



166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart C – Intentional Radiators

Section 15.247

Operation within the bands 902 - 928 MHz,
2400 - 2483.5 MHz, 5725 - 5875 MHz,
and 24.0 - 24.25 GHz.

THE FOLLOWING MEETS THE ABOVE TEST SPECIFICATION

Formal Name: Amber WiFi Module
Kind of Equipment: 802.11b/g/n Wi-Fi appliance module
Frequency Range: 2412-2462 MHz
Test Configuration: DC powered transceiver module
Model Number(s): WICHAM01
Model(s) Tested: WICHAM01
Serial Number(s): 15501X01D01160800025AK01 (with external connector),
15501X01D01160800070AK01
Date of Tests: March 11th to April 4th, 2016
Test Conducted For: Whirlpool Corporation
750 Monte Rd
Benton Harbor, MI 49022, USA

NOTICE: "This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government". Please see the "Description of Test Sample" page listed inside of this report.

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SIGNATURE PAGE

Tested By:

A handwritten signature in black ink that reads 'Craig Brandt'.

Craig Brandt
Senior Test Engineer

Reviewed By:

A handwritten signature in black ink that reads 'William Stumpf'.

William Stumpf
OATS Manager

Approved By:

A handwritten signature in black ink that reads 'Brian J. Mattson'.

Brian Mattson
General Manager



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United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

D.L.S. Electronic Systems, Inc.
Wheeling, IL

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Electromagnetic Compatibility & Telecommunications

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
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 January 2009).*

2015-09-25 through 2016-09-30

Effective Dates



For the National Voluntary Laboratory Accreditation Program

**ELECTROMAGNETIC
COMPATIBILITY &
TELECOMMUNICATIONS**

NVLAP LAB CODE 100276-0

Emissions

Designation

Off-site test location

Description

D.L.S. Electronics performs radiated emissions testing at an additional location, 166 South Carter Street, Genoa City, WI 53128.



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1.0 Summary of Test Report

It was determined that the Whirlpool Inc Amber WiFi Module model WICHAM01, complies with the requirements of CFR 47 Part 15 Subpart C Section 15.247.

Subpart C Section 15.247 Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
15.247(a)(2)	DTS Bandwidth	ANSI C63.10-2013 Sections 11.8 & 11.8.1	1	Yes
15.247(b)(3)	Fundamental Emission Output Power	ANSI C63.10-2013 Sections 11.9.1 & 11.9.1.3	1	Yes
15.247(e)	Maximum Power Spectral Density	ANSI C63.10-2013 Sections 11.10 & 11.10.2	1	Yes
15.247(d)	Emissions in Non-Restricted Frequency Bands – RF Conducted	ANSI C63.10-2013 Sections 11.11, 11.11.2 & 11.11.3	1	Yes
15.247(d) 15.205(a) 15.209(a)	Emissions in Restricted Frequency Bands – Radiated	ANSI C63.10-2013 Sections 11.12 & 11.12.1	2	Yes
15.247(d)	Operating Band-Edge Measurements – RF Conducted	ANSI C63.10-2013 Sections 11.11, 11.11.2 & 11.11.3	1	Yes
15.247(d) 15.205(a) 15.209(a)	Restricted Band-Edge Measurements - Radiated	ANSI C63.10-2013 Sections 11.12 & 11.12.1	2	Yes
15.207	AC Line Conducted Emissions	ANSI C63.10-2013 Section 6.2	3	Yes
Informative	Duty Cycle	ANSI C63.10-2013 Sections 11.6 & 11.6(b)		NA

Note 1: RF conducted measurement.

Note 2: Radiated emission measurement.

Note 3: AC power line conducted measurement.



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2.0 Introduction

From March 11th to April 4th, 2016, the Amber WiFi Module model WICHAM01, as provided from Whirlpool Corporation was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.247 for single modular approval. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.

3.0 Test Facilities

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, Industry Canada, and VCCI.

Wisconsin Test Facility:

D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128

Wheeling Test Facility:

D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090

FCC Registration #90531

4.0 Description of Test Sample

Description:

The test samples consist of 2 AMber WiFi modules. The 802.11b/g/n specification compliant transceivers are mounted on FR4 substrate which includes an integrated printed circuit board with two "on-board" or imbedded antennas and a shield covering the RF circuitry. Through software configuration the "off-board" or external antenna can be enabled depending on the geographic environment. Test tools are used to allow for different modulation types, power settings and frequency of operation to be set as needed. A 7.2V battery and mating connectors are used to power the device. USB is used to communicate with the DUT.

Type of Equipment / Frequency Range:

Mobile / 2412-2462 MHz

Physical Dimensions of Equipment Under Test:

Length: 90 mm, Width: 25 mm, Height: 11 mm



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4.0 Description of Test Sample (continued)

Power Source:

12 VDC \pm 5% provided from the host appliance
7.2 VDC used for radiated testing
12 VDC wall adapter used for RF conducted testing
Stepped down to 3.3VDC for use by the transmitter

120V / 60Hz for AC Line Conducted Testing

Internal Frequencies:

38.4 MHz
Switching power supply frequency: 650 kHz

Transmit / Receive Frequencies Used For Test Purpose:

Low channel: 2412 MHz, Middle channel: 2437 MHz, High channel: 2462 MHz
20MHz channel bandwidth

Type of Modulation(s) / Antenna Type:

802.11b/g/n Modulations /

Internal Vertical Slot Antenna (1.2 dBi = highest antenna gain)
Internal Horizontal Monopole Antenna (.5 dBi = highest antenna gain)
External Planar F (“PIFA”) Antenna Model W10445535 (4.2 dBi = highest antenna gain)
External F Type Antenna Model W10503567 with 41 inch cable (1.6 dBi = highest antenna gain)
(External F Type Antenna has Model W10806955 with 16.5 inch cable. The 41 inch cable is worst case.)

Description of Circuit Board(s) / Part Number:

Basic PC Board (with onboard antennas)	W10856613
Extended PC Board (for external antenna)	W10856614



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5.0 Test Equipment

A list of the equipment used can be found in the table below. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

Radiated 30 – 1000 MHz (Site 3)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	6-25-15	6-25-16
Low Pass Filter	Mini-Circuits	VLFX-1125	MUU9260	30 MHz – 1 GHz	7-1-15	7-1-16
Preamplifier	Rohde & Schwarz	TS-PR10	032001/005	9 kHz – 1 GHz	12-3-15	12-3-16
Antenna	EMCO	3104C	9701-4785	20 MHz – 200 MHz	2-16-16	2-16-17
Antenna	EMCO	3146	9702-4895	200 MHz – 1 GHz	2-4-16	2-4-17
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A

AC Line Conducted (Screen Room)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Narda PMM	9010F	020WW401 02	10Hz-50MHz	6-25-15	6-25-16
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	5-21-15	5-21-16
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	12-3-15	12-3-16
Limiter	Electro-Metrics	EM-7600	705	9 kHz – 30 MHz	12-3-15	12-3-16
Test Software	Narda PMM	PMM Emission Suite	Rel.2.17	N/A	N/A	N/A



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5.0 Test Equipment - continued

Radiated 1-18 GHz (Site G1)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	6-25-15	6-25-16
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	1-20-16	1-20-17
Horn Antenna	EMCO	3115	9502-4451	1-18GHz	6-1-15	6-1-17
Filter- High-Pass	Q-Microwave	100462	2	4.2GHz-18GHz	10-13-15	10-13-16
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A

Additional Radiated 18-26 GHz (Site G1)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18GHz-26GHz	6-29-15	6-29-16
Horn Antenna	EMCO	3116	2549	18 – 40GHz	9-2-14	9-2-16
Filter- High Pass	K&L	50140-11SH10-18000/T40000-K-K	438727	18-40GHz	1-27-16	1-27-17
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A

RF Conducted / Other

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
20 dB attenuator	Aeroflex/weins chel	75A-20-12	1071	DC – 40 GHz	7-1-15	7-1-16
20 dB attenuator	Anritsu	42N50-20	000451	DC – 18 GHz	5-29-15	5-29-16
Power Meter	Anritsu	ML2487A	6K000020 69	N/A	6-25-15	6-25-16
Wideband Power Sensor	Anritsu	MA2490A	031563	50 MHz – 8 GHz	6-25-15	6-25-16



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6.0 Test Arrangements

Radiated Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.10-2013, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up. See Appendix C for measurement uncertainty.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

RF Conducted Emissions Measurement Arrangement:

All RF conducted emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.10-2013, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up. See Appendix C for measurement uncertainty.

7.0 Test Conditions

Normal Test Conditions:

Temperature and Humidity:

68°F at 32% RH unless otherwise noted on test data

Supply Voltage:

7.2 VDC used for radiated testing
12 VDC wall adapter used for RF conducted testing
120V / 60Hz for AC Line Conducted Testing



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8.0 Modifications Made To EUT For Compliance

The output power settings were set during testing. The output power setting is not related to the output power level in dBm.

This is intended to mean that an output power setting of 18 is unitless and does not imply that, at a setting of 18, the output power will be exactly 18 dBm. The power setting is, however, related to the output power to the extent that a lower setting will result in a lower output power level. The output power settings were reduced to facilitate bandedge compliance. These lower power settings did lower the actual output power level. However, the power level measured in dBm does not match exactly with the number of the power setting. Again, the power setting number is a unitless number and not a dBm power level declaration.

9.0 Additional Descriptions

The EUT was powered with an AC to DC power adapter for RF conducted emissions, and with a rechargeable battery for radiated emissions.

The EUT was tested stand-alone for Single Modular Approval.

The EUT was programmed for continuous transmission on Low, Mid, and High channels, using 802.11-b, g, and n modulation types with various data rates.

For radiated emissions, the EUT was rotated through 3 orthogonal axis to find worst-case.

AC line conducted tested with HON-KWANG, model HK-CP12-A12 12V DC power supply.



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10.0 Final Settings

802.11b – with on-board antenna 1

Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	18	18	18	18	18	18	18	18	18	18	17

802.11b – with on-board antenna 2

Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	18	18	18	18	18	18	18	18	18	18	18

802.11b – with PIFA antenna

Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	18	18	18	18	18	18	18	18	18	18	17

802.11b – with F antenna

Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	18	18	18	18	18	18	18	18	18	18	18

802.11g – with on-board antenna 1

Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	13	17	17	17	17	17	17	16	14	13	10

802.11g – with on-board antenna 2

Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	12	16	16	17	17	17	17	17	15	14	11

802.11g – with PIFA antenna

Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	11	15	16	17	17	17	17	16	14	14	10

802.11g – with F antenna

Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	12	15	17	17	17	17	17	17	17	17	13

802.11n – with on-board antenna 1

Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	11	14	14	14	14	14	14	14	14	13	9



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10.0 Final Settings - continued

802.11n – with on-board antenna 2											
Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	10	14	14	14	14	14	14	14	14	13	9

802.11n – with PIFA antenna											
Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	10	14	14	14	14	14	14	14	14	13	9

802.11n – with F antenna											
Channel	1	2	3	4	5	6	7	8	9	10	11
Power Setting	10	14	14	14	14	14	14	14	14	14	11

11.0 Results

Measurements were performed in accordance with CFR 47 Part 15 Subpart C Section 15.247 and ANSI C63.10-2013. Graphical and tabular data can be found in Appendix B at the end of this report.

12.0 Conclusion

The Amber WiFi Module model WICHAM01, as provided from Whirlpool, tested from March 11th to April 4th, 2016 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.247.



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Appendix A – Test Photos

Photo Information and Test Setup:

Item: Whirlpool Corporation Model WICHAM01
Tested with battery pack (not part of the EUT)

Radiated Emissions Below 1 GHz – with Onboard Antennas

Position 1



Position 2



Position 3





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Appendix A

Radiated Emissions Below 1 GHz – with PIFA Antenna

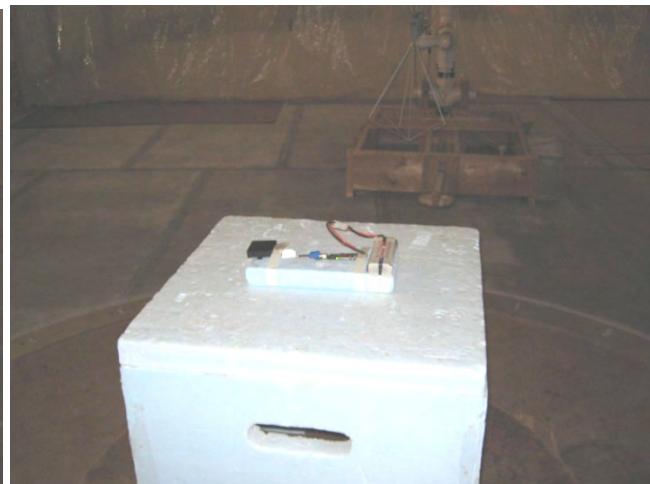
Position 1



Position 2



Position 3





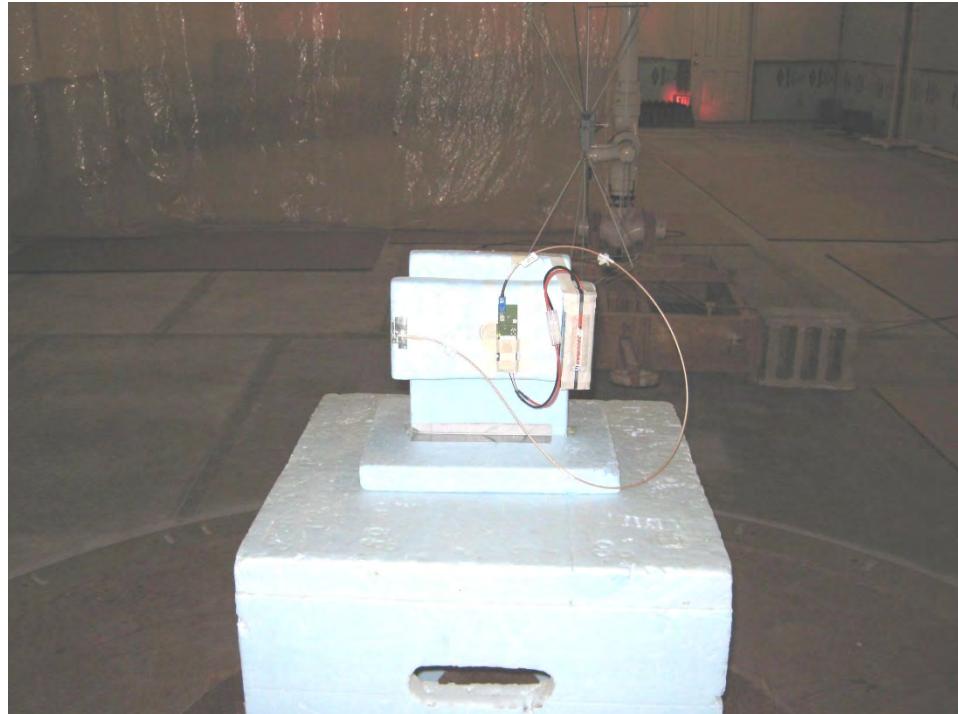
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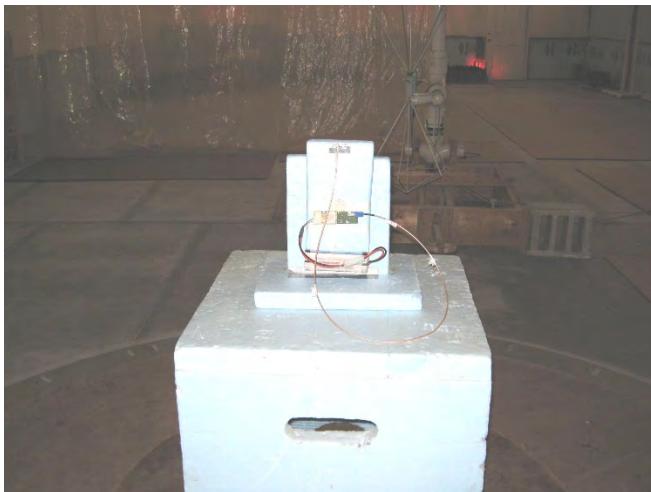
Appendix A

Radiated Emissions Below 1 GHz – with F Antenna and 41 inch cable

Position 1



Position 2



Position 3





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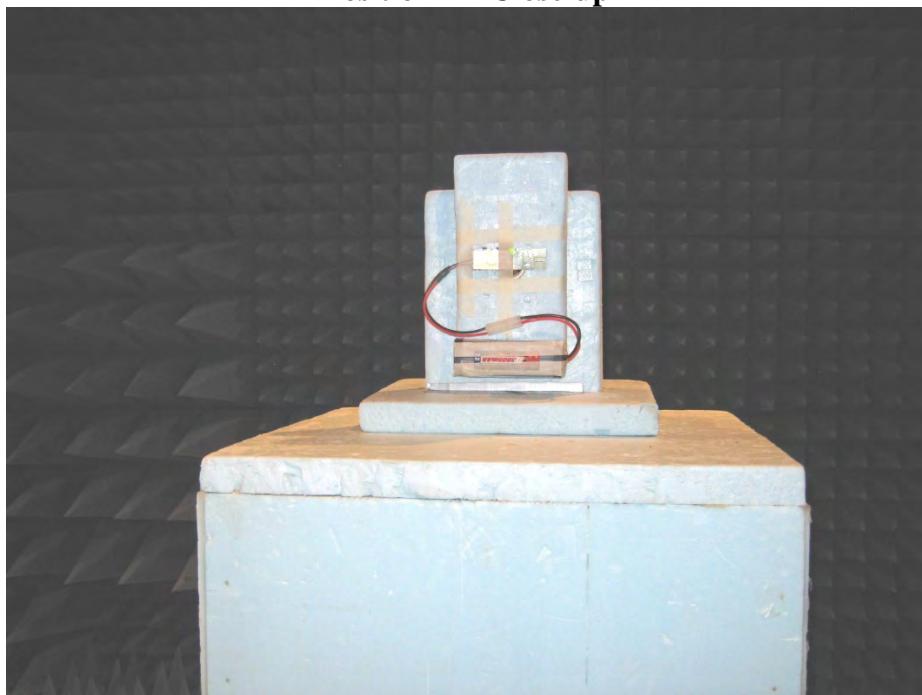
Appendix A

Radiated Emissions Above 1 GHz – with Onboard Antennas

Position 1



Position 1 – Close-up





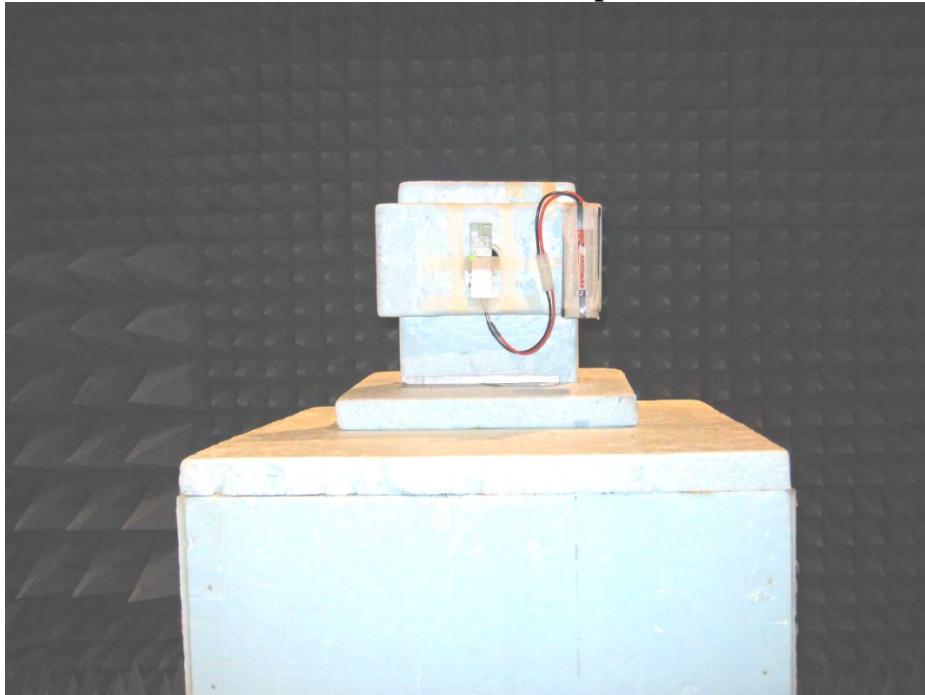
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Appendix A

Radiated Emissions Above 1 GHz – with Onboard Antennas

Position 2 – Close-up



Position 3 – Close-up





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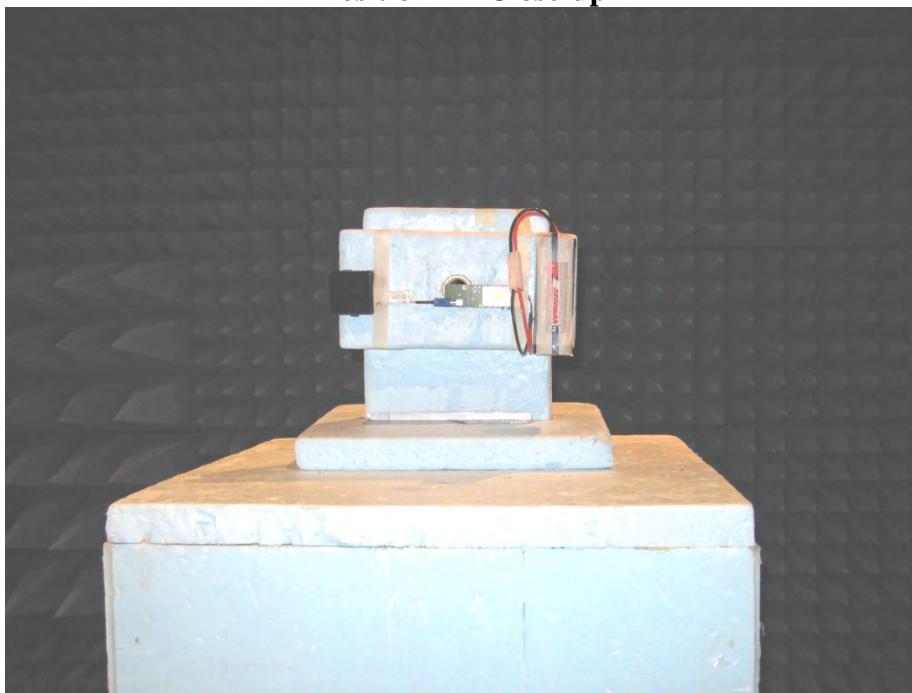
Appendix A

Radiated Emissions Above 1 GHz – with PIFA Antenna

Set-up (Position 2)



Position 1 – Close-up





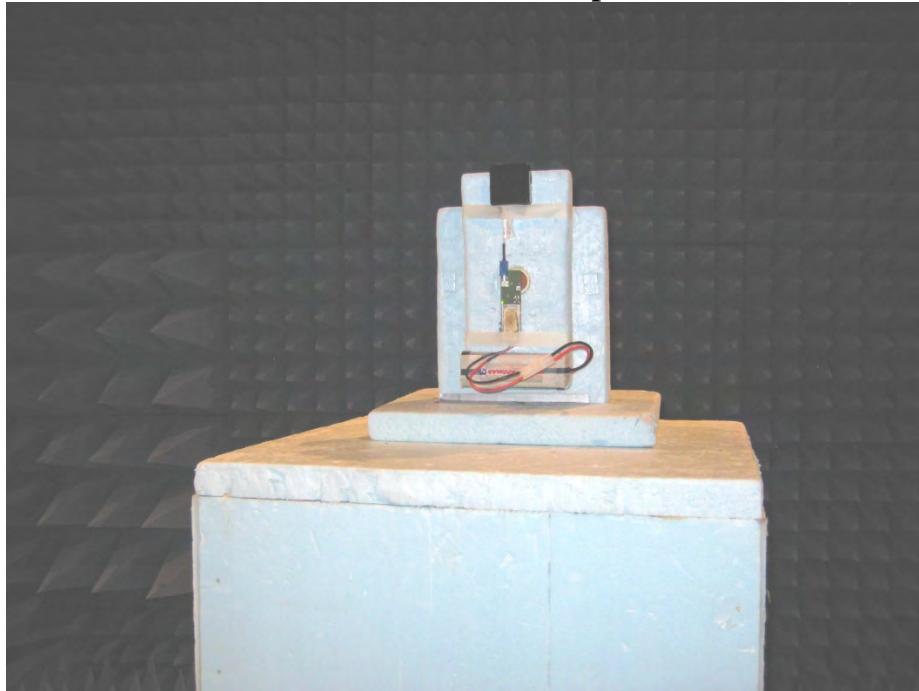
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Appendix A

Radiated Emissions Above 1 GHz – with PIFA Antenna

Position 2 – Close-up



Position 3 – Close-up





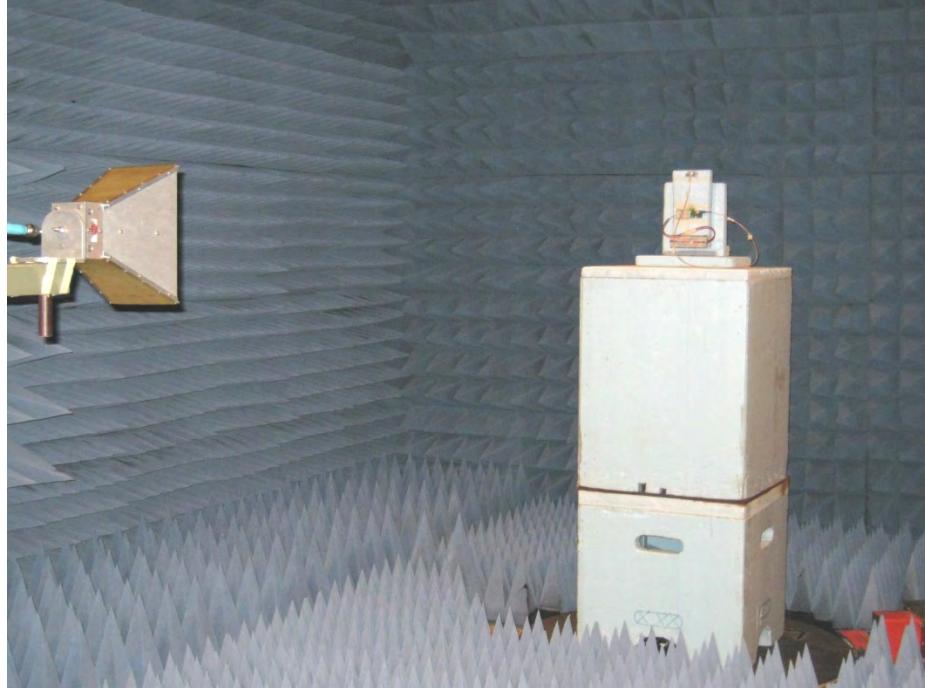
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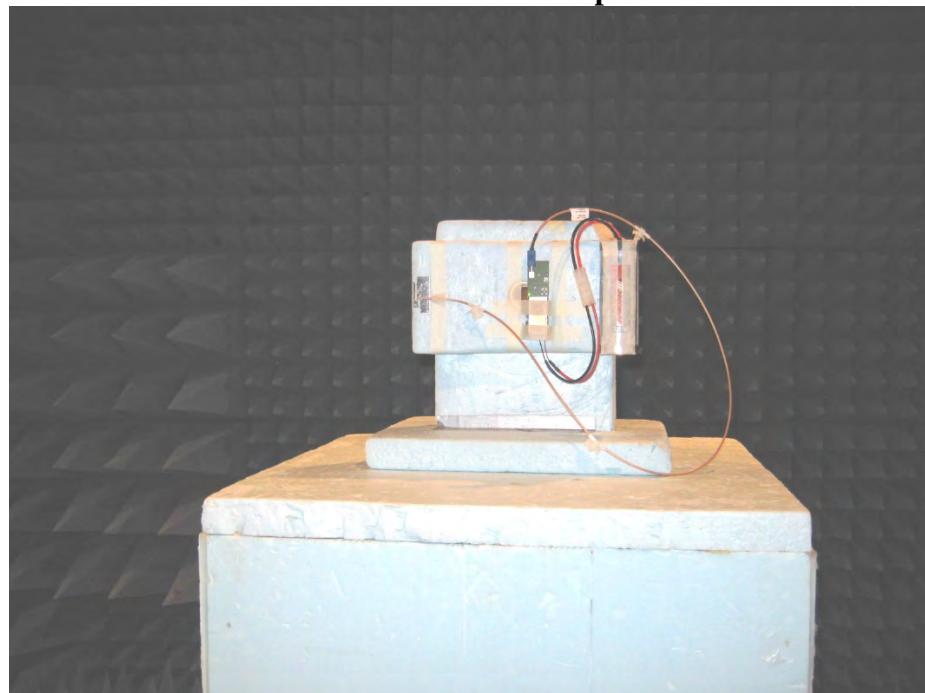
Appendix A

Radiated Emissions Above 1 GHz – with F Antenna

Set-up (Position 2)



Position 1 – Close-up





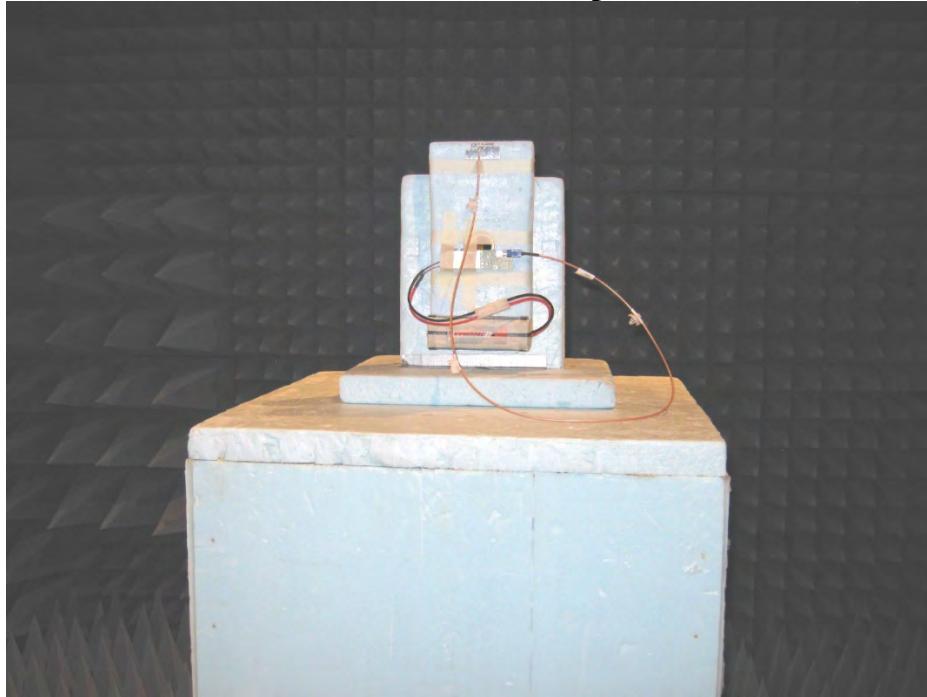
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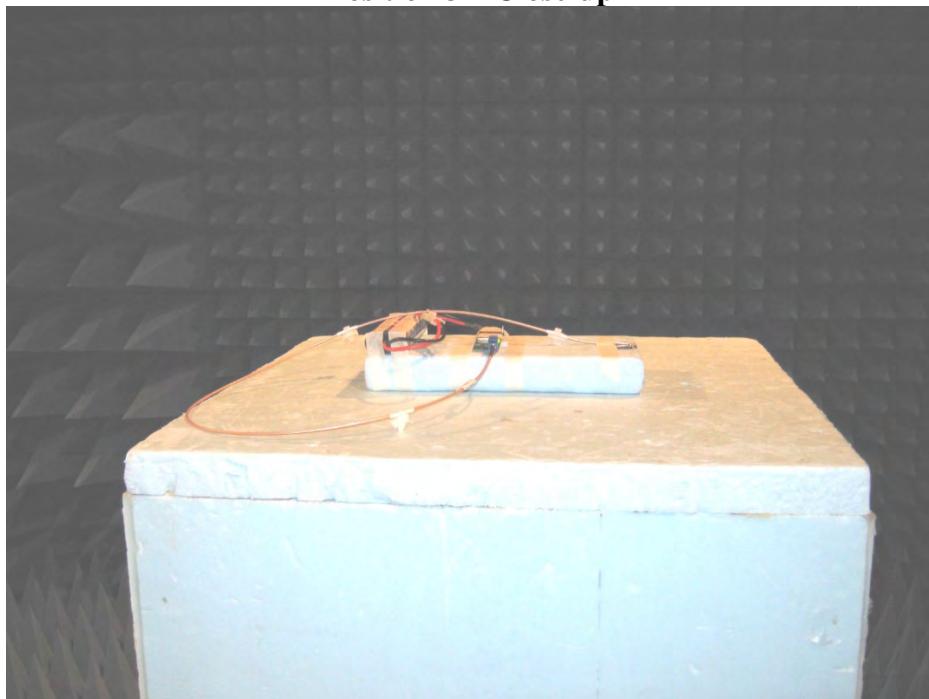
Appendix A

Radiated Emissions Above 1 GHz – with F Antenna

Position 2 – Close-up



Position 3 – Close-up



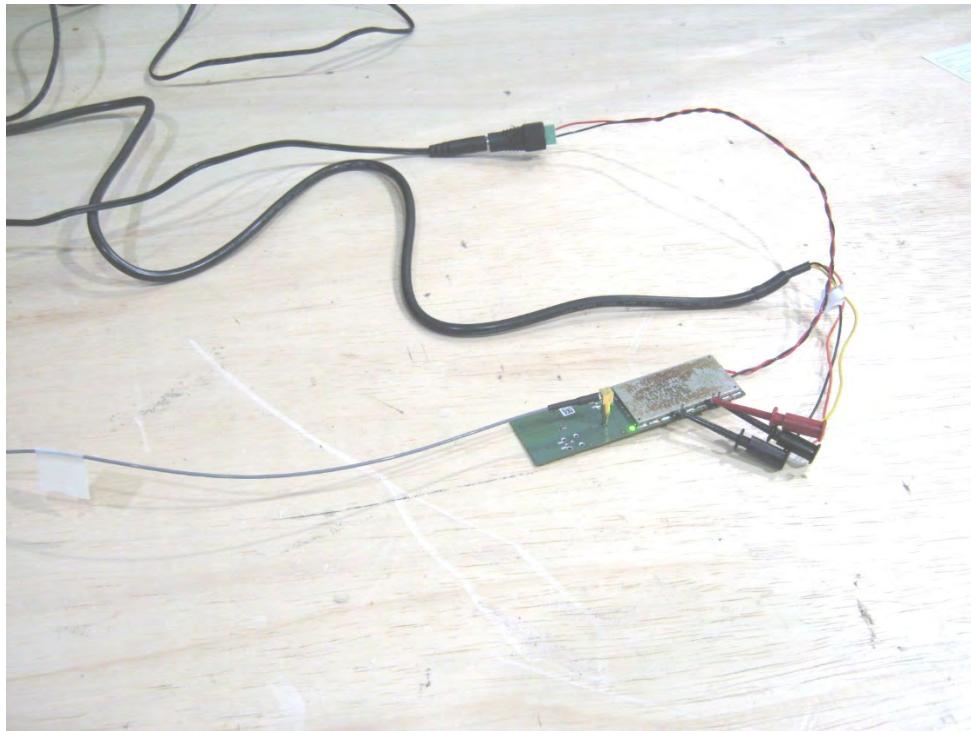


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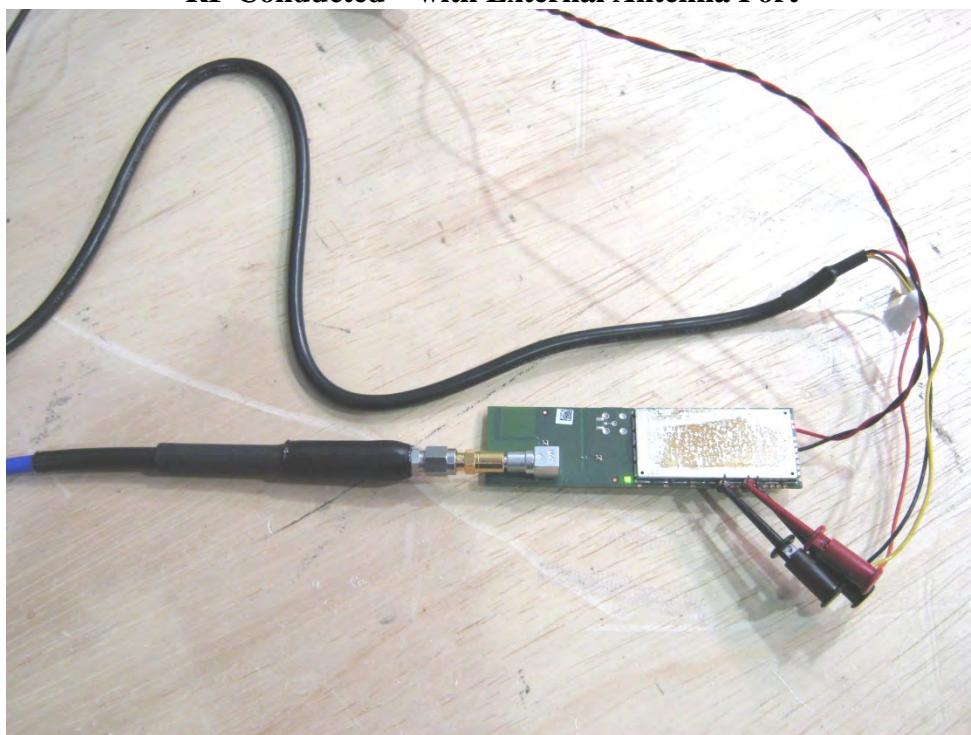
Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Appendix A

RF Conducted – with Onboard Antennas



RF Conducted – with External Antenna Port



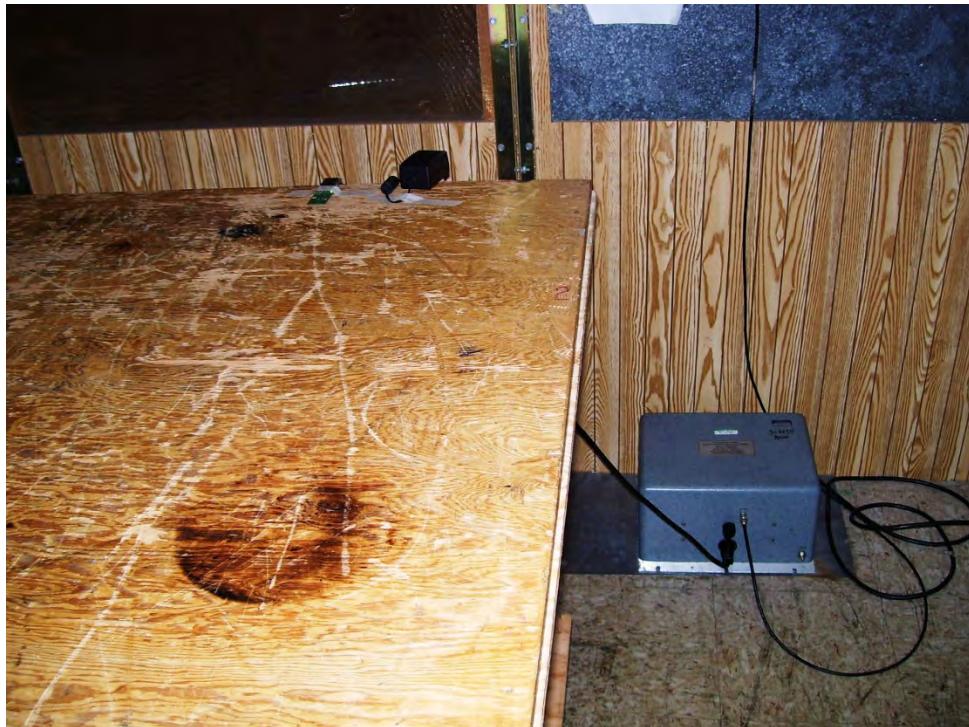


166 South Carter, Genoa City, WI 53128

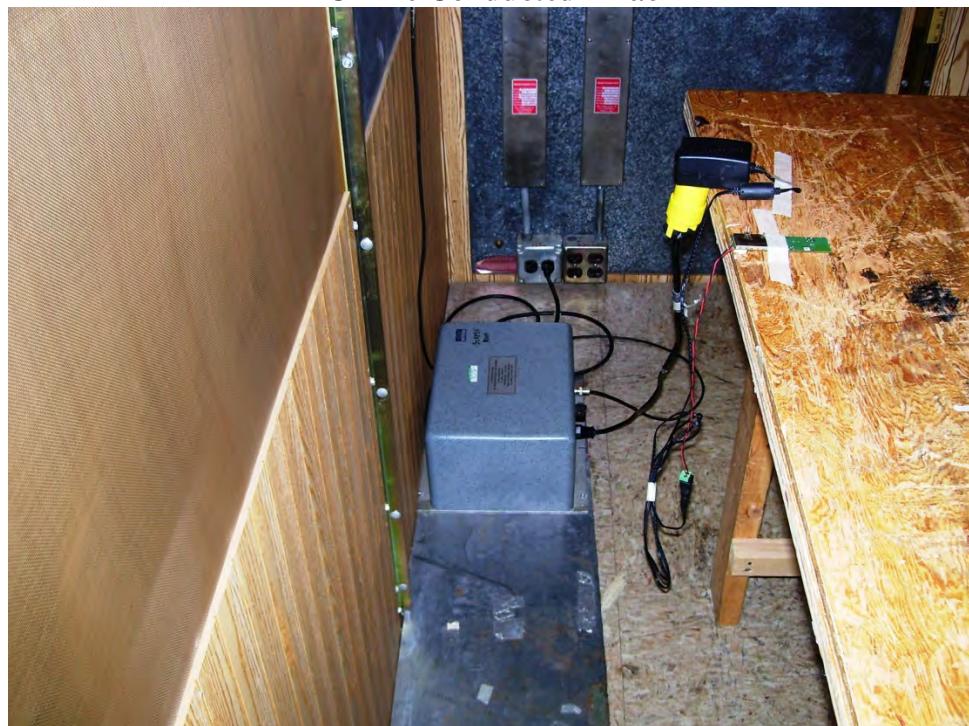
Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Appendix A

AC Line Conducted – Front



AC Line Conducted – Back





166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Appendix B – Measurement Data

B1.0 DTS Bandwidth

Rule Part:

Section 15.247(a)(2)

Test Procedure:

ANSI C63.10-2013
11.8 DTS Bandwidth
11.8.1 Option 1

Limit:

6 dB bandwidth shall be at least 500 kHz

Results:

Compliant
Minimum 6 dB bandwidth: **10.02 MHz**

Notes:

Initial bandwidth measurements indicate the narrowest (worst-case) channel bandwidth occurred with the fastest data rate using 802.11-b modulation (11 Mbps). Therefore, measurements were performed in this mode. Testing was performed using the manufacturer's test software with output power setting 18. The EUT was tested at the low, middle, and high channels of operation.



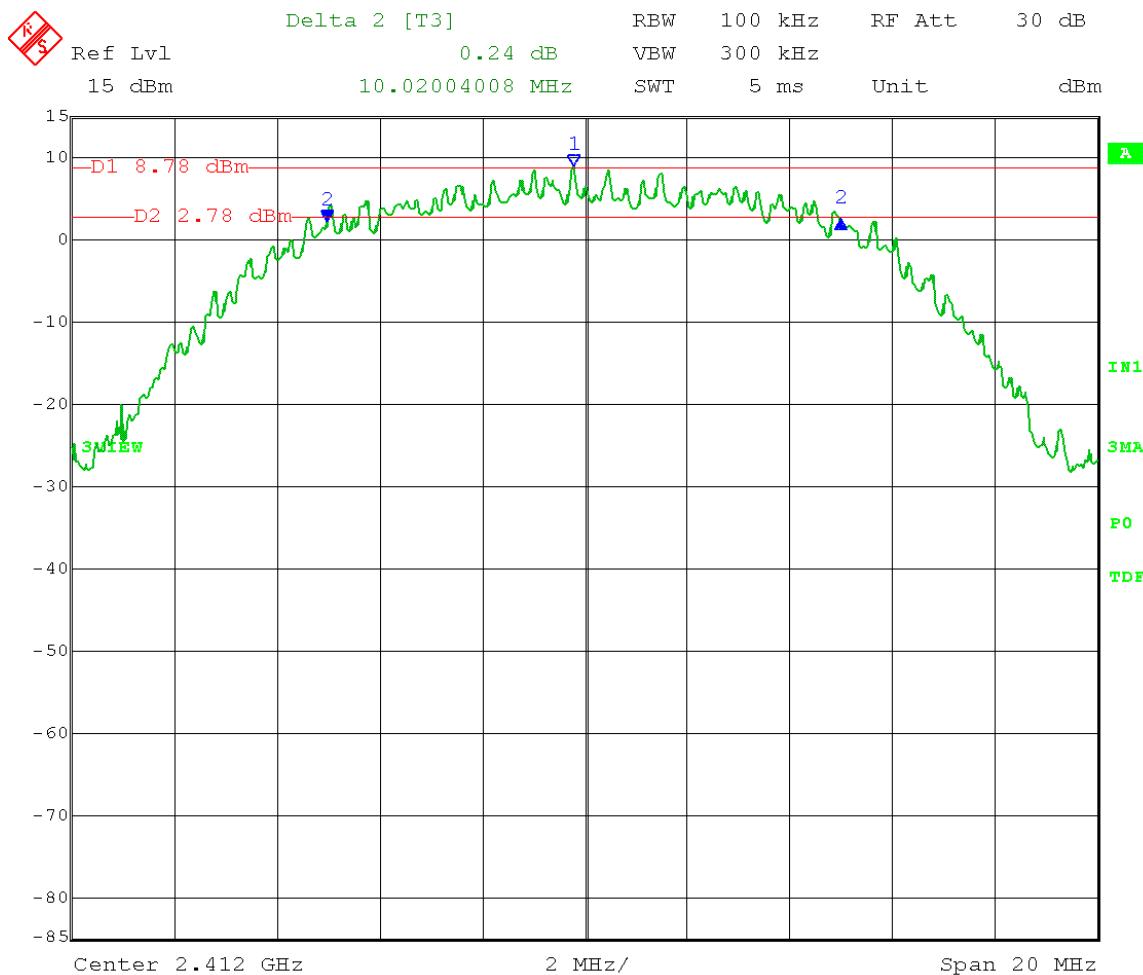
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: DTS Bandwidth
6 dB Bandwidth
Operator: Craig B

Antenna: On-board #2
Channel: Low, 2412 MHz
Modulation: 802.11-b, 11 Mbps
Power setting: 18

Comment: DTS Bandwidth = 10.02 MHz



Date: 14.MAR.2016 12:50:03



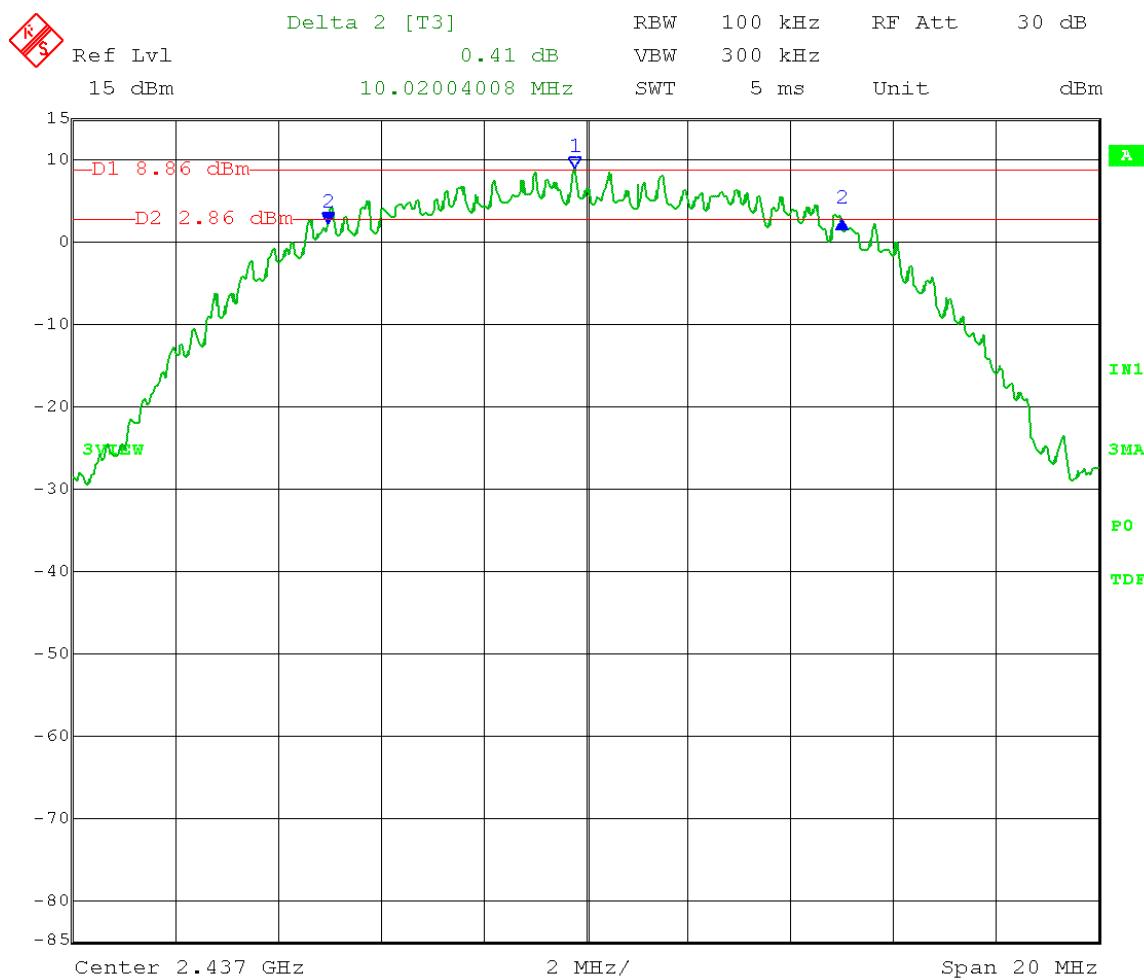
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: DTS Bandwidth
6 dB Bandwidth
Operator: Craig B

Antenna: On-board #2
Channel: Mid, 2437 MHz
Modulation: 802.11-b, 11 Mbps
Power setting: 18

Comment: DTS Bandwidth = 10.02 MHz



Date: 14.MAR.2016 12:34:28



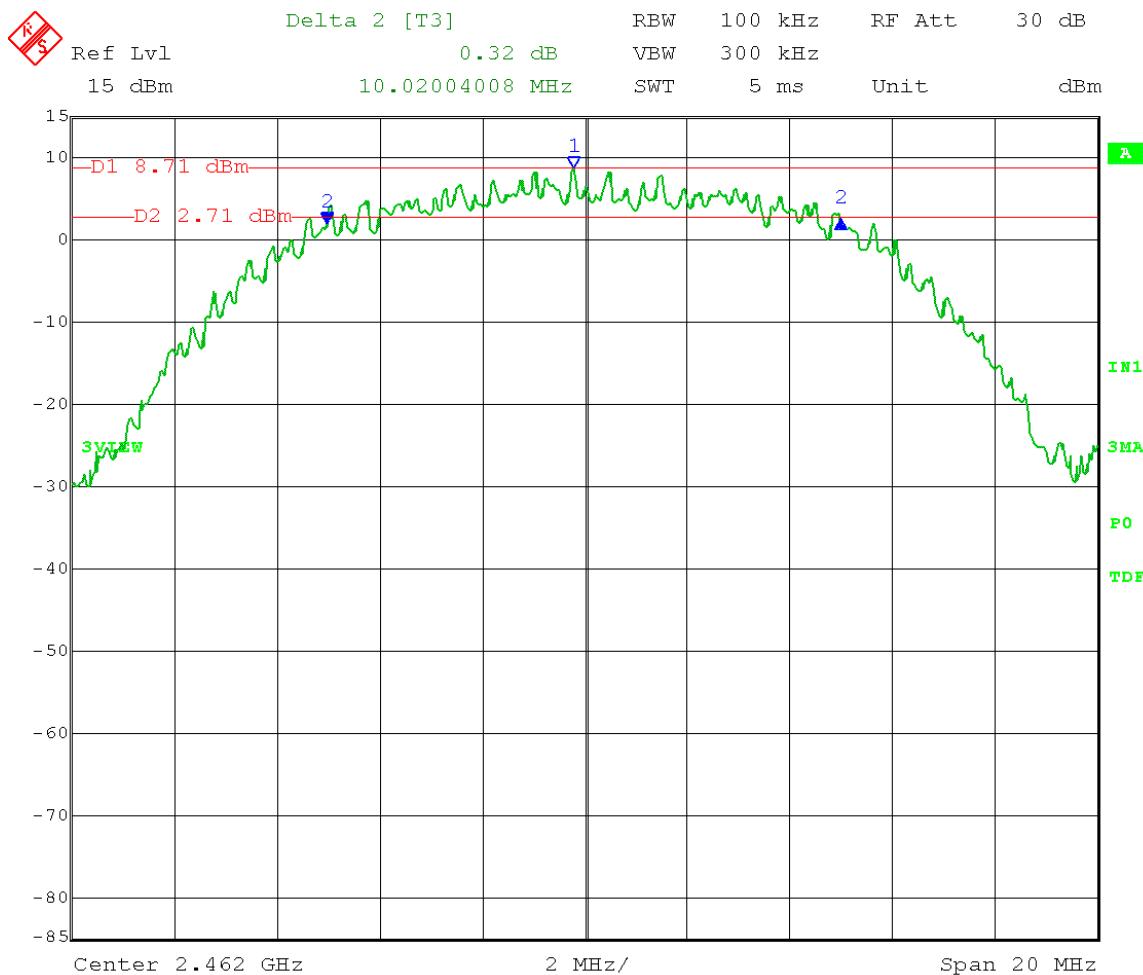
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: DTS Bandwidth
6 dB Bandwidth
Operator: Craig B

Antenna: On-board #2
Channel: High, 2462 MHz
Modulation: 802.11-b, 11 Mbps
Power setting: 18

Comment: DTS Bandwidth = 10.02 MHz



Date: 14.MAR.2016 12:52:25



166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Appendix B

B2.0 Fundamental Emission Output Power

Rule Part:

15.247(b)(3)

Test Procedure:

ANSI C63.10-2013

11.9.1 Maximum Peak Conducted Output Power

11.9.1.3 PKPM1 Peak power meter method

Limit:

The maximum peak conducted output power limit is 1 watt (30 dBm).

Results:

Compliant

Maximum peak conducted output power: **289 mW (24.61 dBm)**

Notes:

The EUT has 2 on-board antennas and one external antenna port of which only one can operate at a time. Initial output power measurements indicate the highest power levels occurred from on-board antenna #2. Measurements were performed on this antenna to represent worst-case power levels. Testing was performed using the manufacturer's test software with output power setting 18 for 802.11-b mode, 17 for 802.11-g, and 14 for 802.11-n mode. The date rate was set to worst-case (highest peak power) for each modulation type. The EUT was tested at the low, middle, and high channels of operation. The power meter measurements were corrected to account for the cable loss and external attenuator.

It was later determined that the power settings of the low and high channels needed to be reduced to meet the restricted band-edge requirements. See pages 13 & 14 for the final power settings.



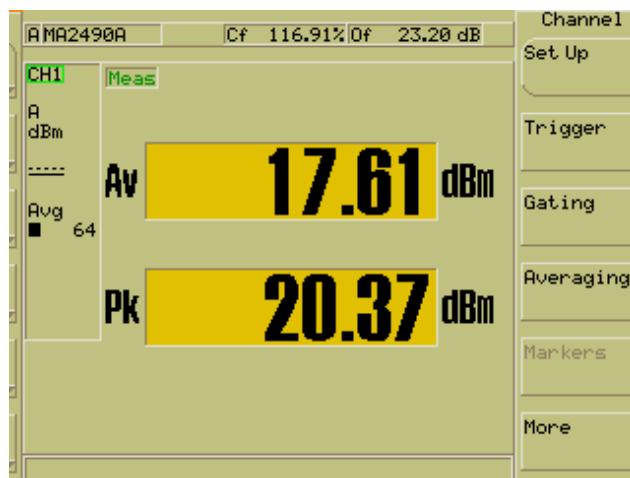
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Fundamental emission output power
Maximum peak conducted output power
Operator: Craig B

Antenna: On-board #2
Channel: Low, 2412 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Comment: Maximum peak conducted output power = 20.37 dBm





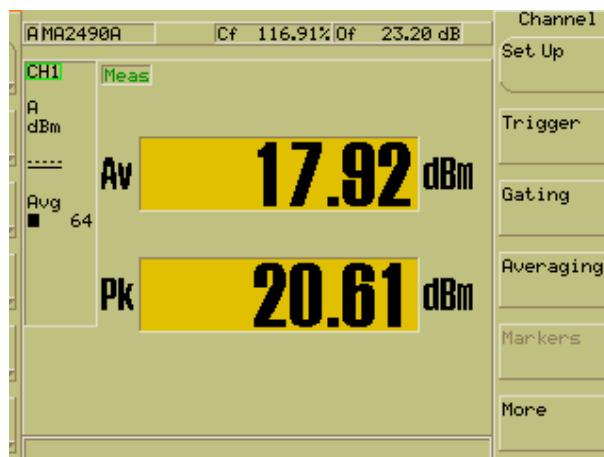
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Fundamental emission output power
Maximum peak conducted output power
Operator: Craig B

Antenna: On-board #2
Channel: Mid, 2437 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Comment: Maximum peak conducted output power = 20.61 dBm





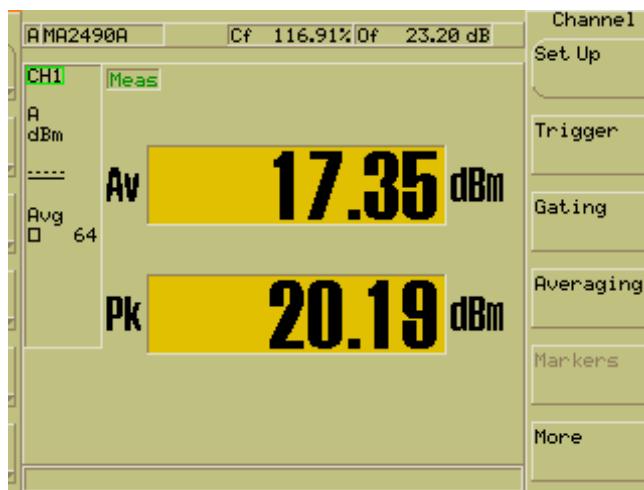
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Fundamental emission output power
Maximum peak conducted output power
Operator: Craig B

Antenna: On-board #2
Channel: High, 2462 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Comment: Maximum peak conducted output power = 20.19 dBm





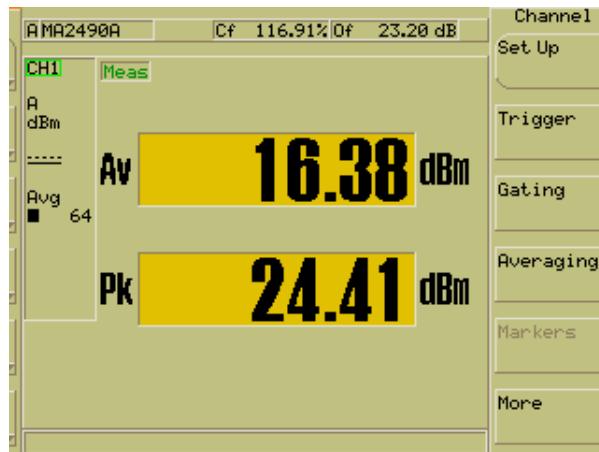
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Fundamental emission output power
Maximum peak conducted output power
Operator: Craig B

Antenna: On-board #2
Channel: Low, 2412 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Comment: Maximum peak conducted output power = 24.41 dBm





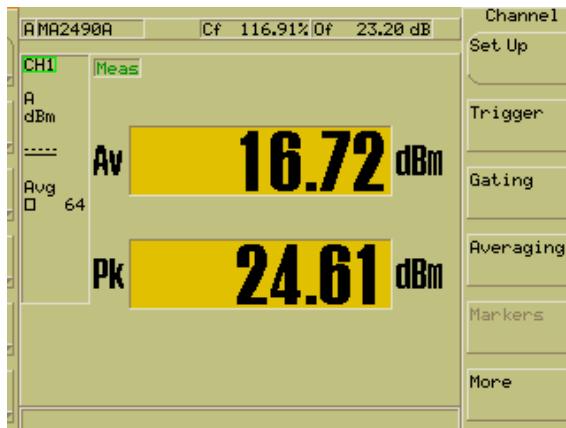
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Fundamental emission output power
Maximum peak conducted output power
Operator: Craig B

Antenna: On-board #2
Channel: Mid, 2437 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Comment: Maximum peak conducted output power = 24.61 dBm





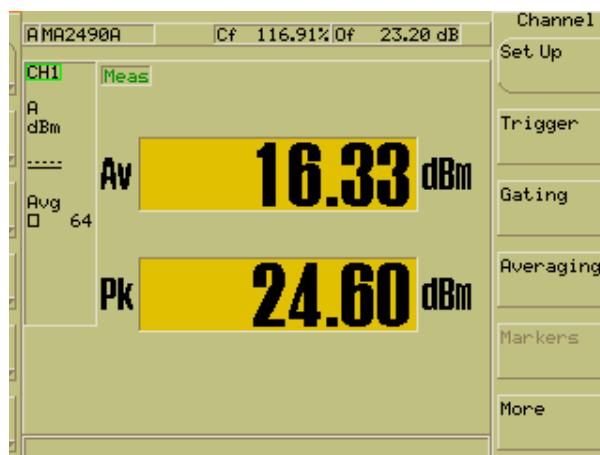
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Fundamental emission output power
Maximum peak conducted output power
Operator: Craig B

Antenna: On-board #2
Channel: High, 2462 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Comment: Maximum peak conducted output power = 24.60 dBm





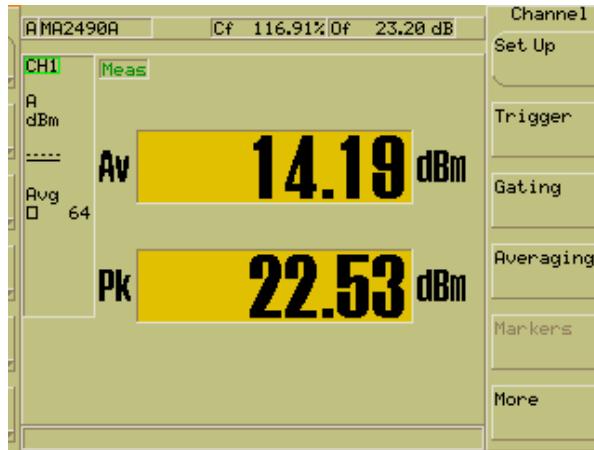
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Fundamental emission output power
Maximum peak conducted output power
Operator: Craig B

Antenna: On-board #2
Channel: Low, 2412 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Comment: Maximum peak conducted output power = 22.53 dBm





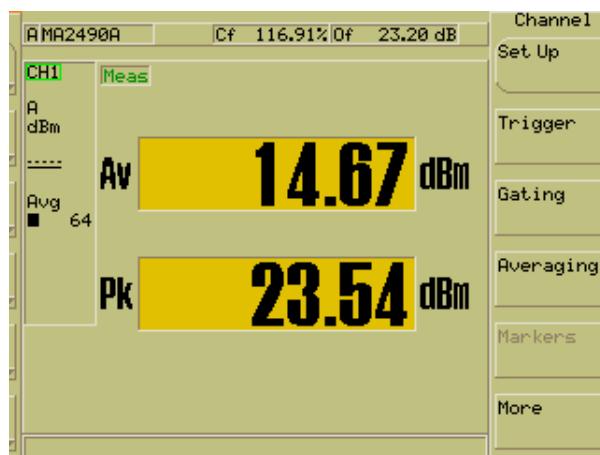
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Fundamental emission output power
Maximum peak conducted output power
Operator: Craig B

Antenna: On-board #2
Channel: Mid, 2437 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Comment: Maximum peak conducted output power = 23.54 dBm





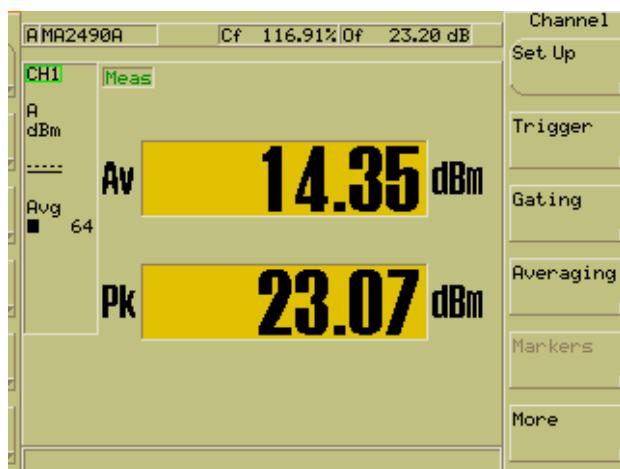
166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Fundamental emission output power
Maximum peak conducted output power
Operator: Craig B

Antenna: On-board #2
Channel: High, 2462 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Comment: Maximum peak conducted output power = 23.07 dBm





166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Appendix B

B3.0 Maximum Power Spectral Density (PSD)

Rule Part:

15.247(e)

Test Procedure:

ANSI C63.10-2013

11.10 Maximum Power Spectral Density Level in the Fundamental Emission
11.10.2 Method PKPSD (peak PSD)

Limit:

+8 dBm in any 3 kHz band segment within the fundamental during any time interval of continuous transmission.

Results:

Compliant

Maximum conducted power spectral density (PSD): **-5.50 dBm**

Notes:

The EUT has 2 on-board antennas and one external antenna port of which only one can operate at a time. Initial pre-scan measurements indicate the highest power spectral density occurred from on-board antenna #2 using 802.11-b modulation and 11 Mbps data rate. Therefore, measurements were performed in this mode from on-board antenna #2 to represent worst-case power spectral density levels. The EUT was tested at the low, middle, and high channels of operation with power setting 18. The spectrum analyzer measurements were corrected to account for the cable loss and external attenuator.



166 South Carter, Genoa City, WI 53128

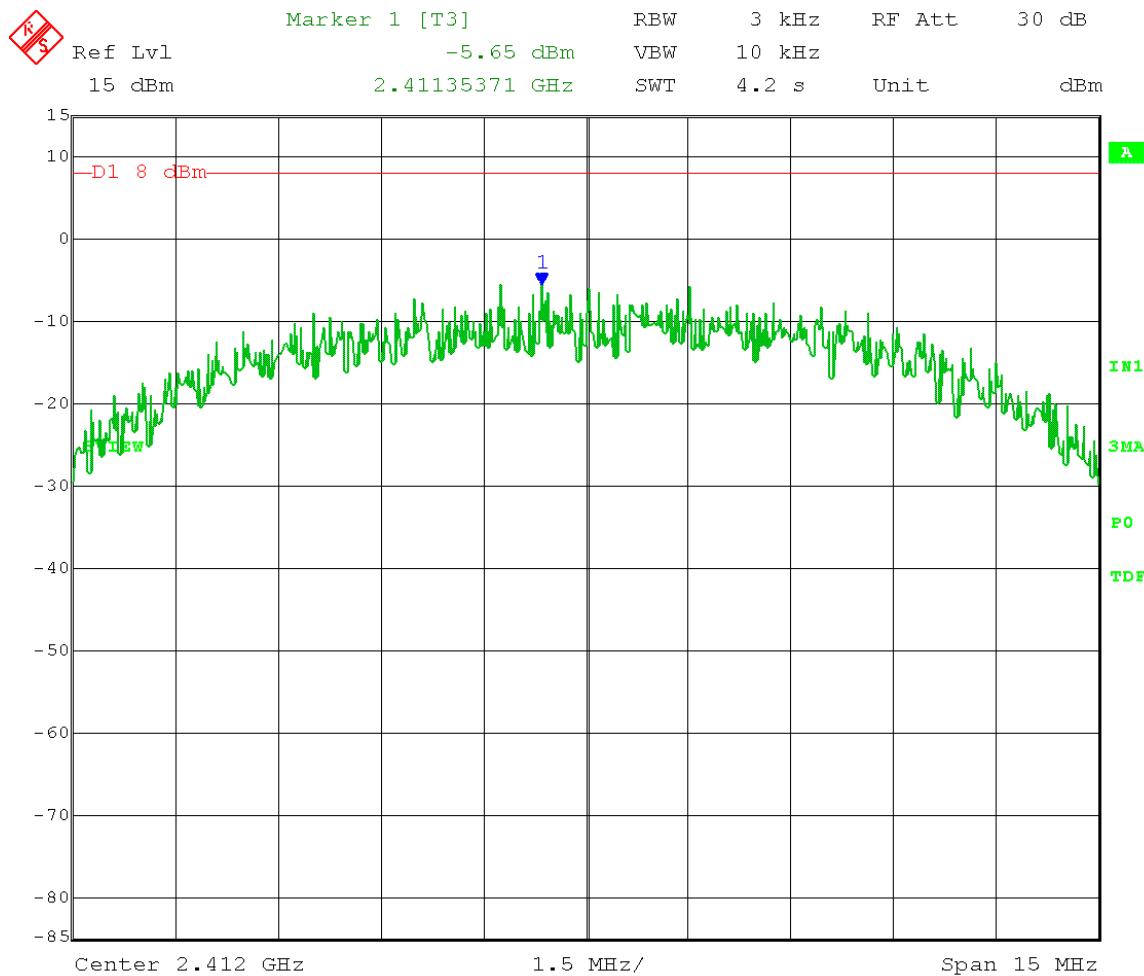
Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Maximum power spectral density level in the fundamental emission
Peak Power Spectral Density
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-b, 11 Mbps
Power setting: 18

Limit: 8 dBm / 3 kHz

Peak PSD = -5.65 dBm / 3 kHz



Date: 14.MAR.2016 13:07:17



166 South Carter, Genoa City, WI 53128

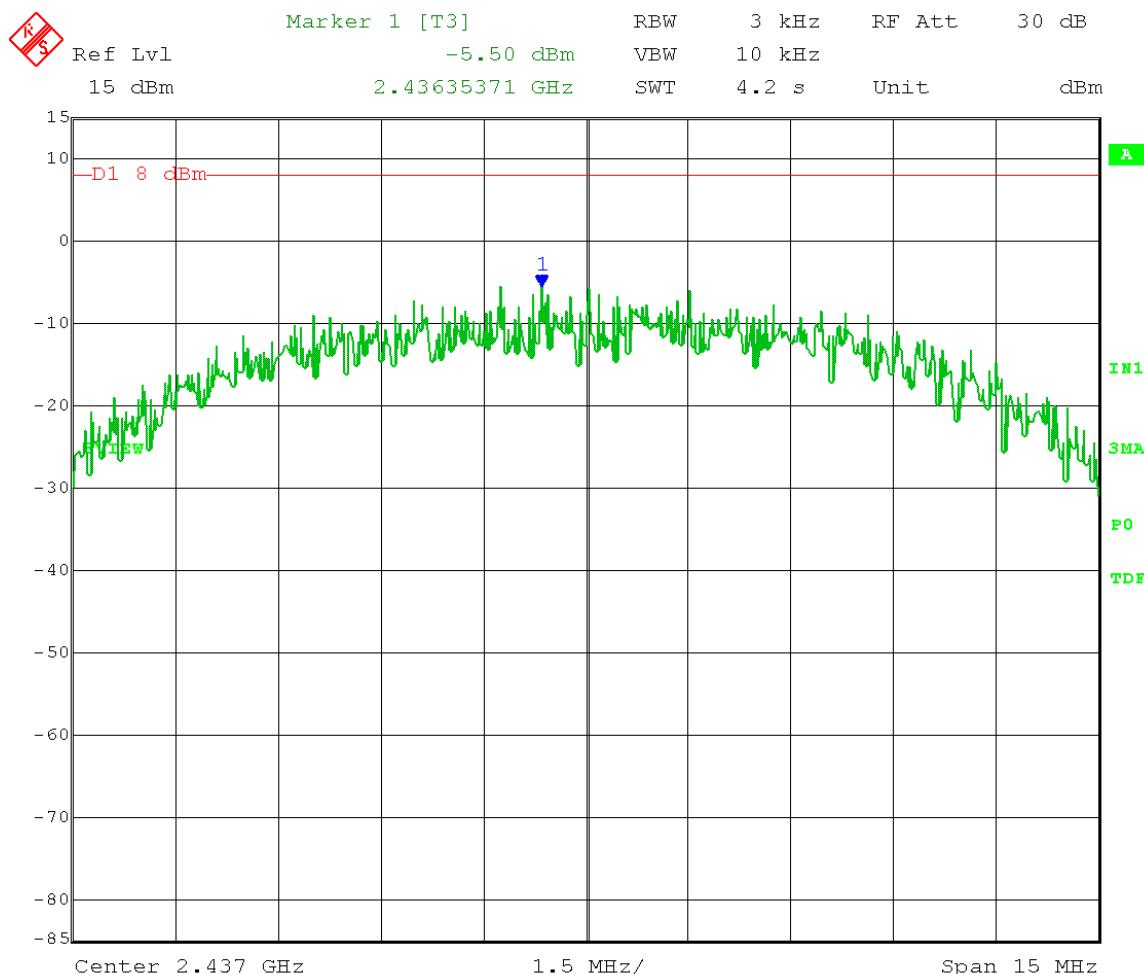
Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Maximum power spectral density level in the fundamental emission
Peak Power Spectral Density
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-b, 11 Mbps
Power setting: 18

Limit: 8 dBm / 3 kHz

Peak PSD = -5.50 dBm / 3 kHz



Date: 14.MAR.2016 12:58:02



166 South Carter, Genoa City, WI 53128

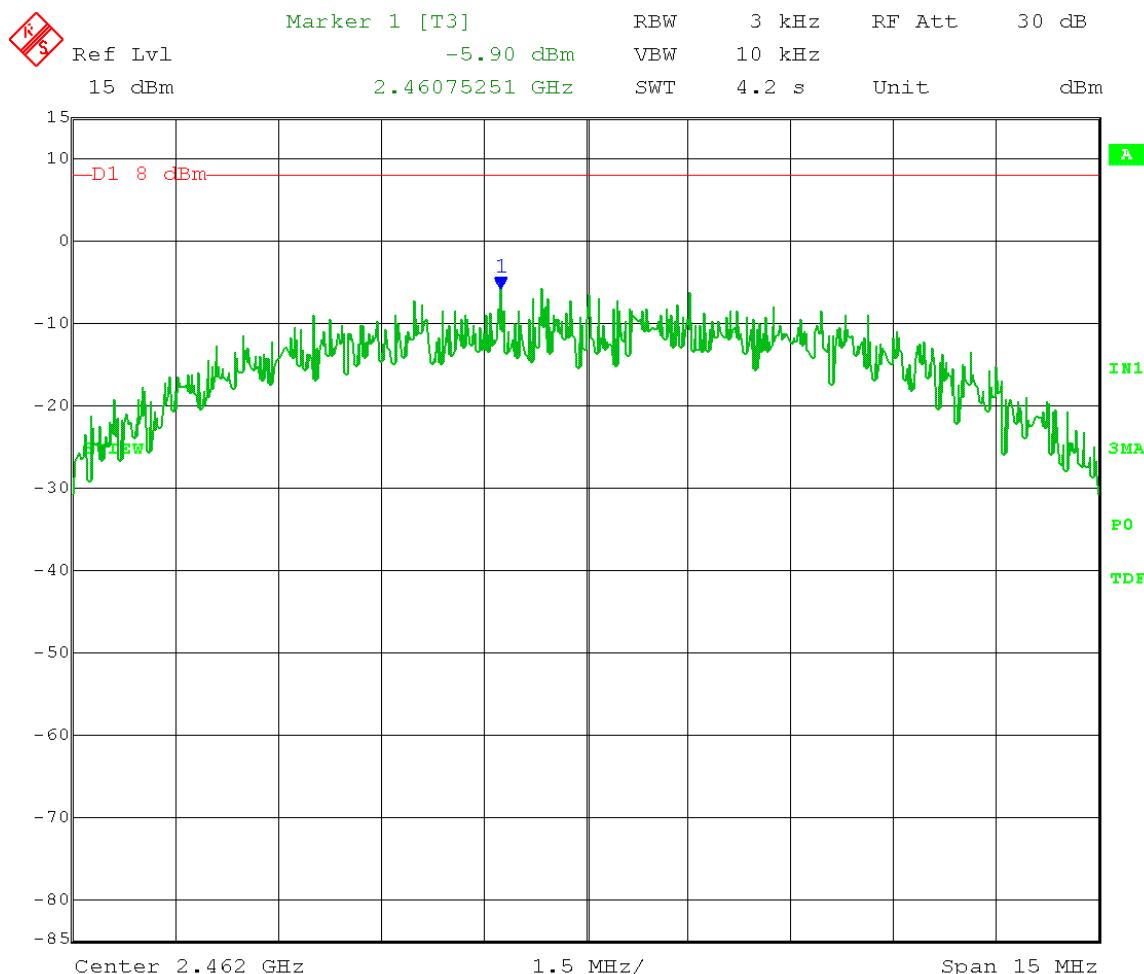
Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Maximum power spectral density level in the fundamental emission
Peak Power Spectral Density
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-b, 11 Mbps
Power setting: 18

Limit: 8 dBm / 3 kHz

Peak PSD = -6.78 dBm / 3 kHz



Date: 14.MAR.2016 13:09:02



166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Appendix B

B4.0 Emissions in Non-Restricted Frequency Bands - RF Conducted

Rule Part:

15.247(d)

Test Procedure:

ANSI C63.10-2013

11.11 Emissions in non-restricted frequency bands

11.11.2 Reference Level Measurement

11.11.3 Unwanted Emissions Level Measurement

Limit:

The peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Results:

Compliant

Notes:

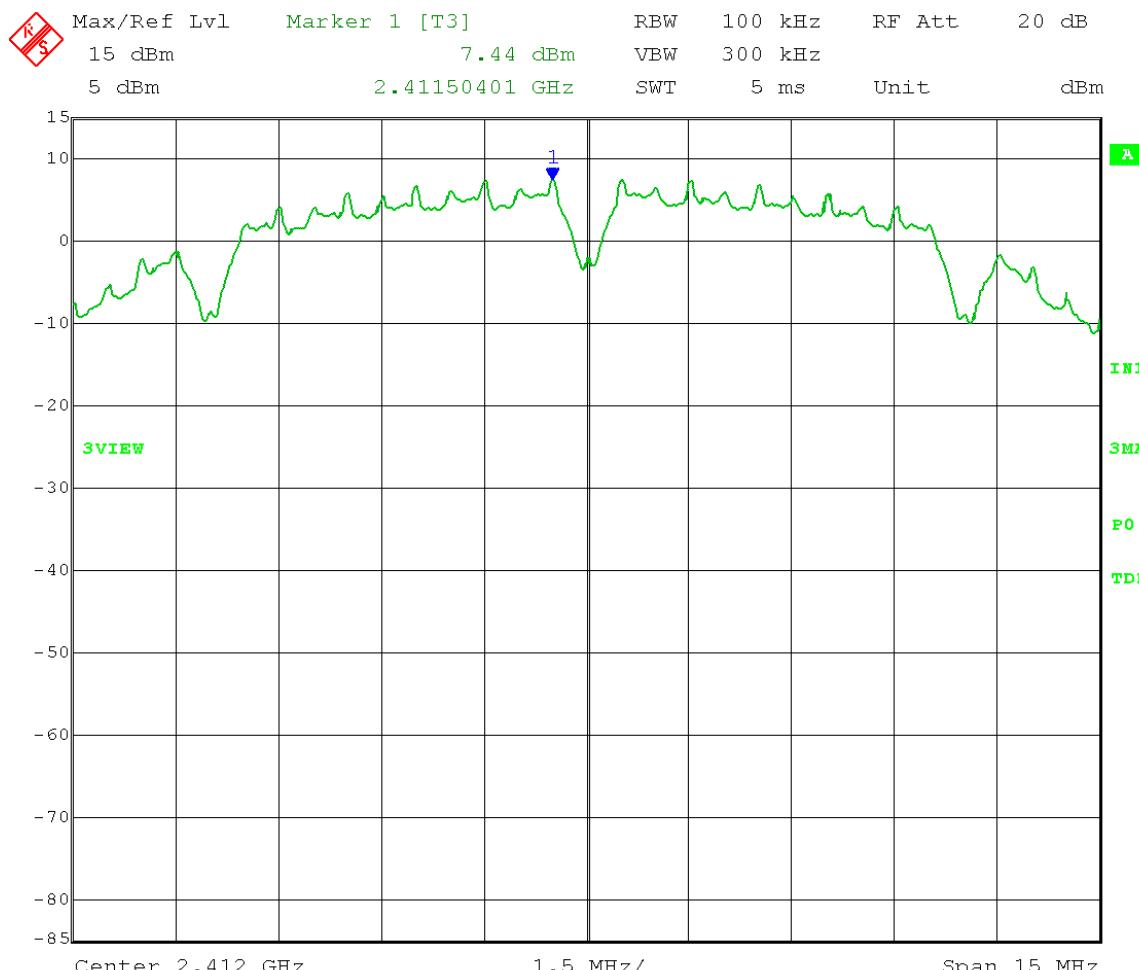
The EUT has 2 on-board antennas and one external antenna port of which only one can operate at a time. Initial output power measurements indicate the highest power levels occurred from on-board antenna #2. Measurements were performed on this antenna to represent worst-case emissions. Testing was performed using the manufacturer's test software with output power setting 18 for 802.11-b mode, 17 for 802.11-g, and 14 for 802.11-n mode. The date rate was set to worst-case (highest peak power) for each modulation type. The EUT was tested at the low, middle, and high channels of operation. The spectrum analyzer measurements were corrected to account for the cable loss and external attenuator.

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Reference Level measurement

$$\text{Limit} = 7.44 \text{ dBm} - 20 \text{ dB} = -12.56 \text{ dBm}$$



Date: 14.MAR.2016 13:16:00

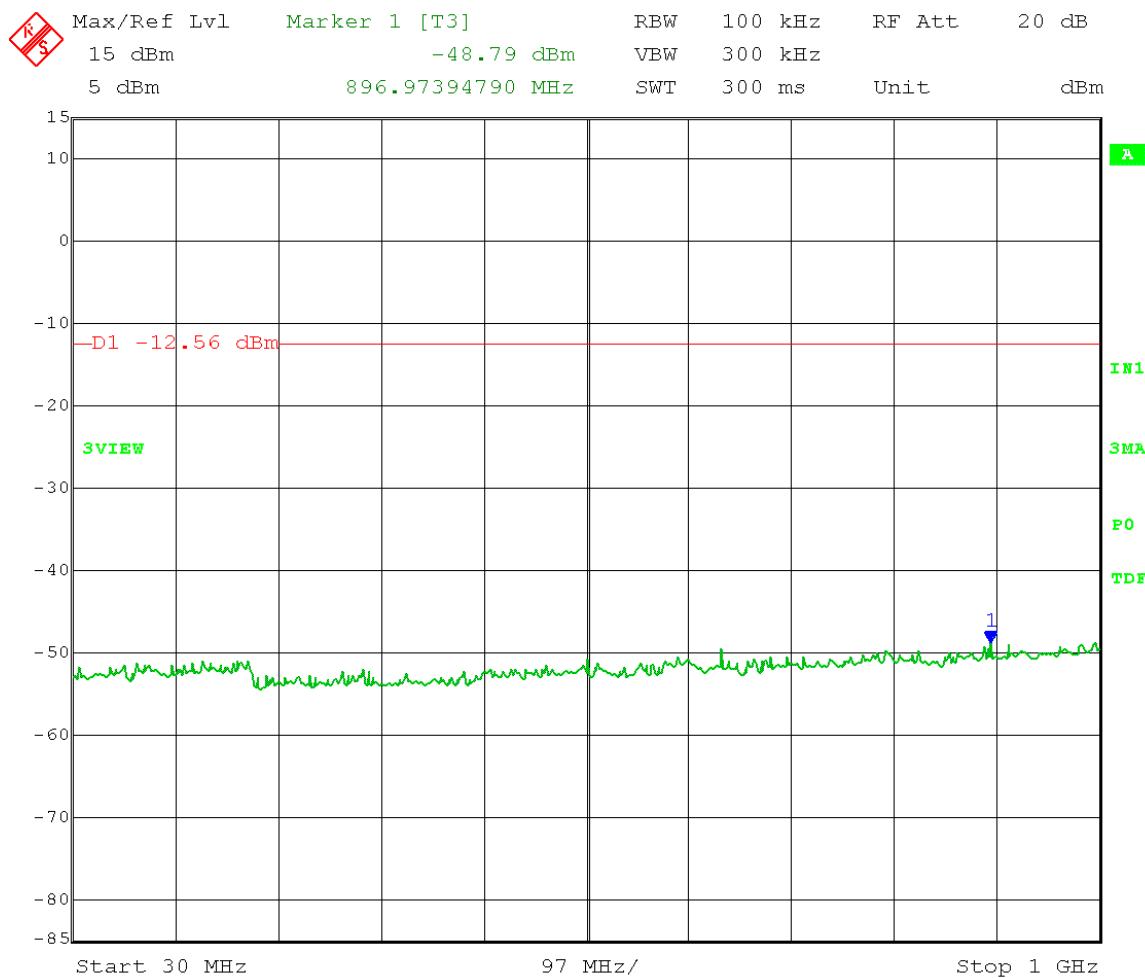
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.44 \text{ dBm} - 20 \text{ dB} = -12.56 \text{ dBm}$$

Frequency Range: 30 - 1000 MHz



Date: 14.MAR.2016 13:24:04

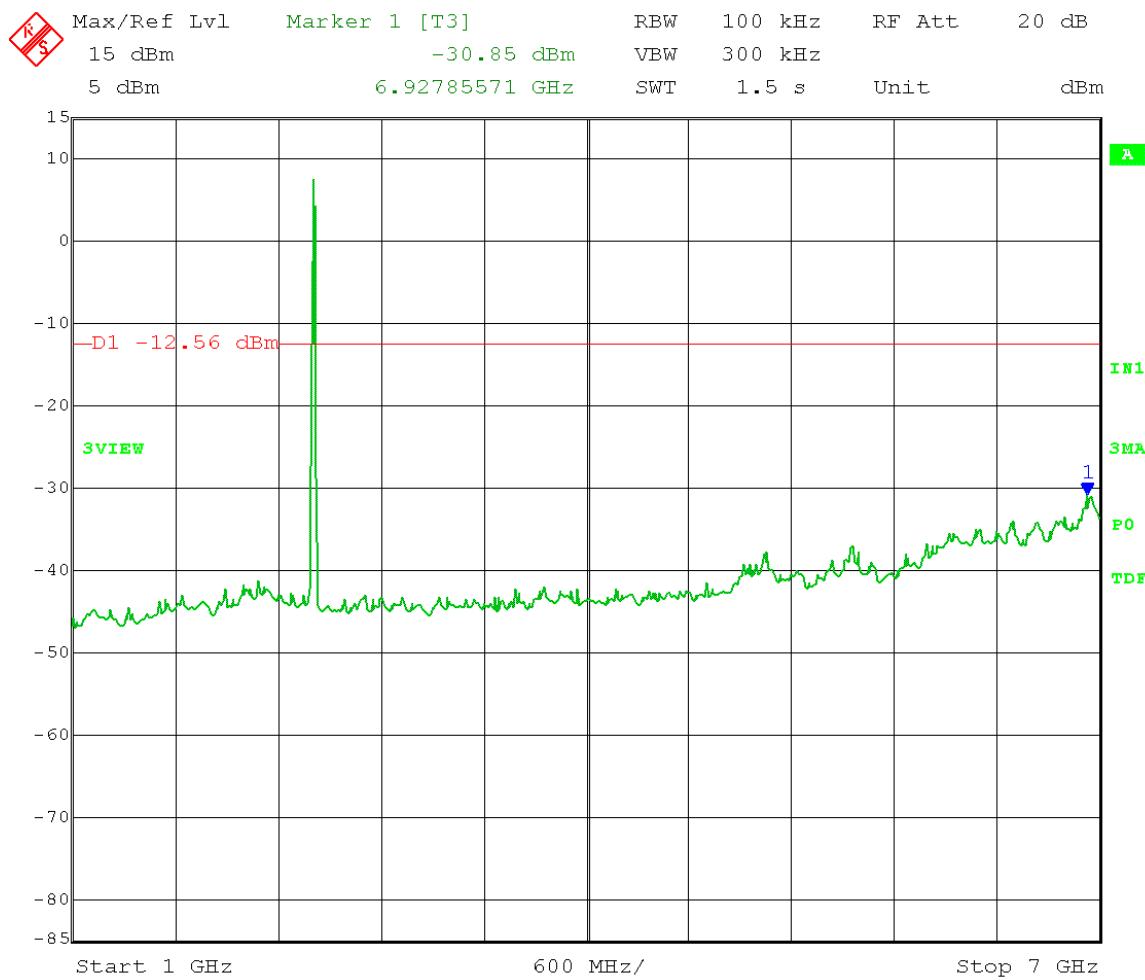
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.44 \text{ dBm} - 20 \text{ dB} = -12.56 \text{ dBm}$$

Frequency Range: 1 - 7 GHz



Date: 14.MAR.2016 13:19:00

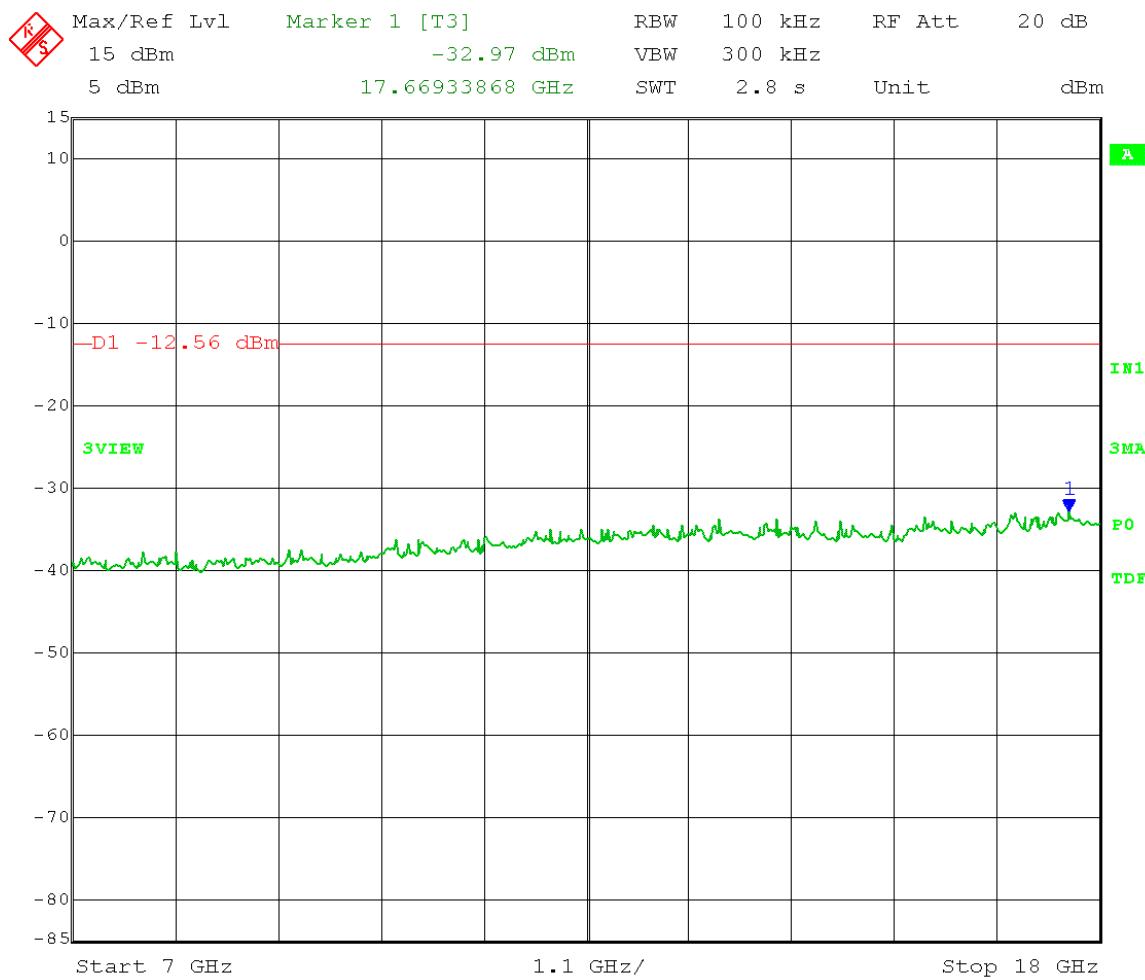
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.44 \text{ dBm} - 20 \text{ dB} = -12.56 \text{ dBm}$$

Frequency Range: 7 - 18 GHz



Date: 14.MAR.2016 13:20:54

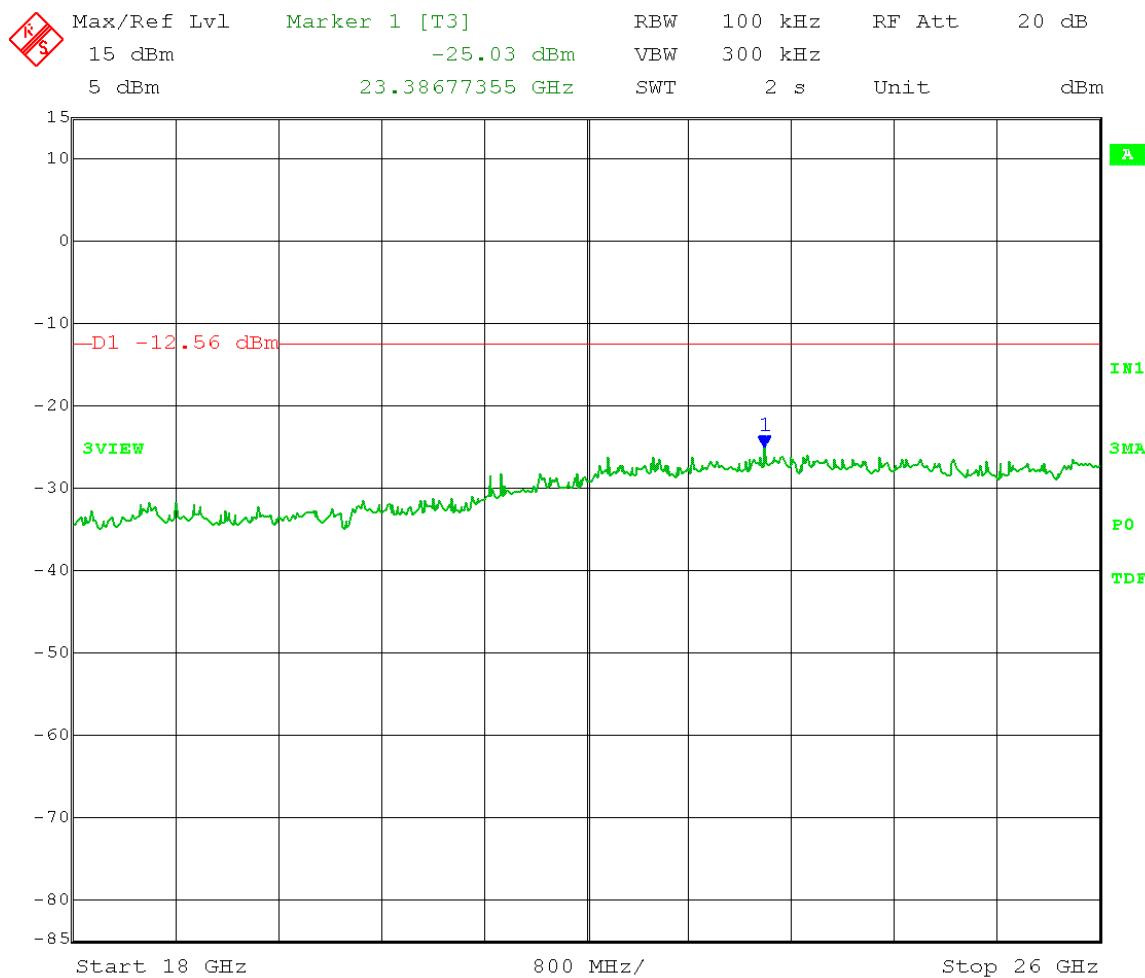
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.44 \text{ dBm} - 20 \text{ dB} = -12.56 \text{ dBm}$$

Frequency Range: 18 - 26 GHz



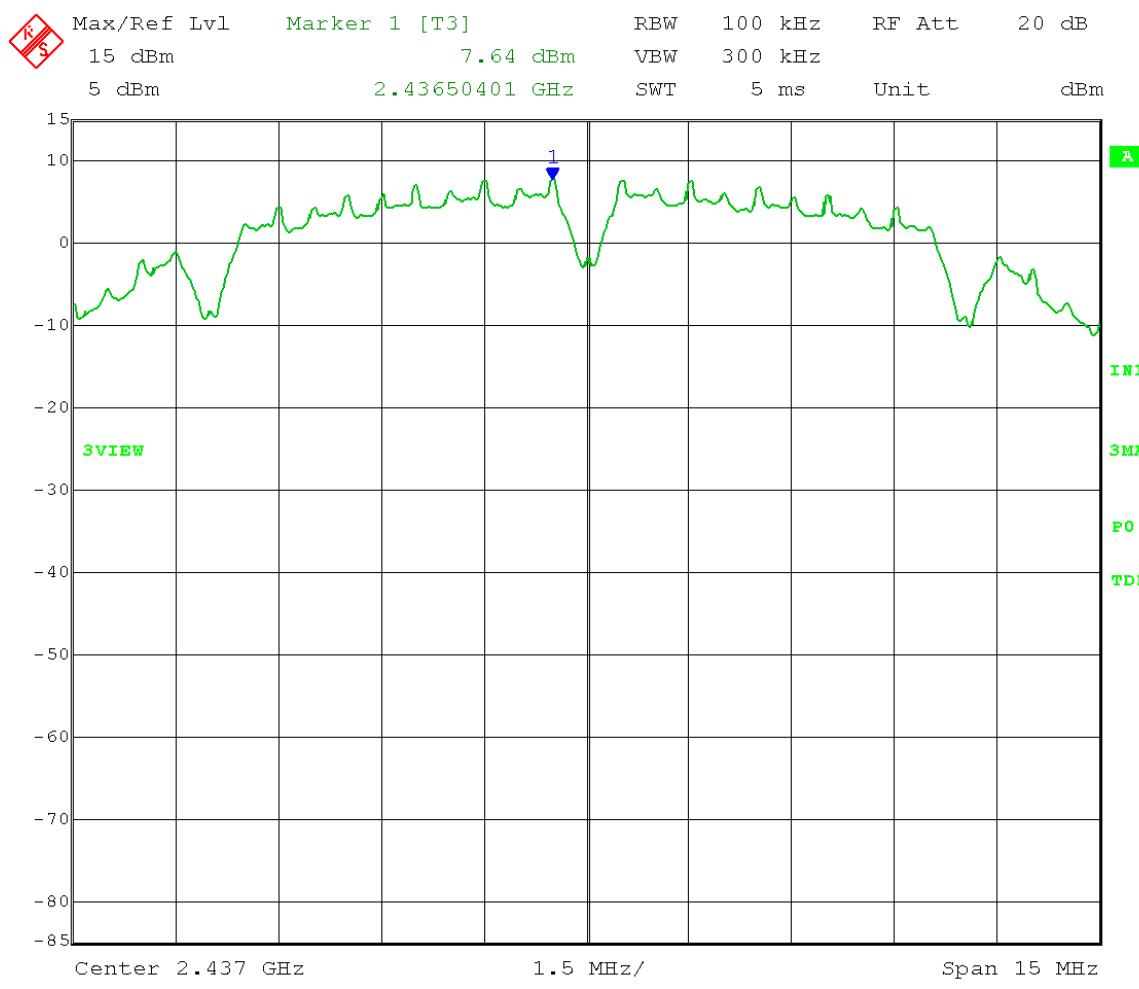
Date: 14.MAR.2016 13:22:17

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Reference Level measurement

$$\text{Limit} = 7.64 \text{ dBm} - 20 \text{ dB} = -12.36 \text{ dBm}$$



Date: 14.MAR.2016 13:25:26

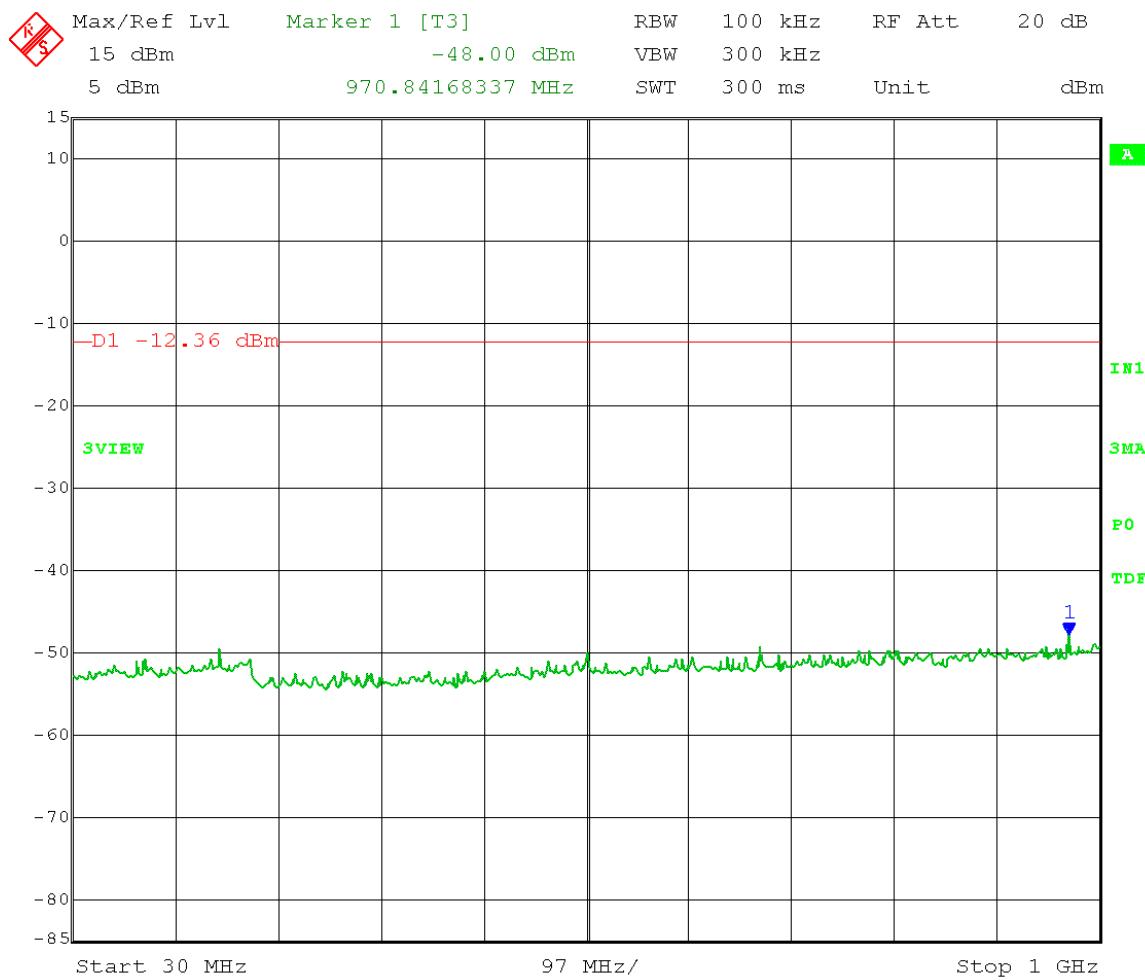
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.64 \text{ dBm} - 20 \text{ dB} = -12.36 \text{ dBm}$$

Frequency Range: 30 - 1000 MHz



Date: 14.MAR.2016 13:32:37

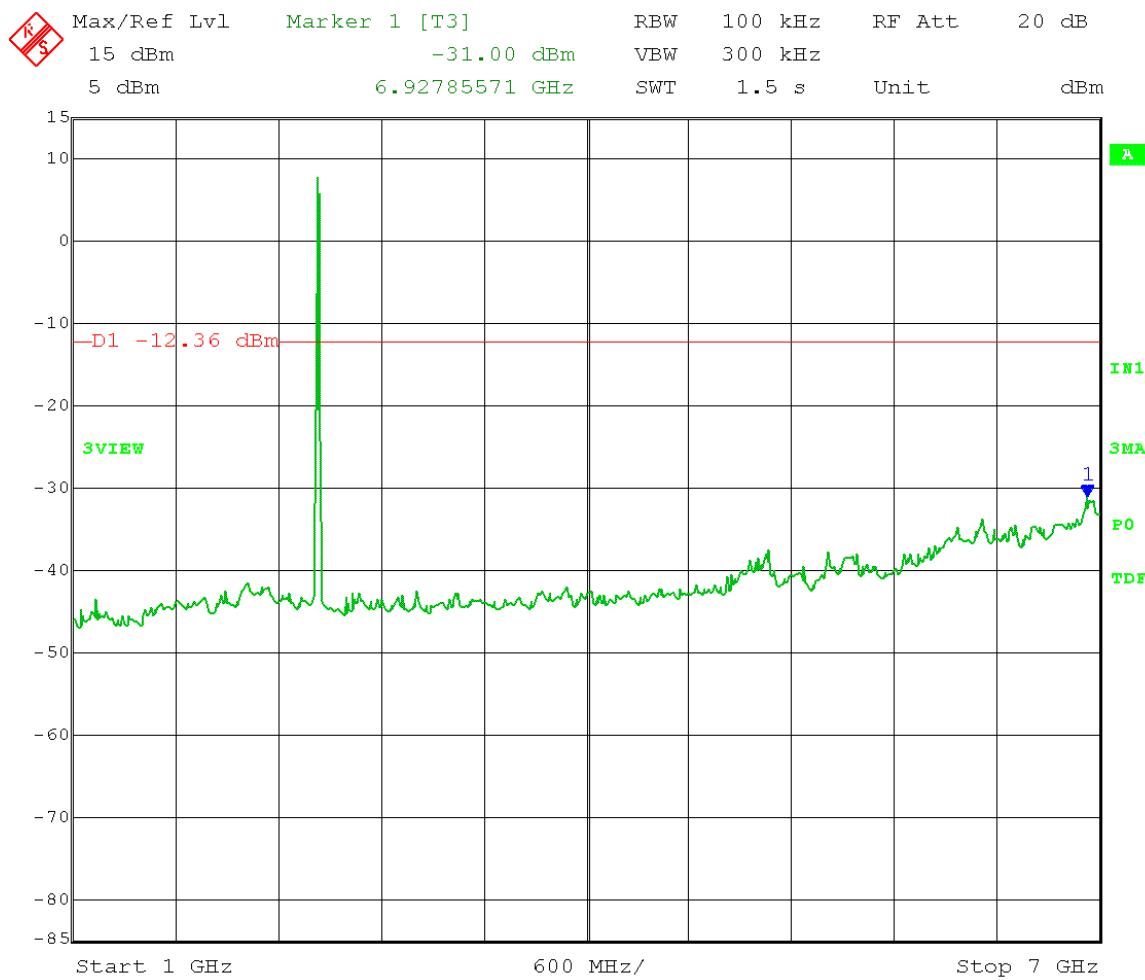
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.64 \text{ dBm} - 20 \text{ dB} = -12.36 \text{ dBm}$$

Frequency Range: 1 - 7 GHz



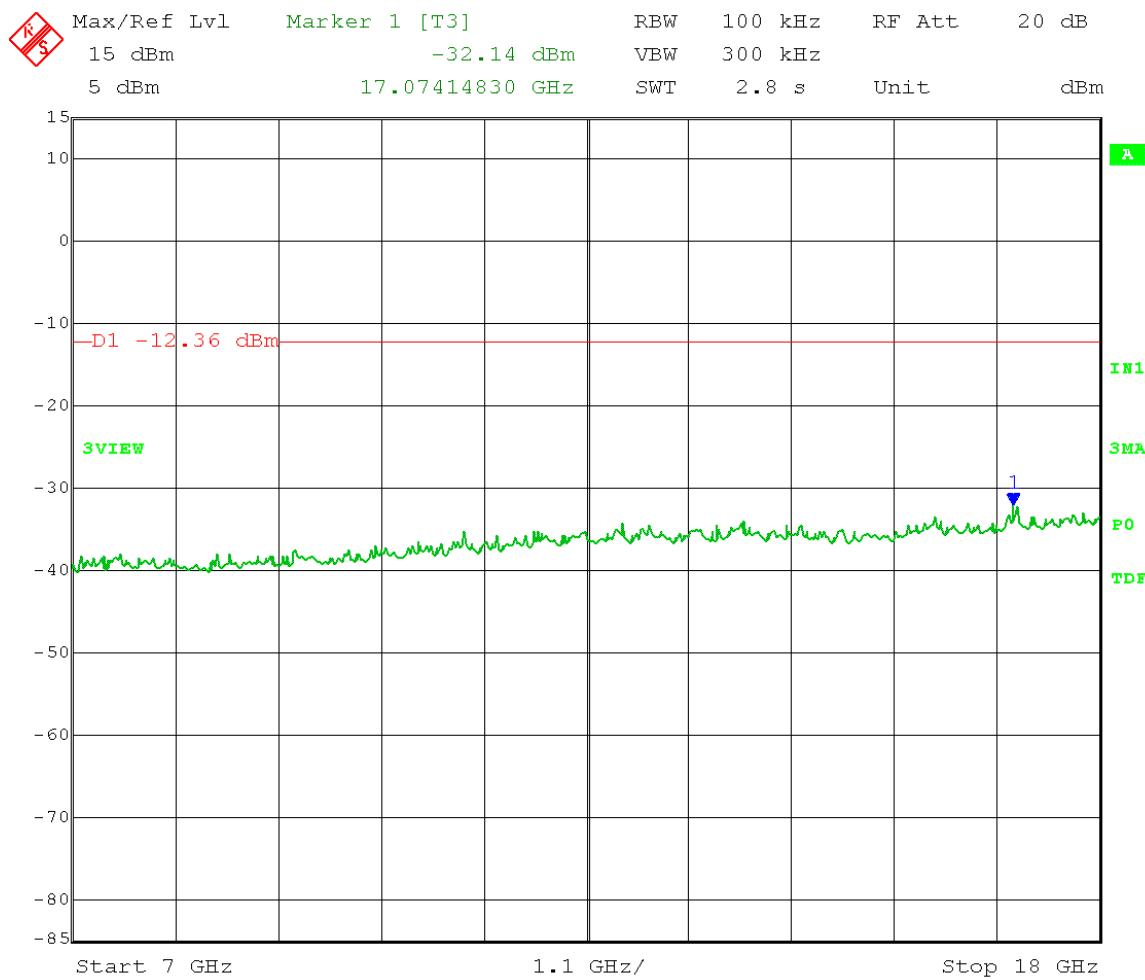
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.64 \text{ dBm} - 20 \text{ dB} = -12.36 \text{ dBm}$$

Frequency Range: 7 - 18 GHz



Date: 14.MAR.2016 13:29:38

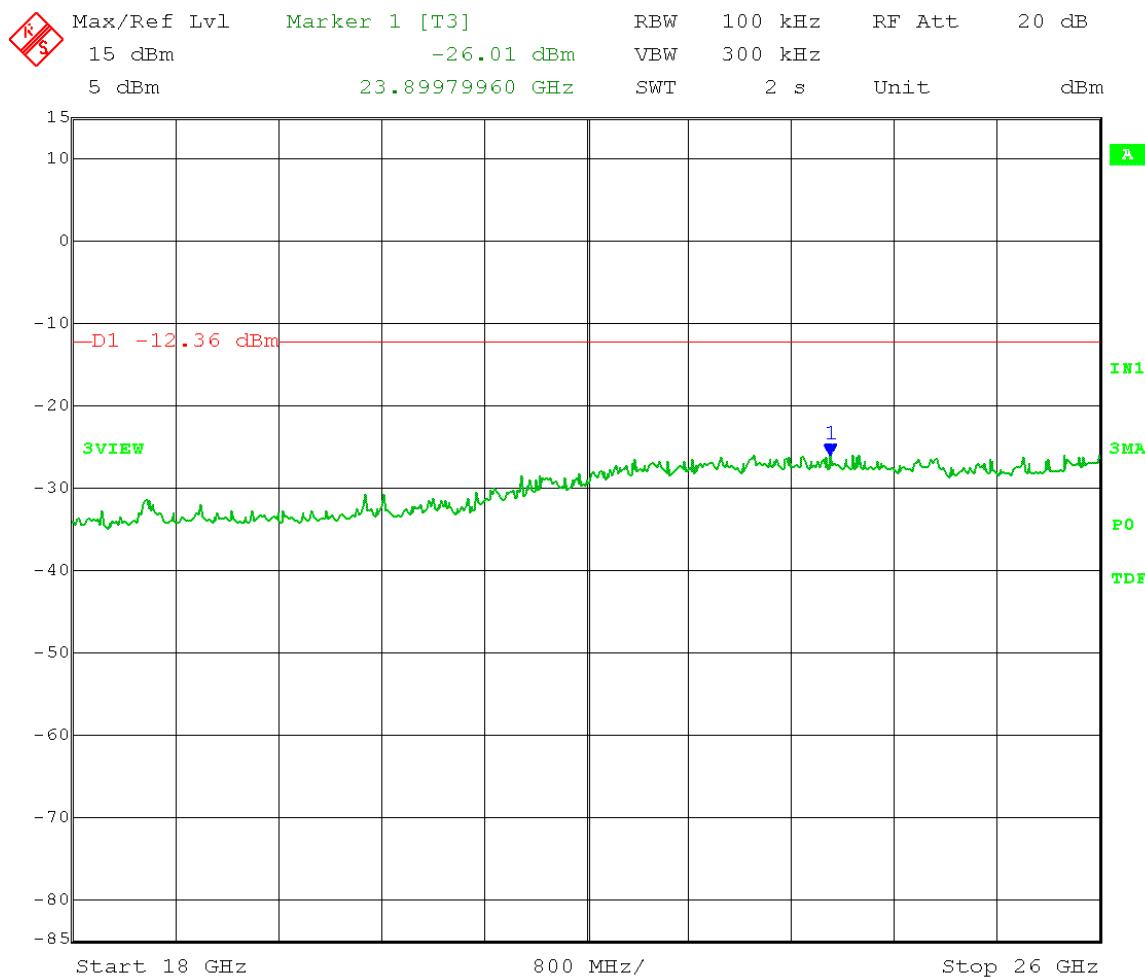
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.64 \text{ dBm} - 20 \text{ dB} = -12.36 \text{ dBm}$$

Frequency Range: 18 - 26 GHz



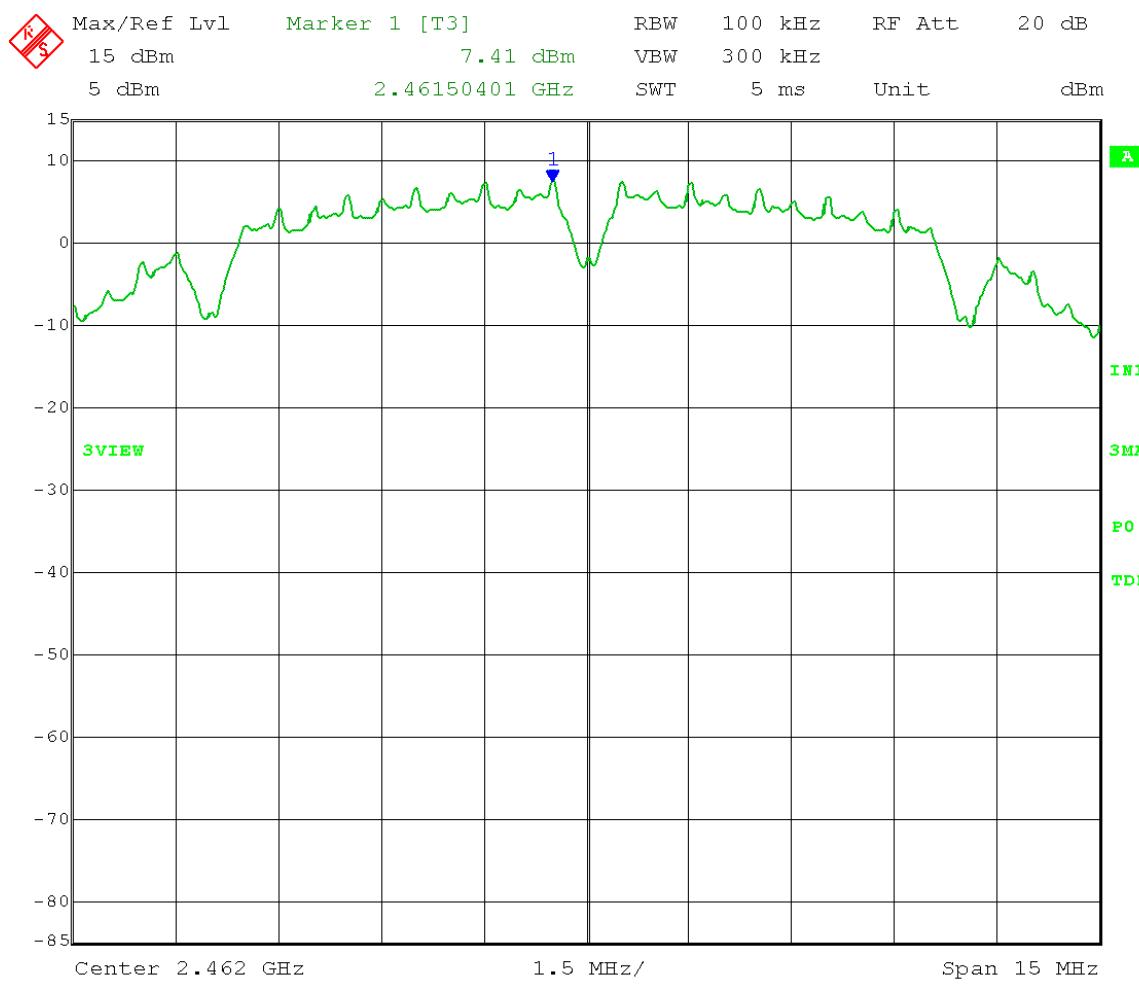
Date: 14.MAR.2016 13:30:58

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Reference Level measurement

$$\text{Limit} = 7.41 \text{ dBm} - 20 \text{ dB} = -12.59 \text{ dBm}$$



Date: 14.MAR.2016 13:40:41

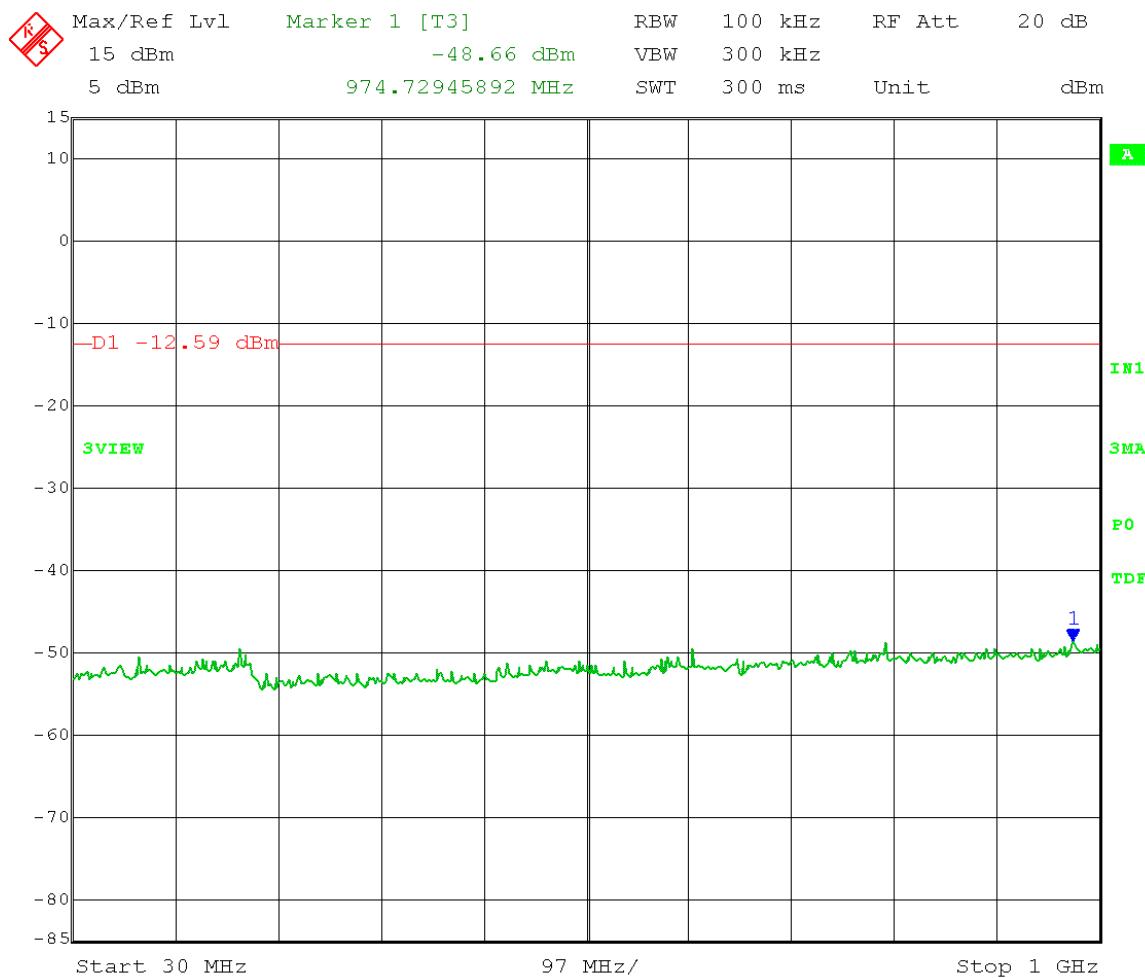
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.41 \text{ dBm} - 20 \text{ dB} = -12.59 \text{ dBm}$$

Frequency Range: 30 - 1000 MHz



Date: 14.MAR.2016 13:47:57

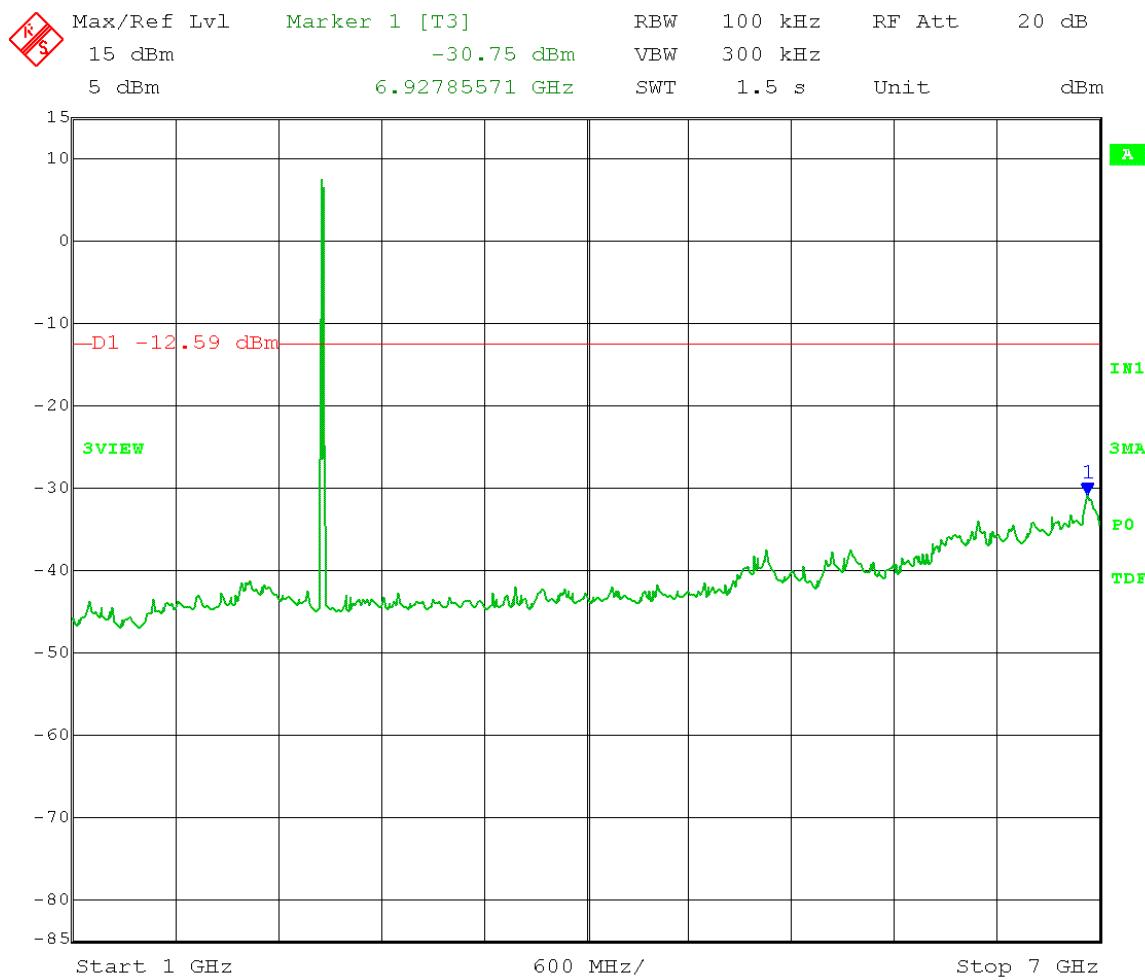
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.41 \text{ dBm} - 20 \text{ dB} = -12.59 \text{ dBm}$$

Frequency Range: 1 - 7 GHz



Date: 14.MAR.2016 13:42:42

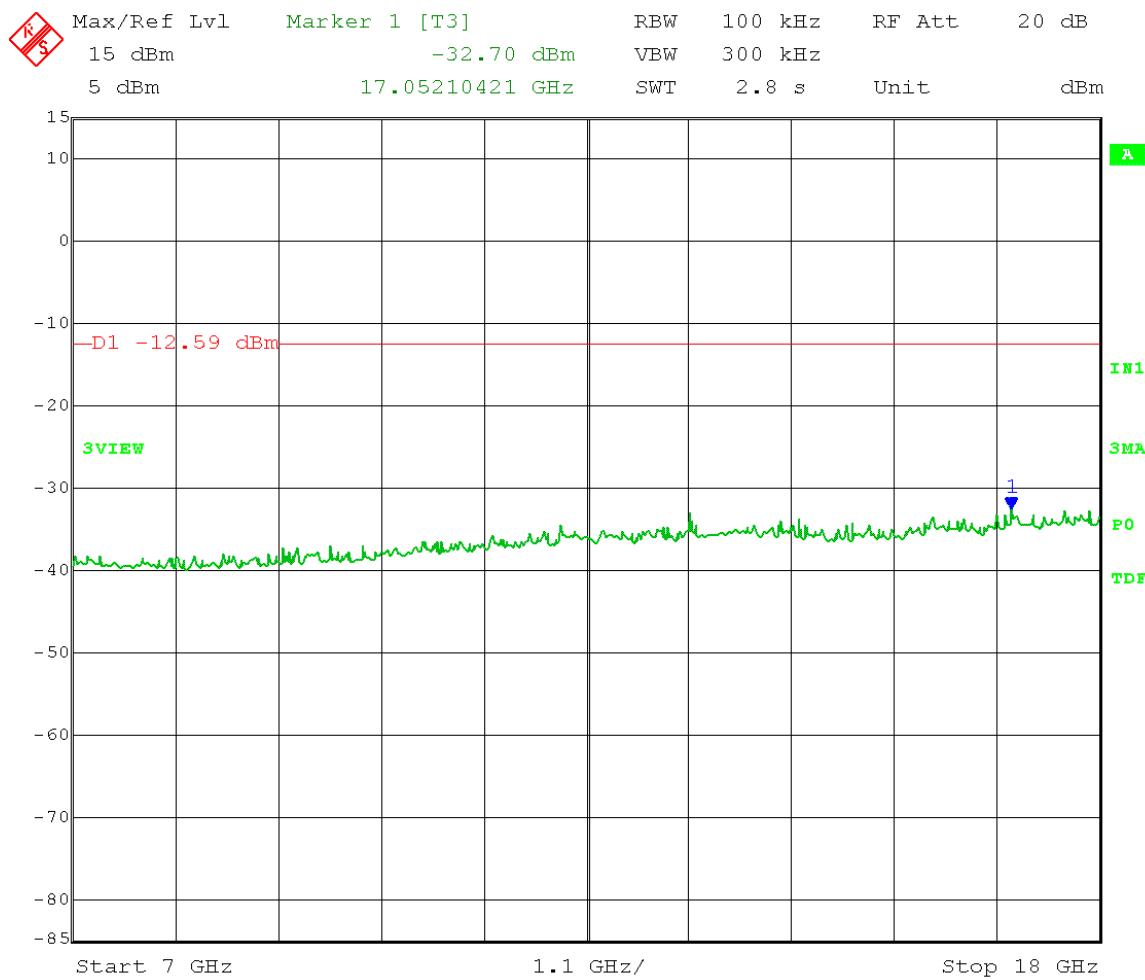
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.41 \text{ dBm} - 20 \text{ dB} = -12.59 \text{ dBm}$$

Frequency Range: 7 - 18 GHz



Date: 14.MAR.2016 13:44:21

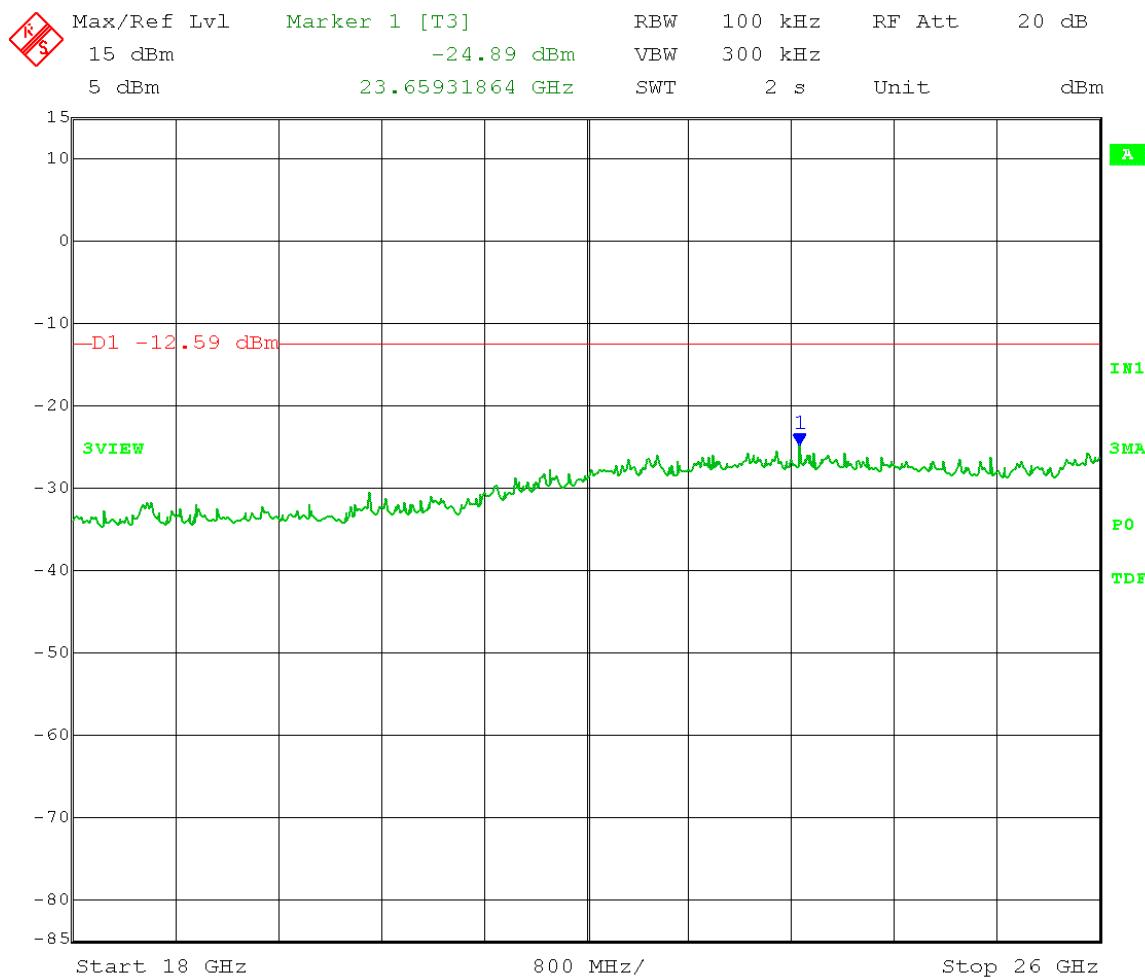
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-b, 1 Mbps
Power setting: 18

Emission Level measurement

$$\text{Limit} = 7.41 \text{ dBm} - 20 \text{ dB} = -12.59 \text{ dBm}$$

Frequency Range: 18 - 26 GHz



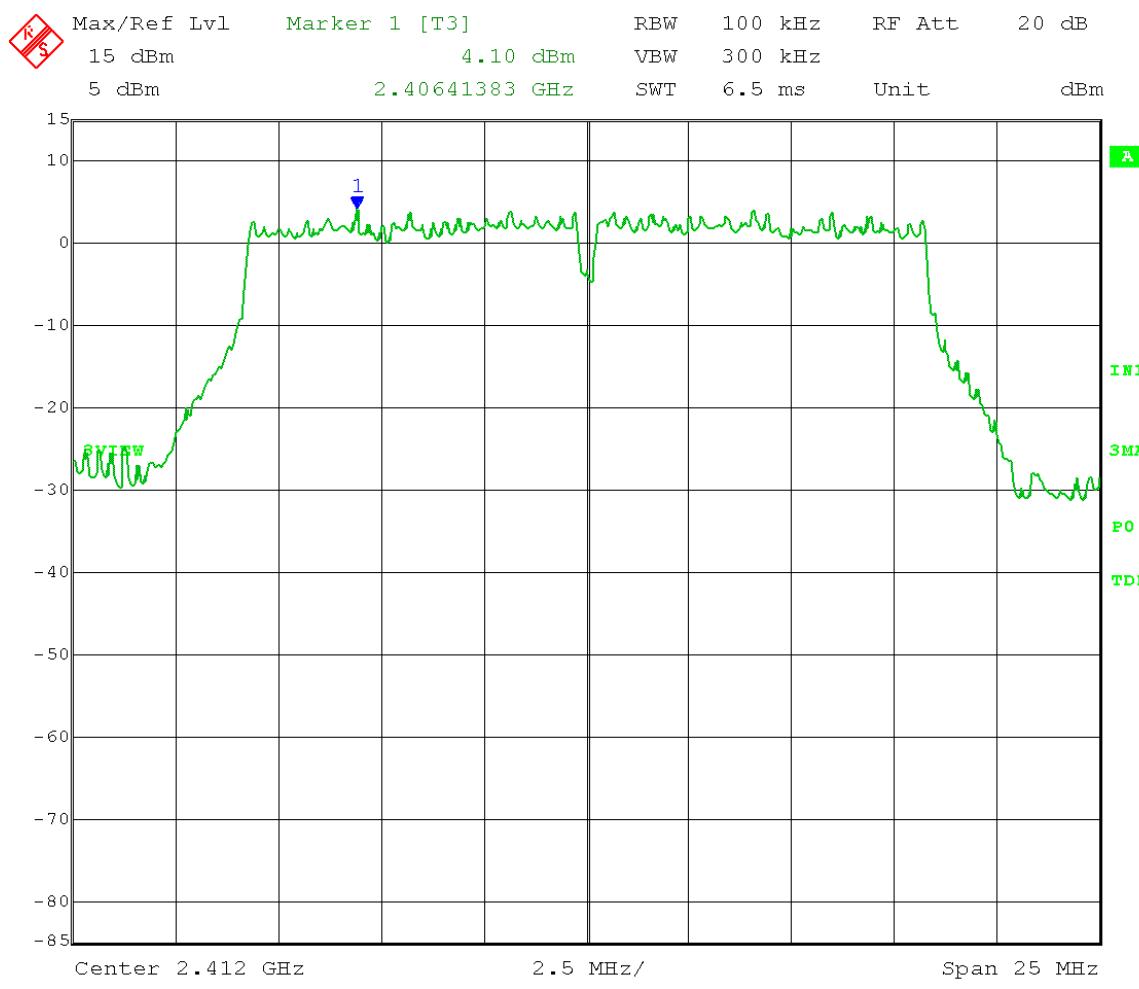
Date: 14.MAR.2016 13:45:56

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Reference Level measurement

$$\text{Limit} = 4.10 \text{ dBm} - 20 \text{ dB} = -15.90 \text{ dBm}$$



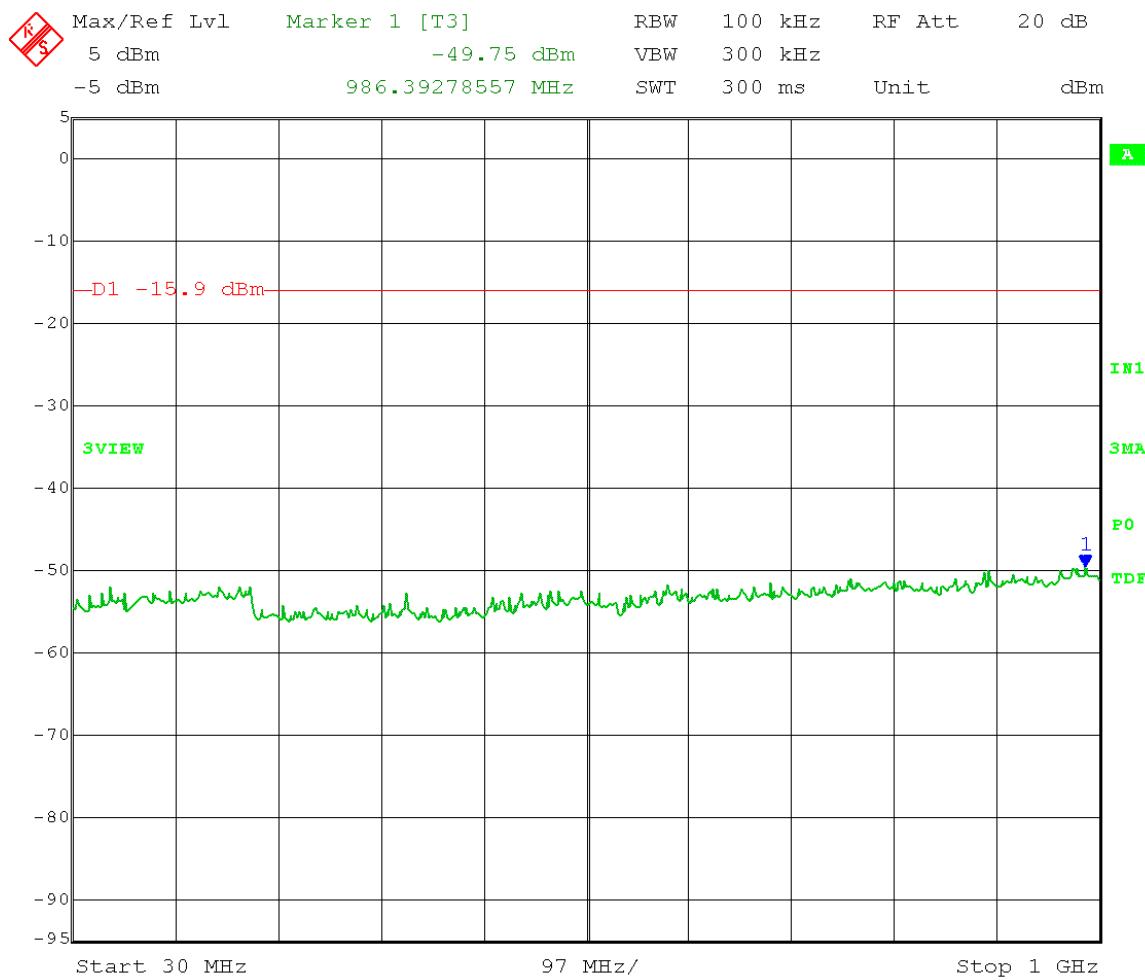
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.10 \text{ dBm} - 20 \text{ dB} = -15.90 \text{ dBm}$$

Frequency Range: 30 – 1000 MHz



Date: 14.MAR.2016 13:59:26

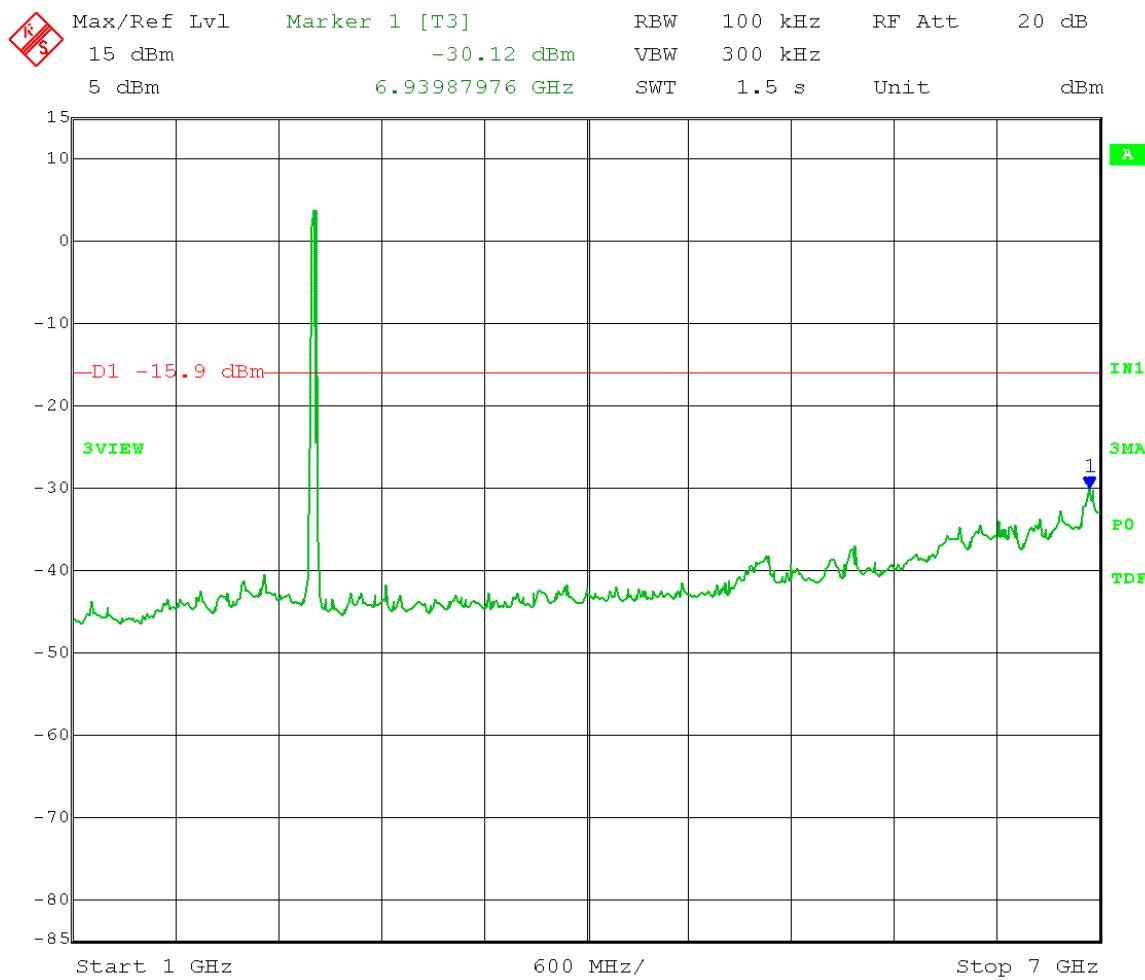
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.10 \text{ dBm} - 20 \text{ dB} = -15.90 \text{ dBm}$$

Frequency Range: 1 – 7 GHz



Date: 14.MAR.2016 13:53:52

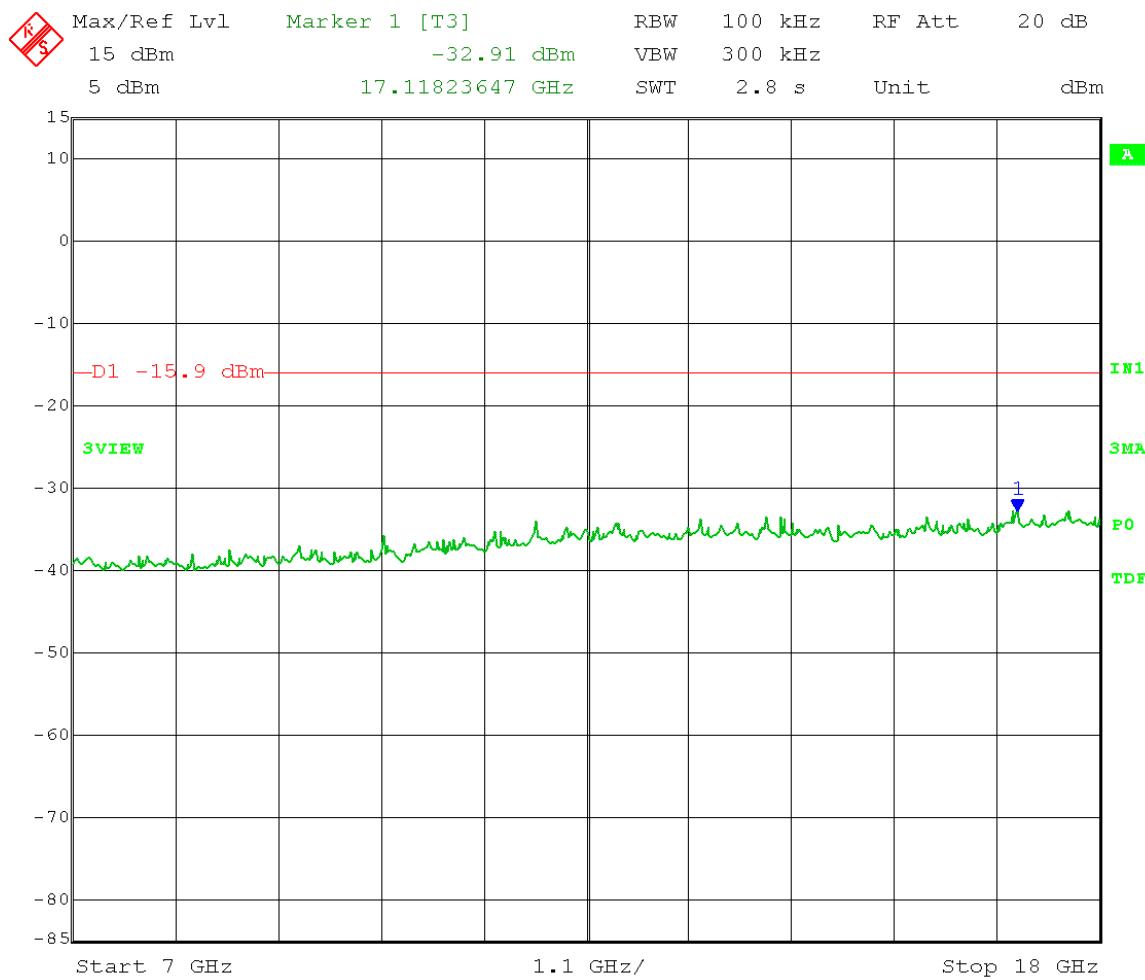
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.10 \text{ dBm} - 20 \text{ dB} = -15.90 \text{ dBm}$$

Frequency Range: 7 – 18 GHz



Date: 14.MAR.2016 13:55:49

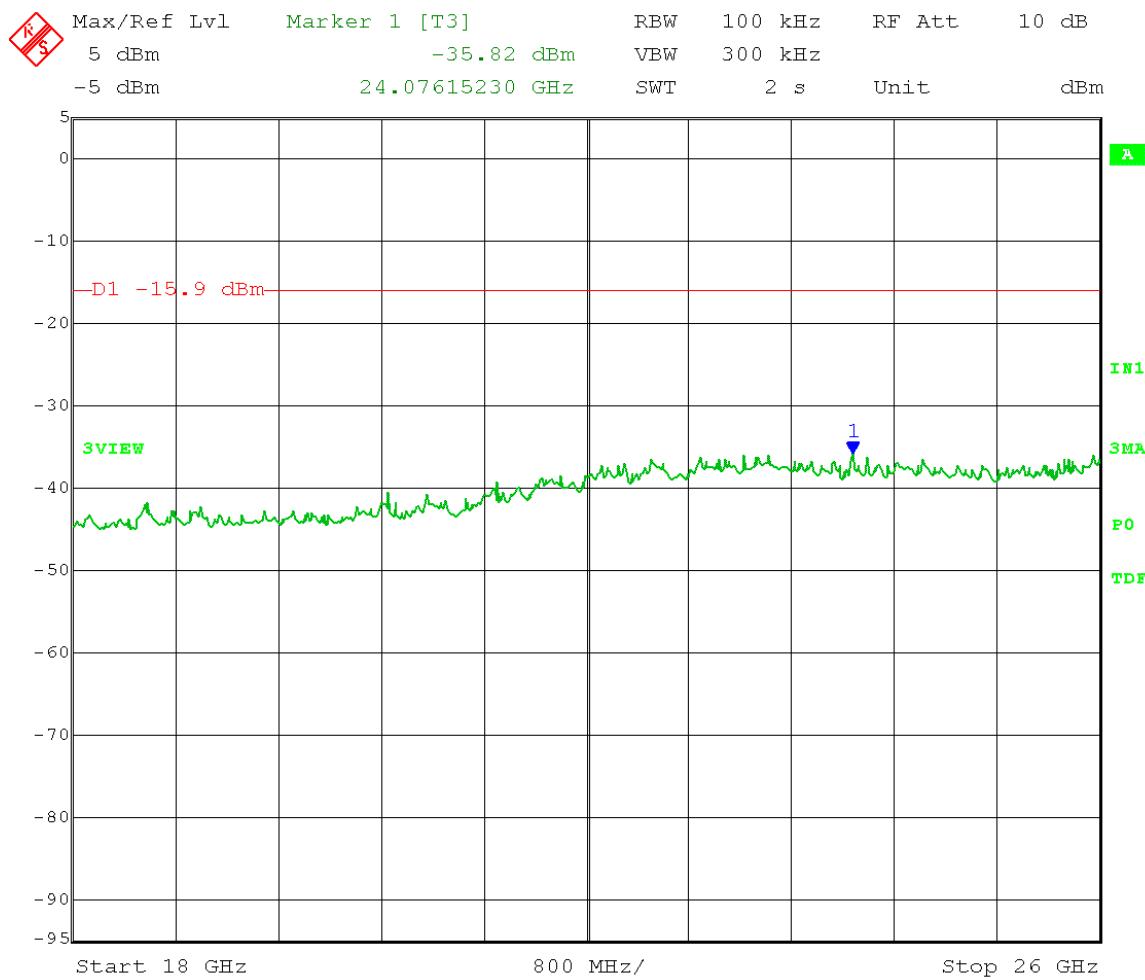
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.10 \text{ dBm} - 20 \text{ dB} = -15.90 \text{ dBm}$$

Frequency Range: 18 – 26 GHz



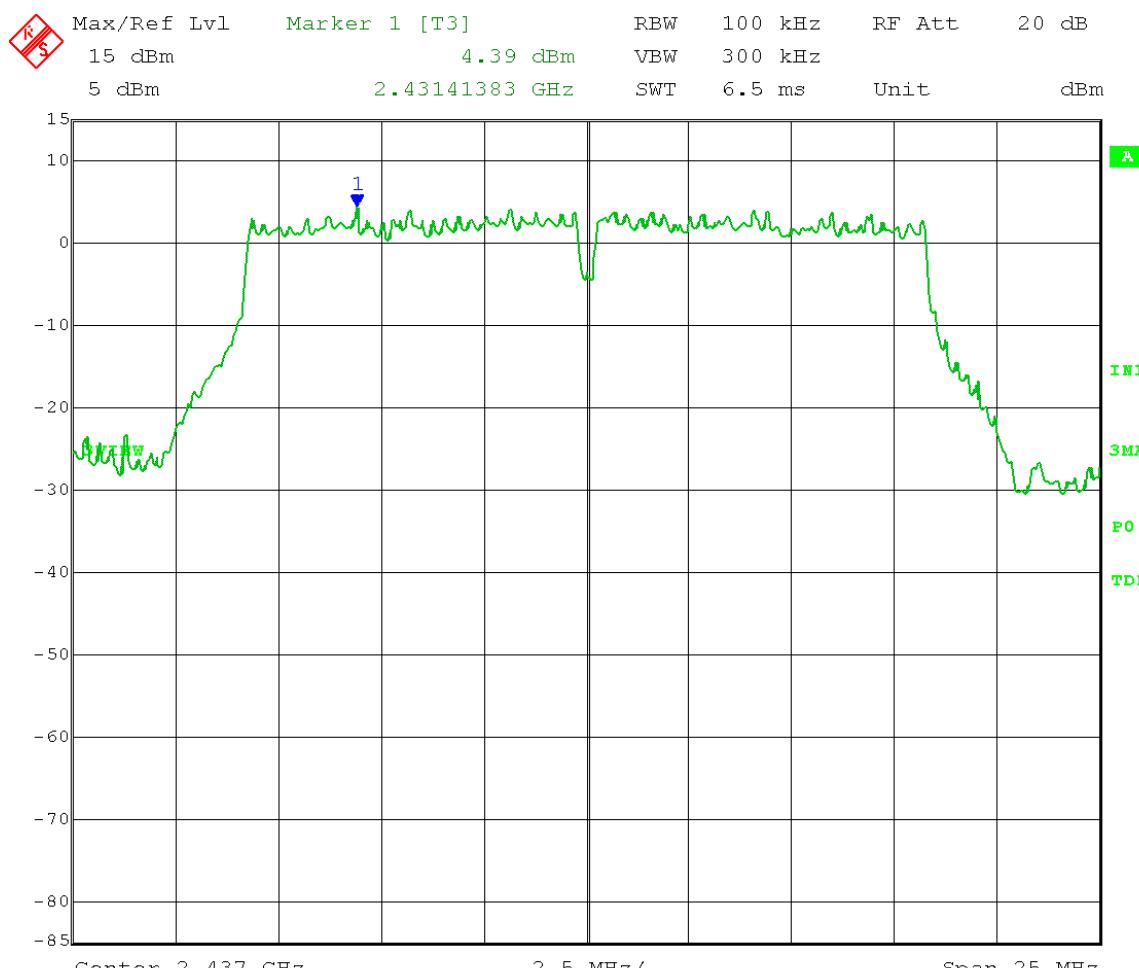
Date: 14.MAR.2016 13:57:46

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Reference Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$



Date: 14.MAR.2016 14:01:08

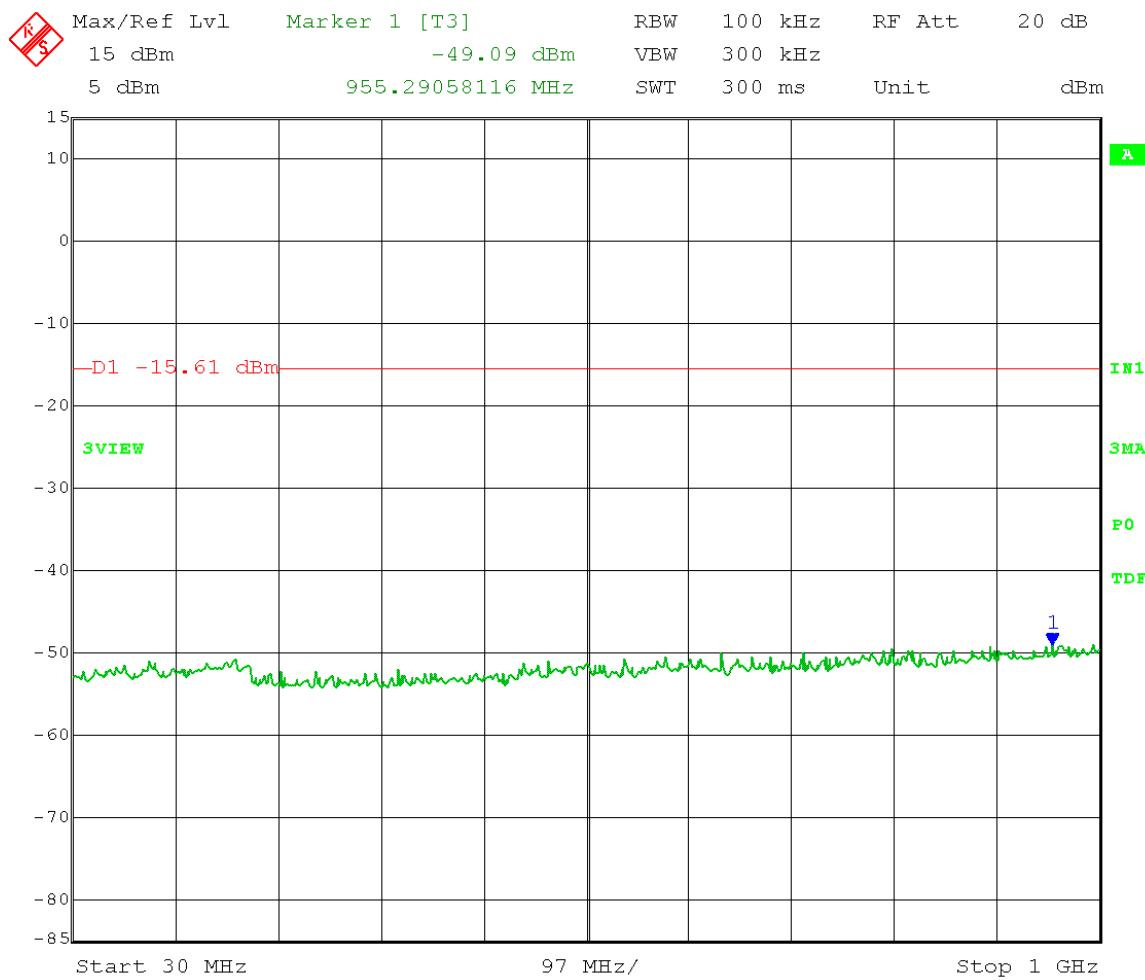
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$

Frequency Range: 30 – 1000 MHz



Date: 14.MAR.2016 14:07:31

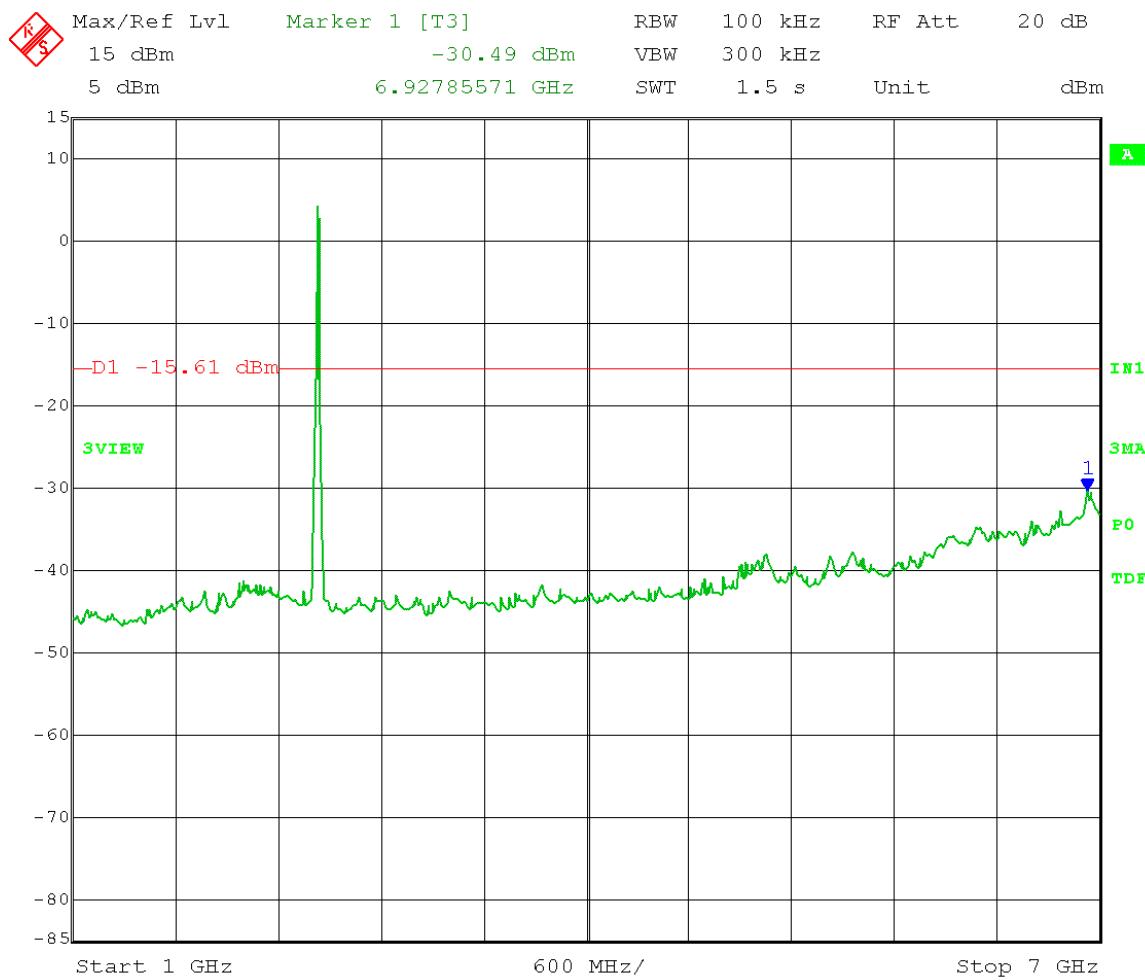
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$

Frequency Range: 1 – 7 GHz



Date: 14.MAR.2016 14:02:55

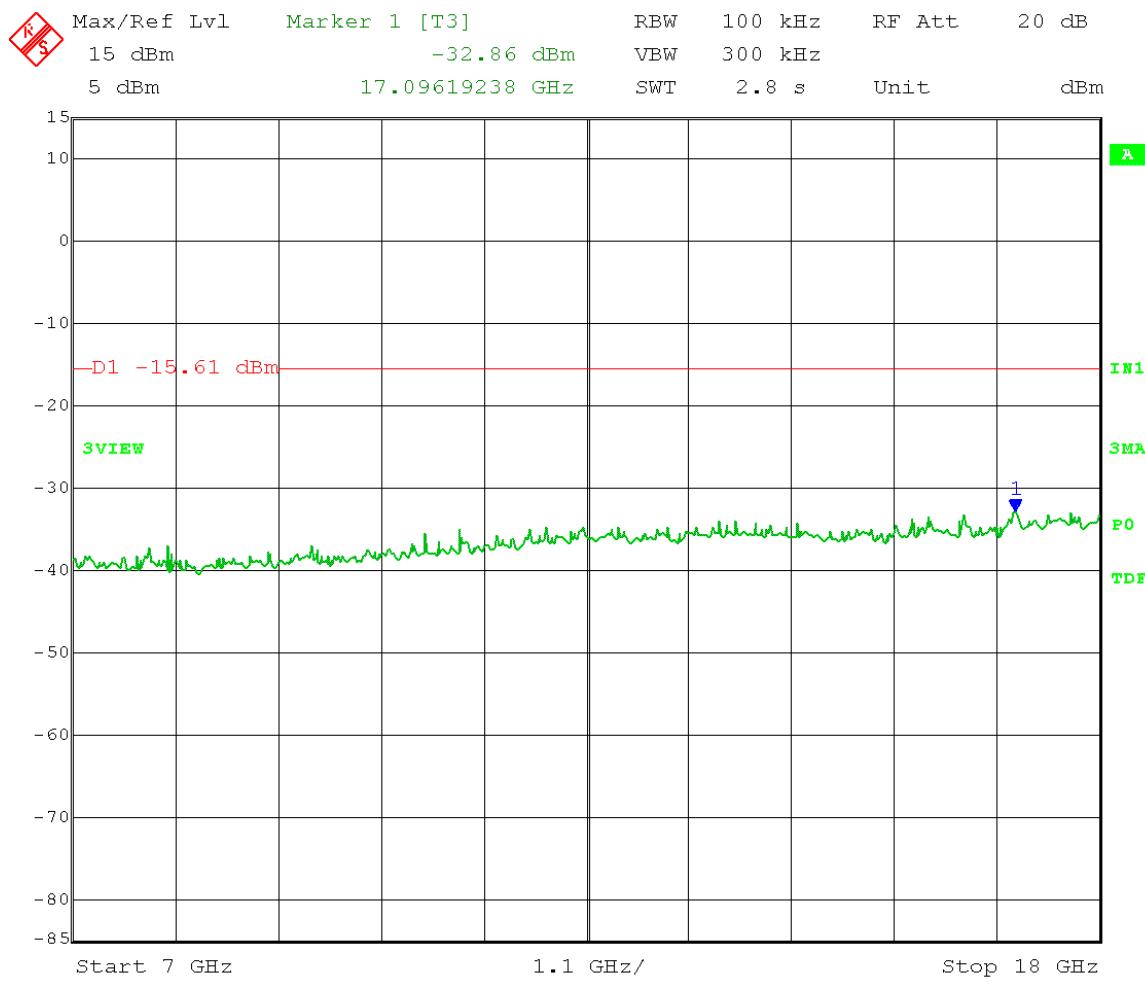
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$

Frequency Range: 7 – 18 GHz



Date: 14.MAR.2016 14:04:21

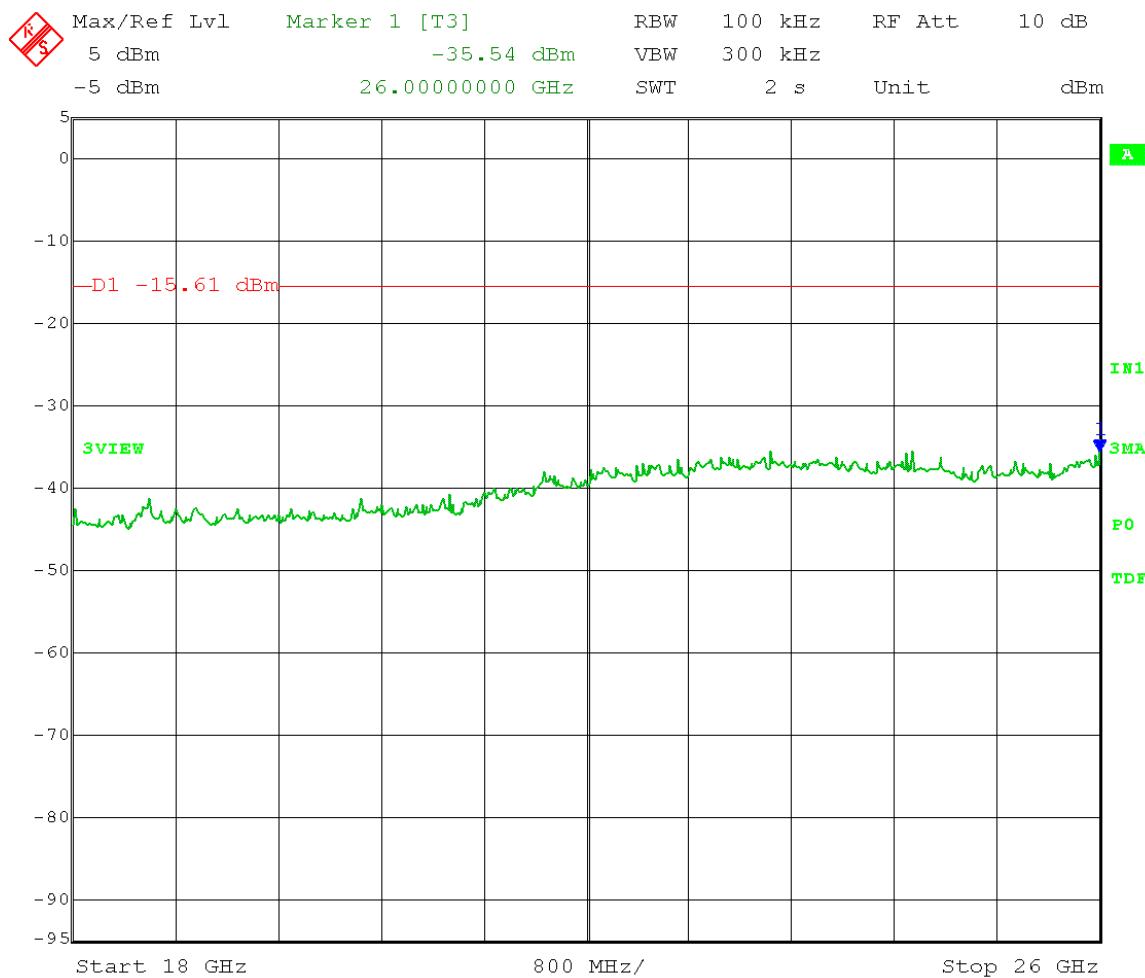
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$

Frequency Range: 18 – 26 GHz



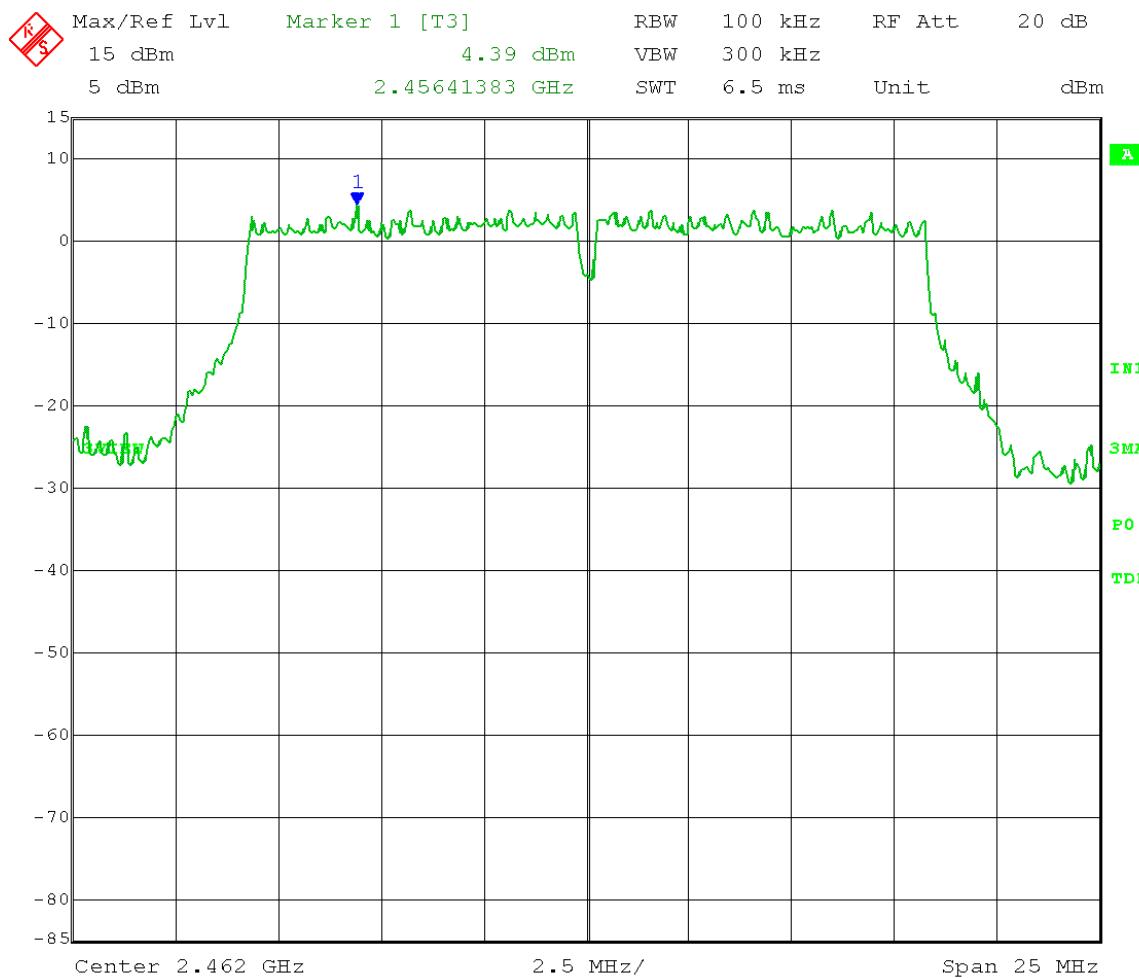
Date: 14.MAR.2016 14:05:46

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Reference Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$



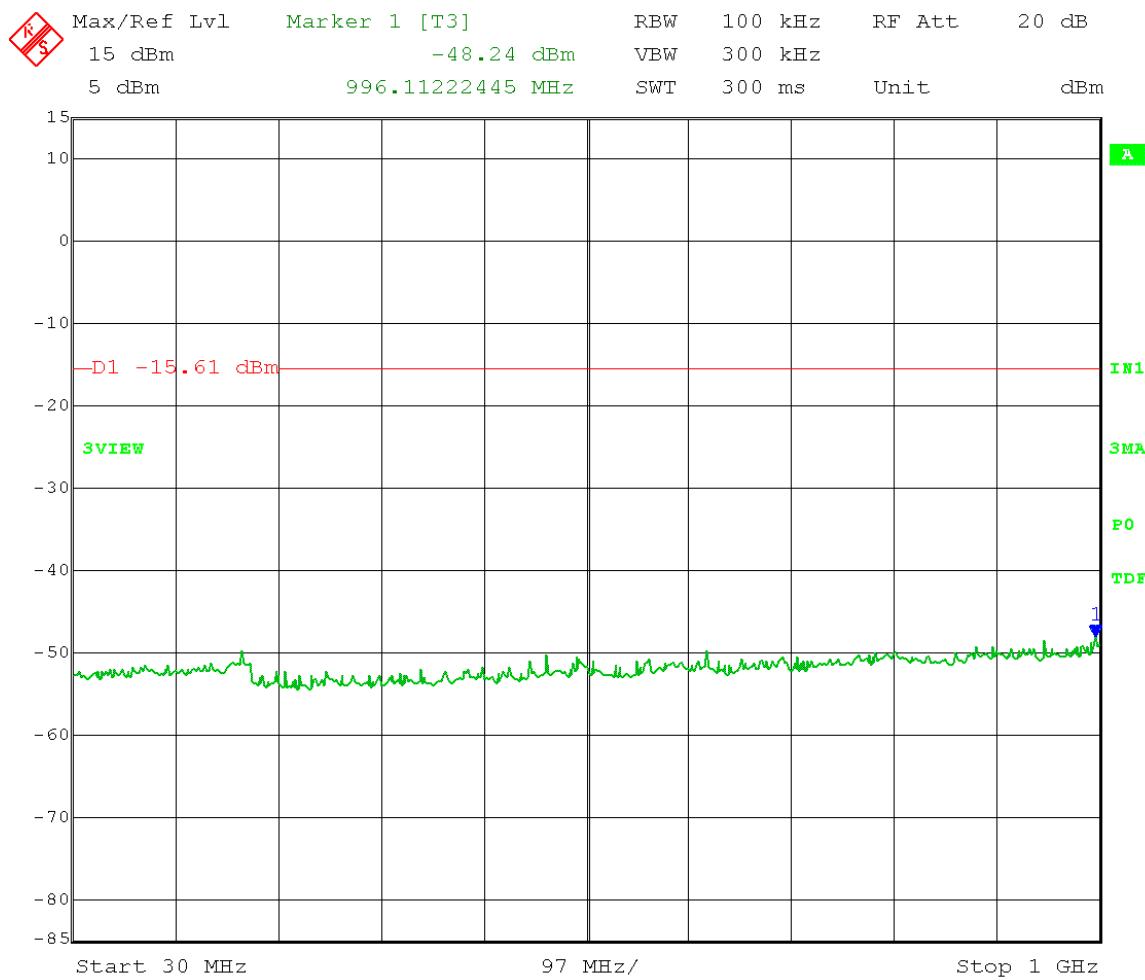
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$

Frequency Range: 30 – 1000 MHz



Date: 14.MAR.2016 14:15:30

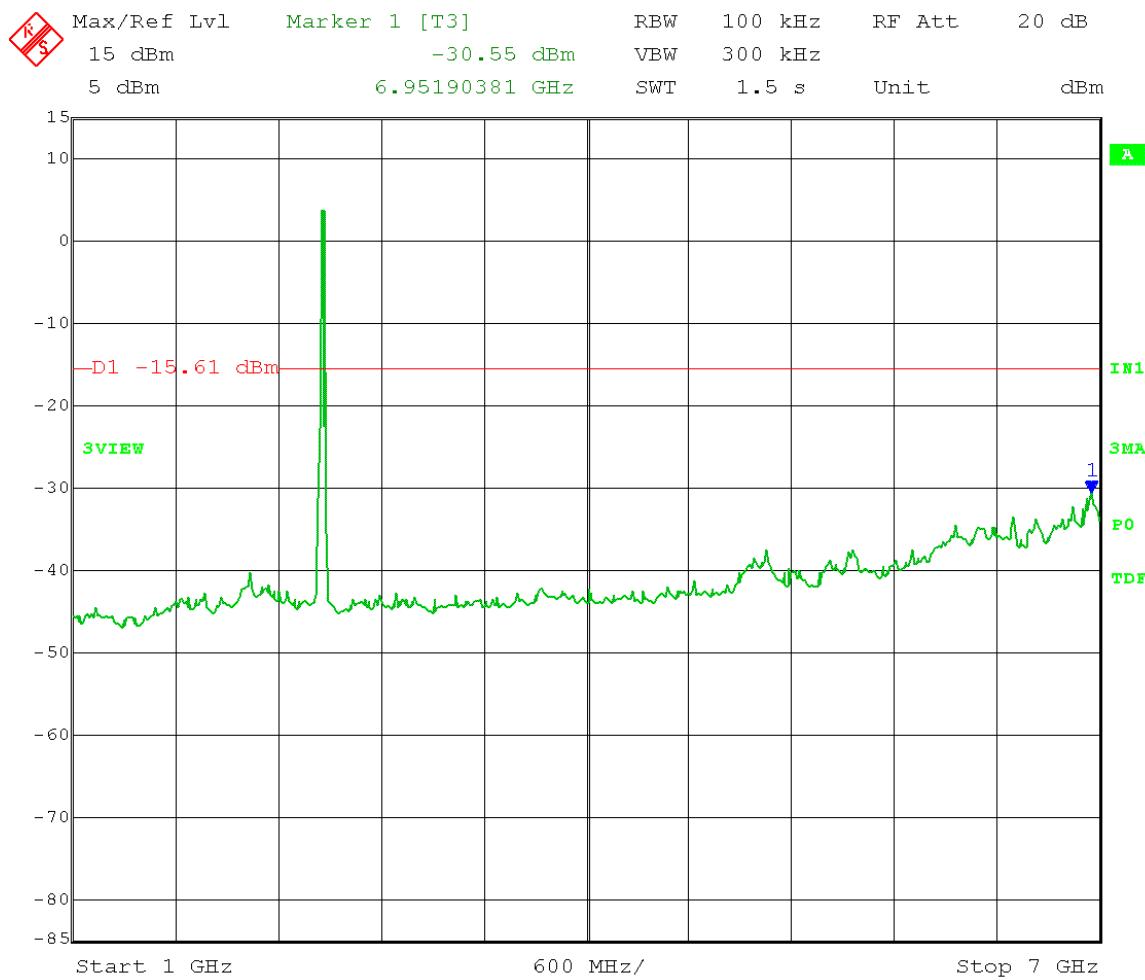
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$

Frequency Range: 1 – 7 GHz



Date: 14.MAR.2016 14:10:50

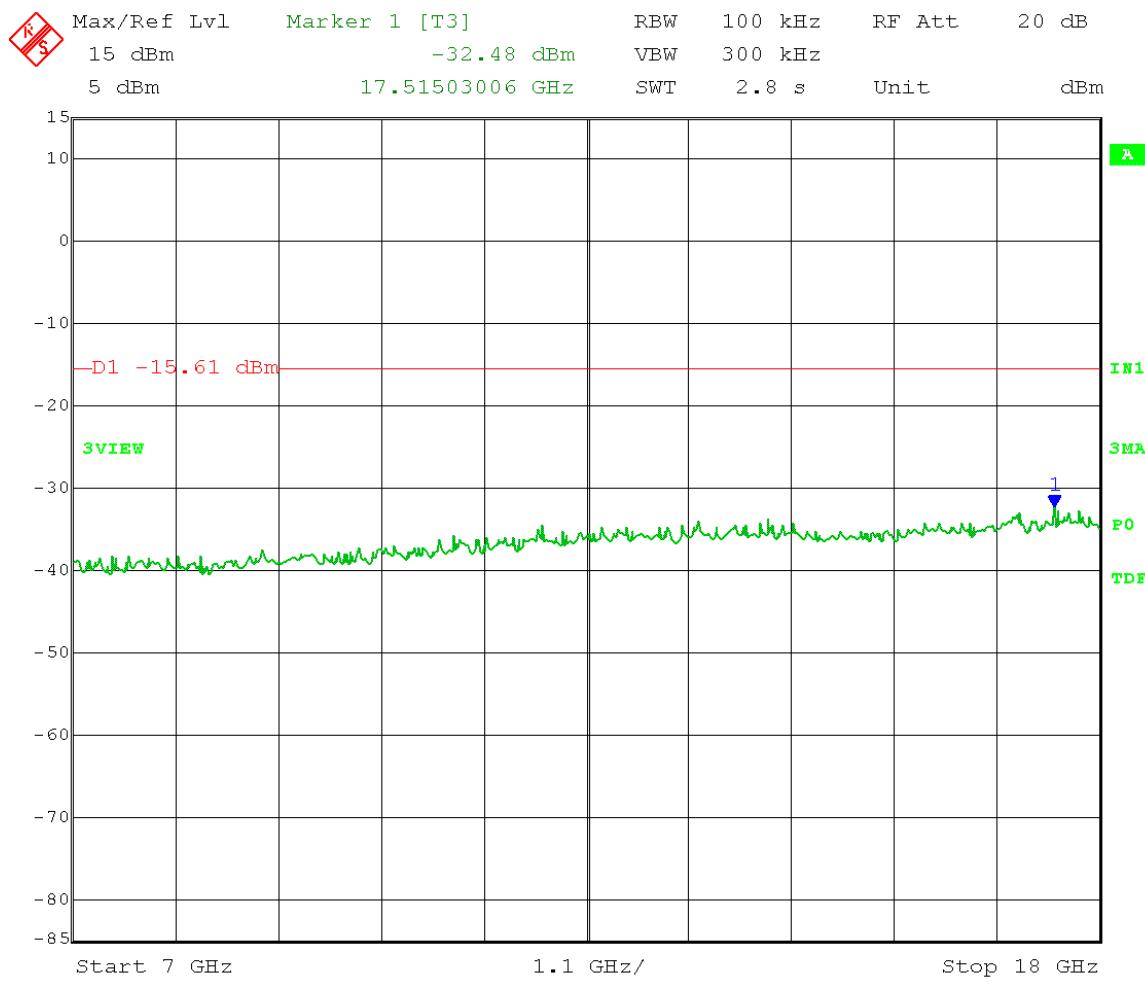
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$

Frequency Range: 7 – 18 GHz



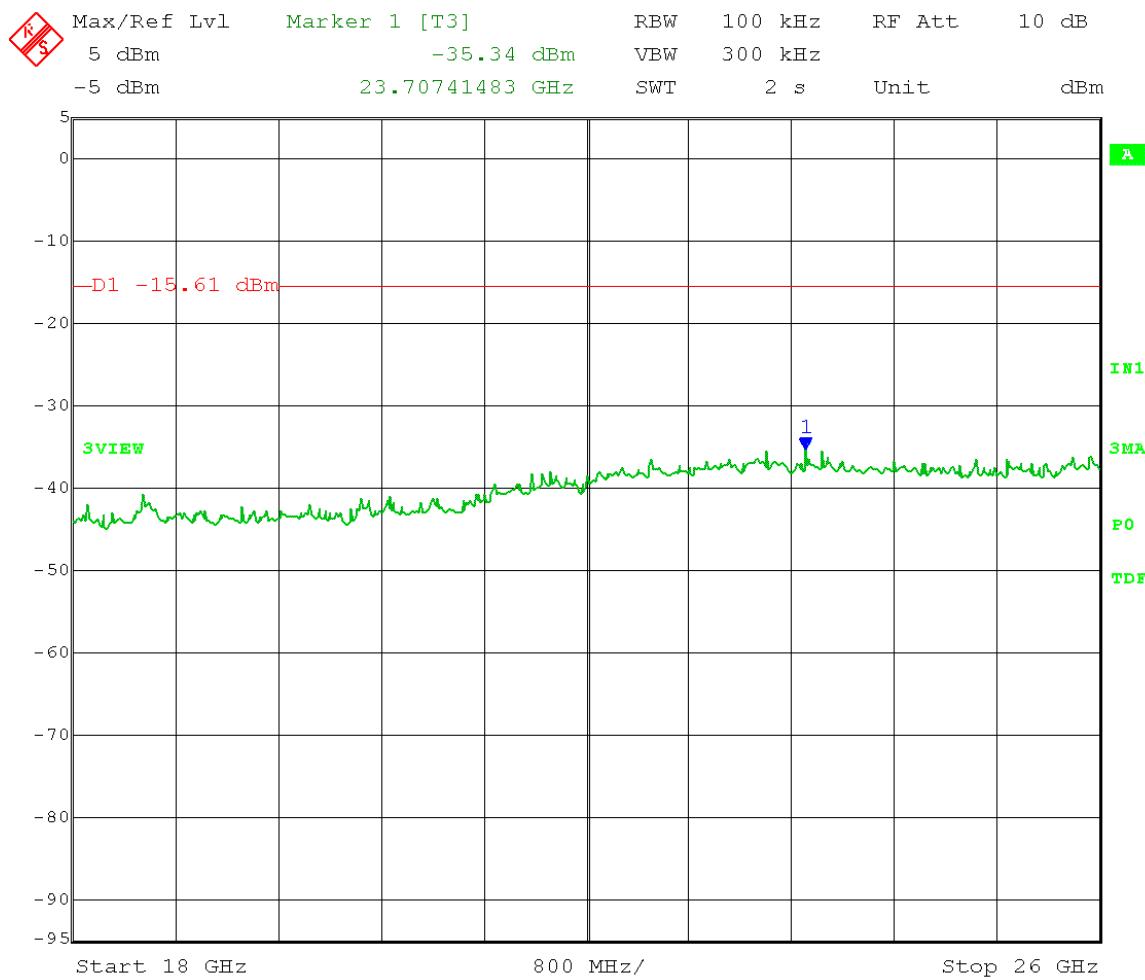
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-g, 54 Mbps
Power setting: 17

Emission Level measurement

$$\text{Limit} = 4.39 \text{ dBm} - 20 \text{ dB} = -15.61 \text{ dBm}$$

Frequency Range: 18 – 26 GHz



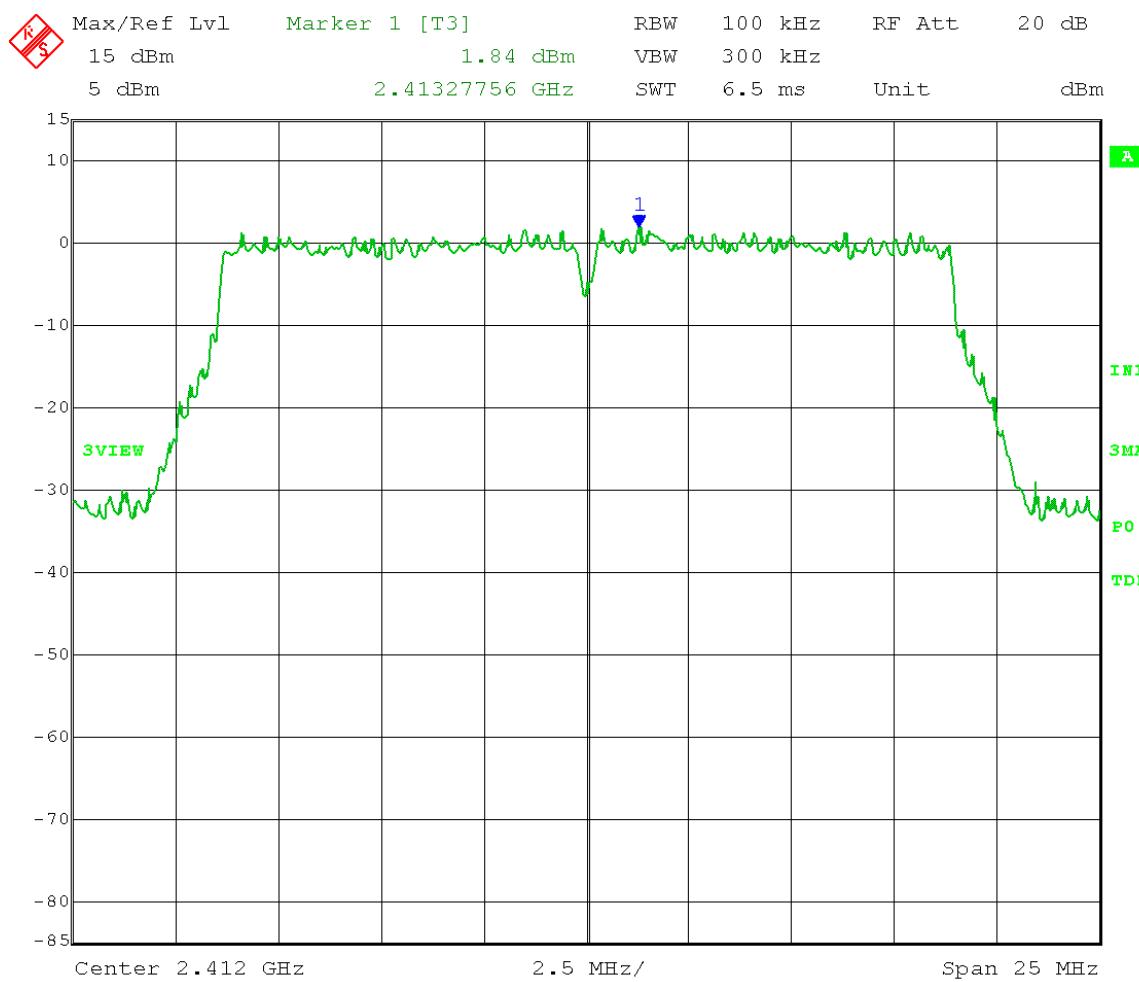
Date: 14.MAR.2016 14:13:46

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Reference Level measurement

$$\text{Limit} = 1.84 \text{ dBm} - 20 \text{ dB} = -18.16 \text{ dBm}$$



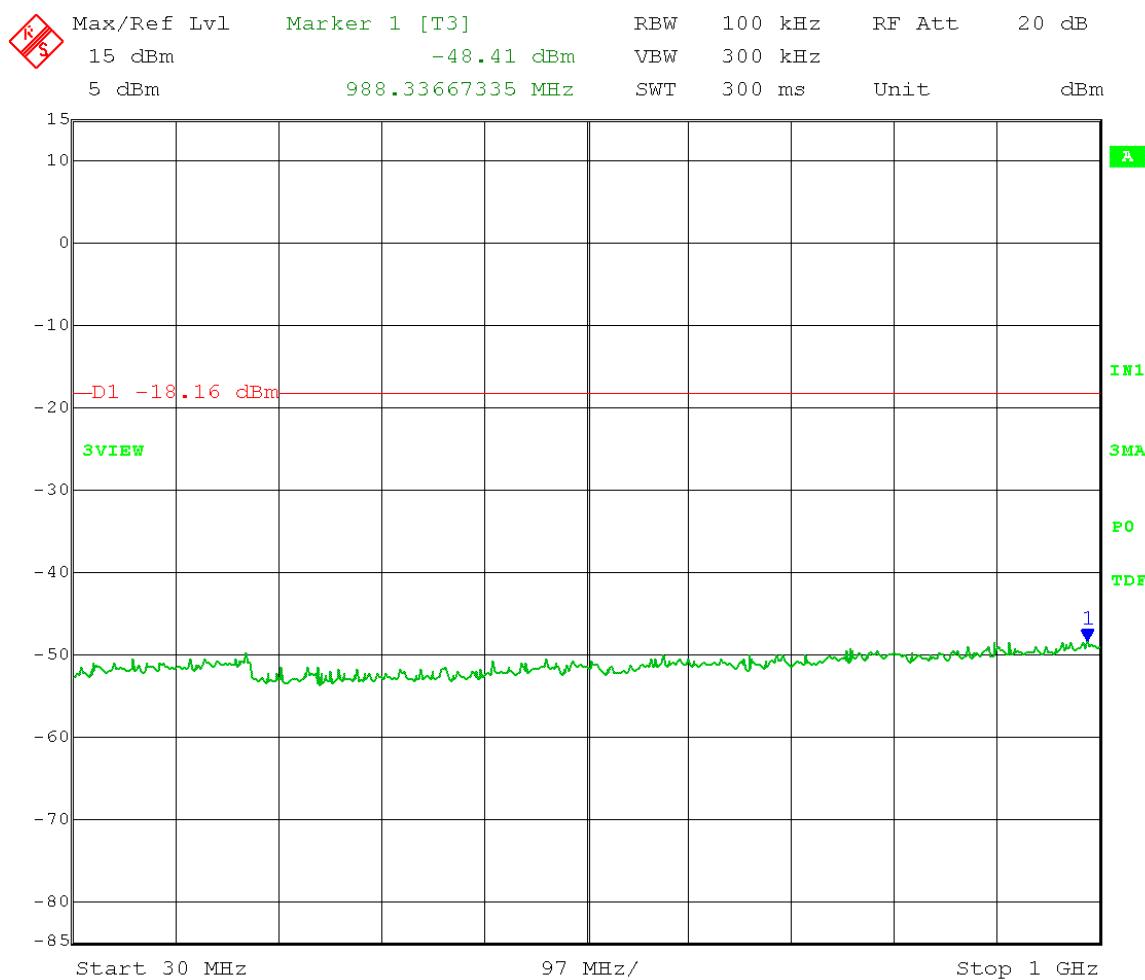
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 1.84 \text{ dBm} - 20 \text{ dB} = -18.16 \text{ dBm}$$

Frequency Range: 30 – 1000 MHz



Date: 14.MAR.2016 14:33:01

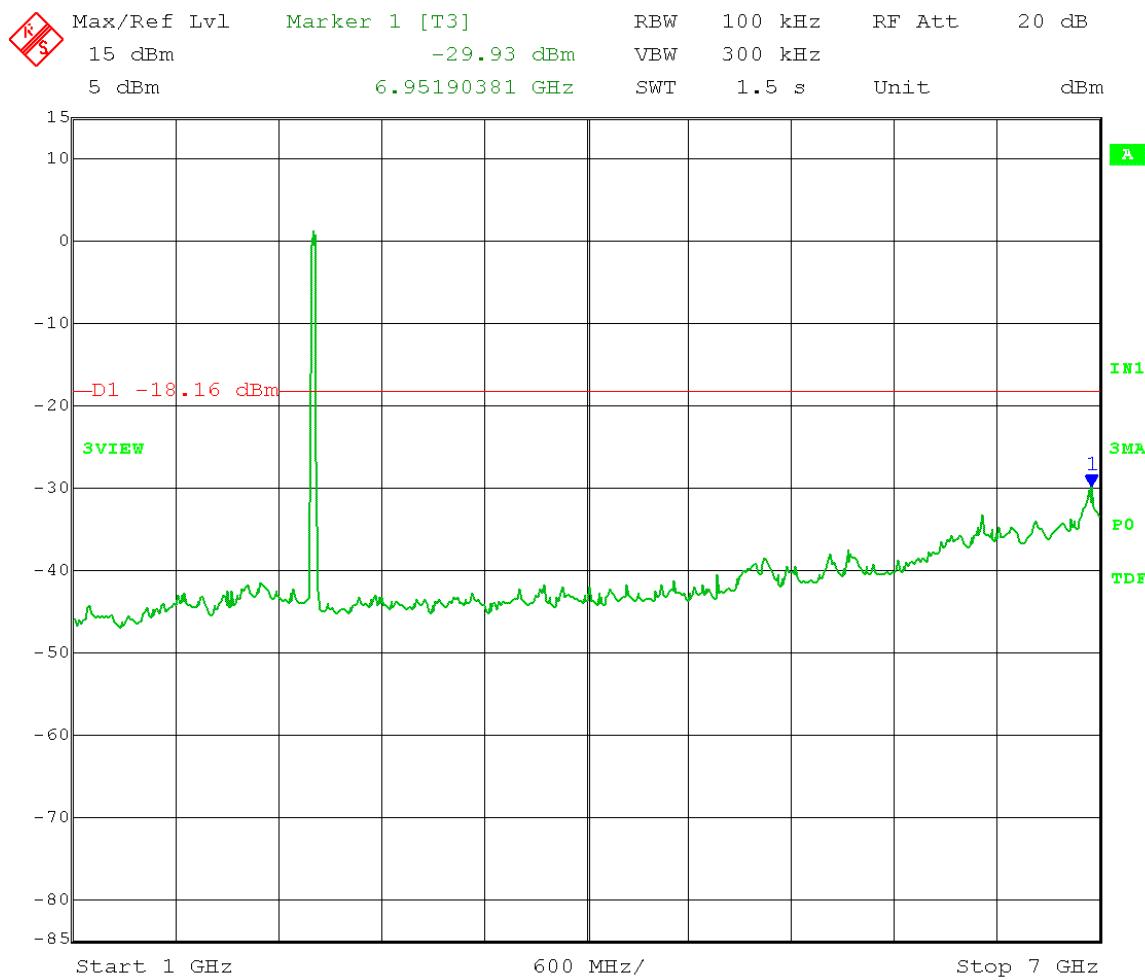
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 1.84 \text{ dBm} - 20 \text{ dB} = -18.16 \text{ dBm}$$

Frequency Range: 1 – 7 GHz



Date: 14.MAR.2016 14:20:14

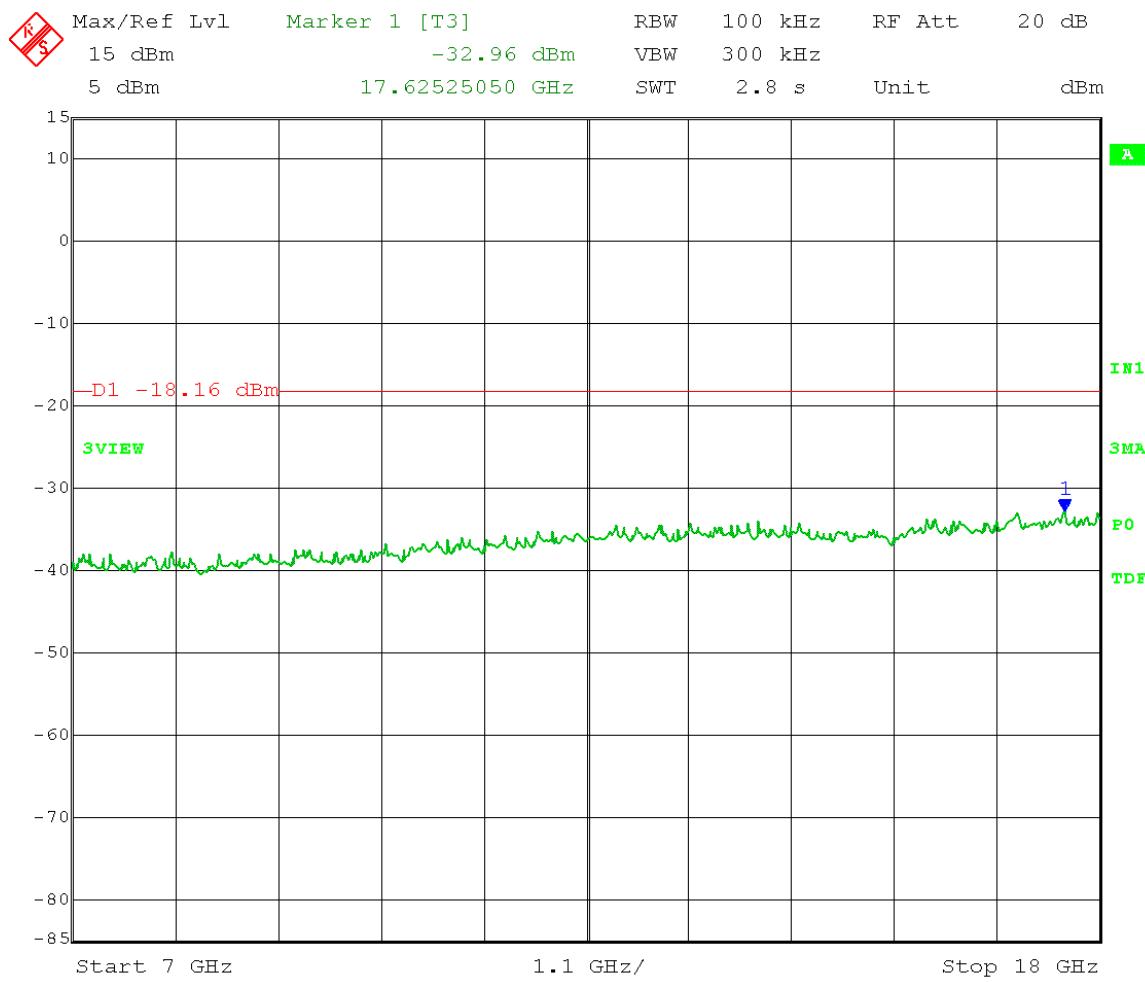
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 1.84 \text{ dBm} - 20 \text{ dB} = -18.16 \text{ dBm}$$

Frequency Range: 7 – 18 GHz



Date: 14.MAR.2016 14:24:02

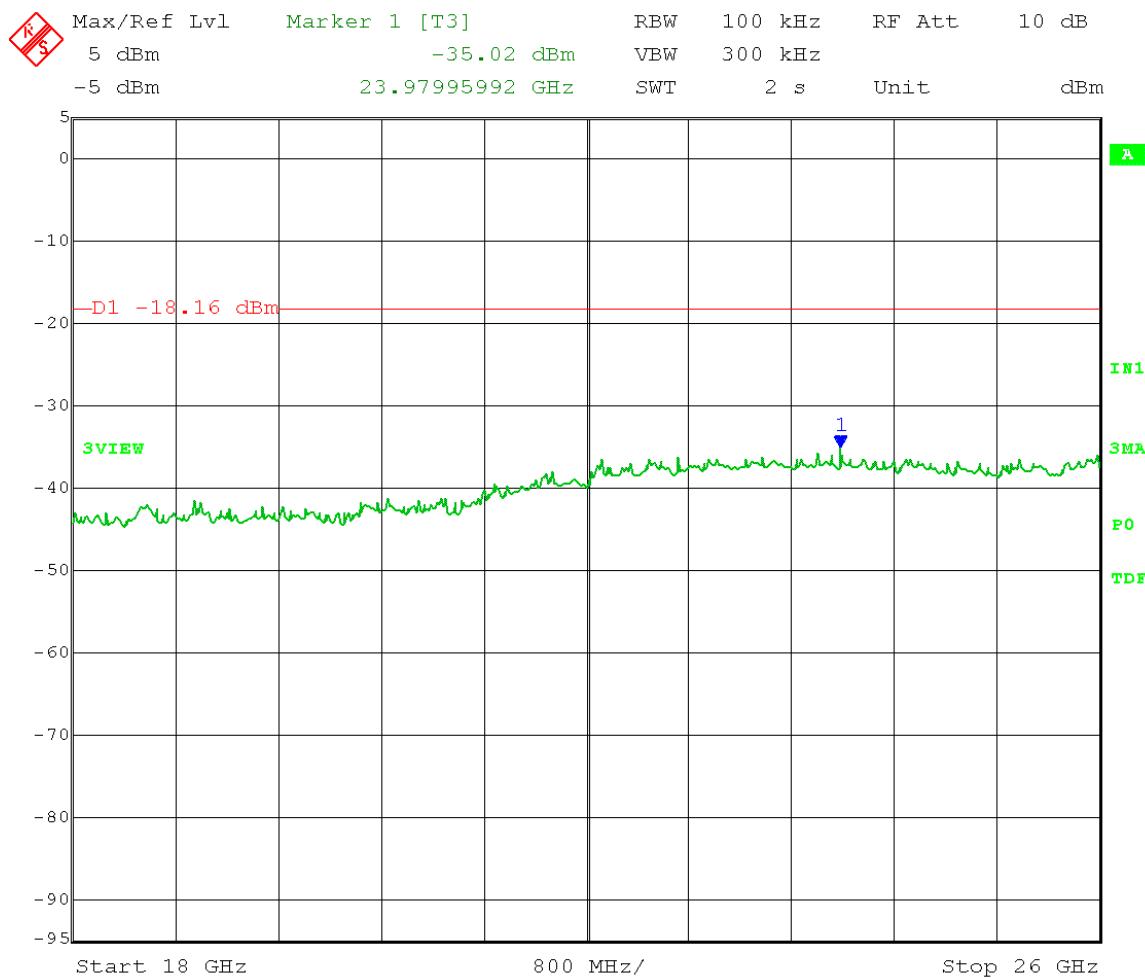
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 1.84 \text{ dBm} - 20 \text{ dB} = -18.16 \text{ dBm}$$

Frequency Range: 18 – 26 GHz



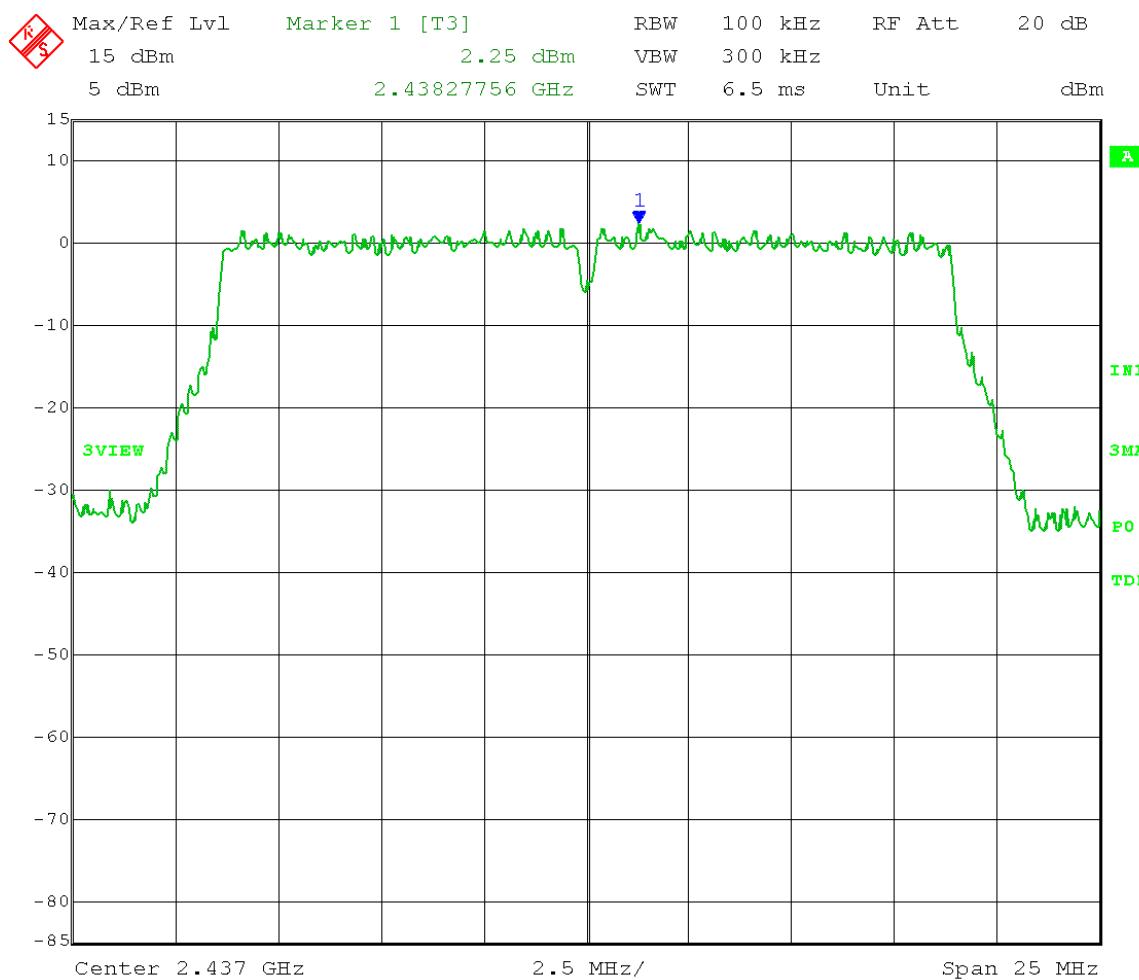
Date: 14.MAR.2016 14:26:08

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Reference Level measurement

$$\text{Limit} = 2.25 \text{ dBm} - 20 \text{ dB} = -17.75 \text{ dBm}$$



Date: 14.MAR.2016 14:34:58

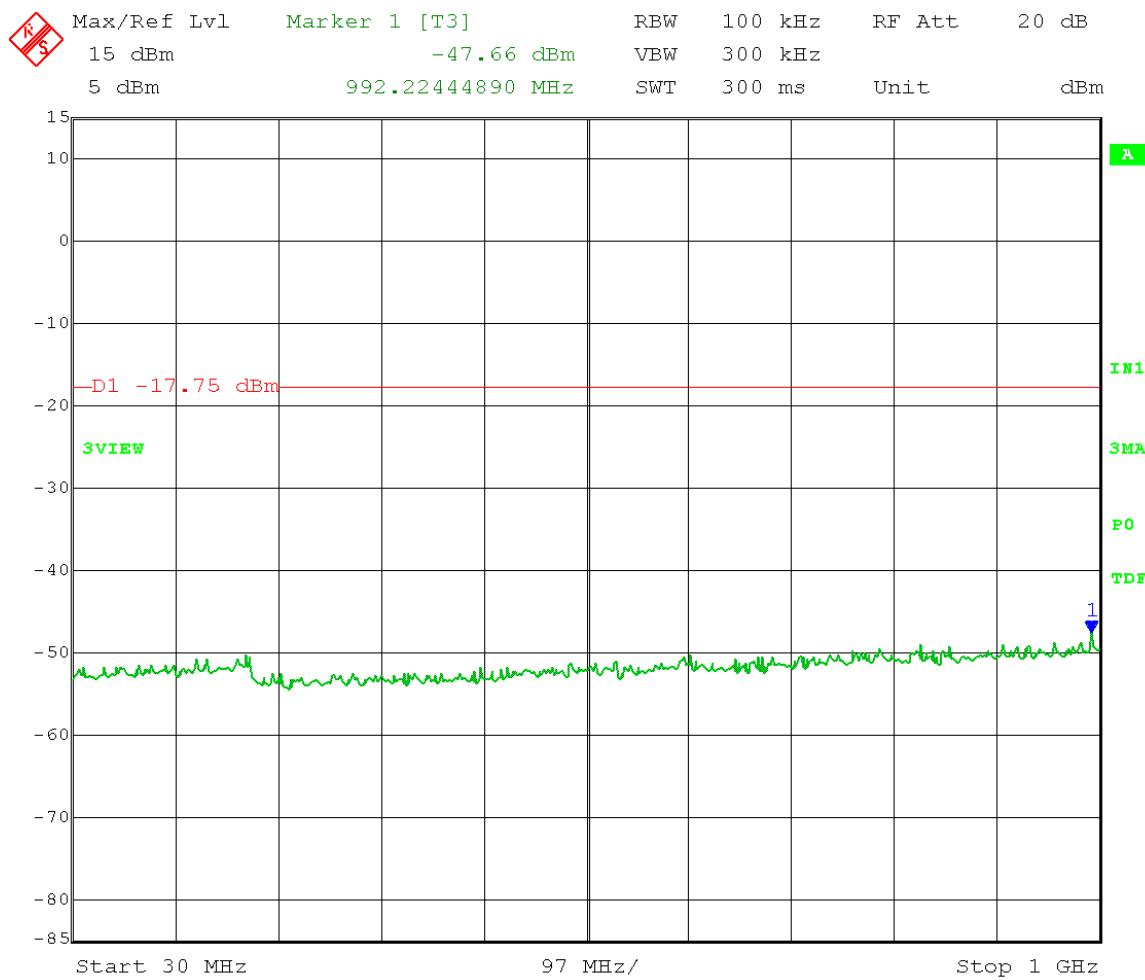
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 2.25 \text{ dBm} - 20 \text{ dB} = -17.75 \text{ dBm}$$

Frequency Range: 30 – 1000 MHz



Date: 14.MAR.2016 14:43:25

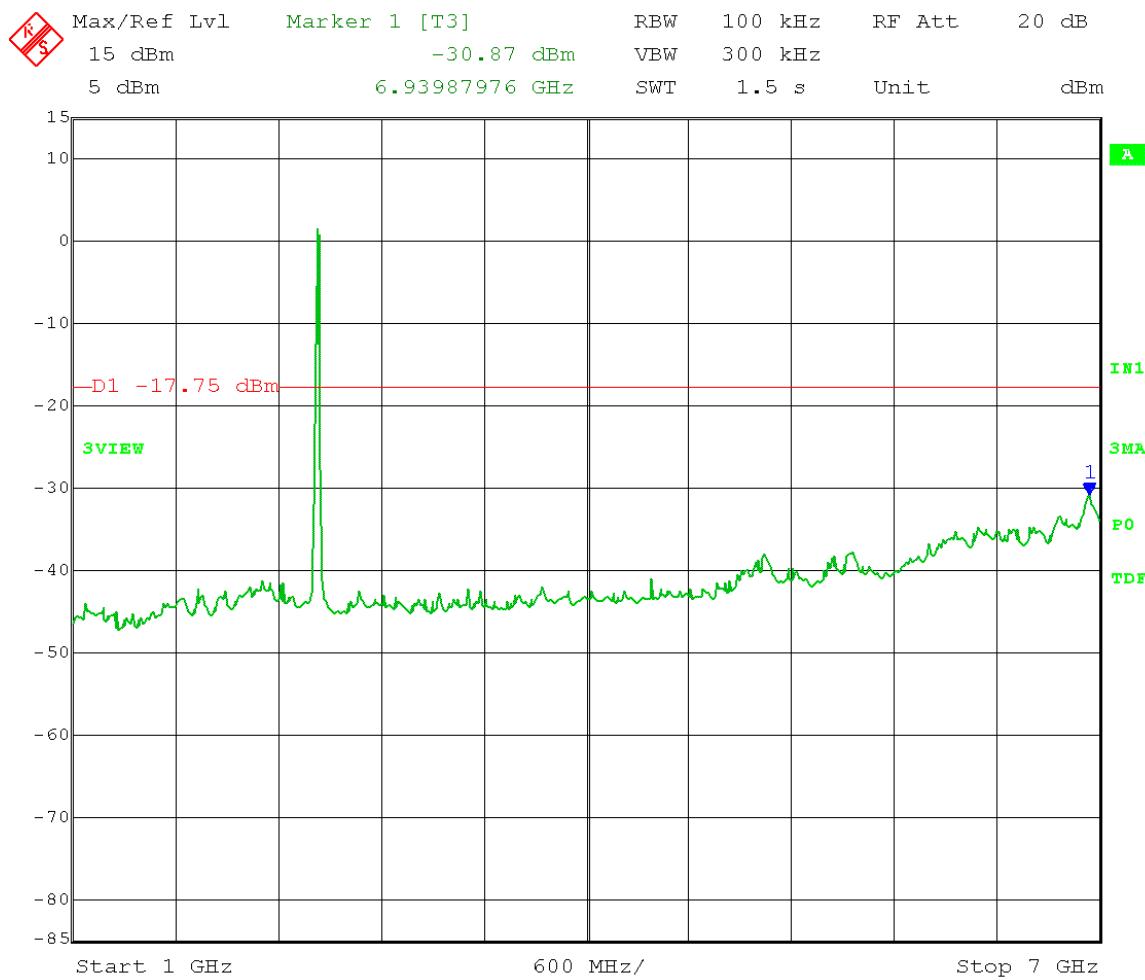
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 2.25 \text{ dBm} - 20 \text{ dB} = -17.75 \text{ dBm}$$

Frequency Range: 1 – 7 GHz



Date: 14.MAR.2016 14:37:40

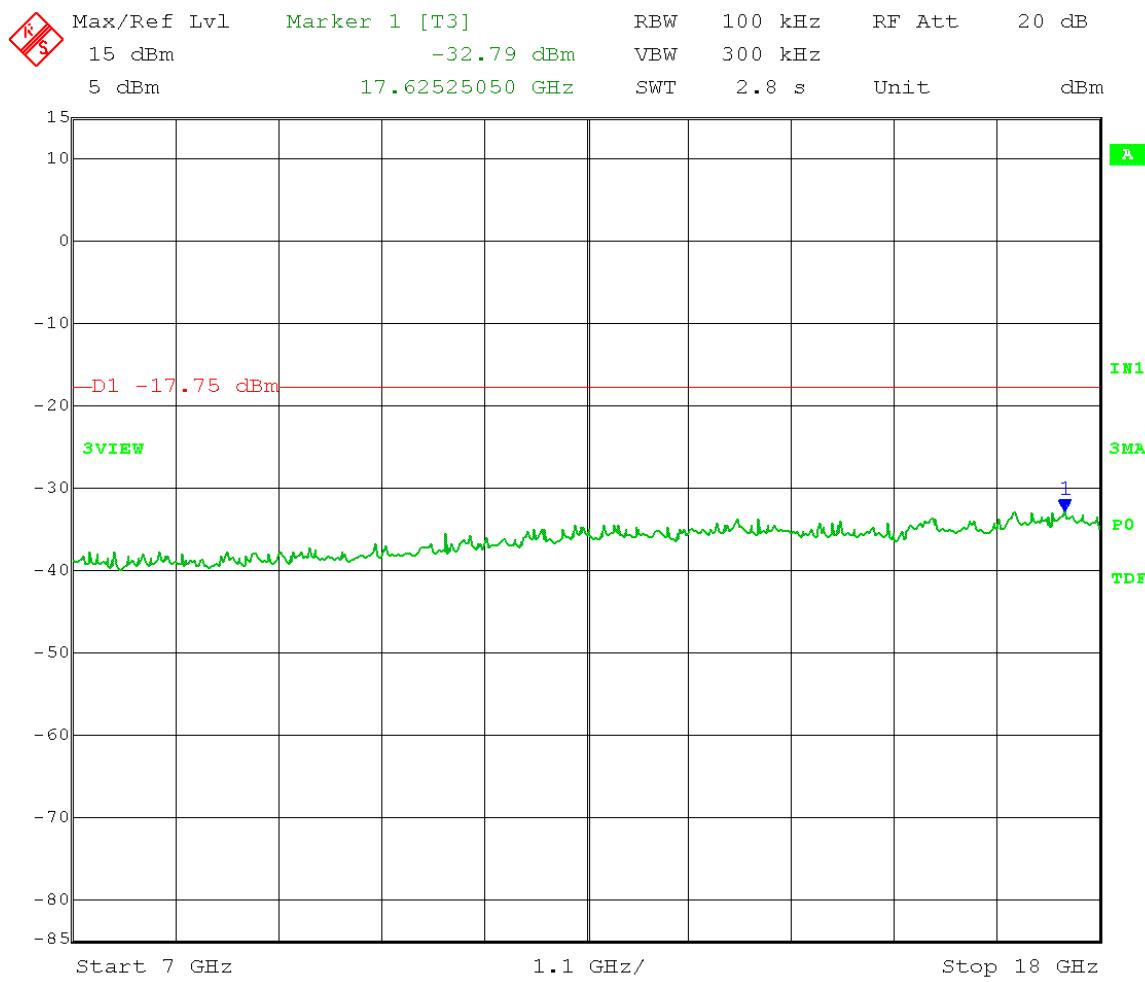
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 2.25 \text{ dBm} - 20 \text{ dB} = -17.75 \text{ dBm}$$

Frequency Range: 7 – 18 GHz



Date: 14.MAR.2016 14:39:59

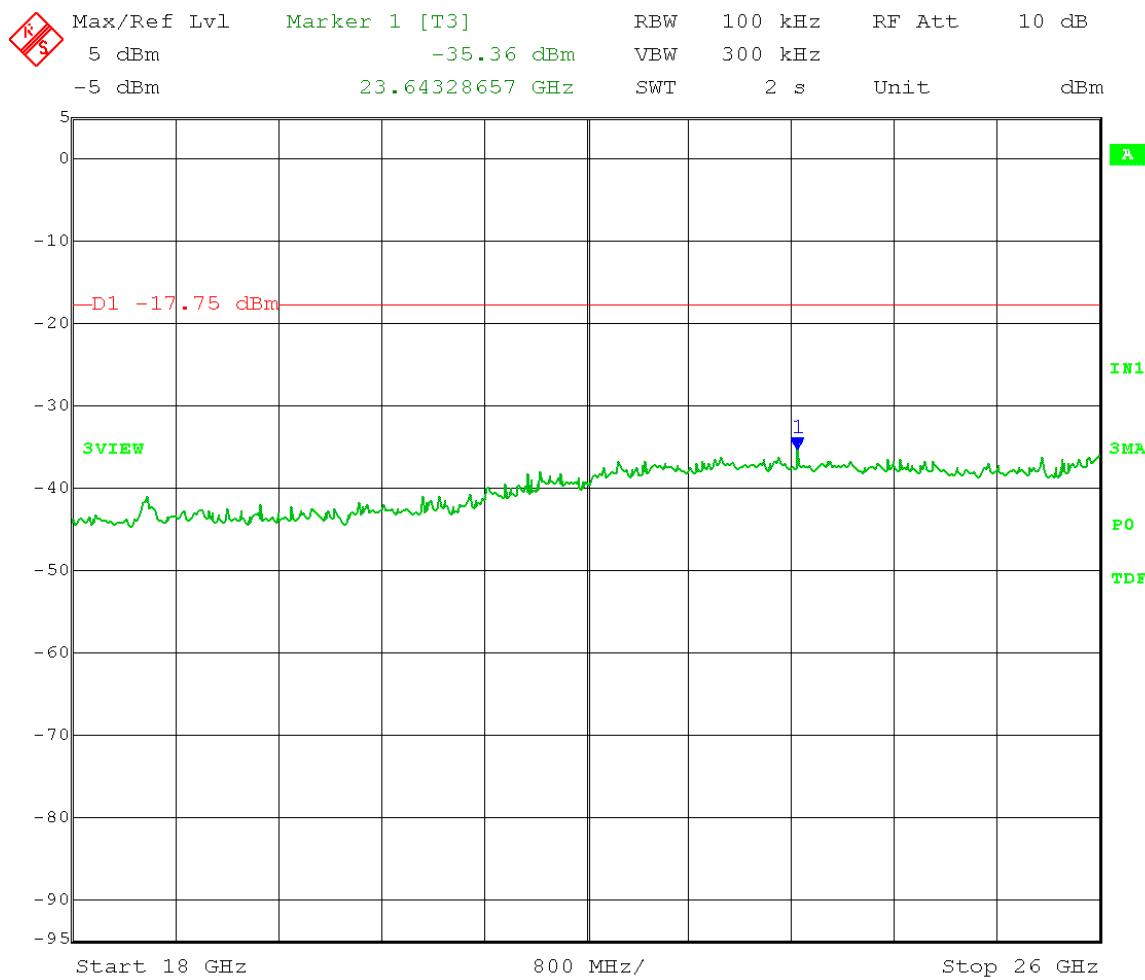
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: Mid, 2437 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 2.25 \text{ dBm} - 20 \text{ dB} = -17.75 \text{ dBm}$$

Frequency Range: 18 – 26 GHz



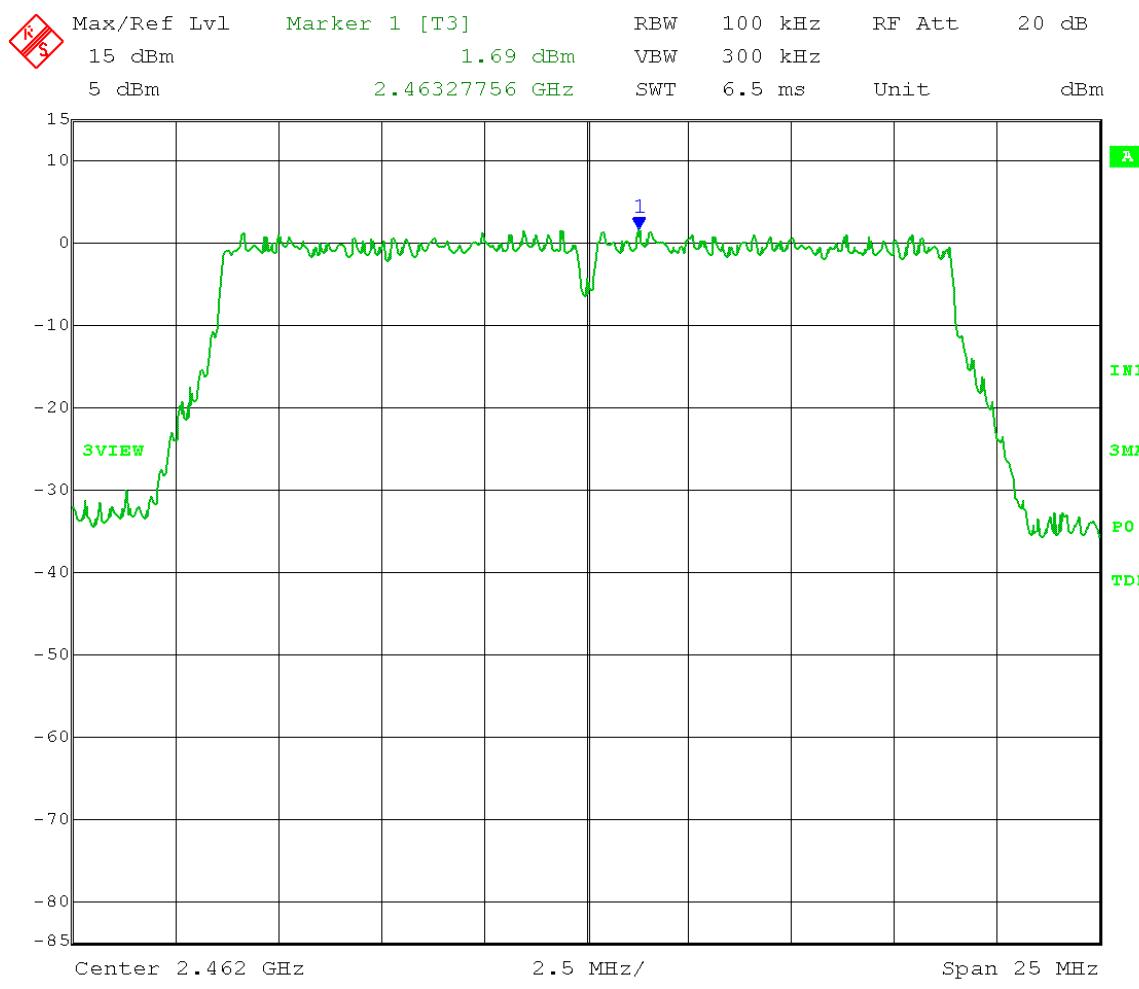
Date: 14.MAR.2016 14:41:32

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Reference Level measurement

$$\text{Limit} = 1.69 \text{ dBm} - 20 \text{ dB} = -18.31 \text{ dBm}$$



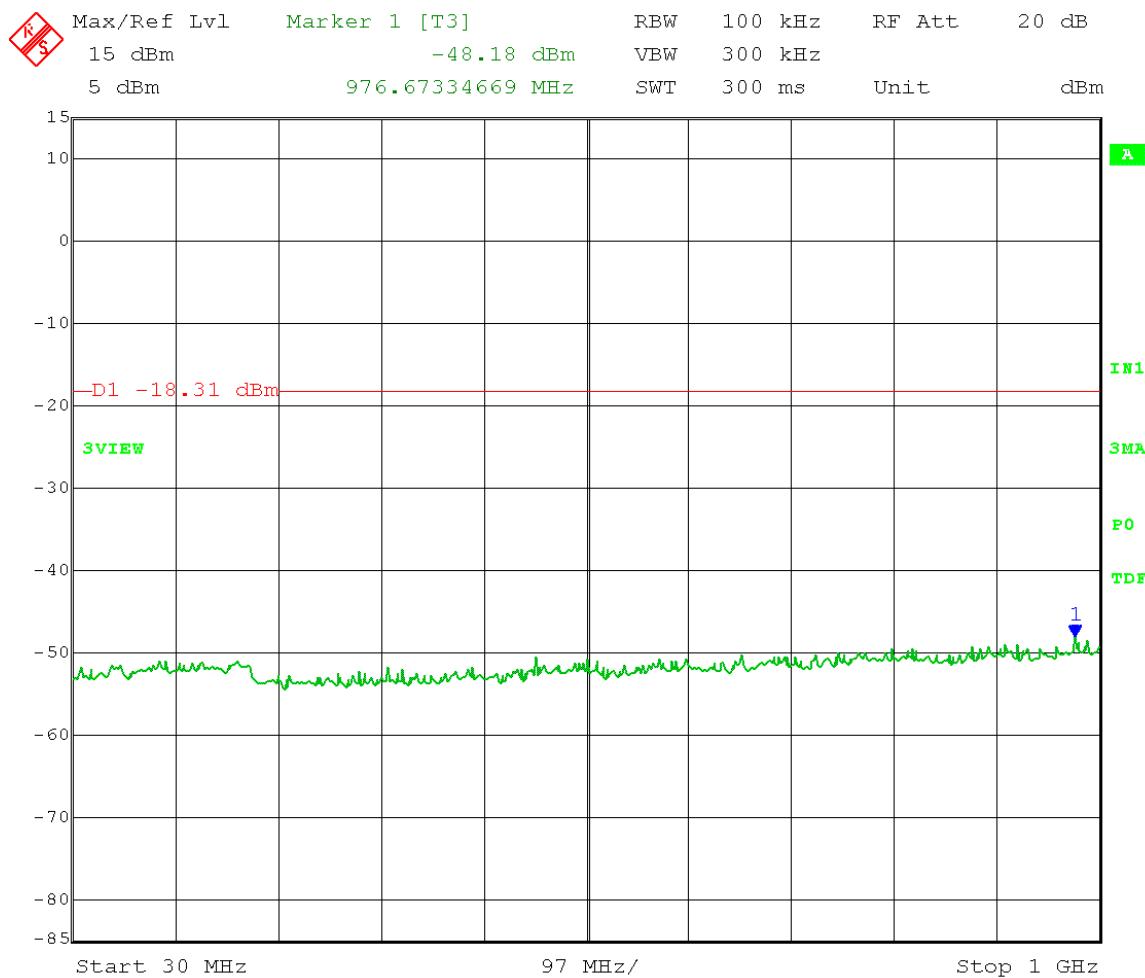
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 1.69 \text{ dBm} - 20 \text{ dB} = -18.31 \text{ dBm}$$

Frequency Range: 30 – 1000 MHz



Date: 14.MAR.2016 14:52:49

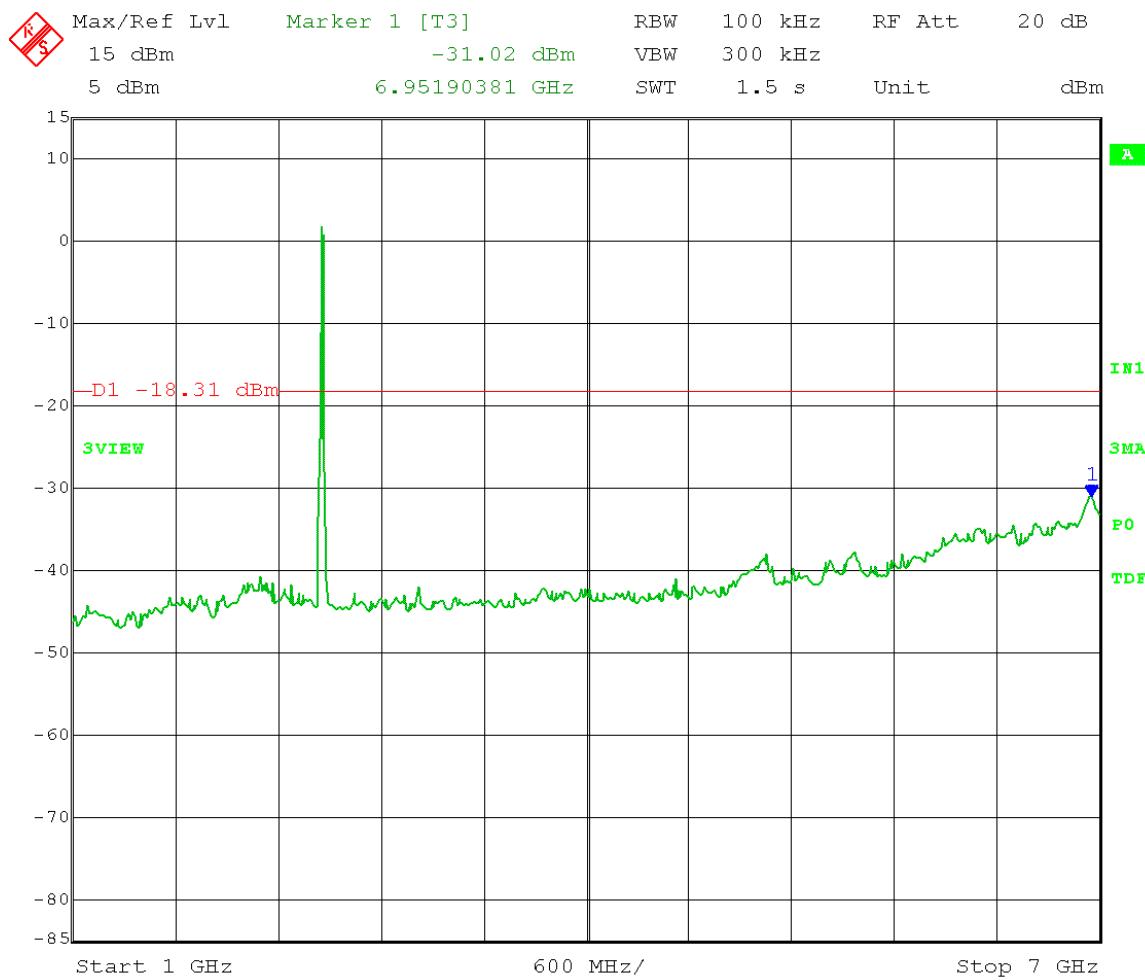
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 1.69 \text{ dBm} - 20 \text{ dB} = -18.31 \text{ dBm}$$

Frequency Range: 1 – 7 GHz



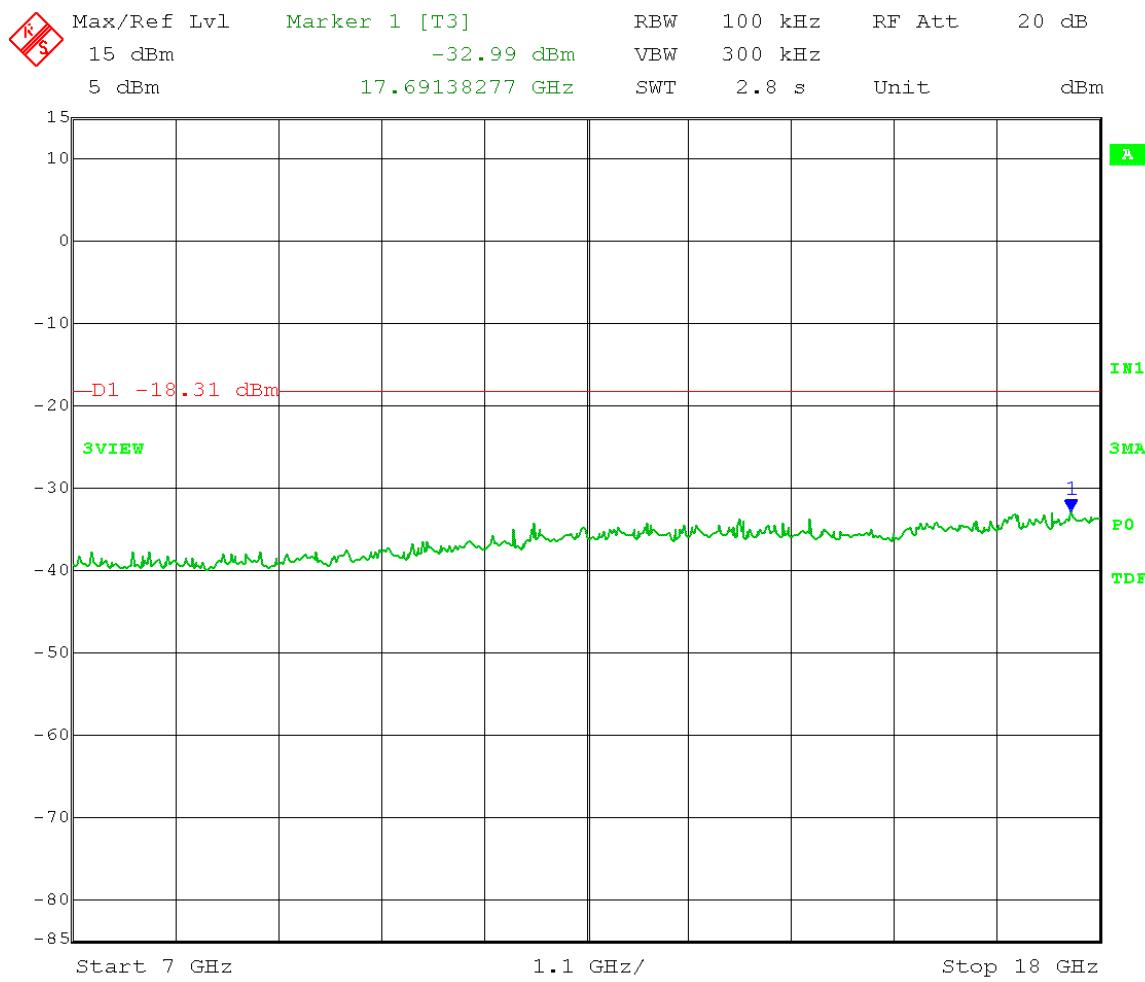
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 1.69 \text{ dBm} - 20 \text{ dB} = -18.31 \text{ dBm}$$

Frequency Range: 7 – 18 GHz



Date: 14.MAR.2016 14:48:57

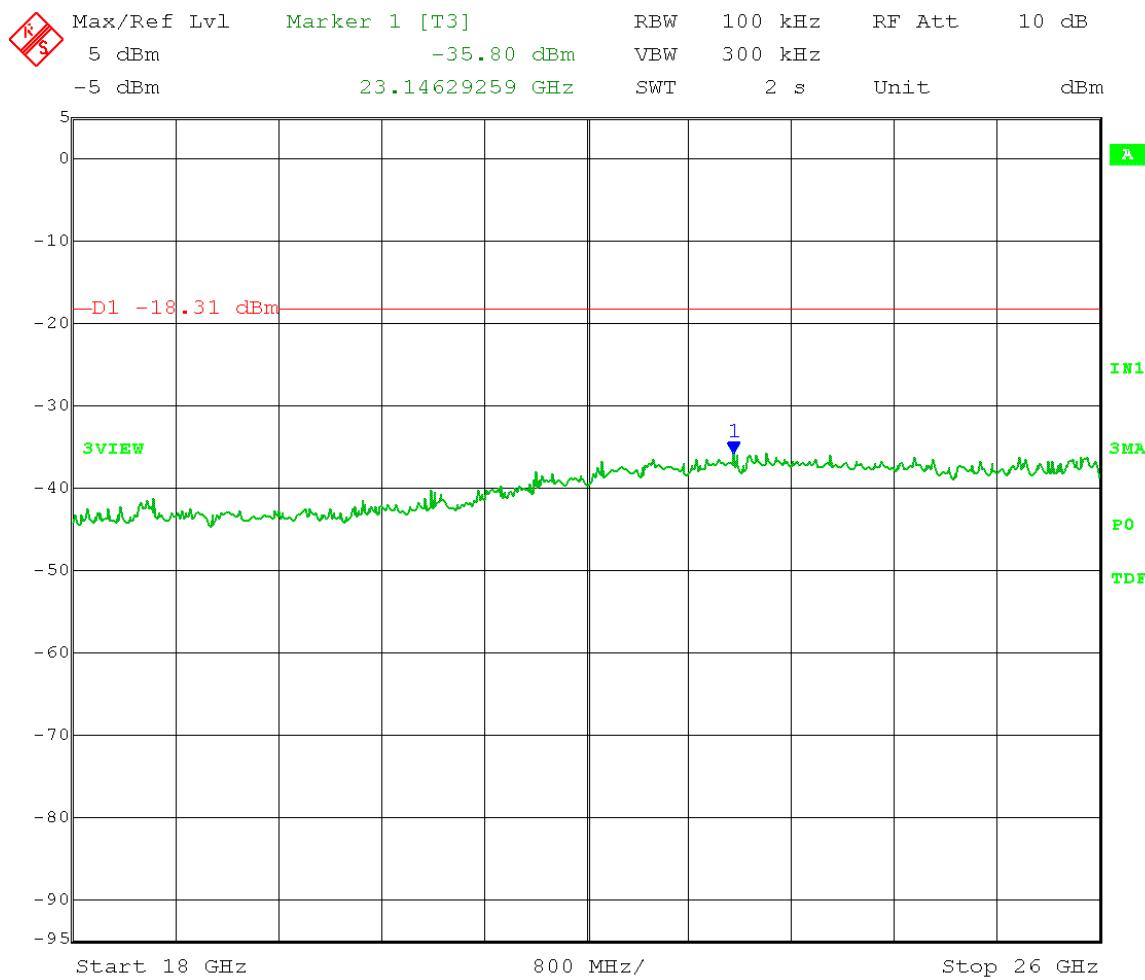
Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted spurious emissions
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Emission Level measurement

$$\text{Limit} = 1.69 \text{ dBm} - 20 \text{ dB} = -18.31 \text{ dBm}$$

Frequency Range: 18 – 26 GHz



Date: 14.MAR.2016 14:50:56



166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Appendix B

B5.0 Emissions in Restricted Frequency Bands – Radiated

Rule Part:

15.247(d), 15.205(a), 15.209(a)

Test Procedure:

ANSI C63.10-2013

11.12 Emissions in Restricted Frequency Bands

11.12.1 Radiated Emissions Measurements

Limit:

15.209(a)

Results:

Compliant

Notes:

Measurements were performed while the EUT was transmitting from on-board antenna number 1. Testing was then repeated with the EUT transmitting from on-board antenna number 2. Testing was also repeated with the EUT transmitting from the external PIFA and F antennas. Testing was performed with 802.11-b 1 Mbps modulation (found to be worst-case) and output power setting 18. The EUT was tested at the low, middle, and high channels of operation. Two versions of the F antenna were tested: Model W10503567 (has a 41 inch long cable), and Model W10806955 Rev A (as a 16.5 inch long cable). Model W10503567 was found to be worst-case and the data shown in the test report for the F antenna is data taken with this worst-case version of the antenna.

Electric Field Strength

EUT: Amber
Manufacturer: Whirlpool Corporation
Operating Condition: 68 deg. F; 32% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B #7620
Test Specification: Radiated Emissions in Restricted Frequency Bands; continuous transmit test mode
Comment: Low, Mid, High channels; 802.11-b, 1 Mbps; On-board antennas 1 & 2
Date: 03-21-2016

TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Sample Equations: Total Level(dB μ V/m) = Level(dB μ V) + System Loss(dB) + Antenna Factor(dB μ V/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin(dB) = Limit(dB μ V/m) - Total Level(dB μ V/m)
15.4 = 40 - 24.6

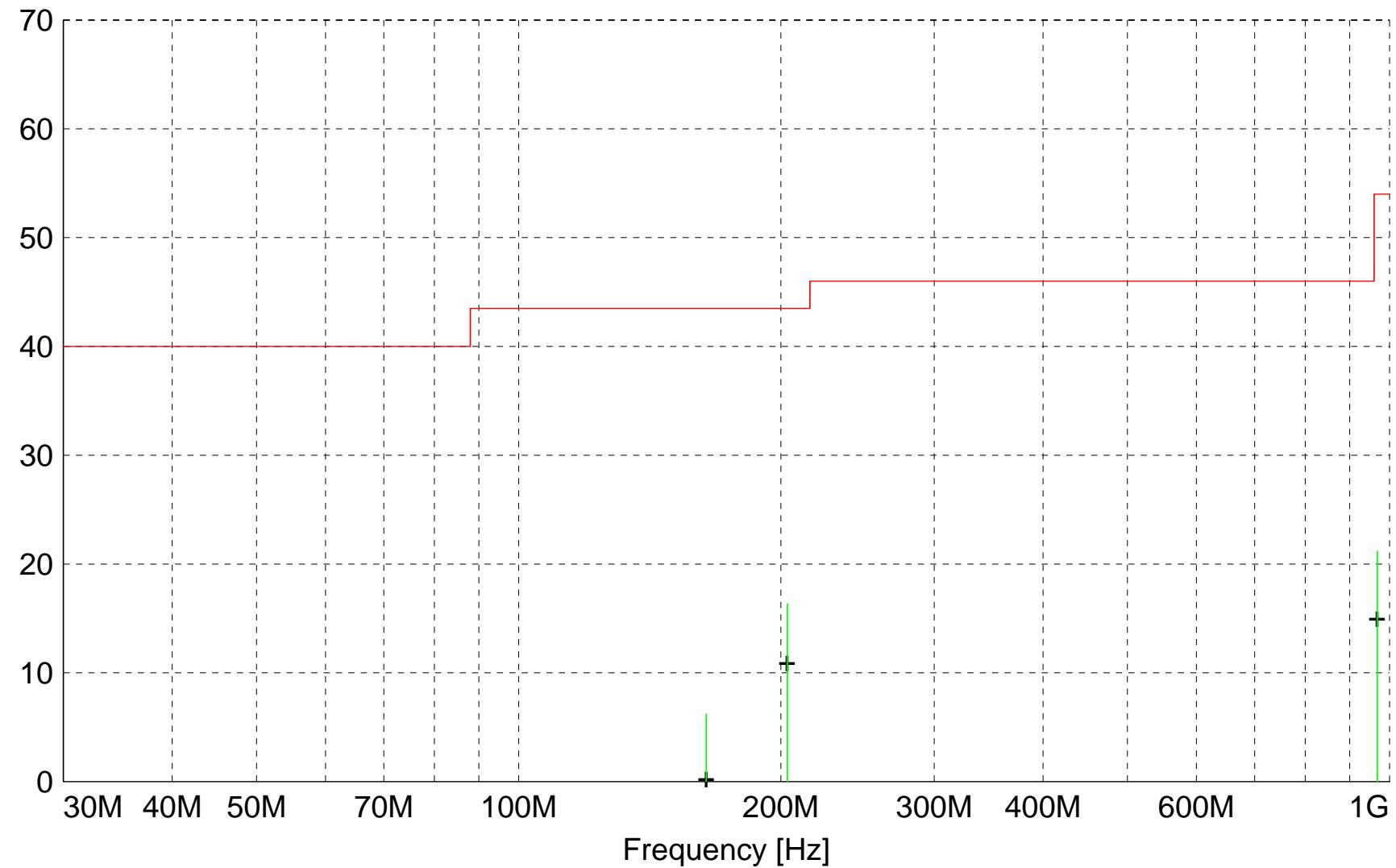
Graph Markers: + Frequency marker (Level of marker not related to final level)

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average detector

Final maximized level using Peak detector

Level [dB μ V/m]



||||| MES A318b_F1H_Quasi-Peak
+ + · MES A318b_F1H_Peak_List
— LIM FCC 15.209 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A318b_F1H_Final"

3/21/2016 10:36AM

Frequency MHz	Level dB μ V	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
		Factor dB μ V/m	Loss dB	Level dB μ V/m	dB μ V/m	dB	Ant. m	Angle deg	Detector	
203.430000	26.97	12.19	-22.8	16.3	43.5	27.2	1.30	0	QUASI-PEAK	None
968.070000	15.37	23.92	-18.1	21.2	54.0	32.8	1.20	190	QUASI-PEAK	noise floor
164.145000	15.63	13.53	-23.0	6.2	43.5	37.3	1.80	30	QUASI-PEAK	noise floor

Electric Field Strength

EUT: Amber
Manufacturer: Whirlpool Corporation
Operating Condition: 68 deg. F; 32% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B #7620
Test Specification: Radiated Emissions in Restricted Frequency Bands; continuous transmit test mode
Comment: Low, Mid, High channels; 802.11-b, 1 Mbps; On-board antennas 1 & 2
Date: 03-21-2016

TEXT: "Vert 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations: Total Level(dB μ V/m) = Level(dB μ V) + System Loss(dB) + Antenna Factor(dB μ V/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin(dB) = Limit(dB μ V/m) - Total Level(dB μ V/m)
15.4 = 40 - 24.6

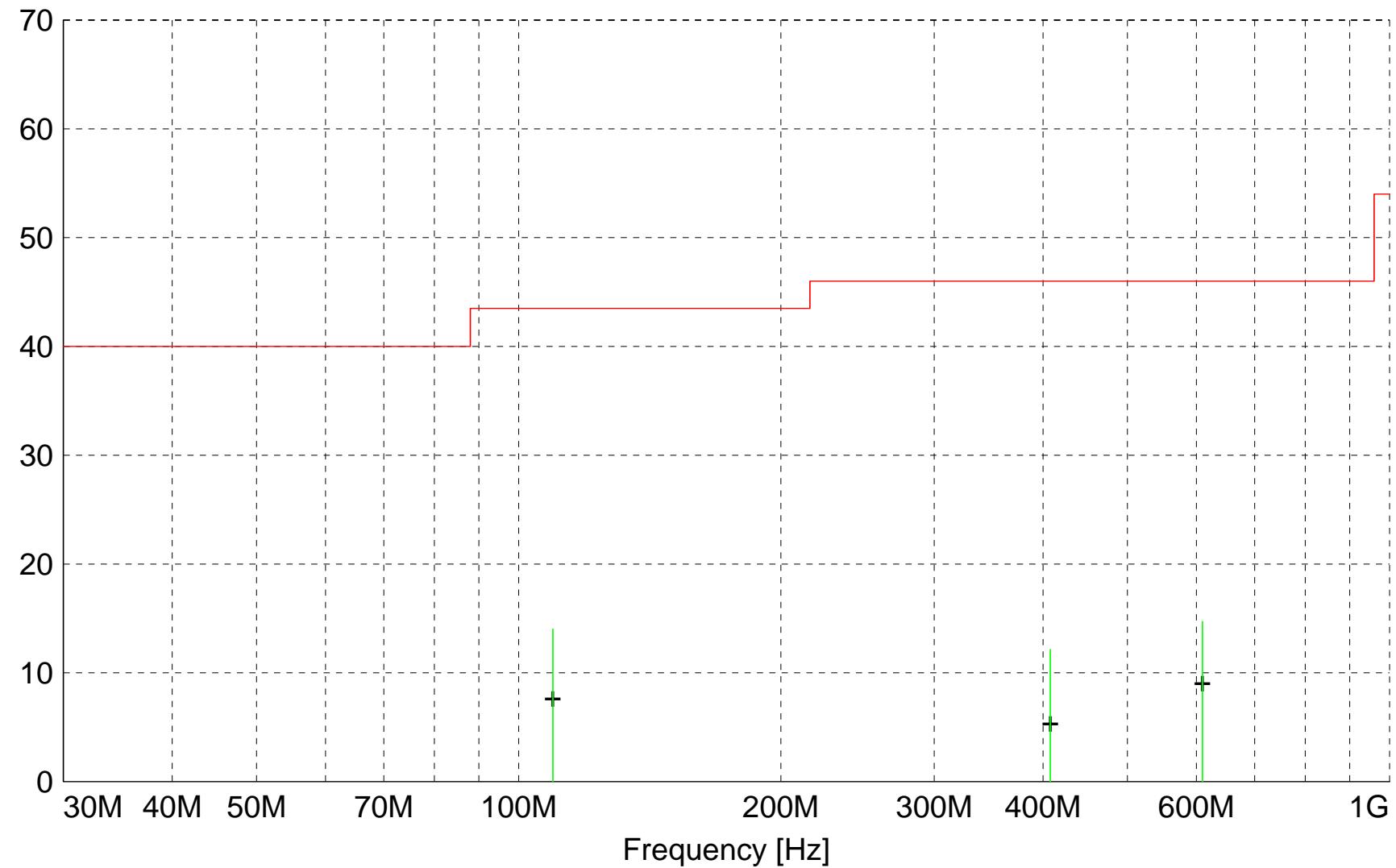
Graph Markers: + Frequency marker (Level of marker not related to final level)

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average detector

Final maximized level using Peak detector

Level [dB μ V/m]



||||| MES A318b_F1V_Quasi-Peak

++ · MES A318b_F1V_Peak_List

— LIM FCC 15.209 3m

Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A318b_F1V_Final"

3/21/2016 10:12AM

Frequency MHz	Level dB μ V	Antenna Factor	System Loss dB	Total dB μ V/m	Limit dB μ V/m	Margin dB	Height		EuT Ant. m	Final Angle deg	Comment Detector
							Margin dB	Height m			
109.455000	25.75	11.89	-23.6	14.0	43.5	29.5	1.00	0	QUASI-PEAK	noise	floor
609.610000	16.19	19.48	-21.0	14.7	46.0	31.3	1.00	0	QUASI-PEAK	noise	floor
407.760000	18.13	15.74	-21.7	12.1	46.0	33.9	1.00	90	QUASI-PEAK	noise	floor

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **Low channel: 2.412 GHz, 802.11-b, DSSS, 1 Mbps; with On-board antenna #1**

Date: 03-23-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.824	Max Peak	Vert	51.73	32.88	-36.3	48.3	74	25.7	1.6	133	Restricted Band
4.824	Average	Vert	44.88	32.88	-36.3	41.5	54	12.5	1.6	133	Restricted Band
4.824	Max Peak	Horz	51.23	32.88	-36.3	47.8	74	26.2	1.2	72	Restricted Band
4.824	Average	Horz	42.67	32.88	-36.3	39.3	54	14.8	1.2	72	Restricted Band

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **Mid channel: 2.437 GHz, 802.11-b, DSSS, 1 Mbps; with On-board antenna #1**

Date: 03-23-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.874	Max Peak	Vert	53.04	32.98	-36.4	49.6	74	24.4	1.6	129	Restricted Band
4.874	Average	Vert	46.75	32.98	-36.4	43.3	54	10.7	1.6	129	Restricted Band
4.874	Max Peak	Horz	51.98	32.98	-36.4	48.6	74	25.4	1.6	326	Restricted Band
4.874	Average	Horz	45.04	32.98	-36.4	41.6	54	12.4	1.6	326	Restricted Band

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **High channel: 2.462 GHz, 802.11-b, DSSS, 1 Mbps; with On-board antenna #1**

Date: 03-23-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.924	Max Peak	Vert	52.70	33.05	-36.4	49.4	74	24.7	1.5	131	Restricted Band
4.924	Average	Vert	46.46	33.05	-36.4	43.1	54	10.9	1.5	131	Restricted Band
4.924	Max Peak	Horz	52.11	33.05	-36.4	48.8	74	25.2	1.6	323	Restricted Band
4.924	Average	Horz	44.46	33.05	-36.4	41.1	54	12.9	1.6	323	Restricted Band

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **Low channel: 2.412 GHz, 802.11-b, DSSS, 1 Mbps; with On-board antenna #2**

Date: 03-22-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.824	Max Peak	Vert	51.51	32.88	-36.3	48.1	74	25.9	1.8	135	Restricted Band
4.824	Average	Vert	42.96	32.88	-36.3	39.5	54	14.5	1.8	135	Restricted Band
4.824	Max Peak	Horz	50.48	32.88	-36.3	47.1	74	26.9	1.5	325	Restricted Band
4.824	Average	Horz	40.84	32.88	-36.3	37.4	54	16.6	1.5	325	Restricted Band

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **Mid channel: 2.437 GHz, 802.11-b, DSSS, 1 Mbps; with On-board antenna #2**

Date: 03-22-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.874	Max Peak	Vert	51.63	32.98	-36.4	48.2	74	25.8	1.8	136	Restricted Band
4.874	Average	Vert	43.8	32.98	-36.4	40.4	54	13.6	1.8	136	Restricted Band
4.874	Max Peak	Horz	51.26	32.98	-36.4	47.8	74	26.2	1.8	58	Restricted Band
4.874	Average	Horz	41.74	32.98	-36.4	38.3	54	15.7	1.8	58	Restricted Band

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **High channel: 2.462 GHz, 802.11-b, DSSS, 1 Mbps; with On-board antenna #2**

Date: 03-22-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.924	Max Peak	Vert	50.84	33.05	-36.4	47.5	74	26.5	2.2	149	Restricted Band
4.924	Average	Vert	42.18	33.05	-36.4	38.8	54	15.2	2.2	149	Restricted Band
4.924	Max Peak	Horz	50.61	33.05	-36.4	47.3	74	26.7	1.7	321	Restricted Band
4.924	Average	Horz	41.56	33.05	-36.4	38.2	54	15.8	1.7	321	Restricted Band

Electric Field Strength

EUT: Amber
Manufacturer: Whirlpool Corporation
Operating Condition: 68 deg. F; 32% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B #7620
Test Specification: Radiated Emissions in Restricted Frequency Bands
Comment: Low, Mid, High channels; 802.11-b, 1 Mbps; PIFA antenna
Date: 03-18-2016

TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Sample Equations: Total Level(dB μ V/m) = Level(dB μ V) + System Loss(dB) + Antenna Factor(dB μ V/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin(dB) = Limit(dB μ V/m) - Total Level(dB μ V/m)
15.4 = 40 - 24.6

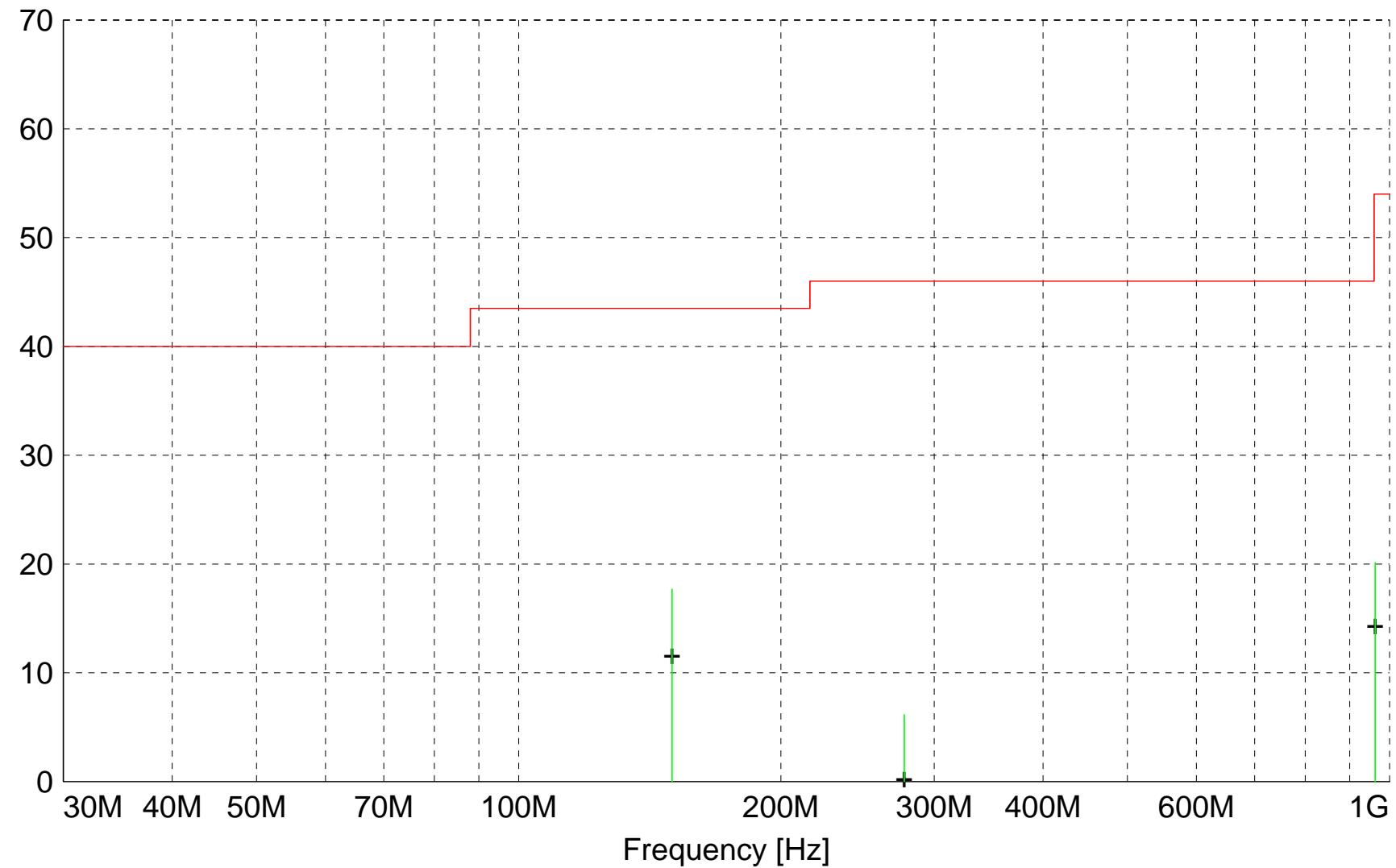
Graph Markers: + Frequency marker (Level of marker not related to final level)

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average detector

Final maximized level using Peak detector

Level [dB μ V/m]



||||| MES A318a_F1H_Quasi-Peak
+ + · MES A318a_F1H_Peak_List
— LIM FCC 15.209 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A318a_F1H_Final"

3/18/2016 1:56PM

Frequency MHz	Level dB μ V	Antenna Factor	System Loss dB	Total dB μ V/m	Limit dB μ V/m	Margin dB	Height		EuT Ant. m	Final Angle deg	Comment Detector
							Height m	EuT Angle deg			
150.015000	29.00	12.00	-23.3	17.7	43.5	25.8	1.30	190	QUASI-PEAK	None	
962.470000	14.70	23.70	-18.3	20.1	54.0	33.9	1.20	0	QUASI-PEAK	noise floor	
277.230000	15.29	13.29	-22.4	6.2	46.0	39.8	1.60	180	QUASI-PEAK	noise floor	

Electric Field Strength

EUT: Amber
Manufacturer: Whirlpool Corporation
Operating Condition: 68 deg. F; 32% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B #7620
Test Specification: Radiated Emissions in Restricted Frequency Bands
Comment: Low, Mid, High channels; 802.11-b, 1 Mbps; PIFA antenna
Date: 03-18-2016

TEXT: "Vert 3 meters"

Short Description: Test Set-up

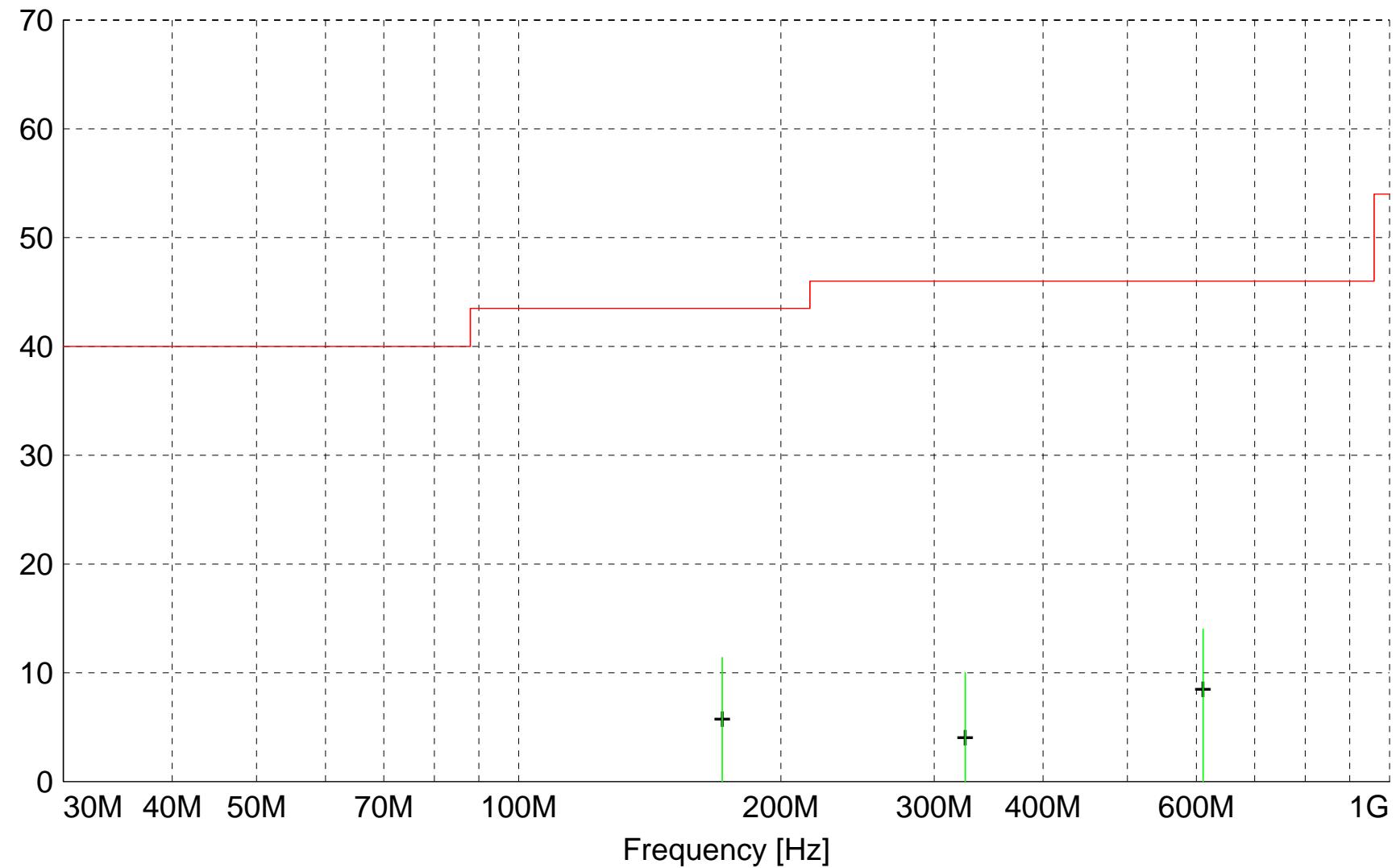
Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations: Total Level(dB μ V/m) = Level(dB μ V) + System Loss(dB) + Antenna Factor(dB μ V/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin(dB) = Limit(dB μ V/m) - Total Level(dB μ V/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector

Level [dB μ V/m]



||||| MES A318a_F1V_Quasi-Peak
+ + · MES A318a_F1V_Peak_List
— LIM FCC 15.209 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A318a_F1V_Final"

3/18/2016 1:38PM

Frequency MHz	Level dB μ V	Antenna Factor	System Loss dB	Total dB μ V/m	Limit dB μ V/m	Margin dB	Height		EuT Ant. m	Final Angle deg	Comment Detector
							Margin dB	Height m			
610.720000	15.44	19.54	-20.9	14.0	46.0	32.0	1.00	135	QUASI-PEAK	noise	floor
171.300000	19.55	14.83	-23.0	11.4	43.5	32.1	1.00	0	QUASI-PEAK	noise	floor
325.760000	17.65	14.38	-22.0	10.0	46.0	36.0	1.00	225	QUASI-PEAK	noise	floor

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **Low channel: 2.412 GHz, 802.11-b, DSSS, 1 Mbps; with external PIFA antenna**

Date: 03-23-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.824	Max Peak	Vert	53.13	32.88	-36.3	49.7	74	24.3	1.7	234	Restricted Band
4.824	Average	Vert	47.38	32.88	-36.3	44.0	54	10.0	1.7	234	Restricted Band
4.824	Max Peak	Horz	52.04	32.88	-36.3	48.6	74	25.4	1.0	173	Restricted Band
4.824	Average	Horz	45.14	32.88	-36.3	41.7	54	12.3	1.0	173	Restricted Band

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **Mid channel: 2.437 GHz, 802.11-b, DSSS, 1 Mbps; with external PIFA antenna**

Date: 03-23-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.874	Max Peak	Vert	54.06	32.98	-36.4	50.6	74	23.4	1.8	231	Restricted Band
4.874	Average	Vert	48.94	32.98	-36.4	45.5	54	8.5	1.8	231	Restricted Band
4.874	Max Peak	Horz	53.39	32.98	-36.4	50.0	74	24.0	1.6	309	Restricted Band
4.874	Average	Horz	47.86	32.98	-36.4	44.4	54	9.6	1.6	309	Restricted Band
7.311	Max Peak	Vert	50.51	36.44	-33.6	53.4	74	20.7	2.3	351	Restricted Band
7.311	Average	Vert	41.74	36.44	-33.6	44.6	54	9.4	2.3	351	Restricted Band
7.311	Max Peak	Horz	51.28	36.44	-33.6	54.1	74	19.9	1.8	22	Restricted Band
7.311	Average	Horz	41.63	36.44	-33.6	44.5	54	9.5	1.8	22	Restricted Band

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **High channel: 2.462 GHz, 802.11-b, DSSS, 1 Mbps; with external PIFA antenna**

Date: 03-23-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.924	Max Peak	Vert	54.73	33.05	-36.4	51.4	74	22.6	1.6	230	Restricted Band
4.924	Average	Vert	50.17	33.05	-36.4	46.8	54	7.2	1.6	230	Restricted Band
4.924	Max Peak	Horz	54.6	33.05	-36.4	51.3	74	22.8	1.5	317	Restricted Band
4.924	Average	Horz	49.63	33.05	-36.4	46.3	54	7.7	1.5	317	Restricted Band
7.386	Max Peak	Vert	51.41	36.60	-32.9	55.1	74	18.9	2.3	356	Restricted Band
7.386	Average	Vert	42.46	36.60	-32.9	46.2	54	7.8	2.3	356	Restricted Band
7.386	Max Peak	Horz	50.38	36.60	-32.9	54.1	74	19.9	1.5	29	Restricted Band
7.386	Average	Horz	41.48	36.60	-32.9	45.2	54	8.8	1.5	29	Restricted Band

Electric Field Strength

EUT: Amber
Manufacturer: Whirlpool Corporation
Operating Condition: 69 deg. F; 28% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B #7620
Test Specification: Radiated Emissions in Restricted Frequency Bands; continuous transmit test mode
Comment: Low, Mid, High channels; 802.11-b, 1 Mbps; F antenna
Date: 03-21-2016

TEXT: "Horz 3 meters"

Short Description: Test Set-up

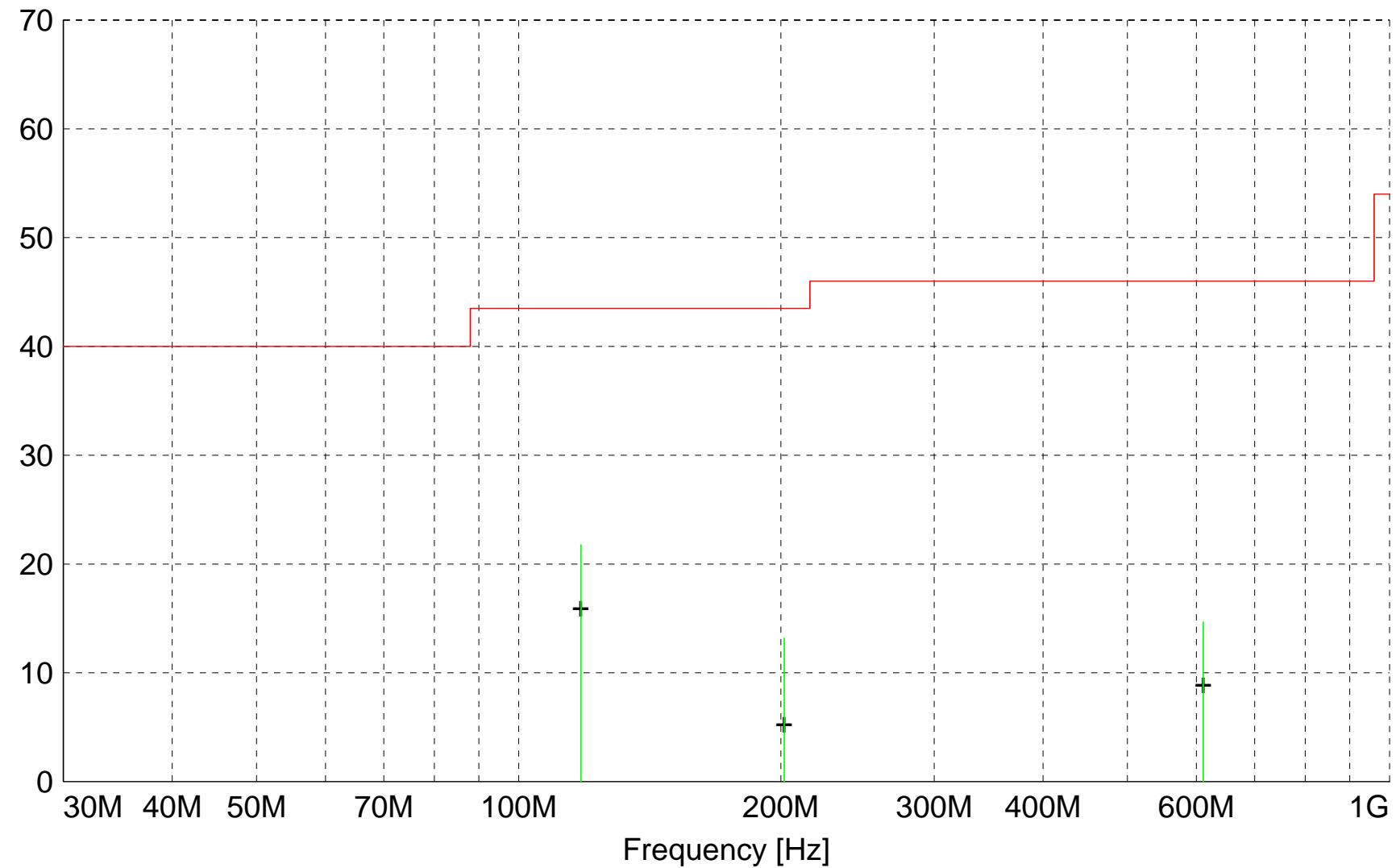
Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Sample Equations: Total Level(dB μ V/m) = Level(dB μ V) + System Loss(dB) + Antenna Factor(dB μ V/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin(dB) = Limit(dB μ V/m) - Total Level(dB μ V/m)
15.4 = 40 - 24.6

Graph Markers: + Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average detector
Final maximized level using Peak detector

Level [dB μ V/m]



||||| MES A318c_F1H_Quasi-Peak
+ + · MES A318c_F1H_Peak_List
— LIM FCC 15.209 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A318c_F1H_Final"

3/21/2016 2:46PM

Frequency MHz	Level dB μ V	Antenna Factor dB μ V/m	System Loss dB	Total Level dB μ V/m	Limit dB μ V/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
117.890000	32.32	12.90	-23.4	21.8	43.5	21.7	1.70	0	QUASI-PEAK	None
201.810000	23.74	12.29	-22.8	13.2	43.5	30.3	1.00	225	QUASI-PEAK	None
611.000000	16.08	19.56	-20.9	14.7	46.0	31.3	1.30	0	QUASI-PEAK	noise floor

Electric Field Strength

EUT: Amber
Manufacturer: Whirlpool Corporation
Operating Condition: 69 deg. F; 28% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B #7620
Test Specification: Radiated Emissions in Restricted Frequency Bands; continuous transmit test mode
Comment: Low, Mid, High channels; 802.11-b, 1 Mbps; F antenna
Date: 03-21-2016

TEXT: "Vert 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations: Total Level(dB μ V/m) = Level(dB μ V) + System Loss(dB) + Antenna Factor(dB μ V/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin(dB) = Limit(dB μ V/m) - Total Level(dB μ V/m)
15.4 = 40 - 24.6

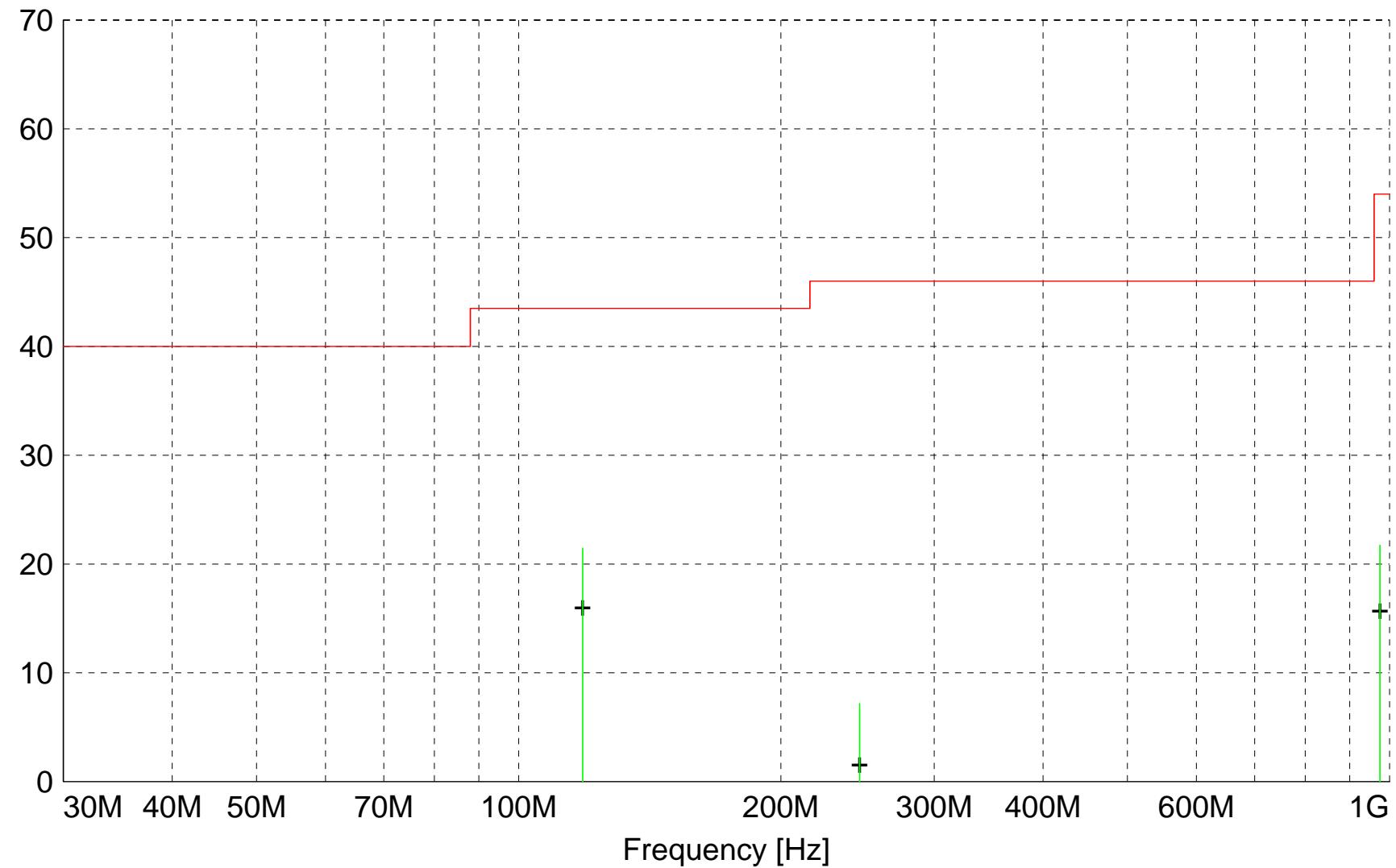
Graph Markers: + Frequency marker (Level of marker not related to final level)

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average detector

Final maximized level using Peak detector

Level [dB μ V/m]



||||| MES A318c_F1V_Quasi-Peak
+ + · MES A318c_F1V_Peak_List
— LIM FCC 15.209 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A318c_F1V_Final"

3/21/2016 2:26PM

Frequency MHz	Level dB μ V	Antenna Factor	System Loss dB	Total Level dB μ V/m	Limit dB μ V/m	Margin dB	Height		EuT Ant. m	Final Angle deg	Comment Detector
							Ant.	m			
118.400000	31.92	12.98	-23.4	21.5	43.5	22.0	1.00	180	QUASI-PEAK	None	
974.790000	15.46	24.19	-17.9	21.7	54.0	32.3	1.00	0	QUASI-PEAK	noise floor	
246.260000	17.71	11.95	-22.5	7.2	46.0	38.8	1.00	45	QUASI-PEAK	noise floor	

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **Low channel: 2.412 GHz, 802.11-b, DSSS, 1 Mbps; with external F antenna**

Date: 03-24-2016 & 04-04-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.824	Max Peak	Vert	53.36	32.88	-36.3	49.9	74	24.1	1.6	133	Restricted Band
4.824	Average	Vert	47.32	32.88	-36.3	43.9	54	10.1	1.6	133	Restricted Band
4.824	Max Peak	Horz	53.29	32.88	-36.3	49.9	74	24.1	1.7	196	Restricted Band
4.824	Average	Horz	47.24	32.88	-36.3	43.8	54	10.2	1.7	196	Restricted Band

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **Mid channel: 2.437 GHz, 802.11-b, DSSS, 1 Mbps; with external F antenna**

Date: 03-24-2016 & 04-04-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.874	Max Peak	Vert	53.09	32.98	-36.4	49.7	74	24.3	1.6	160	Restricted Band
4.874	Average	Vert	47.28	32.98	-36.4	43.9	54	10.1	1.6	160	Restricted Band
4.874	Max Peak	Horz	51.75	32.98	-36.4	48.3	74	25.7	1.3	217	Restricted Band
4.874	Average	Horz	45.24	32.98	-36.4	41.8	54	12.2	1.3	217	Restricted Band
7.311	Max Peak	Vert	49.65	36.44	-33.6	52.5	74	21.5	1.5	207	Restricted Band
7.311	Average	Vert	40.65	36.44	-33.6	43.5	54	10.5	1.5	207	Restricted Band
7.311	Max Peak	Horz	49.65	36.44	-33.6	52.5	74	21.5	1.8	153	Restricted Band
7.311	Average	Horz	38.57	36.44	-33.6	41.4	54	12.6	1.8	153	Restricted Band

Radiated Emissions in Restricted Bands – 1 GHz to 26 GHz

1 GHz to 18 GHz Tested at a 3 Meter Distance

18 GHz to 26 GHz Tested at a 1 Meter Distance

EUT: Amber

Manufacturer: Whirlpool Corporation

Operating Condition: 70 deg F; 29% R.H.

Test Site: 1-18 GHz, Site G1, 18-26 GHz Site 3

Operator: Craig B

Test Specification: FCC Part 15.247 and Part 15.205

Comment: **High channel: 2.462 GHz, 802.11-b, DSSS, 1 Mbps; with external F antenna**

Date: 03-24-2016 & 04-04-2016

Notes: All other emissions at least 20 dB under the limit.

Frequency (GHz)	Measurement Type	Antenna Polarization	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	EUT Angle (deg)	Comment
4.924	Max Peak	Vert	54.81	33.05	-36.4	51.5	74	22.5	1.6	130	Restricted Band
4.924	Average	Vert	50.42	33.05	-36.4	47.1	54	6.9	1.6	130	Restricted Band
4.924	Max Peak	Horz	53.09	33.05	-36.4	49.7	74	24.3	1.3	216	Restricted Band
4.924	Average	Horz	47.21	33.05	-36.4	43.9	54	10.1	1.3	216	Restricted Band
7.386	Max Peak	Vert	48.76	36.60	-32.9	52.5	74	21.5	1.4	213	Restricted Band
7.386	Average	Vert	38.40	36.60	-32.9	42.1	54	11.9	1.4	213	Restricted Band
7.386	Max Peak	Horz	49.27	36.60	-32.9	53.0	74	21.0	1.2	152	Restricted Band
7.386	Average	Horz	37.56	36.60	-32.9	41.3	54	12.7	1.2	152	Restricted Band



166 South Carter, Genoa City, WI 53128

Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Appendix B

B6.0 Operating Band-Edge Measurements – RF Conducted

Rule Part:

15.247(d)

Test Procedure:

ANSI C63.10-2013

11.11 Emissions in non-restricted frequency bands

11.11.2 Reference Level Measurement

11.11.3 Unwanted Emissions Level Measurement

Limit:

The peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Results:

Compliant

Notes:

The EUT has 2 on-board antennas and one external antenna port of which only one can operate at a time. Initial output power measurements indicate the highest power levels occurred from on-board antenna #2. Measurements were performed on this antenna to represent worst-case emissions. Testing was performed using the manufacturer's test software with output power setting 14 and with modulation set to 802.11-n, MCS7 (widest signal; worst-case). The EUT was tested at the lowest, and highest channels of operation. The spectrum analyzer measurements were corrected to account for the cable loss and external attenuator.



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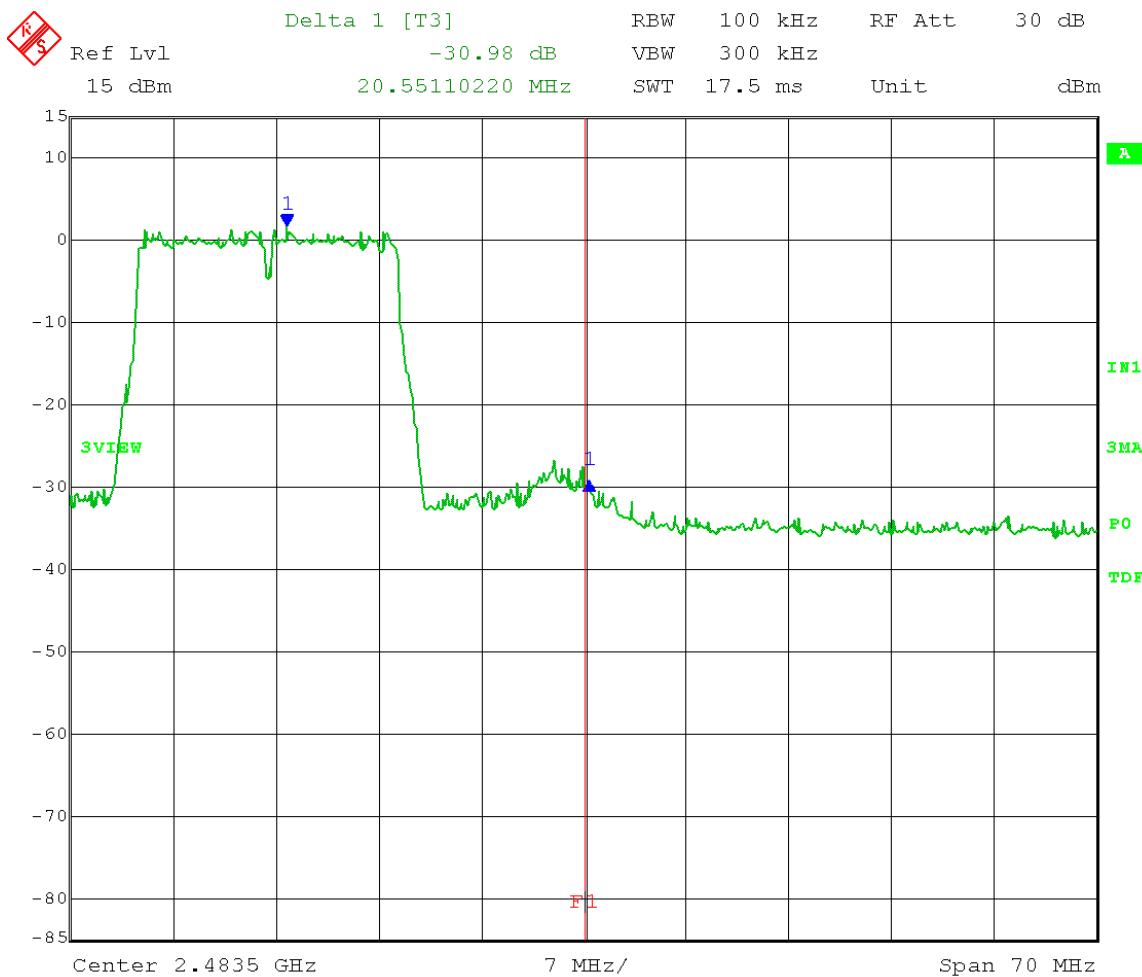
Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted band-edge emission
Operator: Craig B

Antenna: On-board, #2
Channel: High, 2462 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Limit: Band-Edge > 20 dB Below Peak In-Band Emission

Band-Edge Frequency = 2.4835 GHz



Date: 14.MAR.2016 15:02:24



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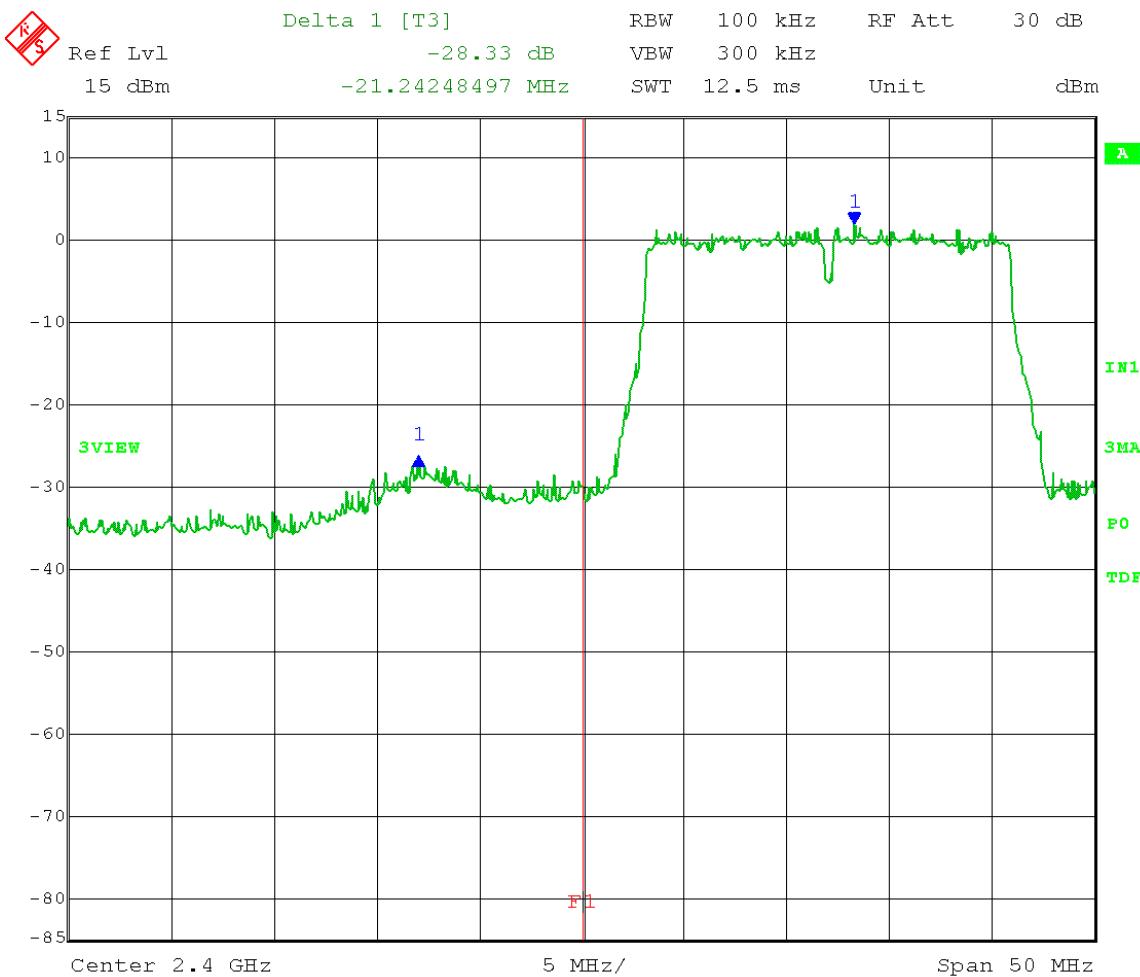
Company: Whirlpool Corporation
Model Tested: WICHAM01
Report Number: 21823
DLS Project: 7620

Test Date: 03-14-2016
Company: Whirlpool Corporation
EUT: Amber
Test: Emissions in non-restricted frequency bands
RF conducted band-edge emission
Operator: Craig B

Antenna: On-board, #2
Channel: Low, 2412 MHz
Modulation: 802.11-n, MCS7
Power setting: 14

Limit: Band-Edge > 20 dB Below Peak In-Band Emission

Band-Edge Frequency = 2.4 GHz



Date: 14.MAR.2016 14:59:29