ	12/5/2018	1/5/2020
RBG2	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101591	2HZ-44GHZ	2/21/2019	2/21/2020
SES0	24VDC POWER SUPPLY	P-TRANS	FS-32024-1M	001	18-27VDC	NOTE 1	
T1N6	10DB 20W ATTENUATOR	NARDA	766-10	---	DC-4GHZ	5/14/2018	5/14/2020
VBR8	CISPR EN FCC CE VOLTAGE.exe						
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	
XLT5	5W, 50 OHM TERMINATION	JFW INDUSTRIES	50T-052	---	DC-2GHZ	1/10/2020	1/10/2022
XOA2	WAVE-TO-COAX ADAPTER	HEWLETT PACKARD	R281B	01138	26.5-65GHZ	NOTE 1	
XPQ4	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000-O/O	1	4.8-20GHZ	9/6/2019	9/6/2021
XPR0	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000	001	4.8-20GHZ	9/6/2019	9/6/2021

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. Antenna Port Conducted Emissions Tests

Manufacturer	Chamberlain Group, Inc.
Product	Phoenix Transceiver
Model	001D9586
Mode	Transmit per Paragraph 11.1

Information	
Setup Format	Tabletop
Height of Support (radiated spurious emissions)	80cm below 1GHz; 1.5M above 1GHz
Type of Test Site	Semi-anechoic chamber
Type of Antennas Used	Below 1GHz: Bilog (or equivalent) Above 1GHz: Double-ridged waveguide (or equivalent)
Highest Internal Frequency of the EUT:	2.4 GHz BLE transmitter and 2.4GHz WiFi transmitter
Highest Measurement Frequency:	25GHz
Notes	The cables were manually maximized during the preliminary emissions sweeps. The cable arrangement which resulted in the worst-case emissions was utilized.

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

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

Procedures

6dB Bandwidth (DTS Bandwidth)

C63.10-2013 section 11.8 Option 1:

- a) The following settings were employed on the EMI Test Receiver:
 1. Center Frequency = Transmit Frequency of the EUT
 2. Frequency Span = 2 x Occupied Channel Bandwidth
 3. RBW = 100kHz
 4. VBW = 3 x RBW
 5. Detector Mode = Max Peak
 6. Trace Mode = Max Hold
- b) Allow the trace to stabilize.
- c) Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
- d) Determine the 6dB down amplitude.
- e) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope trace, such that each marker is at or slightly below the 6dB down amplitude determined in step d). If a marker is below this 6dB down amplitude value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers.

99% Bandwidth (OBW)

C63.10-2013 section 6.9.3:

- a) The following settings were employed on the EMI Test Receiver:
 1. Center Frequency = Transmit Frequency of the EUT
 2. Frequency Span = Between 1.5 and 5 times the OBW
 3. RBW = Between 1% to 5% of the OBW
 4. VBW = Approximately 3 x RBW
 5. Steps 1) through 4) might require iterations to adjust within the specified range
 6. Detector Mode = Max Peak
 7. Trace Mode = Max Hold
- b) Allow the trace to stabilize.
- c) Use the 99% power bandwidth function of the EMI receiver.

Average Conducted Output Power

C63.10-2013 section 11.9.2.3.2:

- a) The antenna port of the EUT was connected to the input of a gated RF average power meter. The gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level.
- b) The average conducted output power was recorded.

Average Power Spectral Density (Duty Cycle $\geq$ 98%)

C63.10-2013 section 11.10.3

- a) The following settings were employed on the EMI Test Receiver:
 1. Center Frequency = Transmit Frequency of the EUT
 2. Frequency Span = At least 1.5 times the OBW
 3. RBW = $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$
 4. VBW $\geq 3 \times \text{RBW}$
 5. Detector Mode = RMS

6. Number of Measurement Points $\geq 2 \times \text{span/RBW}$
 7. Sweep Time = Auto Couple
 8. Employ RMS mode over a minimum of 100 traces
- b) Use the peak marker function to determine the maximum amplitude level within the RBW.
- c) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

Low Band Edge

C63.10-2013 section 11.11:

a) Reference Level Measurement

1. Start Frequency = 2400MHz
2. Stop Frequency = 2483.5MHz
3. RBW = 100kHz
4. VBW $\geq 3 \times \text{RBW}$
5. Detector Mode = Max Peak
6. Trace Mode = Max Hold
7. Sweep Time = Auto

b) Allow the trace to stabilize

c) Use the peak marker function to determine the maximum level

d) Emission Level Measurement

1. Start Frequency = 2310MHz
2. Stop Frequency = 2400MHz
3. RBW = 100kHz
4. VBW $\geq 3 \times \text{RBW}$
5. Detector Mode = Max Peak
6. Trace Mode = Max Hold
7. Sweep Time = Auto

e) Allow the trace to stabilize

f) Use the peak marker function to determine the maximum level

g) The two sweeps were combined and plotted.

h) Ensure that the amplitude of all unwanted emissions is attenuated by at least the minimum requirements.

High Band Edge

- 1) The EUT was set to transmit continuously at the channel closest to the high band-edge.
- 2) A double ridged waveguide was placed 3 meters away from the EUT. The antenna was connected to the input of a spectrum analyzer.
- 3) The center frequency of the analyzer was set to the high band edge (2483.5MHz)
- 4) The resolution bandwidth was set to 1MHz.
- 5) To ensure that the maximum or worst case emission level was measured, the following steps were taken:
 - a. The EUT was rotated so that all of its sides were exposed to the receiving antenna.
 - b. Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
 - c. The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
- 6) The highest measured peak reading was recorded.

The highest measured average reading was recorded.

Duty Cycle Correction Factor

C63.10-2013 section 11.6

- a) The following settings were employed on the EMI Test Receiver:
1. Center Frequency = Transmit Frequency of the EUT
 2. Frequency Span = 0Hz
 3. RBW $\geq$ OBW if possible; otherwise set RBW as large as possible
 4. VBW $\geq$ RBW
 5. Detector Mode = Peak or RMS
 6. Number of Measurement Points $\geq 2 \times \text{span/RBW}$
- b) Measure the ON and OFF times of the transmitted signal
- c) Duty Cycle (D) = ((ON TIME)/((ON TIME) + (OFF TIME)))

EIRP

The EUT was placed on a 1.5 meter high 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 equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power, a double ridged waveguide antenna 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.

Since a quasi-peak detector and an average detector requires a long integration times, it is not practical to automatically sweep through the quasi-peak and average levels. Therefore, radiated emissions from the EUT were first scanned using a peak detector and automatically plotted. The frequencies where significant emission levels were noted were then re-measured using the quasi-peak detector or average detector.

The broadband measuring antenna was positioned at a 3 meter distance from the EUT. The frequency range from 30MHz to 1GHz was investigated using a peak detector function with the bilog antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The frequency range from 1GHz to 25GHz was investigated using a peak detector function with the double ridged waveguide antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The maximum levels for each antenna polarization were plotted.

Final radiated emissions were performed on all significant broadband and narrowband emissions found in the exploratory sweeps using the following methods:

- 1) Measurements from 30MHz to 1GHz were made using a quasi-peak detector and a broadband bilog antenna. Measurements above 1GHz were made using an average detector and a broadband double ridged waveguide antenna.
- 2) To ensure that maximum or worst case, emission levels were measured, the following steps were taken:
 - a) The EUT was rotated so that all sides were exposed to the receiving antenna.
 - b) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
 - c) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
 - d) For hand-held or body-worn devices, the EUT was rotated through three orthogonal axes to determine which orientation produces the highest emission relative to the limit.



Test Setup for Radiated Emissions: 1GHz to 18GHz, Horizontal Polarization



Test Setup for Radiated Emissions: 1GHz to 18GHz, Vertical Polarization



Test Setup for Radiated Emissions: Above 18GHz, Horizontal Polarization



Test Setup for Radiated Emissions: Above 18GHz, Vertical Polarization

FCC Part 47 §15.247 2400-2483.5 MHz 2018

DUT Information

DUT Name: 001D9586
Manufacturer: Chamberlain
Serial Number:
Hardware Rev:
Software Rev:
Comment:

Frequencies

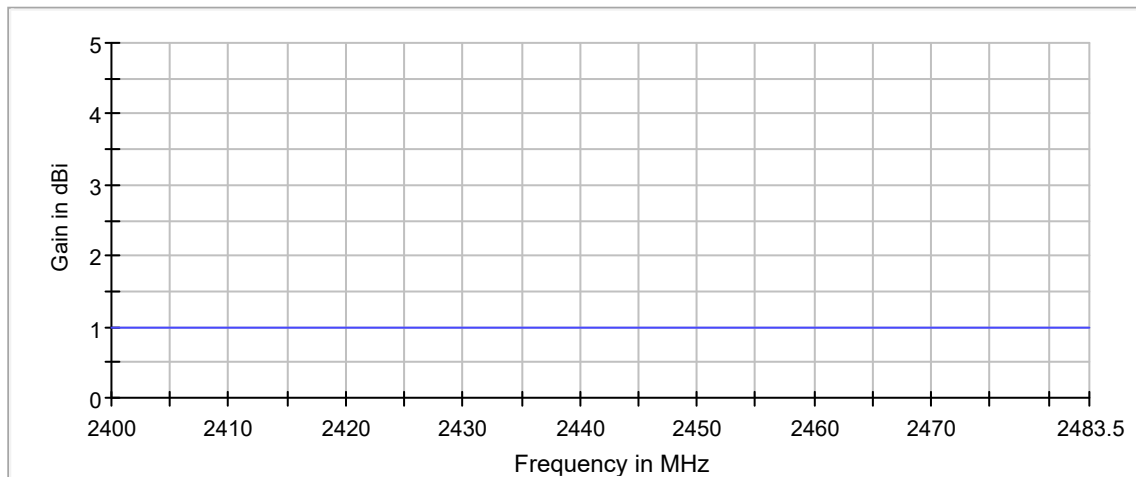
WLAN CH 1 (2412 MHz) WLAN CH 6 (2437 MHz) WLAN CH 11 (2462 MHz)

Bandwidths

20 MHz (20 MHz)

DUT Settings

No. of transmission chains 1
Equipment Type Other
Digital Modulation Yes
Frequency Hopping No



— Gaintable: antenna gain

Hardware Setup: WMS Measurements\TS8997

Spectrum Analyzer: SA ESW 44 (SA ESW 44) @ VISA (ADR
TCPIP::192.168.48.148::inst0::instr), SN 1328.4100K44/101533, FW 1.50 SP1

Vector Generator: VG SMBV100A (VG SMBV100A) @ VISA (ADR
TCPIP::192.168.48.149::inst0::instr), SN 260452, FW 3.1.18.2-3.01.130.48.1

Generator: SMB100A (SMB100A) @ VISA (ADR
TCPIP::192.168.48.150::inst0::instr)

OSP: OSP-B157W (OSP-B157W) @ VISA (ADR
TCPIP::192.168.48.157::inst0::instr), SN 1527.1144. /, FW 1.24.0.10

Emission Bandwidth 20 dB (2412 MHz; 20 MHz)

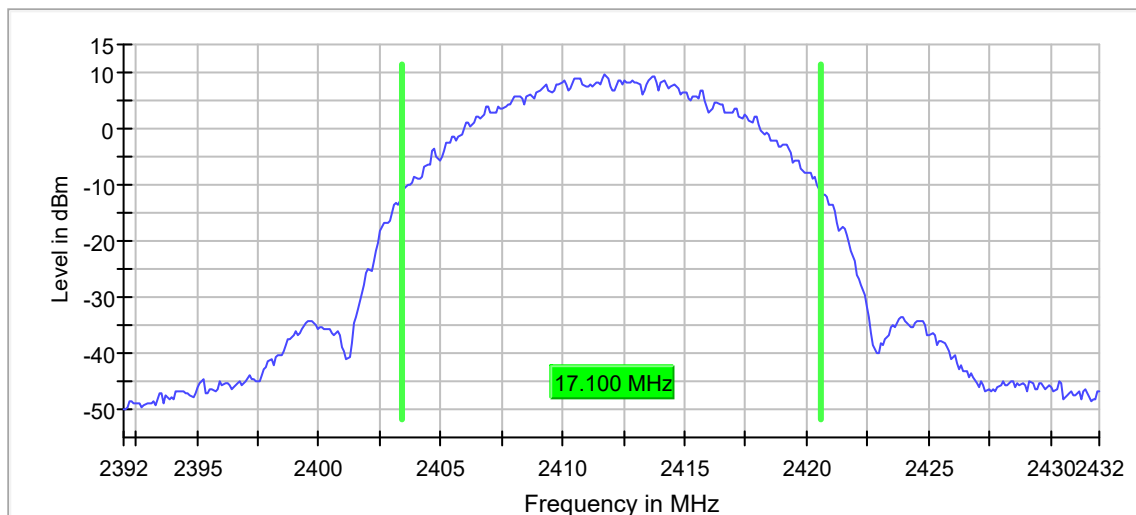
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	17.100000	---	---	2403.450000	2420.550000

(continuation of the "20 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2412.000000	9.5	PASS



Minimum Emission Bandwidth 6 dB (2412 MHz; 20 MHz)

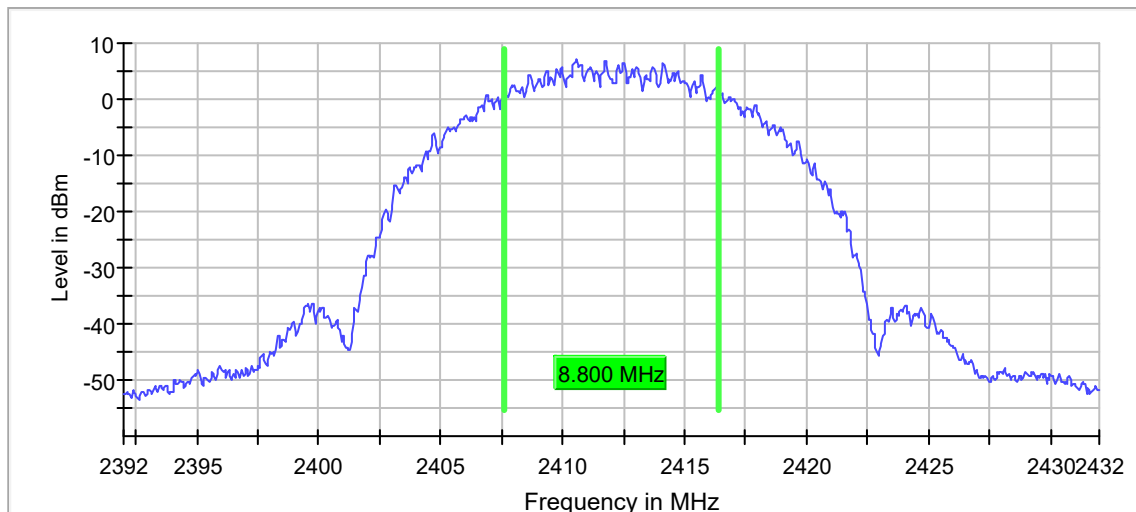
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	8.800000	0.500000	---	2407.575000	2416.375000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2412.000000	7.1	PASS

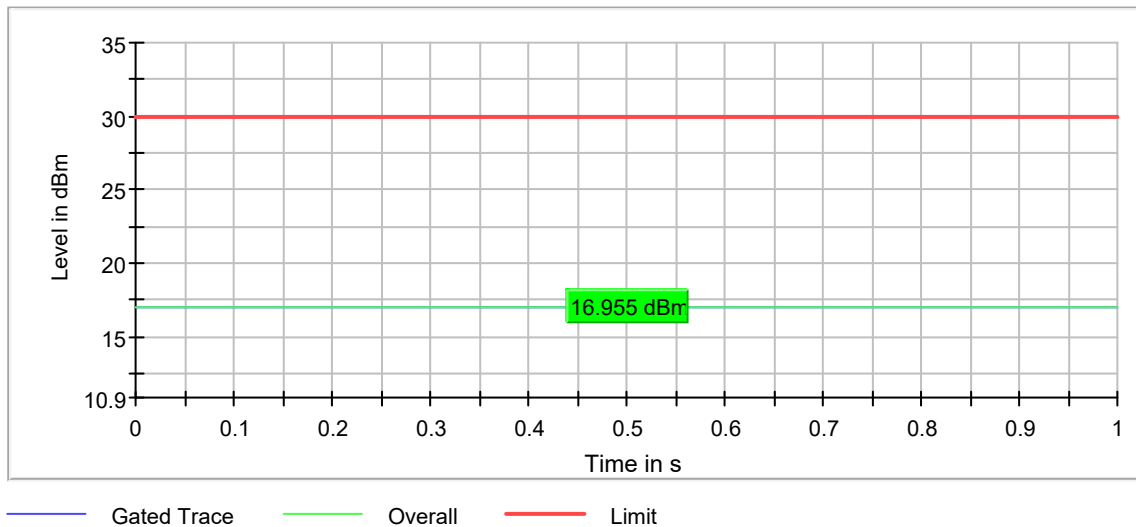


RF output power (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.3.2

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2412.000000	17.0	30.0	17.0	100.000	PASS

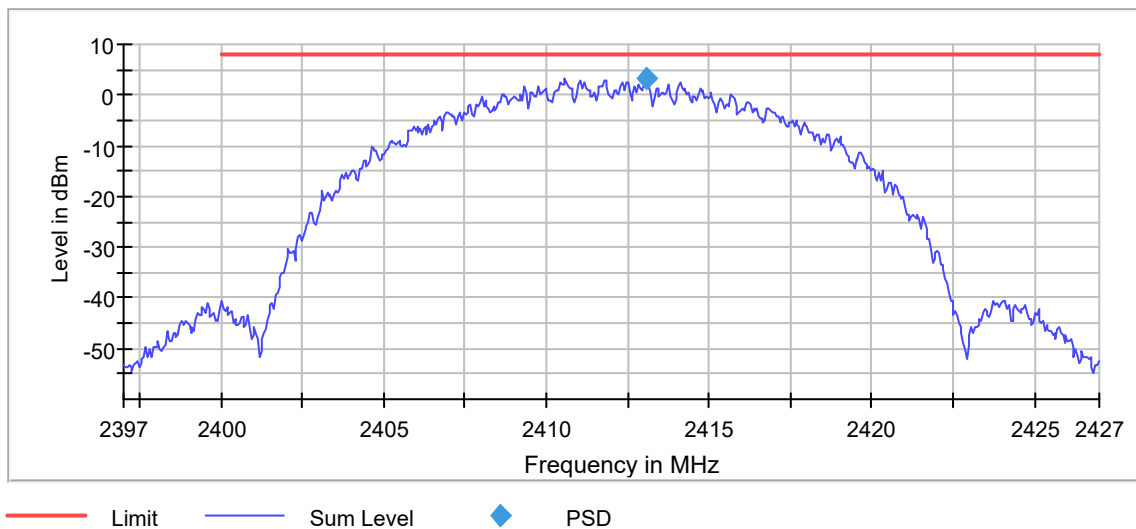


Power Spectral Density (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05 F and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2413.075000	3.445	8.0	PASS



Occupied Channel Bandwidth 99% (2412 MHz; 20 MHz)

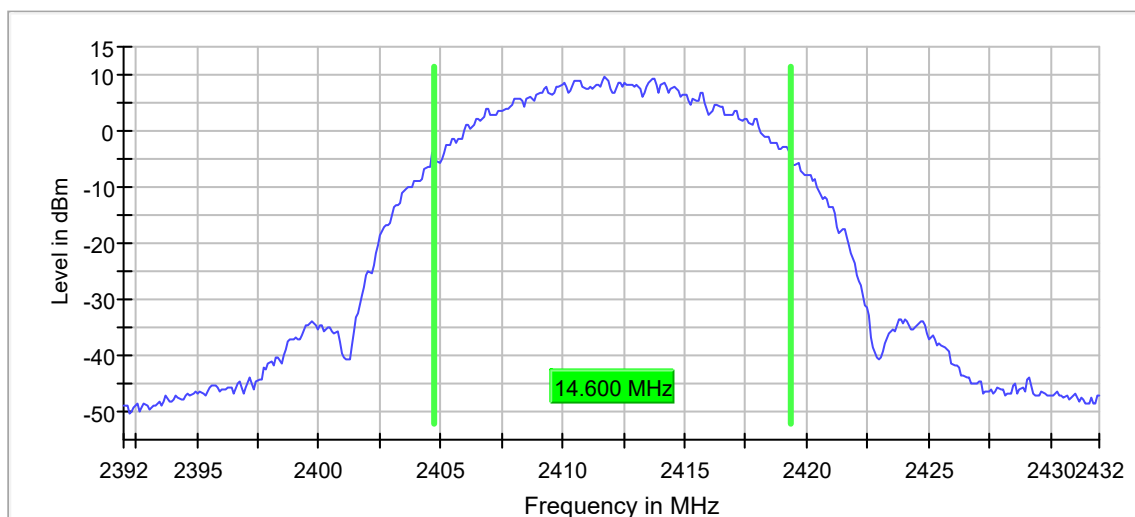
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	14.600000	---	---	2404.750000	2419.350000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2412.000000	PASS



Band Edge low (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05 8.7 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Result
2412.000000	PASS

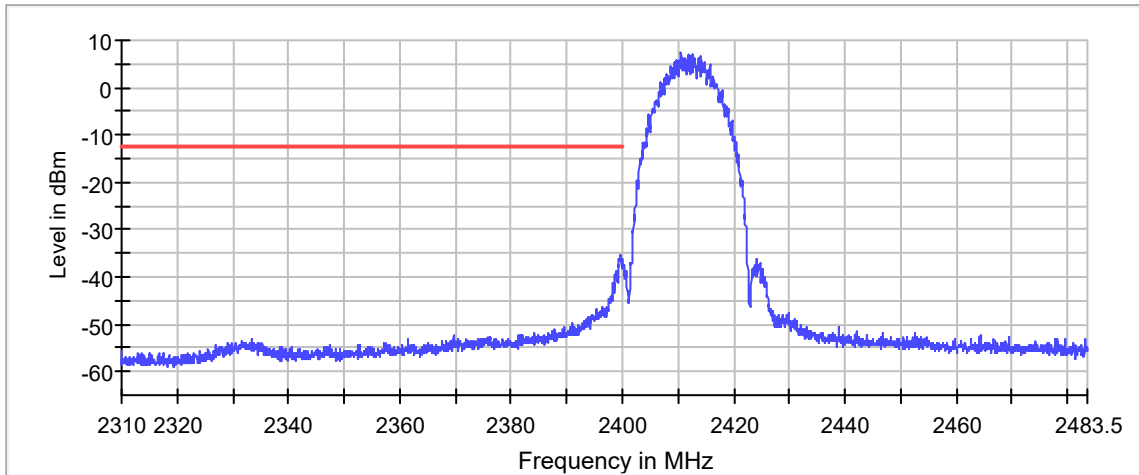
Inband Peak

Frequency (MHz)	Level (dBm)
2410.575000	7.4

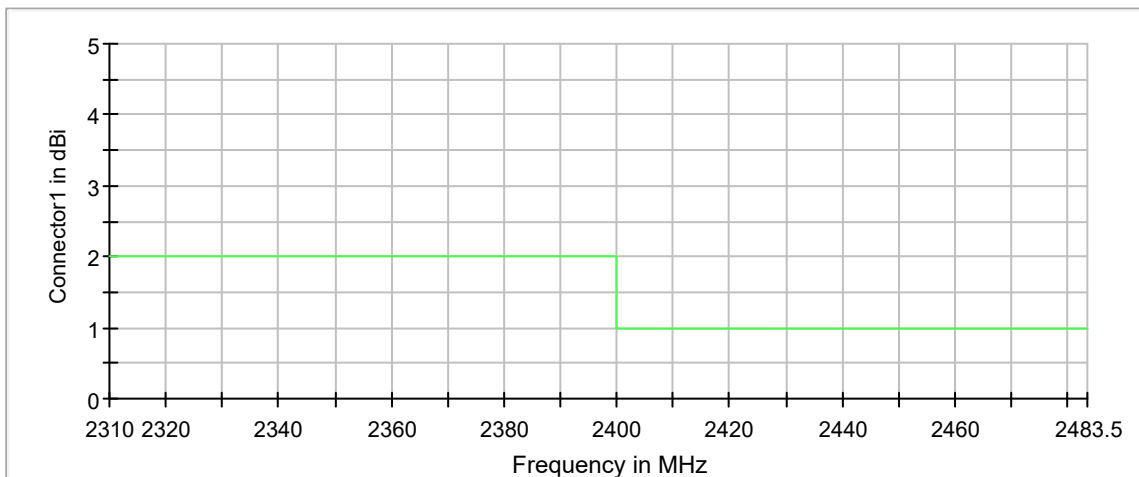
Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.575000	-35.5	22.9	-12.6	PASS
2399.525000	-35.8	23.1	-12.6	PASS
2399.725000	-36.0	23.4	-12.6	PASS
2399.775000	-36.1	23.5	-12.6	PASS

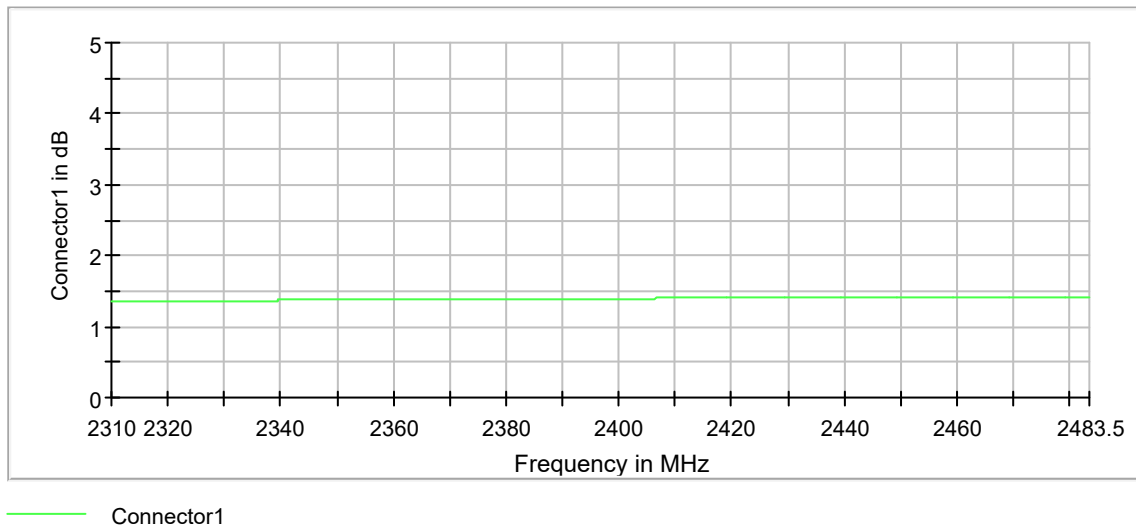
2399.975000	-36.2	23.6	-12.6	PASS
2399.475000	-36.3	23.7	-12.6	PASS
2399.425000	-36.4	23.8	-12.6	PASS
2399.625000	-36.4	23.8	-12.6	PASS
2399.675000	-36.8	24.2	-12.6	PASS
2399.325000	-37.3	24.7	-12.6	PASS
2399.375000	-37.8	25.2	-12.6	PASS
2399.925000	-38.2	25.5	-12.6	PASS
2399.875000	-38.2	25.6	-12.6	PASS
2399.825000	-38.5	25.9	-12.6	PASS
2398.975000	-38.6	26.0	-12.6	PASS



— Limit — Sum Level × Fail



— Connector1



Emission Bandwidth 20 dB (2437 MHz; 20 MHz)

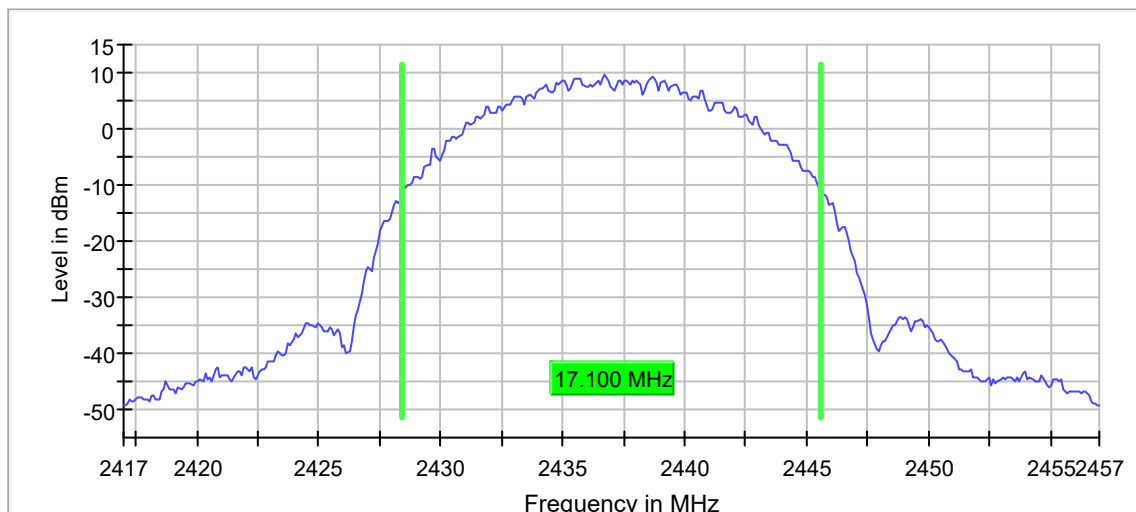
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	17.100000	---	---	2428.450000	2445.550000

(continuation of the "20 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2437.000000	9.5	PASS



Minimum Emission Bandwidth 6 dB (2437 MHz; 20 MHz)

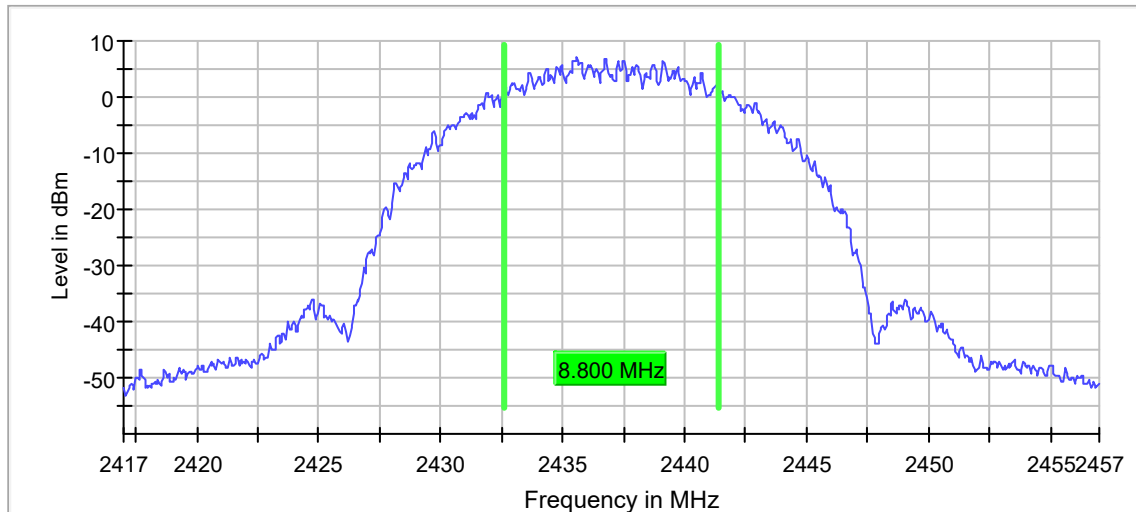
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	8.800000	0.500000	---	2432.575000	2441.375000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2437.000000	7.2	PASS

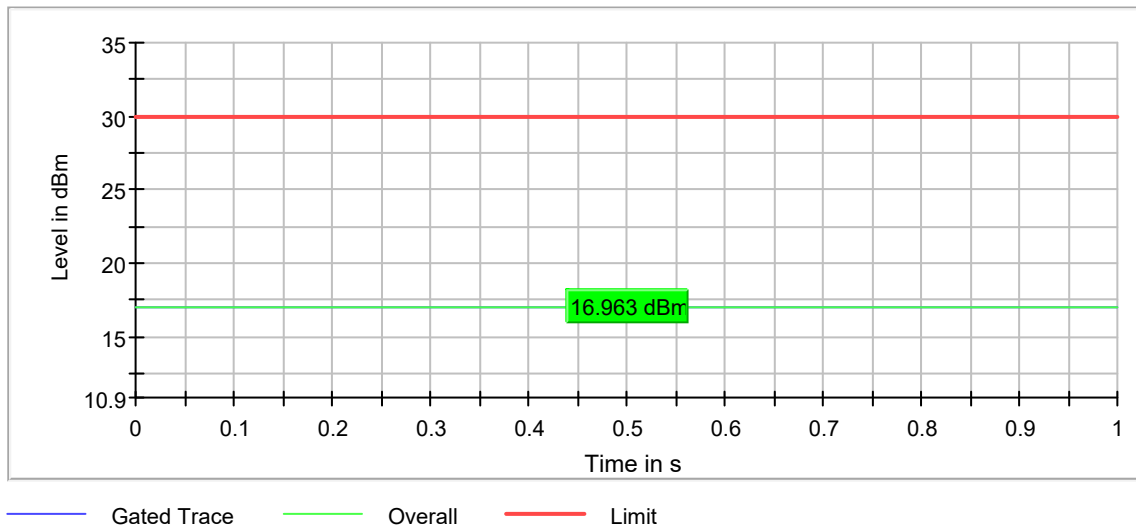


RF output power (2437 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.3.2

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2437.000000	17.0	30.0	17.0	100.000	PASS

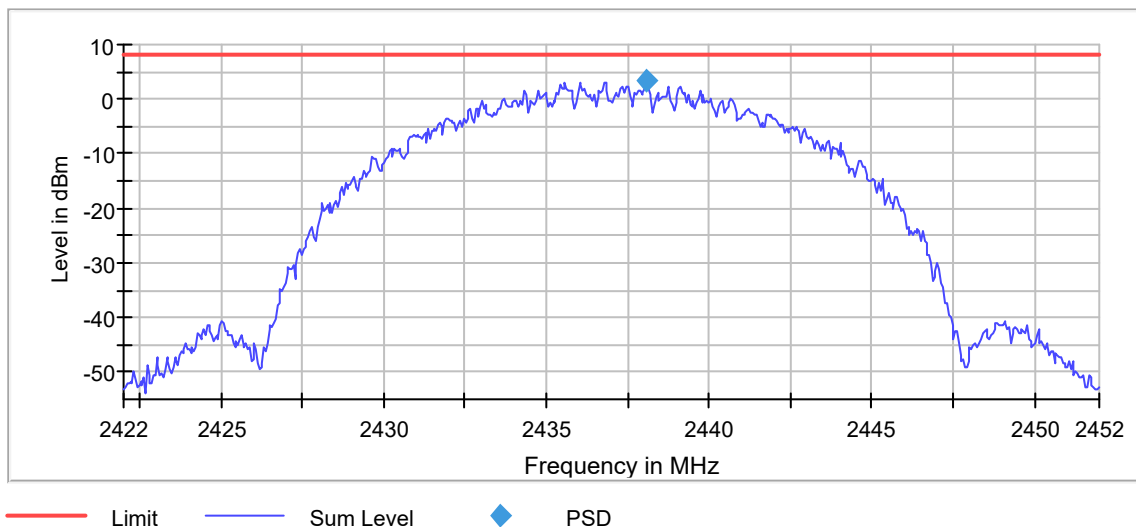


Power Spectral Density (2437 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05 F and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2438.075000	3.489	8.0	PASS



Occupied Channel Bandwidth 99% (2437 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI

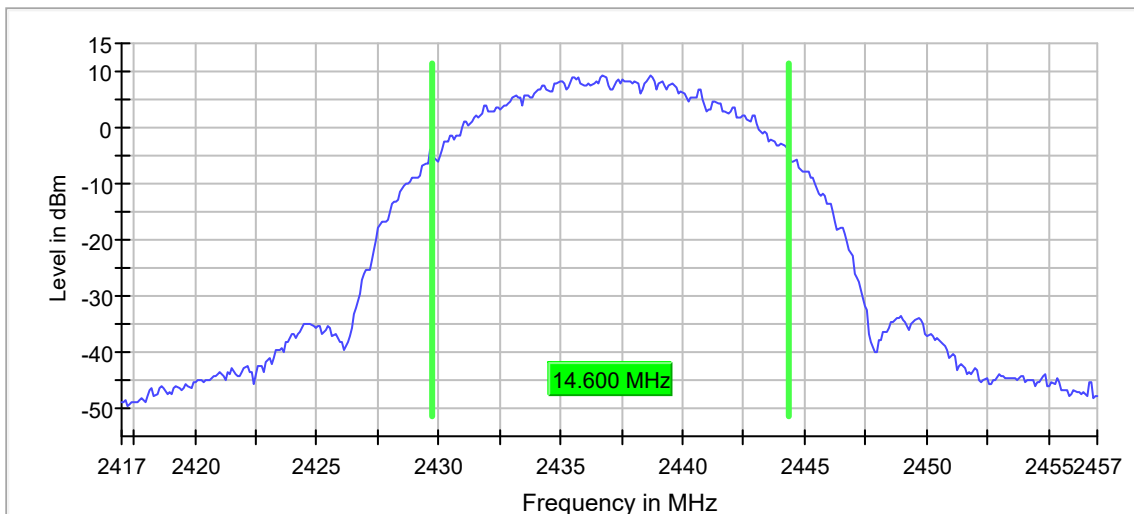
C63.10-2013 11.8.1

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	14.600000	---	---	2429.750000	2444.350000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2437.000000	PASS



Emission Bandwidth 20 dB (2462 MHz; 20 MHz)

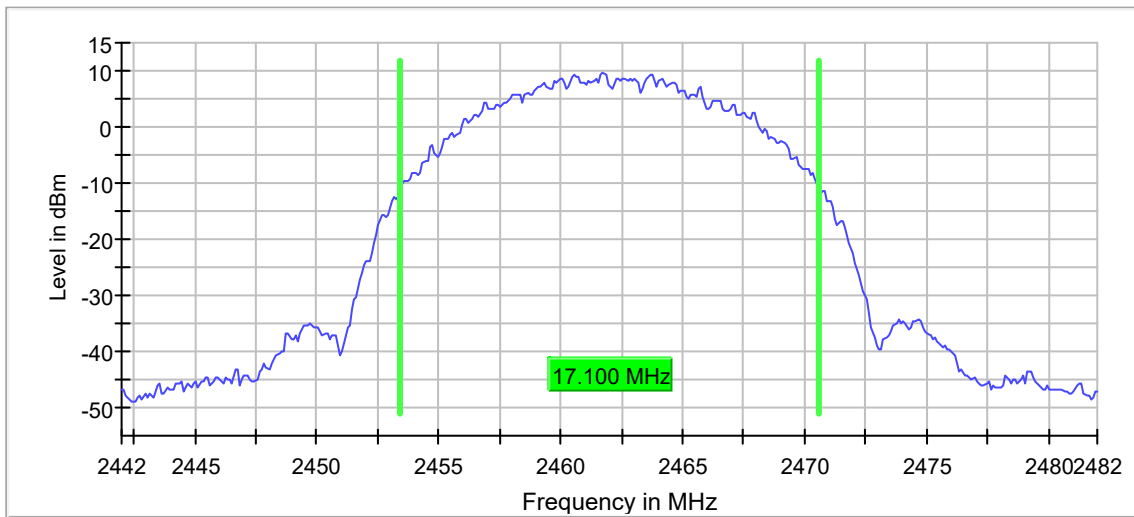
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	17.100000	---	---	2453.450000	2470.550000

(continuation of the "20 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2462.000000	9.6	PASS



Minimum Emission Bandwidth 6 dB (2462 MHz; 20 MHz)

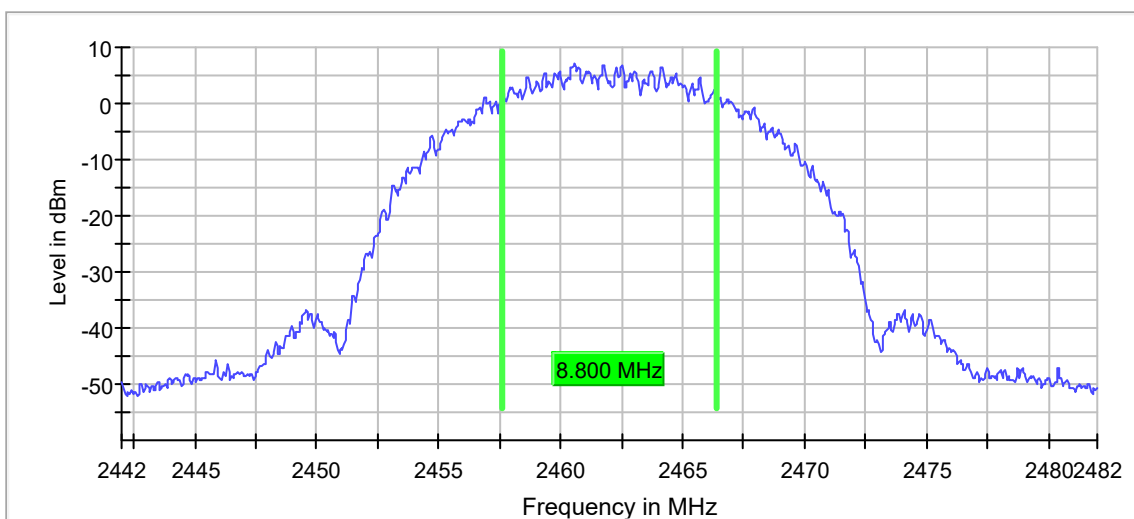
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	8.800000	0.500000	---	2457.575000	2466.375000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2462.000000	7.3	PASS

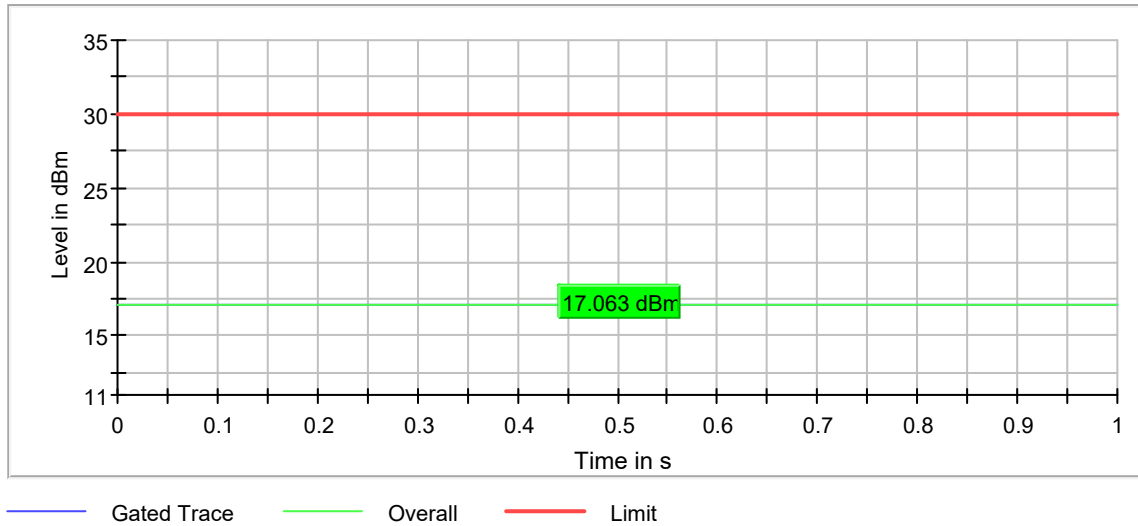


RF output power (2462 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.3.2

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2462.000000	17.1	30.0	17.1	100.000	PASS

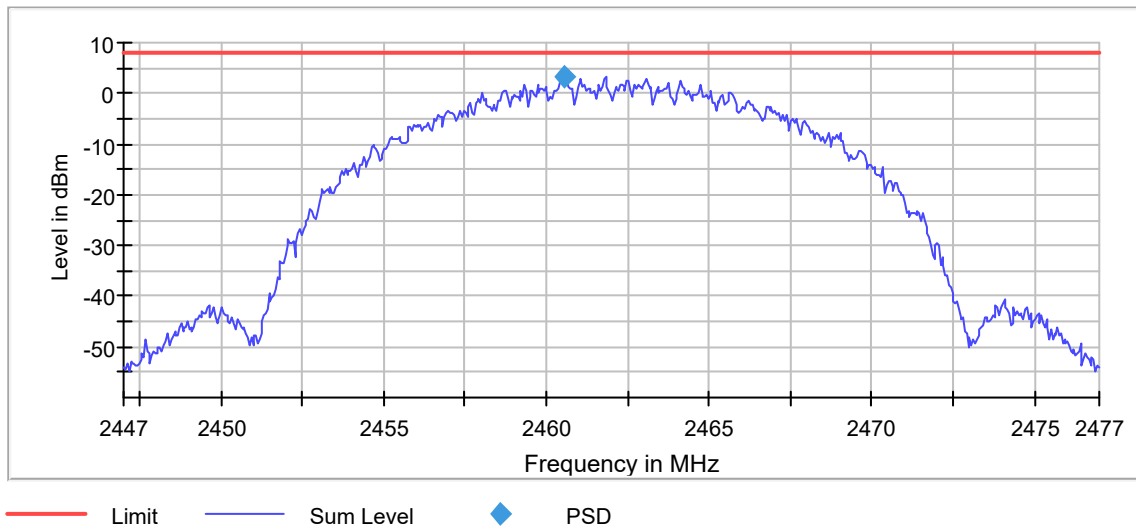


Power Spectral Density (2462 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05 F and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2460.575000	3.340	8.0	PASS



Occupied Channel Bandwidth 99% (2462 MHz; 20 MHz)

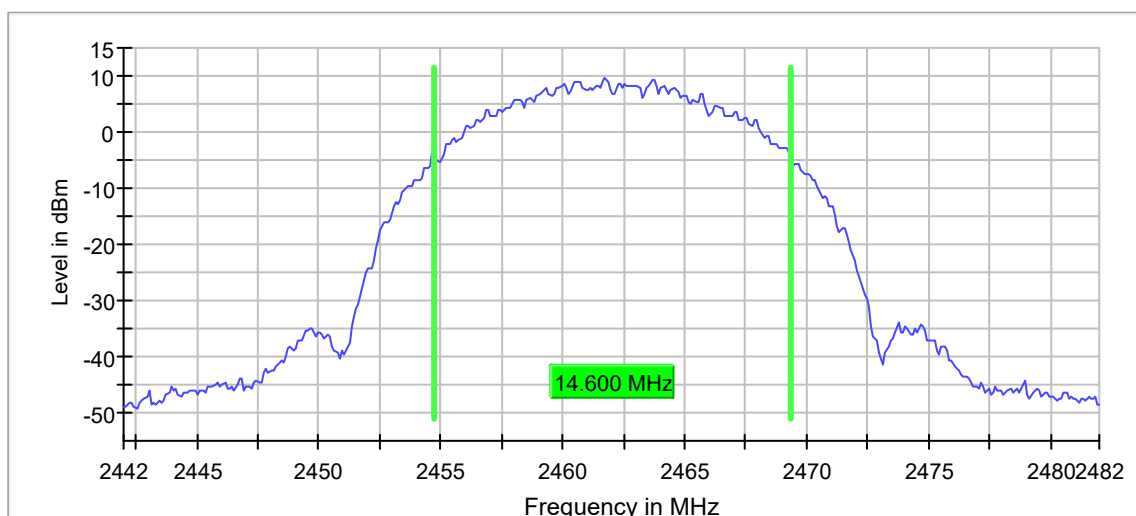
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	14.600000	---	---	2454.750000	2469.350000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2462.000000	PASS





Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2412MHz 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4824.00	H	46.0	*	4.8	34.2	-39.2	45.7	193.4	5000.0	-28.3
4824.00	V	46.0	*	4.8	34.2	-39.2	45.7	193.2	5000.0	-28.3
12060.00	H	46.3	*	8.0	38.7	-39.6	53.4	468.4	5000.0	-20.6
12060.00	V	46.3	*	8.0	38.7	-39.6	53.4	468.4	5000.0	-20.6
14472.00	H	45.6	*	8.7	39.6	-38.6	55.3	583.1	5000.0	-18.7
14472.00	V	45.6	*	8.7	39.6	-38.6	55.4	585.8	5000.0	-18.6
19296.00	H	33.8	*	2.2	40.4	-27.9	48.5	264.5	5000.0	-25.5
19296.00	V	33.8	*	2.2	40.4	-27.9	48.5	264.5	5000.0	-25.5

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. King :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2412MHz 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4824.00	H	33.5	*	4.8	34.2	-39.2	0.0	33.3	46.2	500.0
4824.00	V	33.5	*	4.8	34.2	-39.2	0.0	33.3	46.2	500.0
12060.00	H	34.4	*	8.0	38.7	-39.6	0.0	41.5	119.0	500.0
12060.00	V	34.4	*	8.0	38.7	-39.6	0.0	41.5	119.0	500.0
14472.00	H	33.6	*	8.7	39.6	-38.6	0.0	43.4	147.2	500.0
14472.00	V	33.6	*	8.7	39.6	-38.6	0.0	43.4	147.2	500.0
19296.00	H	20.9	*	2.2	40.4	-27.9	0.0	35.6	59.9	500.0
19296.00	V	20.9	*	2.2	40.4	-27.9	0.0	35.6	59.9	500.0

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2412MHz 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2412.00	H	63.3		2.6	32.2		98.1	80646.3		
2412.00	V	67.0		2.6	32.2		101.9	124075.0		
7236.00	H	37.4	*	6.1	35.9	-39.8	39.6	95.2	5000.0	-34.4
7236.00	V	37.6	*	6.1	35.9	-39.8	39.8	97.4	5000.0	-34.2
9648.00	H	38.8	*	6.8	36.9	-39.5	42.9	140.4	5000.0	-31.0
9648.00	V	37.8	*	6.8	36.9	-39.5	41.9	125.2	5000.0	-32.0
16884.00	H	36.0	*	9.4	42.0	-37.6	49.8	309.7	5000.0	-24.2
16884.00	V	35.8	*	9.4	42.0	-37.6	49.7	304.3	5000.0	-24.3
21708.00	H	24.5	*	2.2	40.6	-28.4	38.9	88.0	5000.0	-35.1
21708.00	V	24.5	*	2.2	40.6	-28.4	38.9	88.0	5000.0	-35.1
24120.00	H	24.7	*	2.2	40.6	-29.0	38.5	84.6	5000.0	-35.4
24120.00	V	24.7	*	2.2	40.6	-29.0	38.6	85.0	5000.0	-35.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2437MHz 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4874.00	H	46.0	*	4.9	34.1	-39.2	45.7	193.3	5000.0	-28.3
4874.00	V	45.6	*	4.9	34.1	-39.2	45.4	185.6	5000.0	-28.6
7311.00	H	44.3	*	6.2	35.9	-39.8	46.6	212.6	5000.0	-27.4
7311.00	V	44.3	*	6.2	35.9	-39.8	46.6	212.6	5000.0	-27.4
12185.00	H	46.2	*	8.0	38.7	-39.6	53.3	461.1	5000.0	-20.7
12185.00	V	46.2	*	8.0	38.7	-39.6	53.3	461.1	5000.0	-20.7
19496.00	H	33.8	*	2.2	40.4	-28.2	48.2	257.2	5000.0	-25.8
19496.00	V	33.8	*	2.2	40.4	-28.2	48.2	257.2	5000.0	-25.8

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2437MHz 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4874.00	H	33.2	*	4.9	34.1	-39.2	32.9	44.4	500.0	-21.0
4874.00	V	33.2	*	4.9	34.1	-39.2	32.9	44.2	500.0	-21.1
7311.00	H	32.69	*	6.2	35.9	-39.8	34.9	55.7	500.0	-19.1
7311.00	V	32.7	*	6.2	35.9	-39.8	34.9	55.7	500.0	-19.1
12185.00	H	34.0	*	8.0	38.7	-39.6	41.1	113.6	500.0	-12.9
12185.00	V	34.0	*	8.0	38.7	-39.6	41.1	113.6	500.0	-12.9
19496.00	H	20.9	*	2.2	40.4	-28.2	35.3	58.2	500.0	-18.7
19496.00	V	20.9	*	2.2	40.4	-28.2	35.3	58.2	500.0	-18.7

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. King :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2437MHz 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2437.00	H	65.1		2.6	32.4		100.1	101061.9		
2437.00	V	65.1		2.6	32.4		100.1	101294.9		
9748.00	H	37.1	*	6.9	37.0	-39.5	41.5	118.7	5000.0	-32.5
9748.00	V	38.0	*	6.9	37.0	-39.5	42.3	130.3	5000.0	-31.7
14622.00	H	37.7	*	8.8	39.7	-38.6	47.6	240.1	5000.0	-26.4
14622.00	V	37.7	*	8.8	39.7	-38.6	47.6	240.1	5000.0	-26.4
17059.00	H	37.1	*	9.5	41.8	-37.6	50.8	347.9	5000.0	-23.2
17059.00	V	37.1	*	9.5	41.8	-37.6	50.8	347.9	5000.0	-23.2
21933.00	H	24.5	*	2.2	40.6	-28.7	38.6	85.2	5000.0	-35.4
21933.00	V	24.5	*	2.2	40.6	-28.7	38.6	85.2	5000.0	-35.4
24370.00	H	24.7	*	2.2	40.6	-29.0	38.6	84.8	5000.0	-35.4
24370.00	V	24.7	*	2.2	40.6	-29.0	38.6	85.2	5000.0	-35.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2462MHz 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4924.00	H	46.0	*	4.9	34.1	-39.2	45.7	193.6	5000.0	-28.2
4924.00	V	45.6	*	4.9	34.1	-39.2	45.4	185.9	5000.0	-28.6
7386.00	H	44.3	*	6.2	35.8	-39.8	46.5	211.9	5000.0	-27.5
7386.00	V	44.3	*	6.2	35.8	-39.8	46.5	211.9	5000.0	-27.5
12310.00	H	46.2	*	8.0	38.7	-39.6	53.2	459.6	5000.0	-20.7
12310.00	V	46.2	*	8.0	38.7	-39.6	53.2	459.6	5000.0	-20.7
19696.00	H	35.2	*	2.2	40.4	-28.5	49.4	294.3	5000.0	-24.6
19696.00	V	35.2	*	2.2	40.4	-28.5	49.4	294.3	5000.0	-24.6
22158.00	H	36.4	*	2.2	40.6	-28.6	50.6	339.6	5000.0	-23.4
22158.00	V	36.4	*	2.2	40.6	-28.6	50.6	339.6	5000.0	-23.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2462MHz 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4924.00	H	33.2	*	4.9	34.1	-39.2	33.0	44.5	500.0	-21.0
4924.00	V	33.2	*	4.9	34.1	-39.2	32.9	44.3	500.0	-21.1
7386.00	H	32.7	*	6.2	35.8	-39.8	34.9	55.5	500.0	-19.1
7386.00	V	32.7	*	6.2	35.8	-39.8	34.9	55.5	500.0	-19.1
12310.00	H	34.0	*	8.0	38.7	-39.6	41.1	113.2	500.0	-12.9
12310.00	V	34.0	*	8.0	38.7	-39.6	41.1	113.2	500.0	-12.9
19696.00	H	21.5	*	2.2	40.4	-28.5	35.7	60.8	500.0	-18.3
19696.00	V	21.5	*	2.2	40.4	-28.5	35.7	60.8	500.0	-18.3
22158.00	H	23.5	*	2.2	40.6	-28.6	37.7	76.9	500.0	-16.3
22158.00	V	23.5	*	2.2	40.6	-28.6	37.7	76.9	500.0	-16.3

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2462MHz 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2462.00	H	64.9		2.6	32.5		100.0	100342.1		
2462.00	V	64.0		2.6	32.5		99.1	90257.5		
9848.00	H	37.1	*	6.9	37.1	-39.5	41.6	120.6	5000.0	-32.4
9848.00	V	38.0	*	6.9	37.1	-39.5	42.4	132.4	5000.0	-31.5
14772.00	H	37.7	*	8.9	39.7	-38.6	47.7	243.0	5000.0	-26.3
14772.00	V	37.7	*	8.9	39.7	-38.6	47.7	243.0	5000.0	-26.3
17234.00	H	37.1	*	9.6	41.7	-37.6	50.8	344.8	5000.0	-23.2
17234.00	V	37.1	*	9.6	41.7	-37.6	50.8	344.8	5000.0	-23.2
24620.00	H	26.0	*	2.2	40.6	-29.1	39.8	97.5	5000.0	-34.2
24620.00	V	26.0	*	2.2	40.6	-29.1	39.8	97.5	5000.0	-34.2

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Tx High Channel - 2462MHz, 802.11 b 11 MB_s
Test Specification : FCC-15.247, RSS-247 Band-Edge Compliance
Date : December 17th, 2019
Test Distance : 3 Meters
Notes : Peak Detector with 1MHzHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2483.50	H	25.5		2.7	32.5		60.7	1078.5	5000.0	-13.3
2483.50	V	21.7		2.7	32.5		56.8	692.3	5000.0	-17.2

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Tx High Channel - 2462MHz, 802.11 b; 11 MB_s
Test Specification : FCC-15.247, RSS-247 Band-Edge Compliance
Date : December 17th, 2019
Test Distance : 3 Meters
Notes : Average Detector with 1MHzHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2483.50	H	10.6		2.7	32.5	0.0	45.8	194.0	500.0	-8.2
2483.50	V	9.6		2.7	32.5	0.0	44.8	172.9	500.0	-9.2

Checked BY RICHARD E. KING :

Richard E. King

FCC Part 47 §15.247 2400-2483.5 MHz 2018

DUT Information

DUT Name: 001D9586
Manufacturer: Chamberlain
Serial Number:
Hardware Rev:
Software Rev:
Comment:

Frequencies

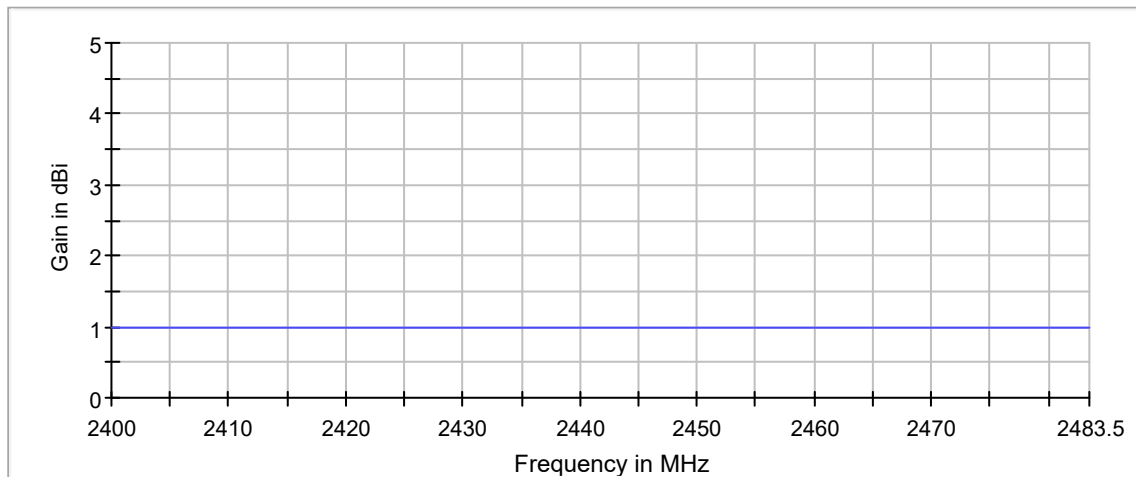
WLAN CH 1 (2412 MHz) WLAN CH 6 (2437 MHz) WLAN CH 11 (2462 MHz)

Bandwidths

20 MHz (20 MHz)

DUT Settings

No. of transmission chains 1
Equipment Type Other
Digital Modulation Yes
Frequency Hopping No



— Gaintable: antenna gain

Hardware Setup: WMS Measurements\TS8997

Spectrum Analyzer: SA ESW 44 (SA ESW 44) @ VISA (ADR
TCPIP::192.168.48.148::inst0::instr), SN 1328.4100K44/101533, FW 1.50 SP1

Vector Generator: VG SMBV100A (VG SMBV100A) @ VISA (ADR
TCPIP::192.168.48.149::inst0::instr), SN 260452, FW 3.1.18.2-3.01.130.48.1

Generator: SMB100A (SMB100A) @ VISA (ADR
TCPIP::192.168.48.150::inst0::instr)

OSP: OSP-B157W (OSP-B157W) @ VISA (ADR
TCPIP::192.168.48.157::inst0::instr), SN 1527.1144. /, FW 1.24.0.10

Emission Bandwidth 20 dB (2412 MHz; 20 MHz)

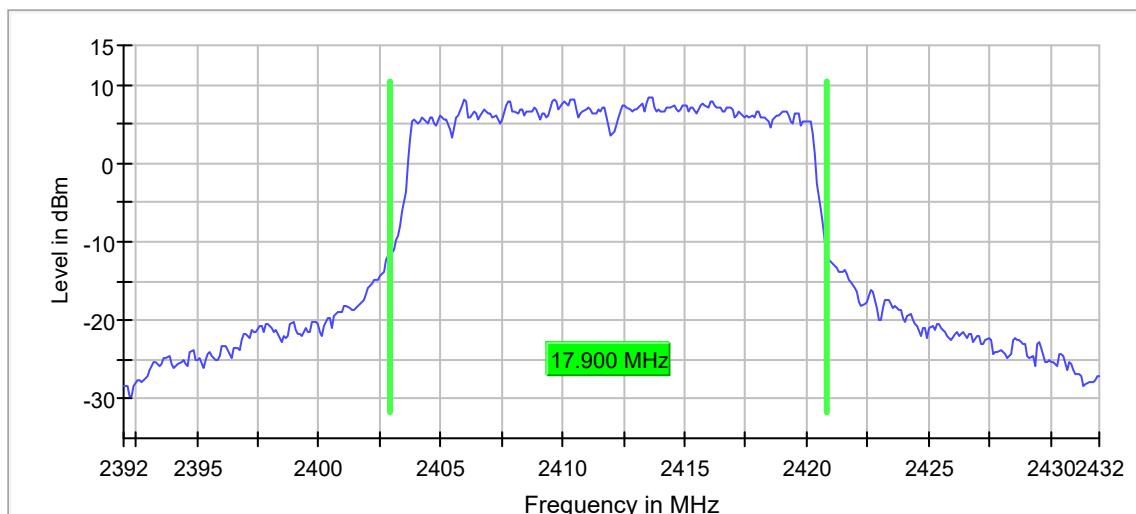
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	17.900000	---	---	2402.950000	2420.850000

(continuation of the "20 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2412.000000	8.4	PASS



Minimum Emission Bandwidth 6 dB (2412 MHz; 20 MHz)

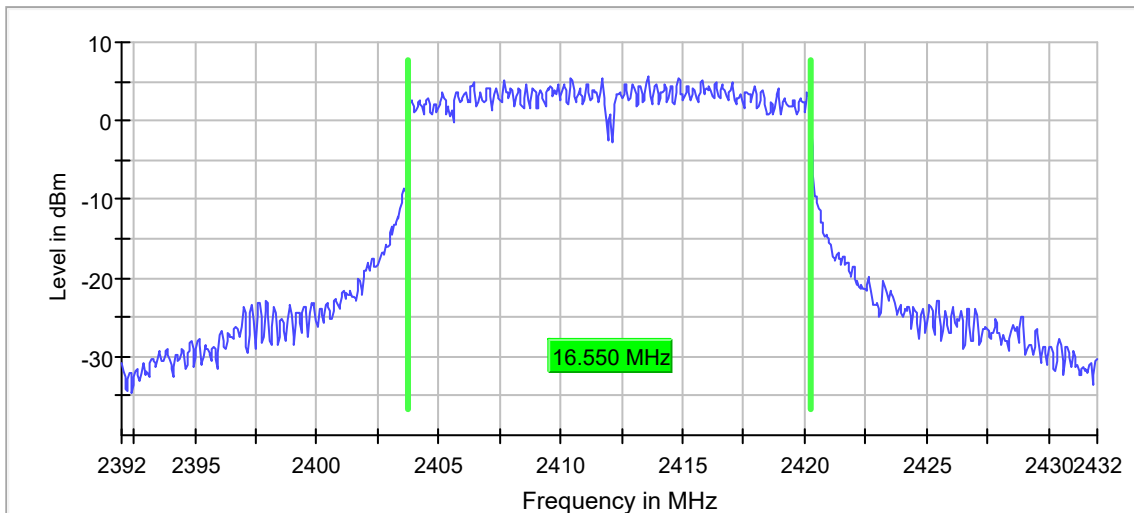
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	16.550000	0.500000	---	2403.725000	2420.275000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2412.000000	5.7	PASS

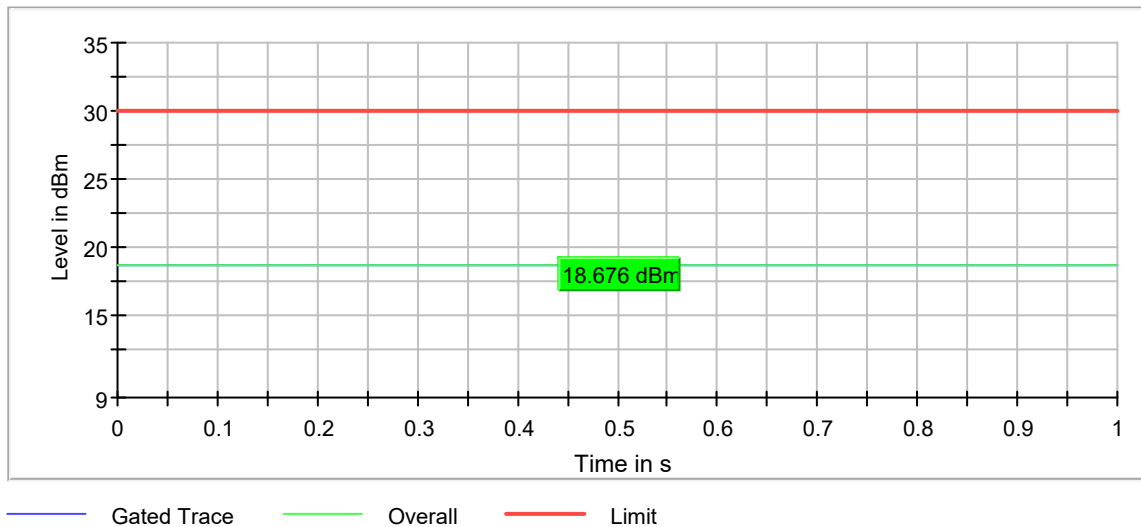


RF output power (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.3.2

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2412.000000	18.7	30.0	18.7	100.000	PASS

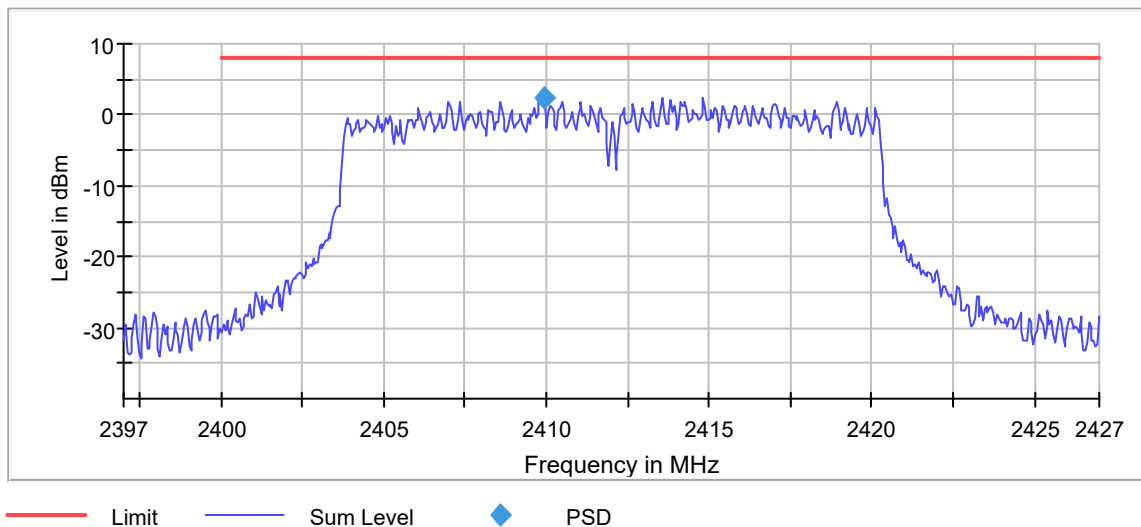


Power Spectral Density (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05 F and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2409.925000	2.512	8.0	PASS



Occupied Channel Bandwidth 99% (2412 MHz; 20 MHz)

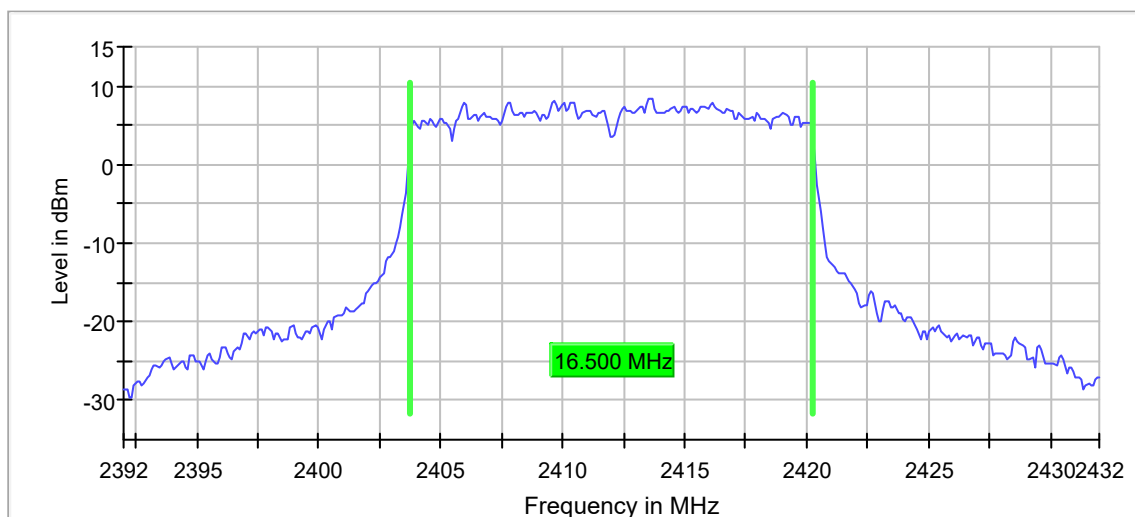
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	16.500000	---	---	2403.750000	2420.250000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2412.000000	PASS



Band Edge low (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05 8.7 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Result
2412.000000	PASS

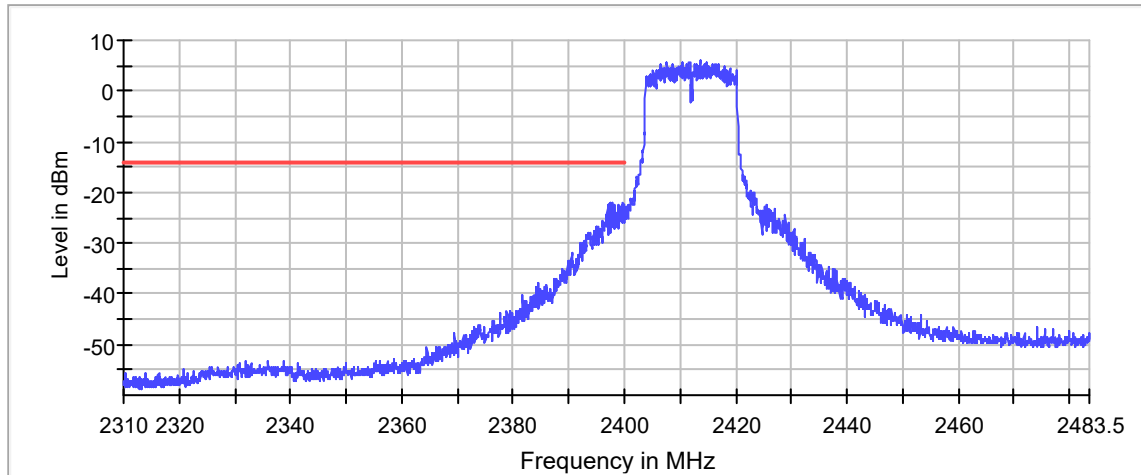
Inband Peak

Frequency (MHz)	Level (dBm)
2413.575000	6.0

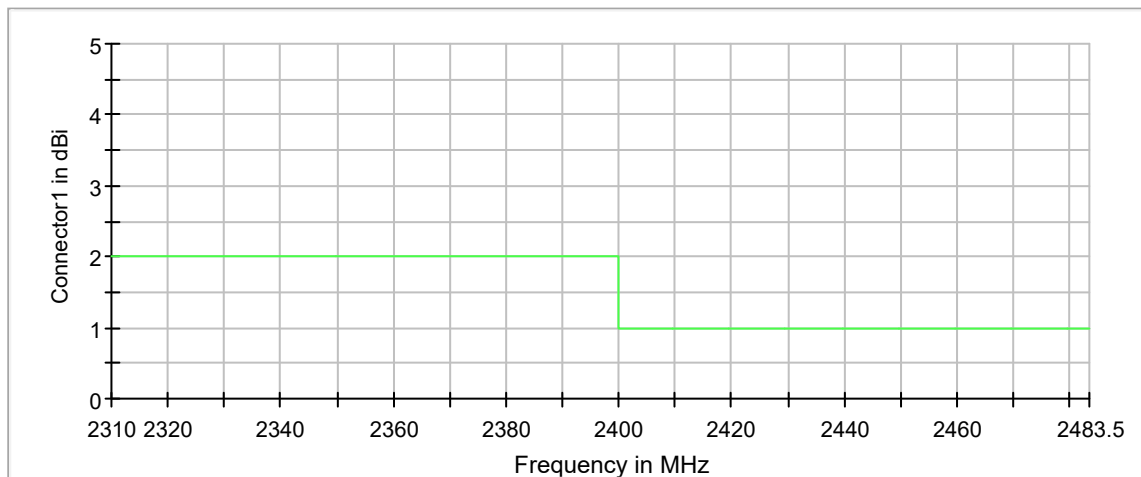
Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2397.925000	-22.0	8.0	-14.0	PASS
2397.325000	-22.1	8.1	-14.0	PASS
2399.775000	-22.2	8.2	-14.0	PASS
2397.625000	-22.2	8.2	-14.0	PASS

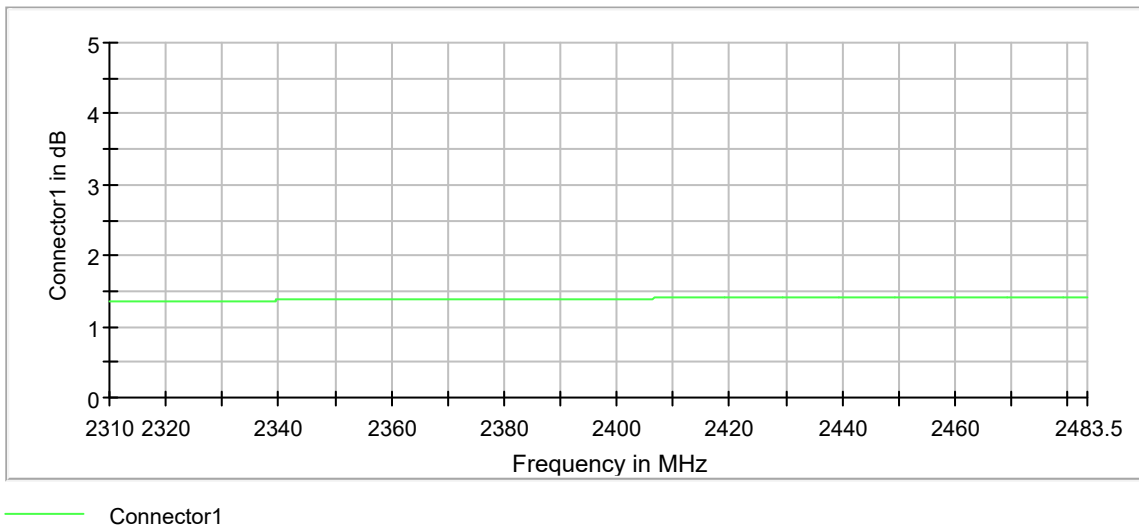
2397.025000	-22.2	8.2	-14.0	PASS
2397.375000	-22.3	8.2	-14.0	PASS
2399.875000	-22.3	8.2	-14.0	PASS
2398.875000	-22.3	8.3	-14.0	PASS
2397.975000	-22.3	8.3	-14.0	PASS
2399.825000	-22.3	8.3	-14.0	PASS
2397.675000	-22.4	8.3	-14.0	PASS
2398.925000	-22.4	8.3	-14.0	PASS
2399.525000	-22.4	8.4	-14.0	PASS
2399.475000	-22.4	8.4	-14.0	PASS
2398.275000	-22.4	8.4	-14.0	PASS



— Limit — Sum Level × Fail



— Connector1



Emission Bandwidth 20 dB (2437 MHz; 20 MHz)

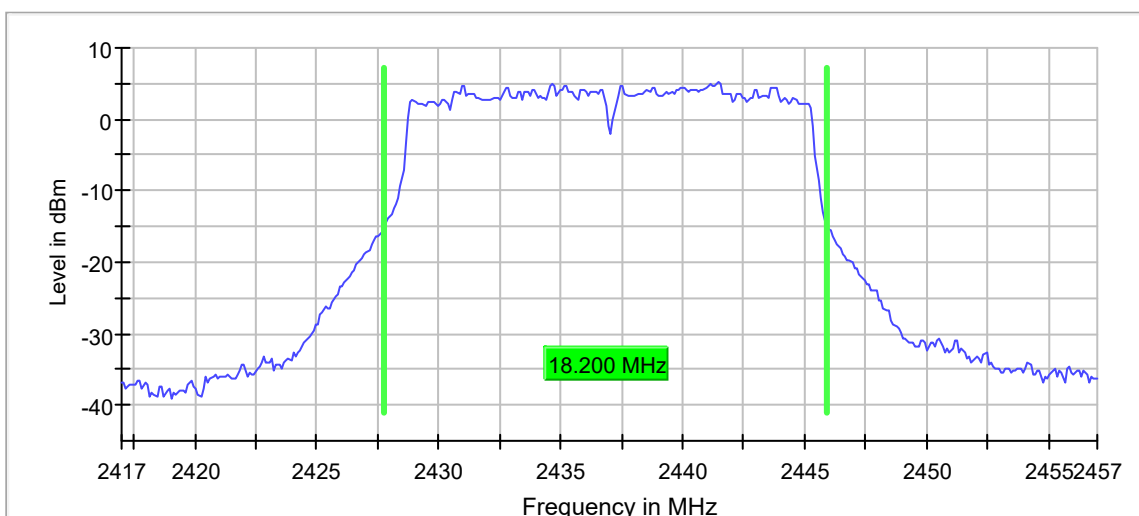
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	18.200000	---	---	2427.750000	2445.950000

(continuation of the "20 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2437.000000	5.2	PASS



Minimum Emission Bandwidth 6 dB (2437 MHz; 20 MHz)

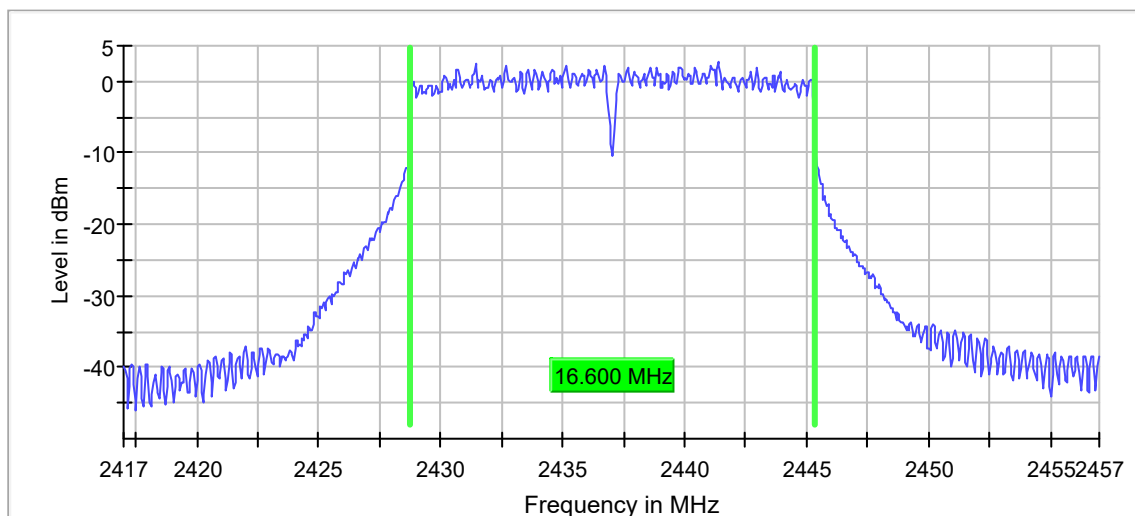
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	16.600000	0.500000	---	2428.725000	2445.325000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2437.000000	2.6	PASS

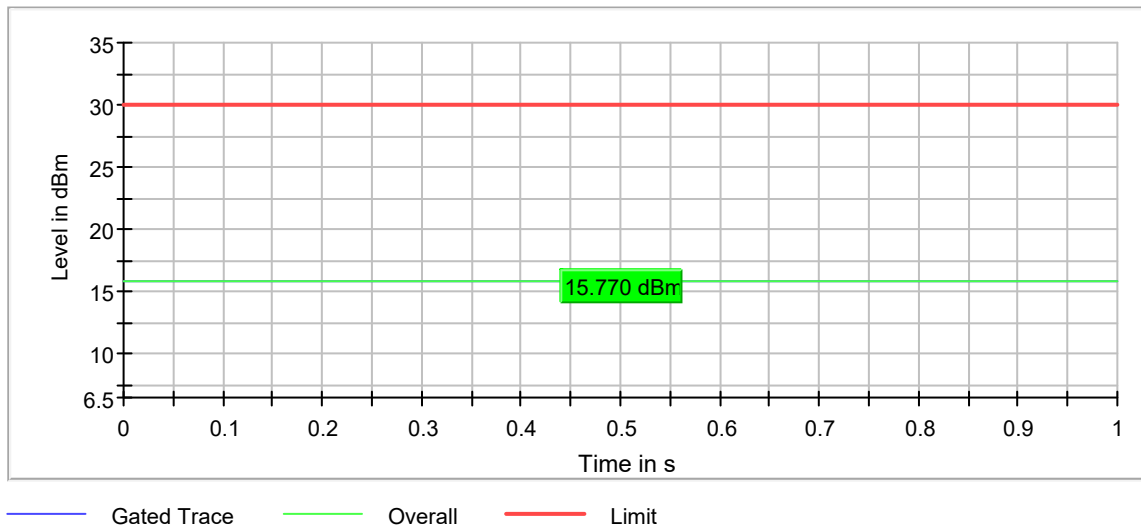


RF output power (2437 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.3.2

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2437.000000	15.8	30.0	15.8	100.000	PASS

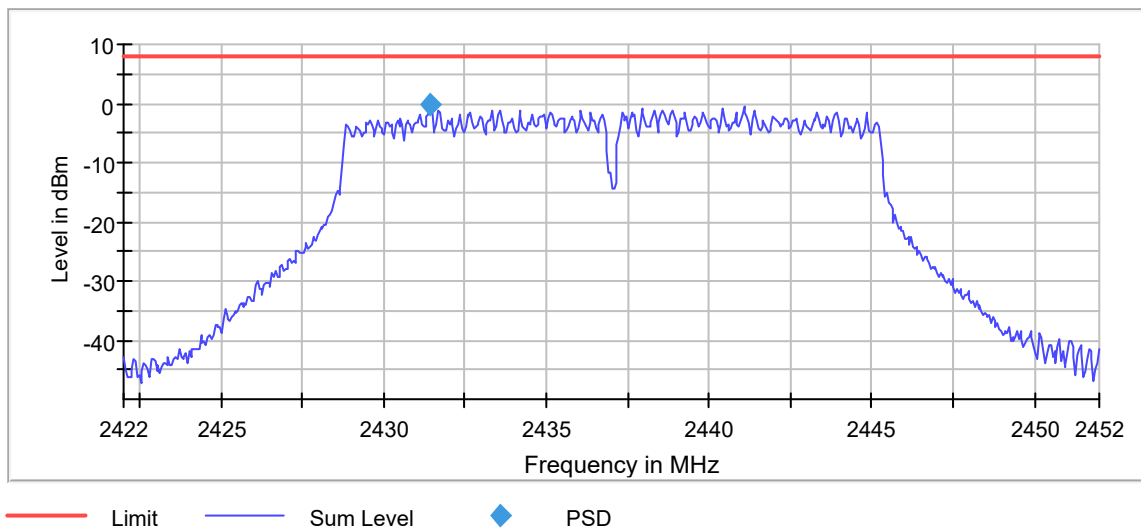


Power Spectral Density (2437 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05 F and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2431.425000	-0.090	8.0	PASS



Occupied Channel Bandwidth 99% (2437 MHz; 20 MHz)

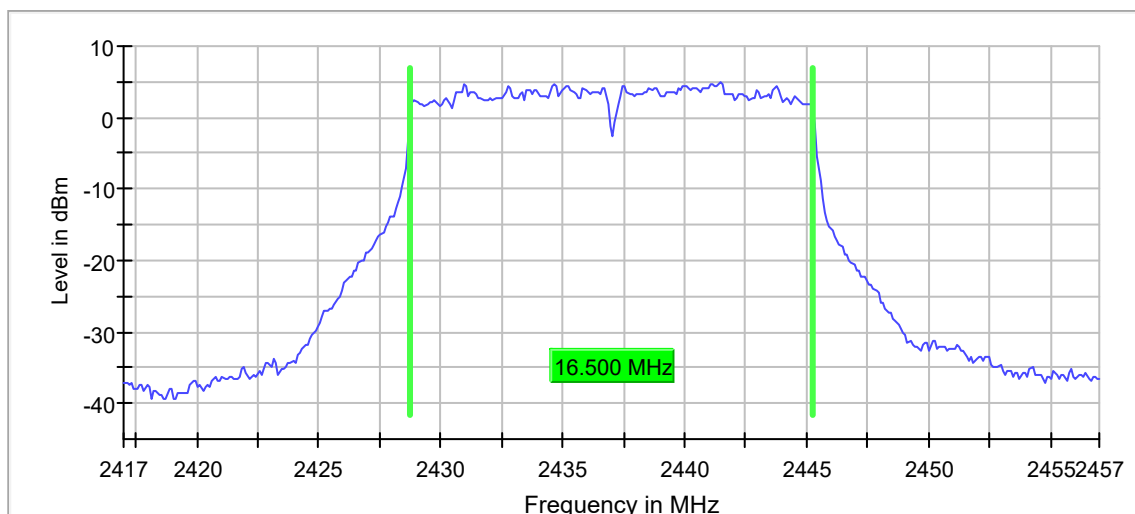
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	16.500000	---	---	2428.750000	2445.250000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2437.000000	PASS



Emission Bandwidth 20 dB (2462 MHz; 20 MHz)

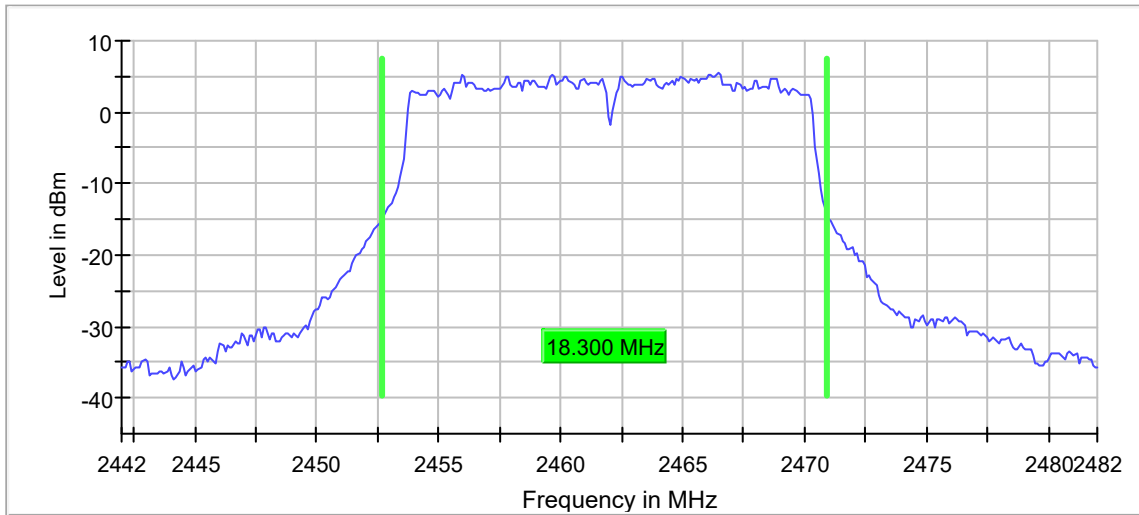
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	18.300000	---	---	2452.650000	2470.950000

(continuation of the "20 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2462.000000	5.5	PASS



Minimum Emission Bandwidth 6 dB (2462 MHz; 20 MHz)

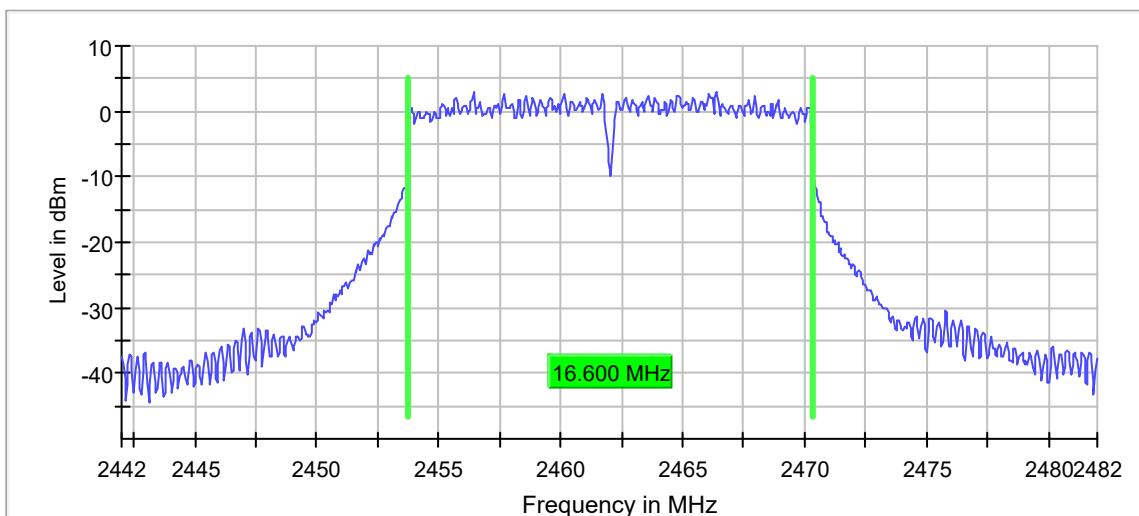
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	16.600000	0.500000	---	2453.725000	2470.325000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2462.000000	3.0	PASS

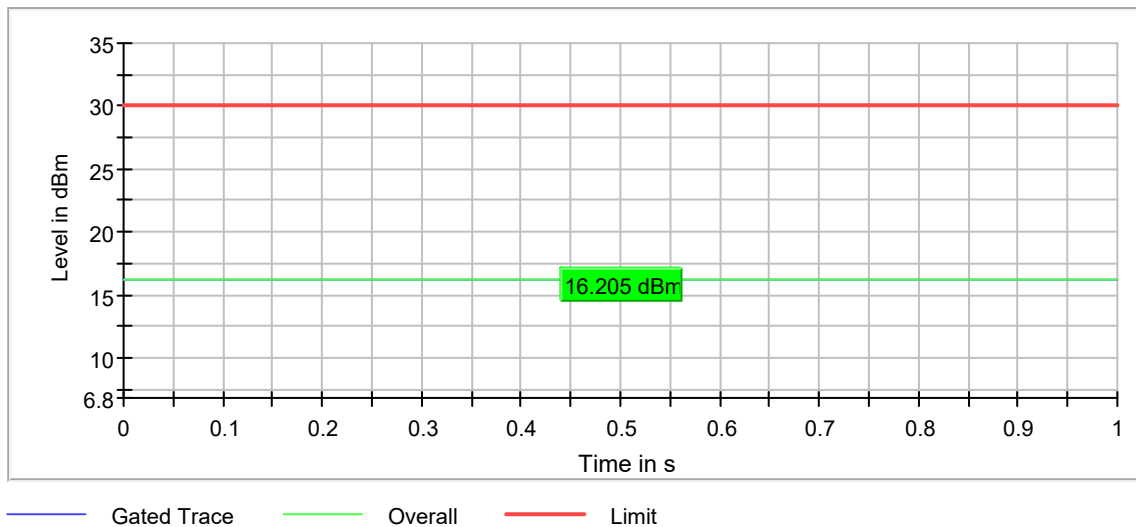


RF output power (2462 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.3.2

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2462.000000	16.2	30.0	16.2	100.000	PASS

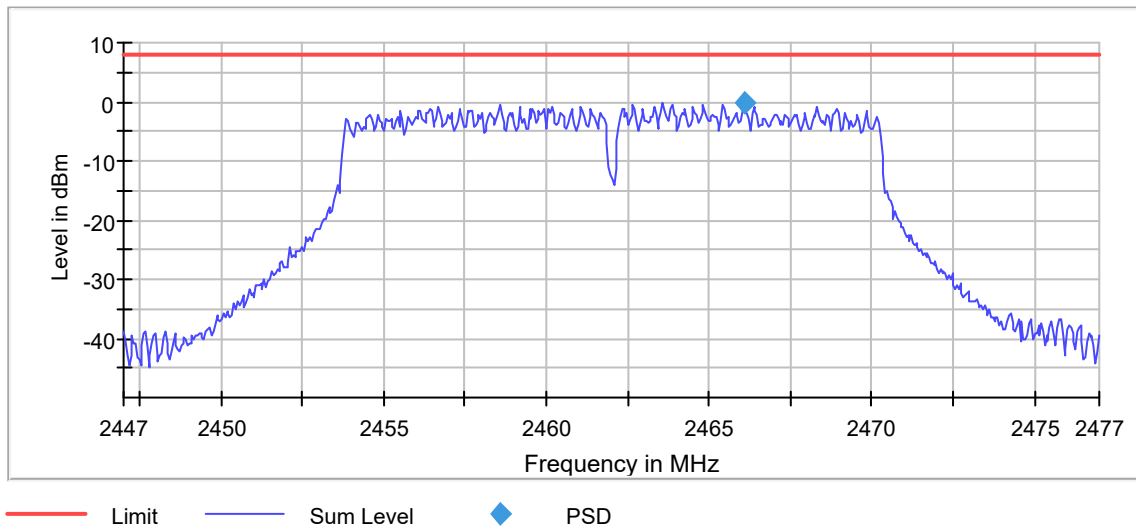


Power Spectral Density (2462 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05 F and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2466.075000	-0.233	8.0	PASS



Occupied Channel Bandwidth 99% (2462 MHz; 20 MHz)

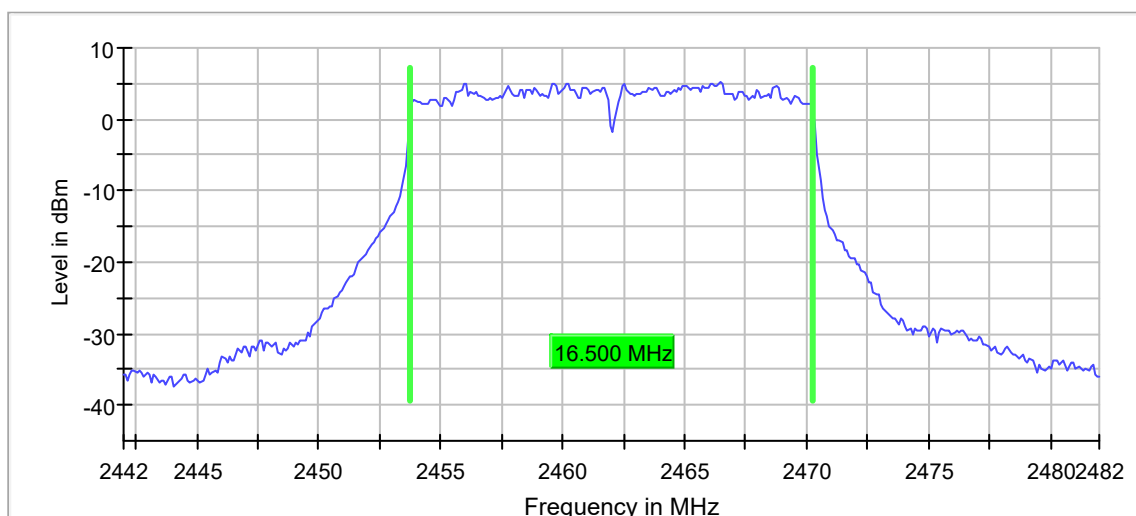
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	16.500000	---	---	2453.750000	2470.250000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2462.000000	PASS





Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2412MHz 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4824.00	H	46.2	*	4.8	34.2	-39.2	46.0	199.0	5000.0	-28.0
4824.00	V	46.2	*	4.8	34.2	-39.2	46.0	198.8	5000.0	-28.0
12060.00	H	46.1	*	8.0	38.7	-39.6	53.2	457.2	5000.0	-20.8
12060.00	V	46.1	*	8.0	38.7	-39.6	53.2	457.2	5000.0	-20.8
14472.00	H	45.5	*	8.7	39.6	-38.6	55.2	577.1	5000.0	-18.8
14472.00	V	45.5	*	8.7	39.6	-38.6	55.2	577.1	5000.0	-18.8
19296.00	H	33.8	*	2.2	40.4	-27.9	48.5	264.5	5000.0	-25.5
19296.00	V	33.8	*	2.2	40.4	-27.9	48.5	264.5	5000.0	-25.5

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2412MHz 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4824.00	H	33.4	*	4.8	34.2	-39.2	33.2	45.8	500.0	-20.8
4824.00	V	33.4	*	4.8	34.2	-39.2	33.2	45.8	500.0	-20.8
12060.00	H	34.1	*	8.0	38.7	-39.6	41.2	114.6	500.0	-12.8
12060.00	V	34.1	*	8.0	38.7	-39.6	41.2	114.6	500.0	-12.8
14472.00	H	33.4	*	8.7	39.6	-38.6	43.2	143.8	500.0	-10.8
14472.00	V	33.4	*	8.7	39.6	-38.6	43.2	143.8	500.0	-10.8
19296.00	H	20.9	*	2.2	40.4	-27.9	35.6	59.9	500.0	-18.4
19296.00	V	20.9	*	2.2	40.4	-27.9	35.6	59.9	500.0	-18.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2412MHz 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2412.00	H	58.5		2.6	32.2		93.3	46193.9		
2412.00	V	62.5		2.6	32.2		97.3	73635.0		
7236.00	H	36.2	*	6.1	35.9	-39.8	38.4	83.6	5000.0	-35.5
7236.00	V	36.2	*	6.1	35.9	-39.8	38.4	83.6	5000.0	-35.5
9648.00	H	37.8	*	6.8	36.9	-39.5	42.0	125.3	5000.0	-32.0
9648.00	V	37.8	*	6.8	36.9	-39.5	42.0	125.3	5000.0	-32.0
16884.00	H	35.7	*	9.4	42.0	-37.6	49.6	300.5	5000.0	-24.4
16884.00	V	35.7	*	9.4	42.0	-37.6	49.6	300.5	5000.0	-24.4
21708.00	H	24.5	*	2.2	40.6	-28.4	38.9	88.0	5000.0	-35.1
21708.00	V	24.5	*	2.2	40.6	-28.4	38.9	88.0	5000.0	-35.1
24120.00	H	24.7	*	2.2	40.6	-29.0	38.5	84.6	5000.0	-35.4
24120.00	V	24.7	*	2.2	40.6	-29.0	38.6	85.0	5000.0	-35.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. King :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2437MHz 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4874.00	H	45.1	*	4.9	34.1	-39.2	44.9	175.3	5000.0	-29.1
4874.00	V	45.1	*	4.9	34.1	-39.2	44.9	175.3	5000.0	-29.1
7311.00	H	44.7	*	6.2	35.9	-39.8	46.9	221.3	5000.0	-27.1
7311.00	V	44.7	*	6.2	35.9	-39.8	46.9	221.3	5000.0	-27.1
12185.00	H	46.3	*	8.0	38.7	-39.6	53.4	468.1	5000.0	-20.6
12185.00	V	46.3	*	8.0	38.7	-39.6	53.4	468.1	5000.0	-20.6
19496.00	H	34.3	*	2.2	40.4	-28.2	48.7	272.4	5000.0	-25.3
19496.00	V	34.3	*	2.2	40.4	-28.2	48.7	272.4	5000.0	-25.3

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2437MHz 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4874.00	H	33.0	*	4.9	34.1	-39.2	32.7	43.2	500.0	-21.3
4874.00	V	33.0	*	4.9	34.1	-39.2	32.7	43.2	500.0	-21.3
7311.00	H	32.63	*	6.2	35.9	-39.8	34.9	55.3	500.0	-19.1
7311.00	V	32.6	*	6.2	35.9	-39.8	34.9	55.3	500.0	-19.1
12185.00	H	33.9	*	8.0	38.7	-39.6	41.1	112.9	500.0	-12.9
12185.00	V	33.9	*	8.0	38.7	-39.6	41.1	112.9	500.0	-12.9
19496.00	H	20.9	*	2.2	40.4	-28.2	35.3	58.2	500.0	-18.7
19496.00	V	20.9	*	2.2	40.4	-28.2	35.3	58.2	500.0	-18.7

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. King :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2437MHz 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2437.00	H	60.4		2.6	32.4		95.4	58964.1		
2437.00	V	61.7		2.6	32.4		96.7	68169.1		
9748.00	H	37.5	*	6.9	37.0	-39.5	41.8	123.2	5000.0	-32.2
9748.00	V	37.5	*	6.9	37.0	-39.5	41.8	123.2	5000.0	-32.2
14622.00	H	37.9	*	8.8	39.7	-38.6	47.8	245.7	5000.0	-26.2
14622.00	V	37.9	*	8.8	39.7	-38.6	47.8	245.7	5000.0	-26.2
17059.00	H	34.9	*	9.5	41.8	-37.6	48.7	272.2	5000.0	-25.3
17059.00	V	34.9	*	9.5	41.8	-37.6	48.7	272.2	5000.0	-25.3
21933.00	H	24.3	*	2.2	40.6	-28.7	38.4	83.3	5000.0	-35.6
21933.00	V	24.3	*	2.2	40.6	-28.7	38.4	83.3	5000.0	-35.6
24370.00	H	25.2	*	2.2	40.6	-29.0	39.1	89.8	5000.0	-34.9
24370.00	V	25.2	*	2.2	40.6	-29.0	39.1	89.8	5000.0	-34.9

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2462MHz 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4924.00	H	45.3	*	4.9	34.1	-39.2	45.1	180.0	5000.0	-28.9
4924.00	V	45.3	*	4.9	34.1	-39.2	45.1	180.0	5000.0	-28.9
7386.00	H	44.6	*	6.2	35.8	-39.8	46.7	217.4	5000.0	-27.2
7386.00	V	44.6	*	6.2	35.8	-39.8	46.7	217.4	5000.0	-27.2
12310.00	H	46.7	*	8.0	38.7	-39.6	53.8	488.0	5000.0	-20.2
12310.00	V	46.7	*	8.0	38.7	-39.6	53.8	488.0	5000.0	-20.2
19696.00	H	35.2	*	2.2	40.4	-28.5	49.4	294.3	5000.0	-24.6
19696.00	V	35.2	*	2.2	40.4	-28.5	49.4	294.3	5000.0	-24.6
22158.00	H	36.4	*	2.2	40.6	-28.6	50.6	339.6	5000.0	-23.4
22158.00	V	36.4	*	2.2	40.6	-28.6	50.6	339.6	5000.0	-23.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2462MHz 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4924.00	H	33.2	*	4.9	34.1	-39.2	33.0	44.5	500.0	-21.0
4924.00	V	33.2	*	4.9	34.1	-39.2	33.0	44.5	500.0	-21.0
7386.00	H	32.49	*	6.2	35.8	-39.8	34.7	54.2	500.0	-19.3
7386.00	V	32.5	*	6.2	35.8	-39.8	34.7	54.2	500.0	-19.3
12310.00	H	34.4	*	8.0	38.7	-39.6	41.5	118.7	500.0	-12.5
12310.00	V	34.4	*	8.0	38.7	-39.6	41.5	118.7	500.0	-12.5
19696.00	H	21.5	*	2.2	40.4	-28.5	35.7	60.8	500.0	-18.3
19696.00	V	21.5	*	2.2	40.4	-28.5	35.7	60.8	500.0	-18.3
22158.00	H	23.5	*	2.2	40.6	-28.6	37.7	76.9	500.0	-16.3
22158.00	V	23.5	*	2.2	40.6	-28.6	37.7	76.9	500.0	-16.3

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2462MHz 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2462.00	H	59.0		2.6	32.5		94.1	50755.5		
2462.00	V	60.9		2.6	32.5		96.0	63384.5		
9848.00	H	37.3	*	6.9	37.1	-39.5	41.8	122.6	5000.0	-32.2
9848.00	V	37.3	*	6.9	37.1	-39.5	41.8	122.6	5000.0	-32.2
14772.00	H	37.3	*	8.9	39.7	-38.6	47.4	233.4	5000.0	-26.6
14772.00	V	37.3	*	8.9	39.7	-38.6	47.4	233.4	5000.0	-26.6
17234.00	H	35.9	*	9.6	41.7	-37.6	49.6	302.1	5000.0	-24.4
17234.00	V	35.2	*	9.6	41.7	-37.6	48.9	278.0	5000.0	-25.1
24620.00	H	26.0	*	2.2	40.6	-29.1	39.8	97.5	5000.0	-34.2
24620.00	V	26.0	*	2.2	40.6	-29.1	39.8	97.5	5000.0	-34.2

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Tx High Channel - 2462MHz, 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Band-Edge Compliance
Date : December 17th, 2019
Test Distance : 3 Meters
Notes : Peak Detector with 1MHzHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2483.50	H	32.2		2.7	32.5		67.4	2332.5	5000.0	-6.6
2483.50	V	28.0		2.7	32.5		63.2	1438.2	5000.0	-10.8

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Tx High Channel - 2462MHz, 802.11 g 54 MB_s
Test Specification : FCC-15.247, RSS-247 Band-Edge Compliance
Date : December 17th, 2019
Test Distance : 3 Meters
Notes : Average Detector with 1MHzHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2483.50	H	16.1		2.7	32.5	0.0	51.3	365.4	500.0	-2.7
2483.50	V	16.0		2.7	32.5	0.0	51.2	361.3	500.0	-2.8

Checked BY RICHARD E. KING :

Richard E. King

FCC Part 47 §15.247 2400-2483.5 MHz 2018

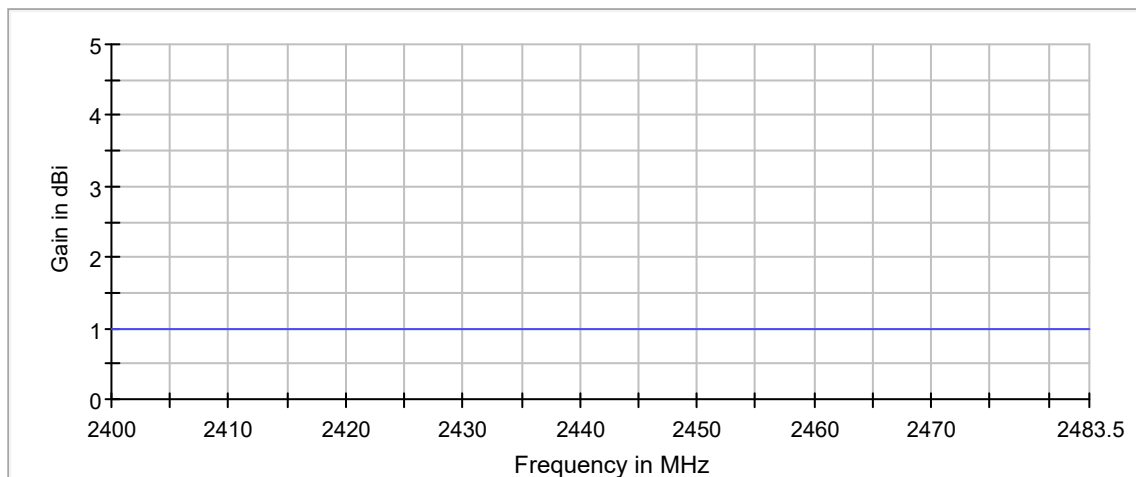
DUT Information

DUT Name: 001D9586
Manufacturer: Chamberlain
Serial Number:
Hardware Rev:
Software Rev:
Comment:

Frequencies
WLAN CH 1 (2412 MHz) WLAN CH 6 (2437 MHz) WLAN CH 11 (2462 MHz)

Bandwidths
20 MHz (20 MHz)

DUT Settings
No. of transmission chains 1
Equipment Type Other
Digital Modulation Yes
Frequency Hopping No



— Gaintable: antenna gain

Hardware Setup: WMS Measurements\TS8997

Spectrum Analyzer: SA ESW 44 (SA ESW 44) @ VISA (ADR
TCPIP::192.168.48.148::inst0::instr), SN 1328.4100K44/101533, FW 1.50 SP1

Vector Generator: VG SMBV100A (VG SMBV100A) @ VISA (ADR
TCPIP::192.168.48.149::inst0::instr), SN 260452, FW 3.1.18.2-3.01.130.48.1

Generator: SMB100A (SMB100A) @ VISA (ADR
TCPIP::192.168.48.150::inst0::instr)

OSP: OSP-B157W (OSP-B157W) @ VISA (ADR
TCPIP::192.168.48.157::inst0::instr), SN 1527.1144. /, FW 1.24.0.10

Emission Bandwidth 20 dB (2412 MHz; 20 MHz)

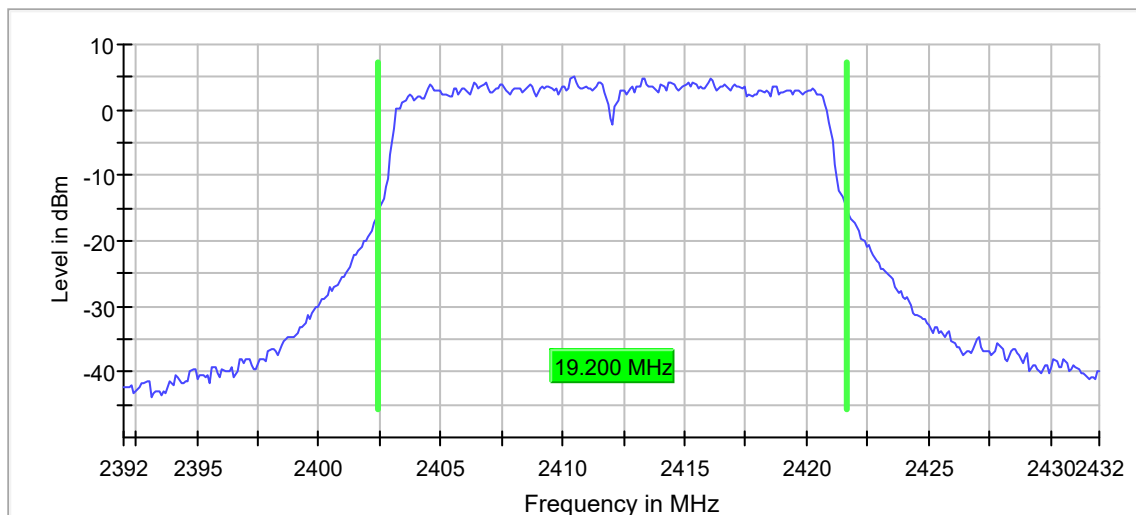
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	19.200000	---	---	2402.450000	2421.650000

(continuation of the "20 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2412.000000	5.1	PASS



Minimum Emission Bandwidth 6 dB (2412 MHz; 20 MHz)

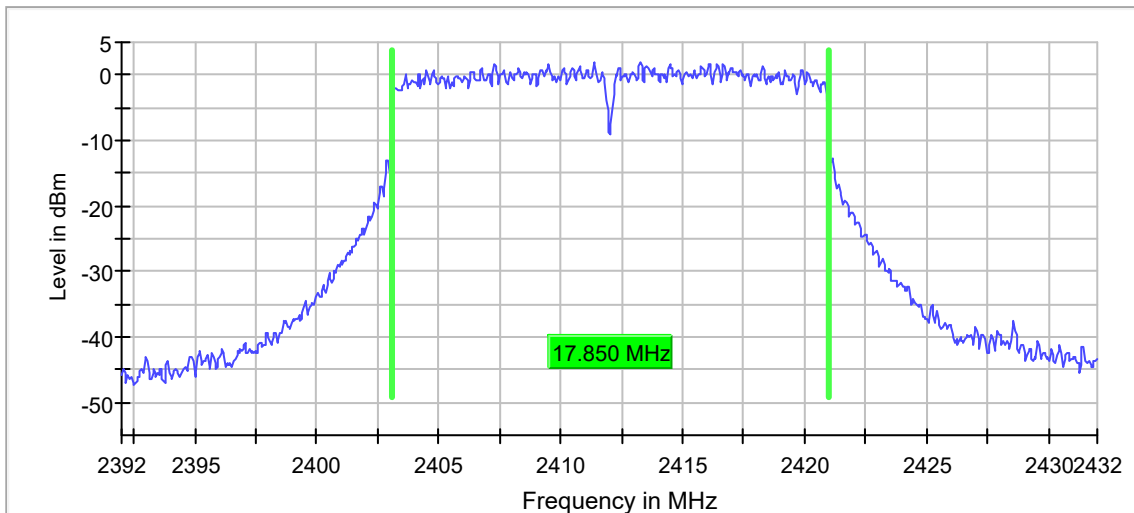
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	17.850000	0.500000	---	2403.125000	2420.975000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2412.000000	1.8	PASS

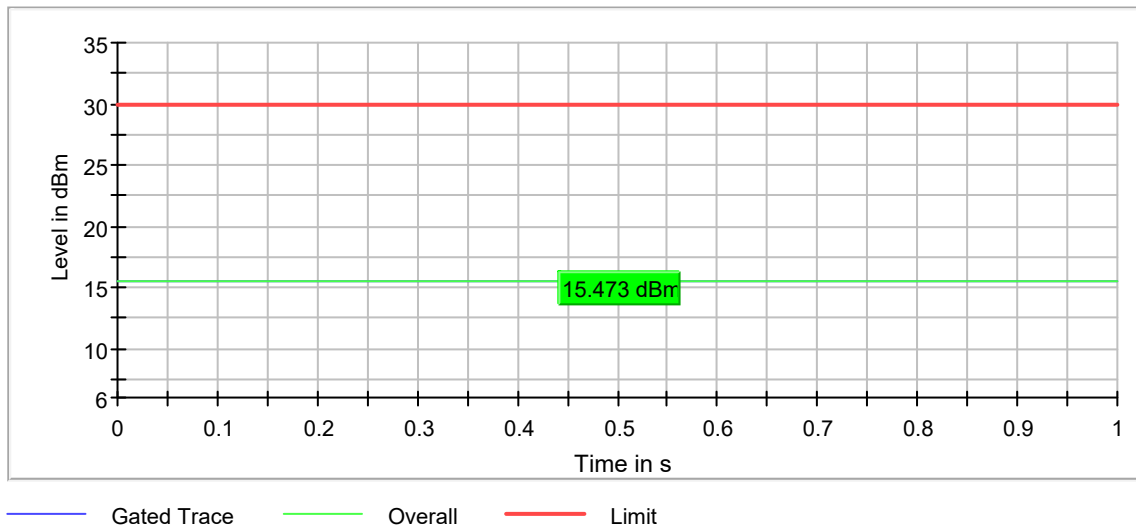


RF output power (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.3.2

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2412.000000	15.5	30.0	15.5	100.000	PASS

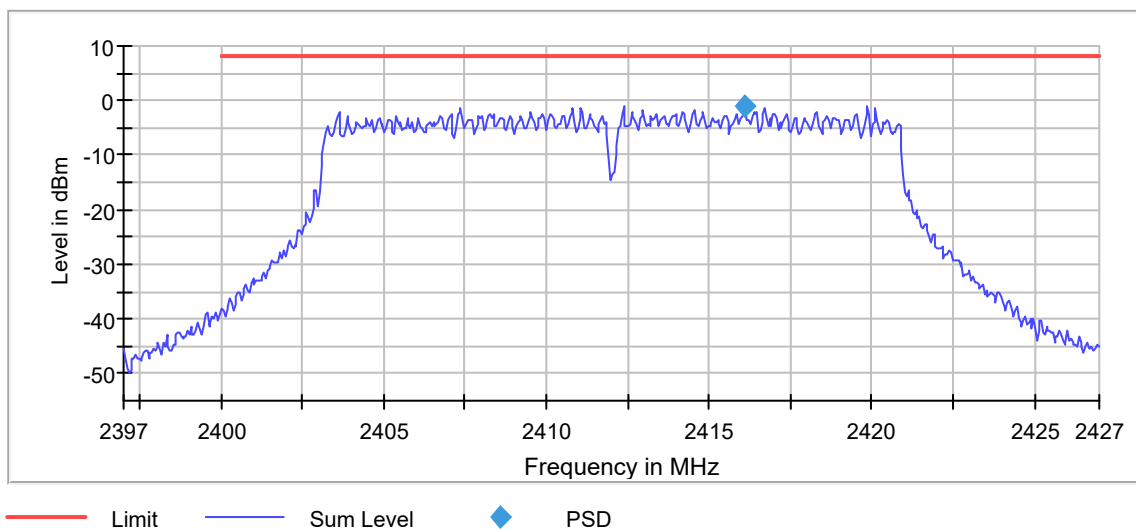


Power Spectral Density (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05 F and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2412.000000	2416.125000	-1.054	8.0	PASS



Occupied Channel Bandwidth 99% (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI

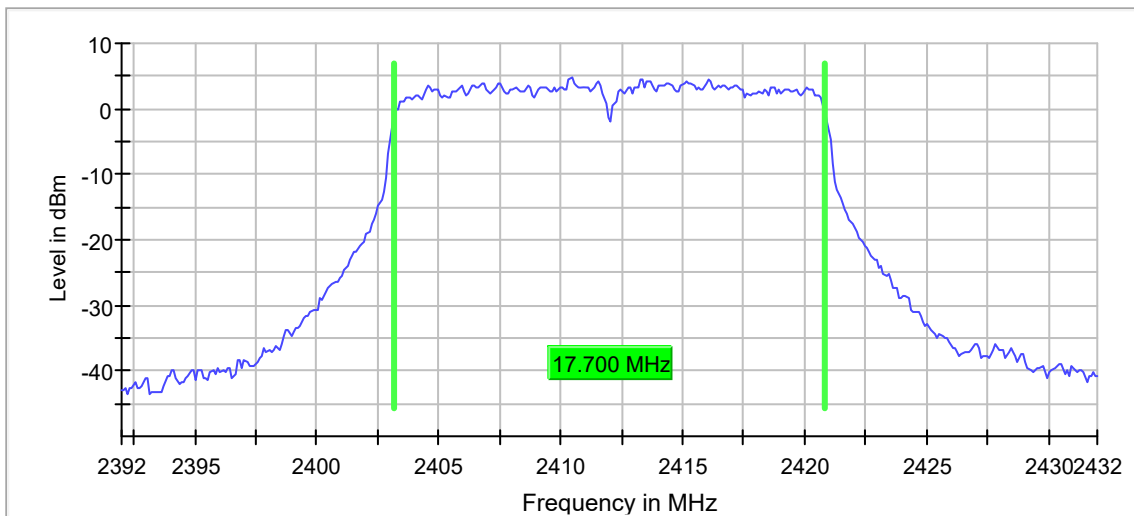
C63.10-2013 11.8.1

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2412.000000	17.700000	---	---	2403.150000	2420.850000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2412.000000	PASS



Band Edge low (2412 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05 8.7 and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Result
2412.000000	PASS

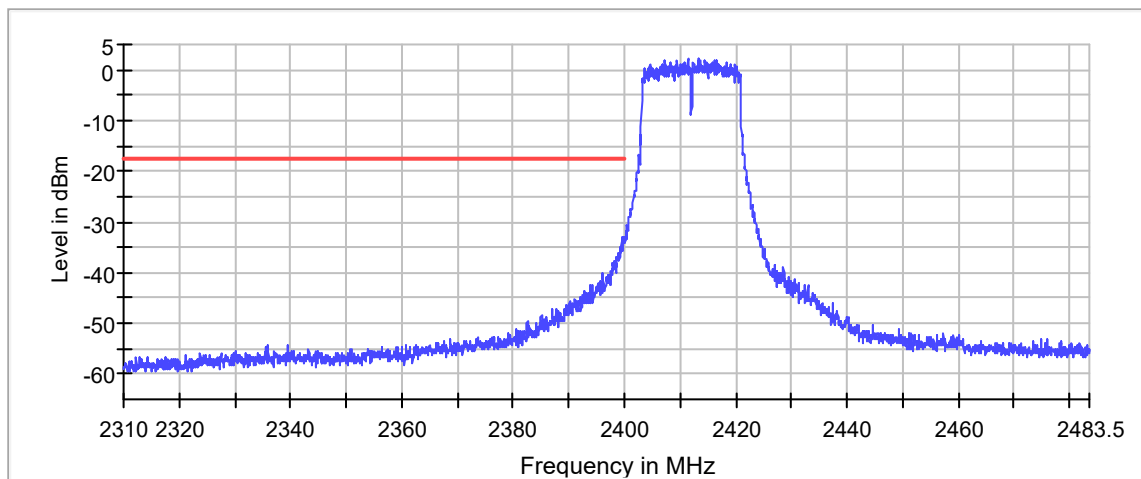
Inband Peak

Frequency (MHz)	Level (dBm)
2413.275000	2.3

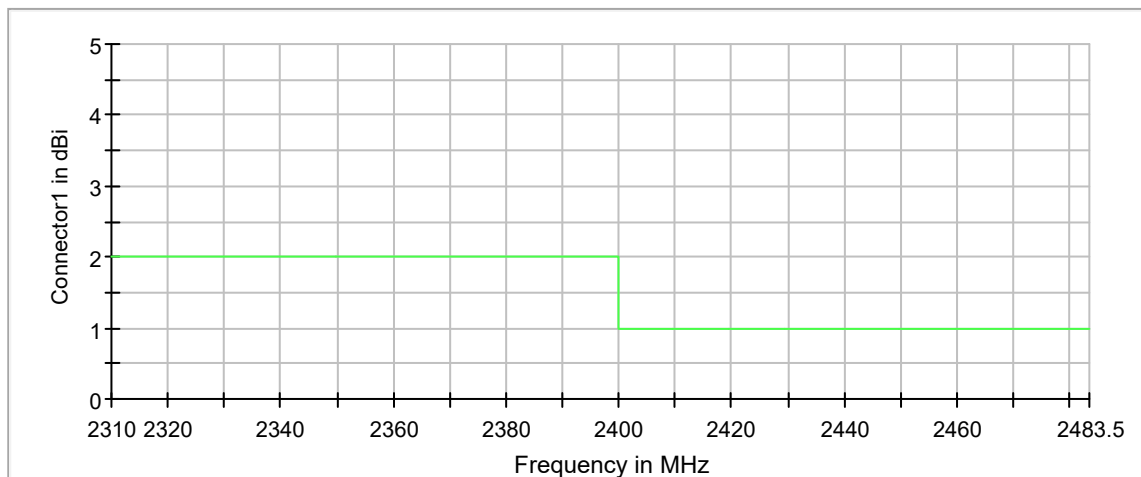
Measurements

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.525000	-33.0	15.3	-17.7	PASS
2399.775000	-33.2	15.4	-17.7	PASS

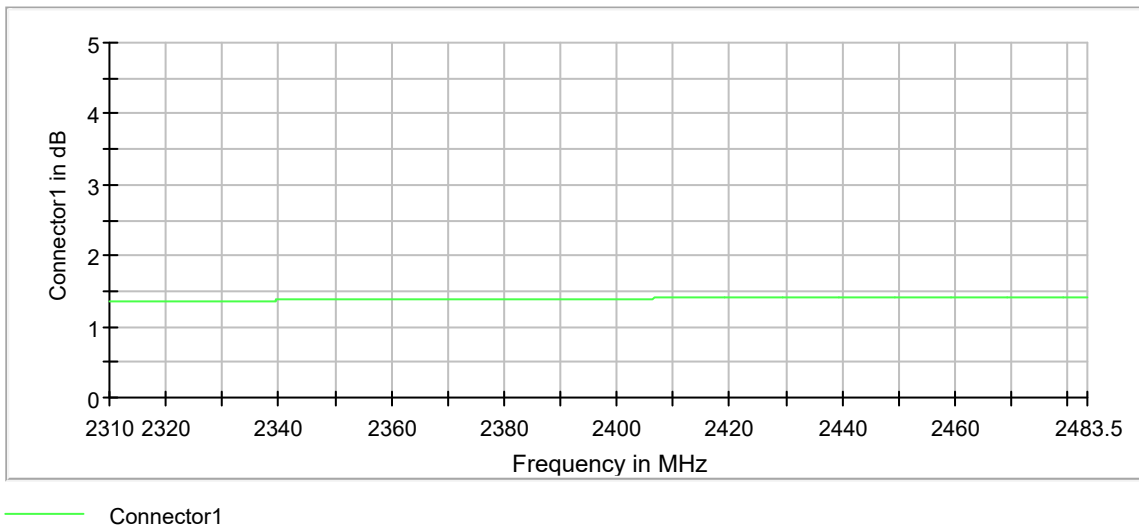
2399.475000	-33.5	15.8	-17.7	PASS
2399.975000	-33.5	15.8	-17.7	PASS
2399.825000	-33.8	16.1	-17.7	PASS
2399.875000	-33.8	16.1	-17.7	PASS
2399.725000	-33.9	16.2	-17.7	PASS
2399.925000	-34.0	16.3	-17.7	PASS
2399.575000	-34.4	16.6	-17.7	PASS
2399.275000	-34.8	17.1	-17.7	PASS
2399.675000	-35.1	17.4	-17.7	PASS
2399.225000	-35.2	17.5	-17.7	PASS
2399.425000	-35.5	17.8	-17.7	PASS
2399.325000	-35.5	17.8	-17.7	PASS
2399.625000	-35.7	18.0	-17.7	PASS



— Limit — Sum Level × Fail



— Connector1



Emission Bandwidth 20 dB (2437 MHz; 20 MHz)

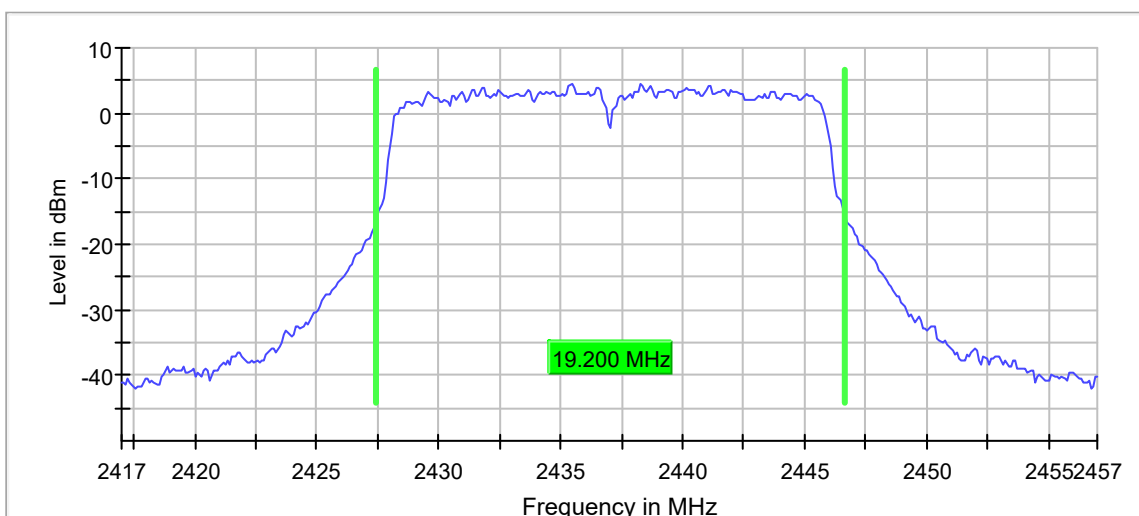
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	19.200000	---	---	2427.450000	2446.650000

(continuation of the "20 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2437.000000	4.6	PASS



Minimum Emission Bandwidth 6 dB (2437 MHz; 20 MHz)

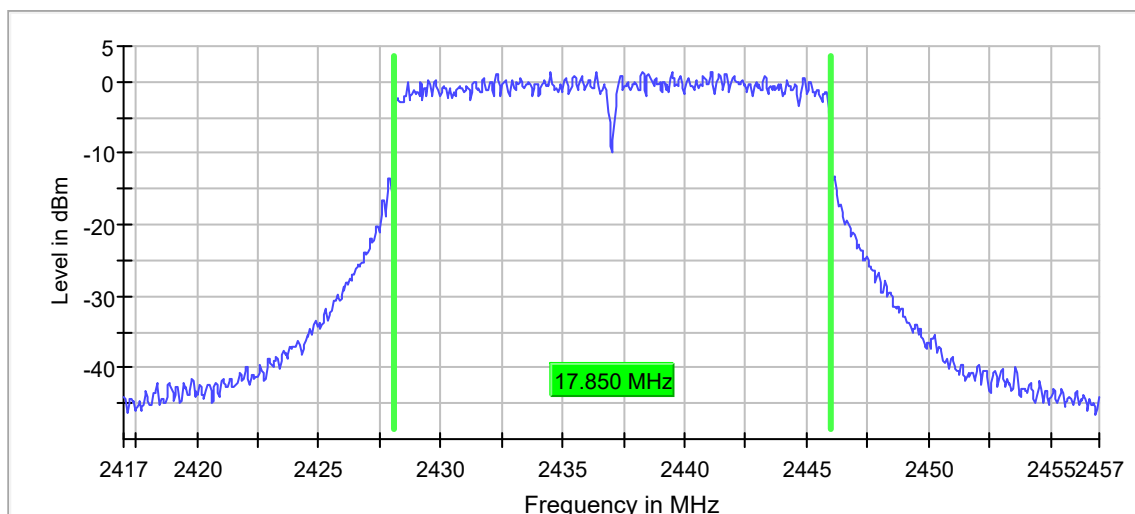
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	17.850000	0.500000	---	2428.125000	2445.975000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2437.000000	1.5	PASS

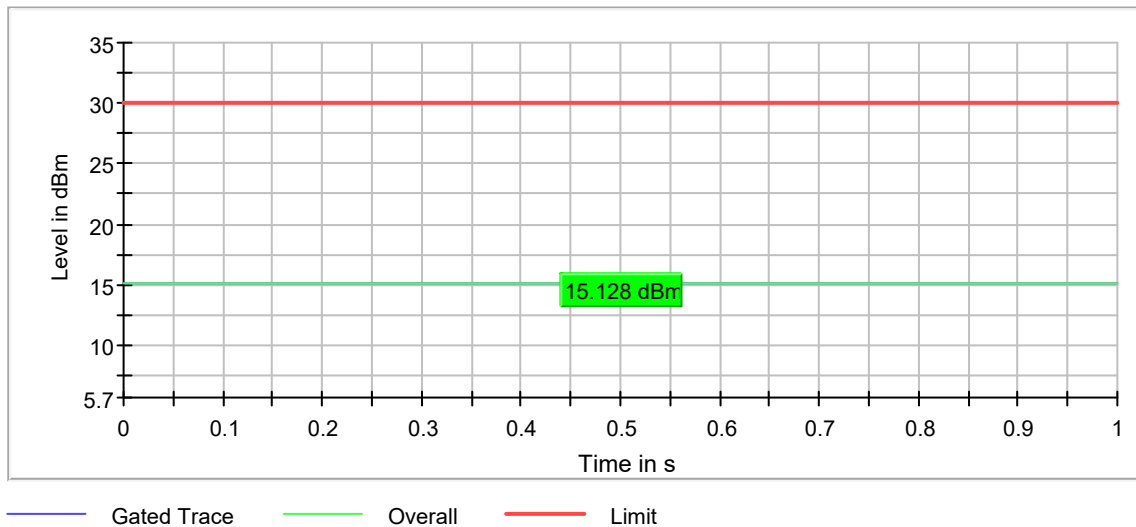


RF output power (2437 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.3.2

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2437.000000	15.1	30.0	15.1	100.000	PASS

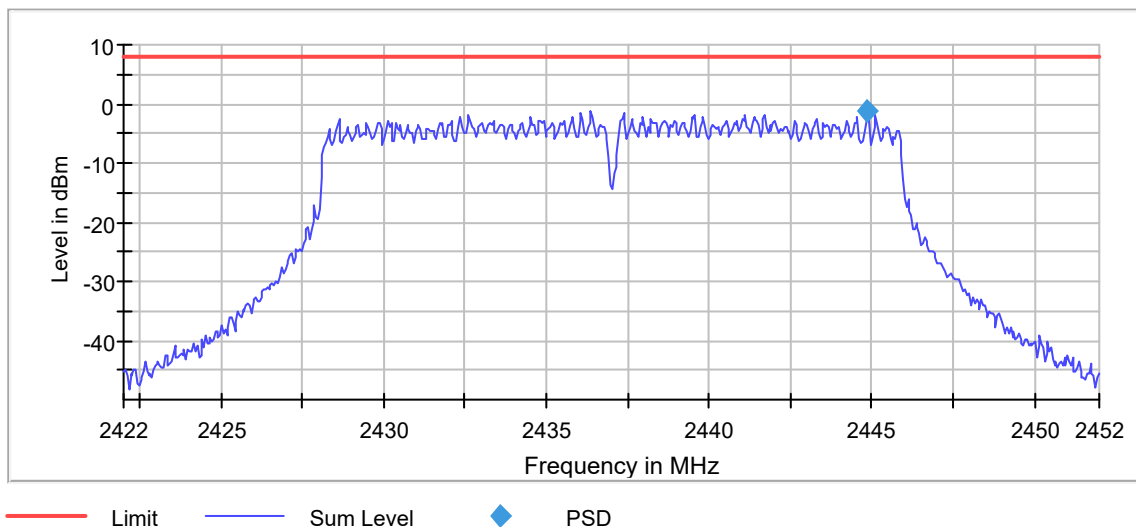


Power Spectral Density (2437 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05 F and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2437.000000	2444.875000	-1.253	8.0	PASS



Occupied Channel Bandwidth 99% (2437 MHz; 20 MHz)

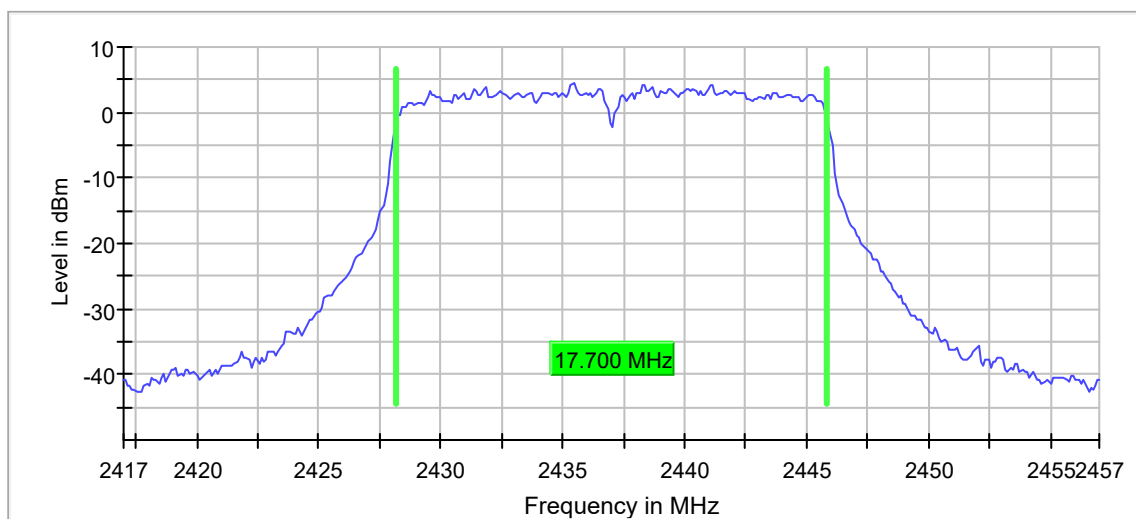
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2437.000000	17.700000	---	---	2428.150000	2445.850000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2437.000000	PASS



Emission Bandwidth 20 dB (2462 MHz; 20 MHz)

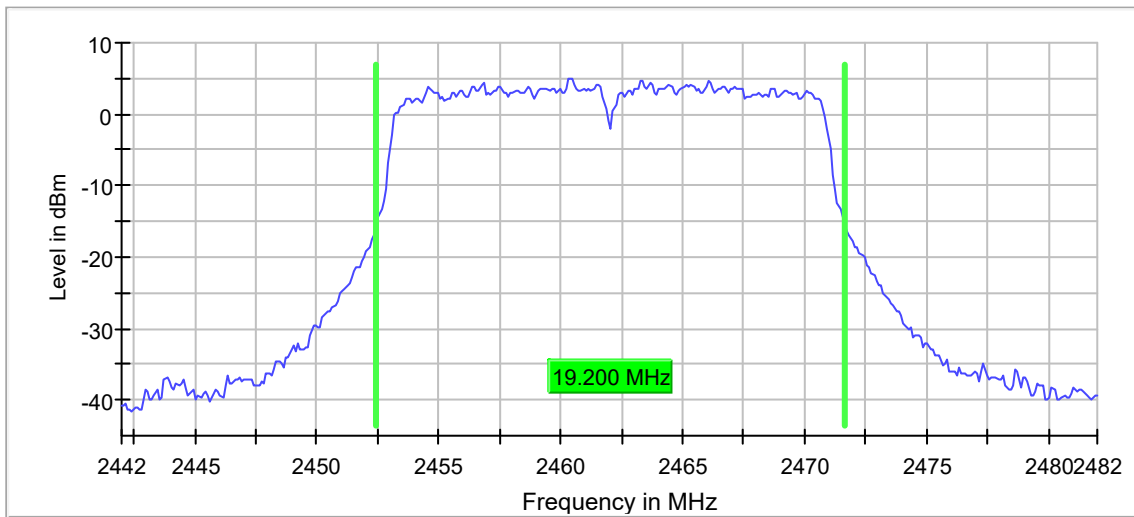
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

20 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	19.200000	---	---	2452.450000	2471.650000

(continuation of the "20 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2462.000000	5.0	PASS



Minimum Emission Bandwidth 6 dB (2462 MHz; 20 MHz)

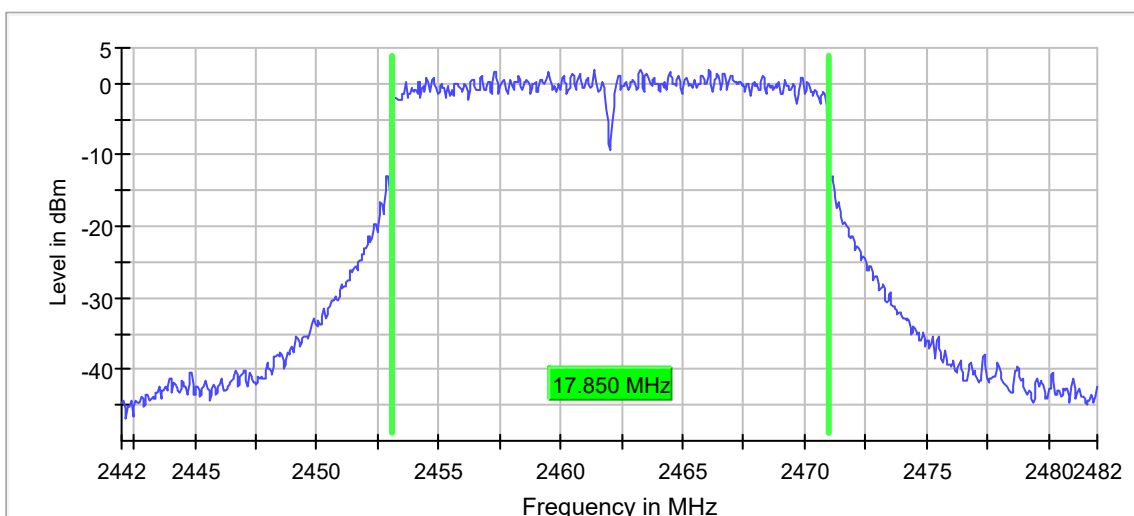
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	17.850000	0.500000	---	2453.125000	2470.975000

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2462.000000	1.8	PASS

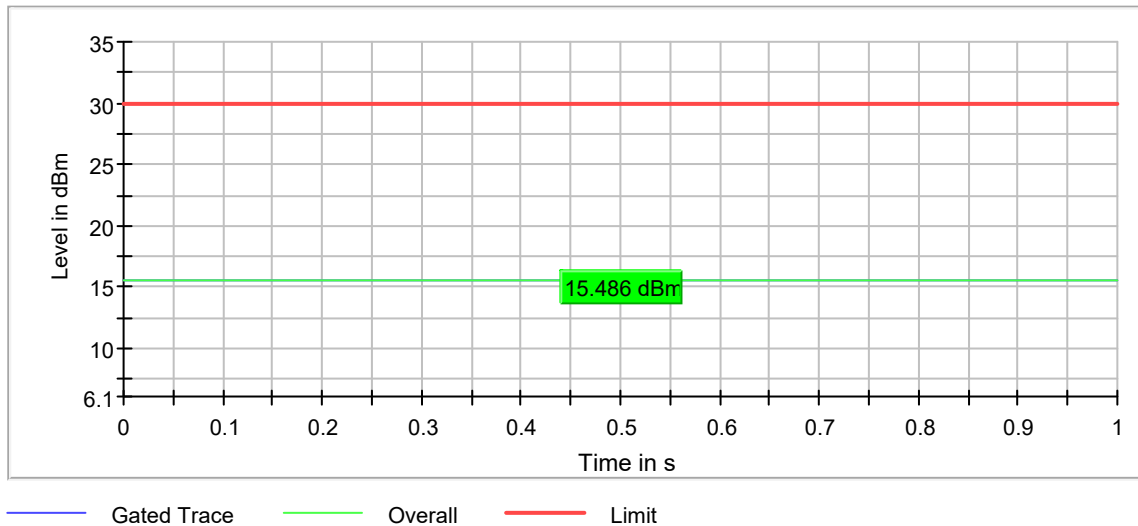


RF output power (2462 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.9.2.3.2

Result

DUT Frequency (MHz)	Gated RMS (dBm)	Limit Max (dBm)	Gated EIRP (dBm)	DutyCycle (%)	Result
2462.000000	15.5	30.0	15.5	100.000	PASS

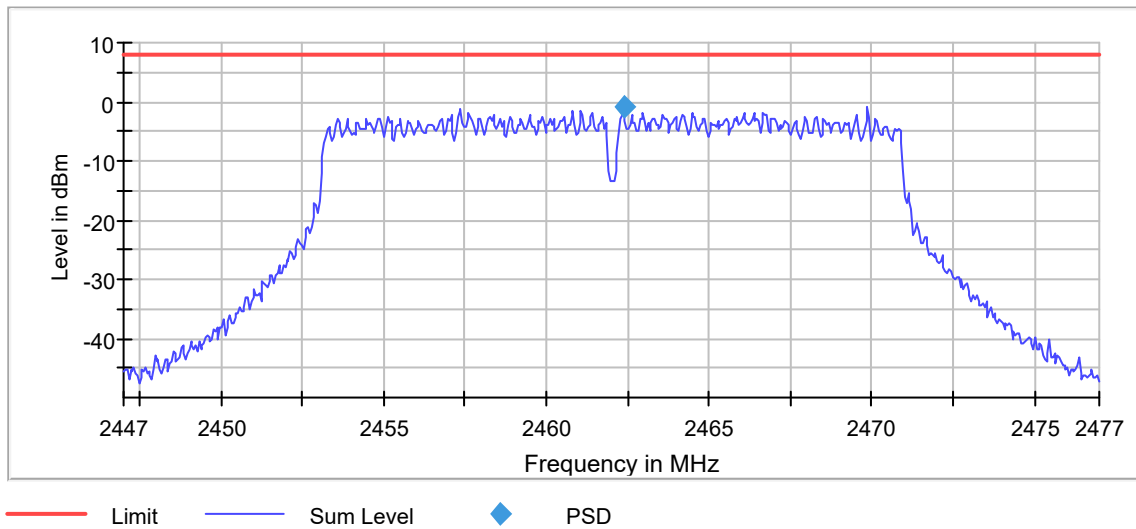


Power Spectral Density (2462 MHz; 20 MHz)

Test according to FCC title 47 part 15 §15.247(a),(e), KDB 558074 D01 DTS Meas Guidance v05 F and ANSI C63.10-2013

Result

DUT Frequency (MHz)	Frequency (MHz)	PSD (dBm)	Limit Max (dBm)	Result
2462.000000	2462.375000	-0.953	8.0	PASS



Occupied Channel Bandwidth 99% (2462 MHz; 20 MHz)

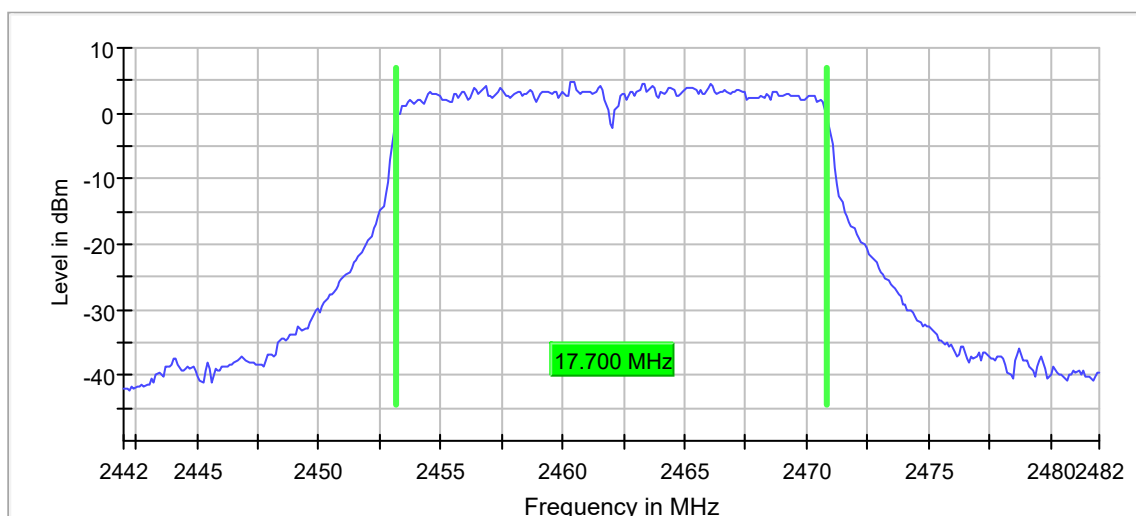
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05 and ANSI C63.10-2013 11.8.1

99 % Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2462.000000	17.700000	---	---	2453.150000	2470.850000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2462.000000	PASS





Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2412MHz 802.11 n MCS 7
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4824.00	H	45.8	*	4.8	34.2	-39.2	45.5	189.0	5000.0	-28.5
4824.00	V	45.8	*	4.8	34.2	-39.2	45.5	189.0	5000.0	-28.5
12060.00	H	46.4	*	8.0	38.7	-39.6	53.5	473.8	5000.0	-20.5
12060.00	V	46.4	*	8.0	38.7	-39.6	53.5	473.8	5000.0	-20.5
14472.00	H	46.2	*	8.7	39.6	-38.6	55.9	627.0	5000.0	-18.0
14472.00	V	46.2	*	8.7	39.6	-38.6	55.9	627.0	5000.0	-18.0
19296.00	H	33.8	*	2.2	40.4	-27.9	48.5	264.5	5000.0	-25.5
19296.00	V	33.8	*	2.2	40.4	-27.9	48.5	264.5	5000.0	-25.5

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2412MHz 802.11 n MCS 7
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4824.00	H	33.6	*	4.8	34.2	-39.2	33.4	46.7	500.0	-20.6
4824.00	V	33.6	*	4.8	34.2	-39.2	33.4	46.7	500.0	-20.6
12060.00	H	34.2	*	8.0	38.7	-39.6	41.3	116.6	500.0	-12.6
12060.00	V	34.2	*	8.0	38.7	-39.6	41.3	116.6	500.0	-12.6
14472.00	H	33.5	*	8.7	39.6	-38.6	43.3	145.5	500.0	-10.7
14472.00	V	33.5	*	8.7	39.6	-38.6	43.3	145.5	500.0	-10.7
19296.00	H	20.9	*	2.2	40.4	-27.9	35.6	59.9	500.0	-18.4
19296.00	V	20.9	*	2.2	40.4	-27.9	35.6	59.9	500.0	-18.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2412MHz 802.11 n MCS 7
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2412.00	H	60.6		2.6	32.2		95.4	58828.0		
2412.00	V	60.1		2.6	32.2		95.0	55986.6		
7236.00	H	36.7	*	6.1	35.9	-39.8	38.9	87.9	5000.0	-35.1
7236.00	V	36.7	*	6.1	35.9	-39.8	38.9	87.9	5000.0	-35.1
9648.00	H	38.3	*	6.8	36.9	-39.5	42.5	134.0	5000.0	-31.4
9648.00	V	38.3	*	6.8	36.9	-39.5	42.5	134.0	5000.0	-31.4
16884.00	H	34.5	*	9.4	42.0	-37.6	48.4	262.6	5000.0	-25.6
16884.00	V	34.5	*	9.4	42.0	-37.6	48.4	262.6	5000.0	-25.6
21708.00	H	24.5	*	2.2	40.6	-28.4	38.9	88.0	5000.0	-35.1
21708.00	V	24.5	*	2.2	40.6	-28.4	38.9	88.0	5000.0	-35.1
24120.00	H	24.7	*	2.2	40.6	-29.0	38.5	84.6	5000.0	-35.4
24120.00	V	24.7	*	2.2	40.6	-29.0	38.6	85.0	5000.0	-35.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2437MHz 802.11 n MCS 7
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4874.00	H	45.1	*	4.9	34.1	-39.2	44.9	175.9	5000.0	-29.1
4874.00	V	45.1	*	4.9	34.1	-39.2	44.9	175.9	5000.0	-29.1
7311.00	H	44.7	*	6.2	35.9	-39.8	46.9	222.1	5000.0	-27.0
7311.00	V	44.7	*	6.2	35.9	-39.8	46.9	222.1	5000.0	-27.0
12185.00	H	46.5	*	8.0	38.7	-39.6	53.6	477.9	5000.0	-20.4
12185.00	V	46.5	*	8.0	38.7	-39.6	53.6	477.9	5000.0	-20.4
19496.00	H	34.3	*	2.2	40.4	-28.2	48.7	272.4	5000.0	-25.3
19496.00	V	34.3	*	2.2	40.4	-28.2	48.7	272.4	5000.0	-25.3

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2437MHz 802.11 n MCS 7
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4874.00	H	33.2	*	4.9	34.1	-39.2	32.9	44.4	500.0	-21.0
4874.00	V	33.2	*	4.9	34.1	-39.2	32.9	44.4	500.0	-21.0
7311.00	H	32.26	*	6.2	35.9	-39.8	34.5	53.0	500.0	-19.5
7311.00	V	32.3	*	6.2	35.9	-39.8	34.5	53.0	500.0	-19.5
12185.00	H	34.0	*	8.0	38.7	-39.6	41.1	113.1	500.0	-12.9
12185.00	V	34.0	*	8.0	38.7	-39.6	41.1	113.1	500.0	-12.9
19496.00	H	20.9	*	2.2	40.4	-28.2	35.3	58.2	500.0	-18.7
19496.00	V	20.9	*	2.2	40.4	-28.2	35.3	58.2	500.0	-18.7

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. King :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2437MHz 802.11 n MCS 7
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2437.00	H	61.2		2.6	32.4		96.2	64727.3		
2437.00	V	58.3		2.6	32.4		93.3	46247.4		
9748.00	H	37.3	*	6.9	37.0	-39.5	41.6	120.9	5000.0	-32.3
9748.00	V	37.3	*	6.9	37.0	-39.5	41.6	120.9	5000.0	-32.3
14622.00	H	37.5	*	8.8	39.7	-38.6	47.4	235.5	5000.0	-26.5
14622.00	V	37.5	*	8.8	39.7	-38.6	47.4	235.5	5000.0	-26.5
17059.00	H	36.8	*	9.5	41.8	-37.6	50.5	336.8	5000.0	-23.4
17059.00	V	36.8	*	9.5	41.8	-37.6	50.5	336.8	5000.0	-23.4
21933.00	H	24.3	*	2.2	40.6	-28.7	38.4	83.3	5000.0	-35.6
21933.00	V	24.3	*	2.2	40.6	-28.7	38.4	83.3	5000.0	-35.6
24370.00	H	25.2	*	2.2	40.6	-29.0	39.1	89.8	5000.0	-34.9
24370.00	V	25.2	*	2.2	40.6	-29.0	39.1	89.8	5000.0	-34.9

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2462MHz 802.11 n MCS 7
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4924.00	H	45.0	*	4.9	34.1	-39.2	44.8	174.1	5000.0	-29.2
4924.00	V	45.0	*	4.9	34.1	-39.2	44.8	174.1	5000.0	-29.2
7386.00	H	44.1	*	6.2	35.8	-39.8	46.3	206.9	5000.0	-27.7
7386.00	V	44.1	*	6.2	35.8	-39.8	46.3	206.9	5000.0	-27.7
12310.00	H	46.8	*	8.0	38.7	-39.6	53.9	495.9	5000.0	-20.1
12310.00	V	46.8	*	8.0	38.7	-39.6	53.9	495.9	5000.0	-20.1
19696.00	H	35.2	*	2.2	40.4	-28.5	49.4	294.3	5000.0	-24.6
19696.00	V	35.2	*	2.2	40.4	-28.5	49.4	294.3	5000.0	-24.6
22158.00	H	36.4	*	2.2	40.6	-28.6	50.6	339.6	5000.0	-23.4
22158.00	V	36.4	*	2.2	40.6	-28.6	50.6	339.6	5000.0	-23.4

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2462MHz 802.11 n MCS 7
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4924.00	H	33.2	*	4.9	34.1	-39.2	33.0	44.6	500.0	-21.0
4924.00	V	33.1	*	4.9	34.1	-39.2	32.9	44.1	500.0	-21.1
7386.00	H	31.72	*	6.2	35.8	-39.8	33.9	49.6	500.0	-20.1
7386.00	V	31.7	*	6.2	35.8	-39.8	33.9	49.6	500.0	-20.1
12310.00	H	34.4	*	8.0	38.7	-39.6	41.5	118.4	500.0	-12.5
12310.00	V	34.4	*	8.0	38.7	-39.6	41.5	118.4	500.0	-12.5
19696.00	H	21.5	*	2.2	40.4	-28.5	35.7	60.8	500.0	-18.3
19696.00	V	21.5	*	2.2	40.4	-28.5	35.7	60.8	500.0	-18.3
22158.00	H	23.5	*	2.2	40.6	-28.6	37.7	76.9	500.0	-16.3
22158.00	V	23.5	*	2.2	40.6	-28.6	37.7	76.9	500.0	-16.3

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Transmit at 2462MHz 802.11 n MCS 7
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : December 17, 2019
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2462.00	H	60.8		2.6	32.5		95.9	62371.1		
2462.00	V	60.9		2.6	32.5		96.1	63530.6		
9848.00	H	37.7	*	6.9	37.1	-39.5	42.2	128.5	5000.0	-31.8
9848.00	V	37.7	*	6.9	37.1	-39.5	42.2	128.5	5000.0	-31.8
14772.00	H	37.0	*	8.9	39.7	-38.6	47.0	225.0	5000.0	-26.9
14772.00	V	37.0	*	8.9	39.7	-38.6	47.0	225.0	5000.0	-26.9
17234.00	H	35.7	*	9.6	41.7	-37.6	49.4	294.2	5000.0	-24.6
17234.00	V	35.7	*	9.6	41.7	-37.6	49.4	294.2	5000.0	-24.6
24620.00	H	26.0	*	2.2	40.6	-29.1	39.8	97.5	5000.0	-34.2
24620.00	V	26.0	*	2.2	40.6	-29.1	39.8	97.5	5000.0	-34.2

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Tx High Channel - 2462MHz, 802.11 n MCS7
Test Specification : FCC-15.247, RSS-247 Band-Edge Compliance
Date : December 17th, 2019
Test Distance : 3 Meters
Notes : Peak Detector with 1MHzHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2483.50	H	35.9		2.7	32.5		71.1	3571.2	5000.0	-2.9
2483.50	V	31.2		2.7	32.5		66.4	2078.8	5000.0	-7.6

Checked BY RICHARD E. KING :

Richard E. King



Manufacturer : Chamberlain Group, Inc.
Test Item : Phoenix Transceiver
Model No. : 001D9586
Mode : Tx High Channel - 2462MHz, 802.11 n MCS7
Test Specification : FCC-15.247, RSS-247 Band-Edge Compliance
Date : December 17th, 2019
Test Distance : 3 Meters
Notes : Average Detector with 1MHzHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2483.50	H	14.6		2.7	32.5	0.0	49.8	307.5	500.0	-4.2
2483.50	V	11.6		2.7	32.5	0.0	46.8	217.7	500.0	-7.2

Checked BY RICHARD E. KING :

Richard E. King

20. 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
Stanley Dolecki (Automotive Team Leader) Phone: 630 495 9770 ext. 103
Email: sdolecki@elitetest.com
Website: www.elitetest.com

ELECTRICAL

Valid to: June 30, 2021

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

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)

Vehicle Radiated Emissions

CISPR 12; ICES-002

(A2LA Cert. No. 1786.01) 08/08/2019



Page 1 of 7

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:
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)

*Bulk Current Injections (BCI)
(Closed Loop Method)*

ISO 11452-4; SAE J1113-4

*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

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

Electrical Loads

ISO 16750-2, Sections 4.2, 4.3, 4.4, 4.5, 4.6, 4.7,
4.8, 4.9, 4.11, and 4.12

Dielectric Withstand Voltage

MIL-STD-202, Method 301;
EIA-364-20D

Insulation Resistance

MIL-STD-202, Method 302;
SAE/USCAR-2, Revision 6, Section 5.5.1;
EIA-364-21D

Contact Resistance

MIL-STD-202, Method 307;
SAE/USCAR-2, Revision 6, Section 5.3.1;
EIA/ECA-364-23C;
USCAR21-3 Section 4.5.3

DC Resistance

MIL-STD-202, Method 303

Contact Chatter

MIL-STD-202, Method 310;
SAE/USCAR-2, Revision 6, Section 5.1.9

Voltage Drop

SAE/USCAR-2, Revision 6, Section 5.3.2;
USCAR21-3 Section 4.5.6

Test Technology:
Emissions

Radiated and Conducted
(3m Semi-anechoic chamber,
up to 40 GHz)

Test Method(s) ¹:

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; KN 11; CNS 13803 (1997, 2003);
CISPR 14-1; EN 55014-1; AS/NZS CISPR 14.1; 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; KN 32

Current Harmonics

IEC 61000-3-2; EN 61000-3-2; KN 61000-3-2

Flicker and Fluctuations

IEC 61000-3-3; EN 61000-3-3; KN 61000-3-3

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;
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;
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

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;
IEEE C37.90.1 2012

Test Technology:
Test Method(s) ¹:
Immunity (cont'd)
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

Power Frequency Magnetic Field Immunity

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

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

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

Generic and Product Specific EMC Standards

IEC/EN 61000-6-1; AS/NZS 61000-6-1; KN 61000-6-1;
IEC/EN 61000-6-2; AS/NZS 61000-6-2; KN 61000-6-2;
IEC/EN 61000-6-3; AS/NZS 61000-6-3; KN 61000-6-3;
IEC/EN 61000-6-4; AS/NZS 61000-6-4; KN 61000-6-4;
EN 50130-4; IEC 61326-1;
IEC/CISPR 14-2; EN 55014-2; AS/NZS CISPR 14.2; KN 14-2;
IEC/CISPR 24; AS/NZS CISPR 24; EN 55024; KN 24;
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 301 489-52;

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 300 330-1; 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 301 413;
ETSI EN 302 502

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-246; RSS-247; RSS-251; RSS-252; RSS-287; RSS-288; RSS-310; RSS-GEN

Mexico Radio Tests

IFT-008; NOM-208-SCFI

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

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

**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; ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015;

**Electrical Measurements and
Simulation**
AC Voltage / Current

(1mV to 5kV) 60 Hz

(0.1V to 250V) up to 500 MHz

(1μA to 150A) 60 Hz

DC Voltage / Current

(1mV to 15-kV) / (1μA to 10A)

Power Factor / Efficiency / Crest Factor

(Power to 30kW)

Resistance

(1mΩ to 4000MΩ)

Surge

(Up to 10 kV / 5 kA) (Combination Wave and Ring Wave)

FAA AC 150/5345-10H

FAA AC 150/5345-43J

FAA AC 150/5345-44K

FAA AC 150/5345-46E

FAA AC 150/5345-47C

FAA EB 67D

(A2LA Cert. No. 1786.01) 08/08/2019



Page 5 of 7

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, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is expected to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA R101 - *General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.

Testing Activities Performed in Support of FCC Declaration of Conformity and Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1²

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
<u>Unintentional Radiators</u>		
Part 15B	ANSI C63.4:2014	40000
<u>Industrial, Scientific, and Medical Equipment</u>		
Part 18	FCC MP-5 (February 1986)	40000
<u>Intentional Radiators</u>		
Part 15C	ANSI C63.10:2013	40000
<u>Unlicensed Personal Communication Systems Devices</u>		
Part 15D	ANSI C63.17:2013	40000
<u>U-NII without DFS Intentional Radiators</u>		
Part 15E	ANSI C63.10:2013	40000
<u>U-NII with DFS Intentional Radiators</u>		
Part 15E	FCC KDB 905462 D02 (v02)	40000
<u>UWB Intentional Radiators</u>		
Part 15F	ANSI C63.10:2013	40000
<u>BPL Intentional Radiators</u>		
Part 15G	ANSI C63.10:2013	40000
<u>White Space Device Intentional Radiators</u>		
Part 15H	ANSI C63.10:2013	40000

Testing Activities Performed in Support of FCC Declaration of Conformity and Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1²

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
<u>Commercial Mobile Services (FCC Licensed Radio Service Equipment)</u> Parts 22 (cellular), 24, 25 (below 3 GHz), and 27	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>General Mobile Radio Services (FCC Licensed Radio Service Equipment)</u> 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
<u>Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment)</u> Part 96	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>Maritime and Aviation Radio Services</u> Parts 80 and 87	ANSI/TIA-603-E; ANSI C63.26:2015	40000
<u>Microwave and Millimeter Bands Radio Services</u> 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
<u>Broadcast Radio Services</u> Parts 73 and 74 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
<u>Signal Boosters</u> Part 20 (Wideband Consumer Signal Boosters, Provider-specific signal boosters, and Industrial Signal Boosters) Section 90.219	ANSI C63.26:2015	40000

²Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (<https://apps.fcc.gov/oetcf/cas/>) 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 8th day of August 2019.



Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1786.01
Valid to June 30, 2021

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