1601 North A.W. Grimes Blvd., Suite B
Round Rock, TX 78665
e-mail: info@ptitest.com
(512) 244-3371 Fax: (512) 244-1846

November 12, 2014

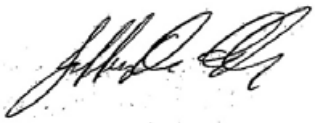
David Cameron
Hetronic International
3905 NW 36th St.
Oklahoma City, OK 73112
USA

David:

Thank you for allowing Professional Testing (EMI), Inc. an opportunity to perform testing for Hetronic International. Enclosed is the Wireless Certification Report for the TC1. This report can be used to demonstrate compliance with requirements for wireless devices in North America.

If you have any questions, please contact me.

Sincerely,



Jeffrey A. Lenk
President

Attachment

Project 16270-15

Hetronic International
Model TC1

Wireless Certification Report

Prepared for:

Hetronic International
3905 NW 36th St.
Oklahoma City, OK 73112
USA

By

Professional Testing (EMI), Inc.
1601 North A.W. Grimes Blvd., Suite B
Round Rock, Texas 78665

November 10, 2014

Reviewed by

Larry Finn
Chief Technical Officer

Written by

Eric Lifsey
Test Engineer

Revision History

Revision Number	Description	Date
00	Draft for review.	November 6, 2014
01	Revised to client and internal review comments.	November 10, 2014
02	Revised to TCB comments.	November 12, 2014

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NOTICE: (1) This Report must not be used to claim product endorsement, by NVLAP, NIST, the FCC or any other Agency. This report also does not warrant certification by NVLAP or NIST. (2) This report shall not be reproduced except in full, without the written approval of Professional Testing (EMI), Inc. (3) The significance of this report is dependent on the representative character of the test sample submitted for evaluation and the results apply only in reference to the sample tested. The manufacturer must continuously implement the changes shown herein to attain and maintain the required degree of compliance.

Compliance Certificate

Applicant	Device & Test Identification	
David Cameron	FCC ID:	LW9-TX-TC1
Hetronic International	Industry Canada ID:	2119B-TXTC1
3905 NW 36th St.	Model(s):	TC1
Oklahoma City, OK 73112 USA	Part Number(s):	N/A
Certificate Date: November 10, 2014	Laboratory Project ID:	16270-15

The device named above was tested utilizing the following documents and found to be in compliance with the required criteria:

Standard	Reference	Detail
FCC 47 CFR Part 15 C	15.247	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
FCC 47 CFR Part 15 C	15.209	Radiated emission limits; general requirements.
FCC 47 CFR Part 15 C	15.205	Restricted Bands of Operation
KDB 558074 D01	DR01	DTS Measurement Guidance v03r02
KDB 412172	D01	Guidelines for Determining the ERP and EIRP of an RF Transmitting System
OET Bulletin 65*	Edition 97-01, and Supplement C, Ed. 01-01	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
RSS-210	Issue 8	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment
RSS-Gen	Issue 3	General Requirements and Information for the Certification of Radio Apparatus
RSS-102	Issue 4	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

*MPE is reported separately from this document.

I, Eric Lifsey, for Professional Testing (EMI), Inc., being familiar with the above rules and test procedures have reviewed the test setup, measured data, and this report. I believe them to be true and accurate.

Eric Lifsey
EMC Engineer

This report has been reviewed and accepted by the Applicant**.** The undersigned is responsible for ensuring that this device will continue to comply with the rules listed above.

_____
Representative of Applicant

1.0 Introduction

1.1 Scope

This report describes the extent to which the equipment under test (EUT) conformed to the intentional radiator requirements of the United States and Canada.

Professional Testing (EMI), Inc., (PTI) follows the guidelines of National Institute of Standards and Technology (NIST) for all uncertainty calculations, estimates, and expressions thereof for electromagnetic compatibility testing. The procedures of ANSI C63.4: 2009 were used for making all radiated enclosure and mains emission measurements.

1.2 EUT Description

The device (EUT) as tested is identified in the table that follows.

Table 1.2.1: Equipment Under Test

Manufacturer	Model	Serial #	Description
Hetronic International	TC1	None	Wireless remote control transmitter/receiver for 2400-2483.5 MHz.

This device is a remote wireless transmitter/receiver that communicates by wireless means with a companion wireless device that incorporates relays to control moving industrial machinery.

The EUT measures approximately 15 x 12 x 23 cm and is shaped with a handle extending out from the main enclosure that contains a small array of toggle switches and an LCD display with four smaller push buttons. The EUT is powered by a 3.6 Volt DC rechargeable battery housed in the handle.

1.3 EUT Operation

The EUT was exercised in a manner consistent with normal operations.

This device is strictly battery powered cannot be powered from the AC mains during use. The antenna is embedded internally and not subject to user modification.

The EUT internal software operated the transmitter in a continuous modulated mode, unmodulated mode or operating in communication with the companion wireless device as needed for measurement.

1.4 Modifications to Equipment

No modifications were made to the EUT during the performance of the test program.

1.5 Test Site

Measurements were made at the PTI semi-anechoic facility designated Site 45 (FCC 459644, IC 3036B-1) in Austin, Texas. The site is registered with the FCC under Section 2.948 and Industry Canada per RSS-GEN, and is subsequently confirmed by laboratory accreditation (NVLAP). The test site is located at 11400 Burnet Road, Austin, Texas 78758, while the main office is located at 1601 North A.W. Grimes Boulevard, Suite B, Round Rock, Texas, 78665.

1.6 Applicable Documents and Clauses

Table 1.6.1: Applicable Documents	
Document	**Title**
47 CFR	Part 15 – Radio Frequency Devices Subpart C -Intentional Radiators
RSS-210 Issue 8	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment
RSS-Gen Issue 3	General Requirements and Information for the Certification of Radio Apparatus
ANSI C63.4 2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment

Table 1.6.2: Applicable Clauses		
Parameter	**FCC Part 15 Rule Paragraphs**	**IC RSS References**
Transmitter Characteristics	15.247	RSS 210 A1.1, RSS-Gen
Power Spectral Density	15.247e	RSS 210 A2.9
Bandwidth	15.247(a)(2), 2.1049, KDB 558074 D01	RSS-Gen 4.6
Spurious Radiated Power	15.247, 15.209, 15.205	RSS 210 A1.1, RSS-GEN 4.9, 4.10
Band Edge	15.274, 15.205	RSS-Gen 4.9
Antenna Requirement	15.203	RSS-Gen

2.0 Fundamental Power

2.1 Test Procedure

Bandwidth is first determined to select correct entire bandwidth for power measurement and the fundamental power is measured.

2.2 Test Criteria

47 CFR (USA) // IC (Canada)		
Section Reference	Parameter	Date
15.247(a)(3) // RSS-210 Issue 8, A2.9	Fundamental Power Conducted Limit: 1 Watt	2014-09-28

2.3 Test Results

Bandwidth was found to be 1377.4 kHz in 6 dB, so 3 MHz resolution bandwidth was employed for peak power measurement. The EUT has no antenna port or connector so power was measured as a radiated field. The EUT is hand-held so three orientations of the device were measured.

Fundamental Power Measured as Field Strength
Conducted Limit 1 Watt (30 dBm)
Restated as Radiated Limit 125.23 dBµV/m at 3 meters

Table 2.3.1 Field Strength, Maximum

Frequency (MHz)	Polarity / Orientation	Measured Peak Power (dBµV/m)
2405	Vertical / Side	91.4
2440	Vertical / Side	89.4
2480	Vertical / Side	88.4

Measured in 3 MHz RBW, 3 MHz VBW.

Field strength maximum from above converts to EIRP of 0.414 mW.

The EUT was found to be in compliance with the applicable criteria.

3.0 Power Spectral Density

3.1 Test Procedure

The EUT is placed in maximum signal orientation in operation on the test site turntable positioned for maximum signal. The spectrum analyzer is then adjusted to measure the power spectral density in the prescribed resolution bandwidth with an extended sweep time.

3.2 Test Criteria

47 CFR (USA) // IC (Canada)		
Section Reference	Parameter	Date
15.247e // RSS-210 Issue 8, A2.9	Power Spectral Density, Conducted Limit: 8 dBm / 3 kHz	2014-10-04

3.3 Test Results

Power Spectral Density
Conducted Limit 8 dBm in 3 kHz
Restated as Radiated Limit 103.23 dBµV/m

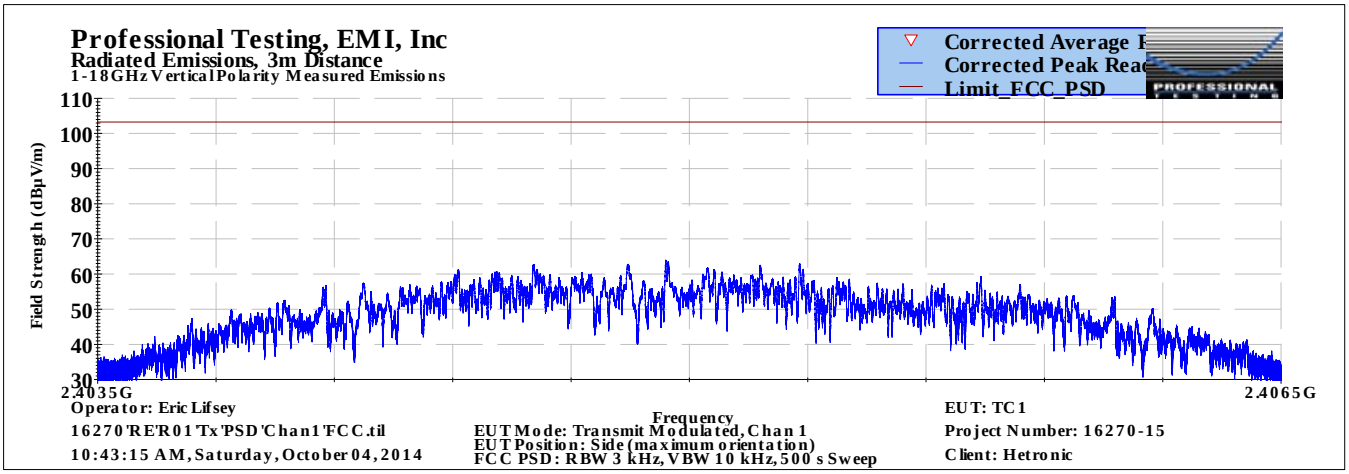
Frequency MHz	Corrected Measured Peak PSD (dBµV/m)
2405	63.9
2440	61.7
2480	73.8

Sweep time 500 seconds.

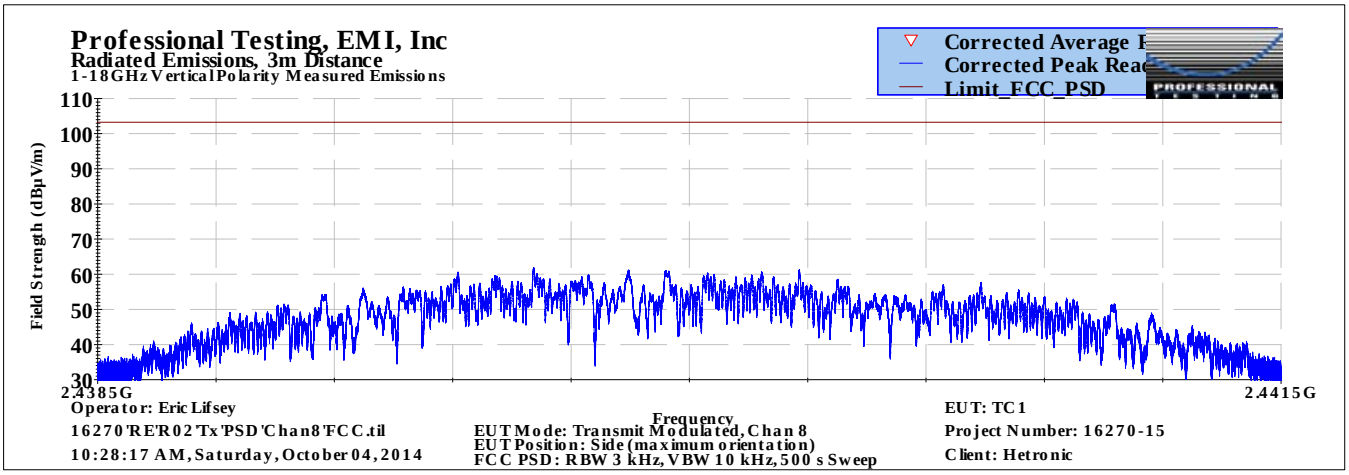
The EUT was found to be in compliance with the applicable criteria.

Plotted measurements appear below.

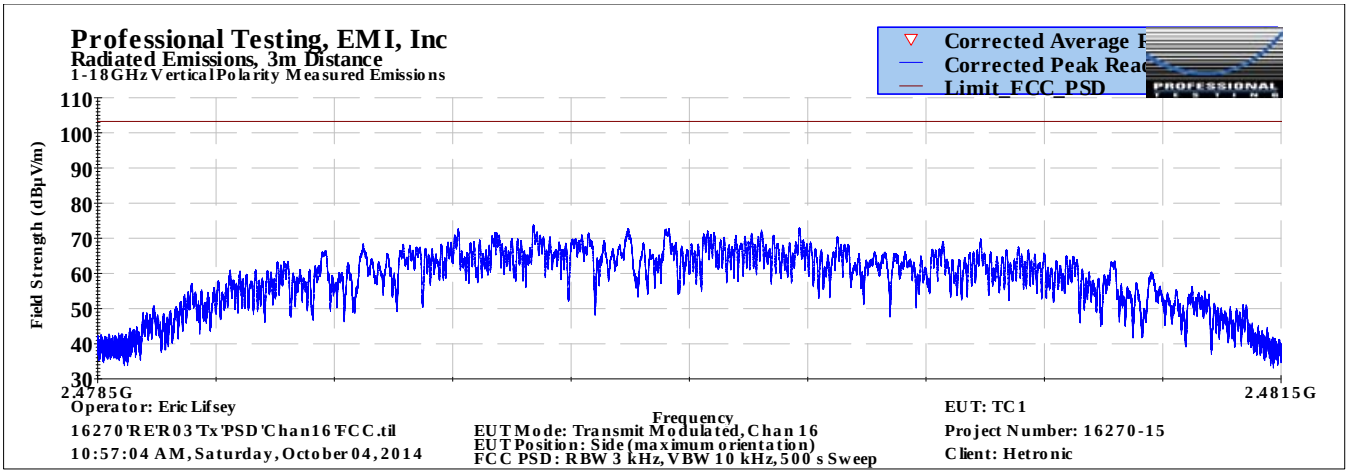
3.3.1 Low Channel PSD



3.3.2 Middle Channel PSD



3.3.3 High Channel PSD



4.0 Transmitter Duty Cycle

4.1 Test Procedure

EUT is placed into normal transmit operation to observe and record transmitter time domain performance.

4.2 Test Criteria

47 CFR (USA) // IC (Canada)		
Section Reference	Parameter	Date
15.35(c) // RSS-Gen Issue 8, 4.5	Averaging of Pulsed Transmissions	2014-09-15

Measurement is based on intervals not to exceed 100 msec. Maximum transmitter on time is divided by the lesser of 100 msec or the actual measured minimum transmitter interval time. The result is converted to dB and applied as needed to peak measurements of transmitter artifacts to determine average power. For permissible exposure the calculation is based on power and no limit applies to the result. This is not a pass/fail measurement.

4.3 Test Results

Table 4.3.1 Duty Cycle Results

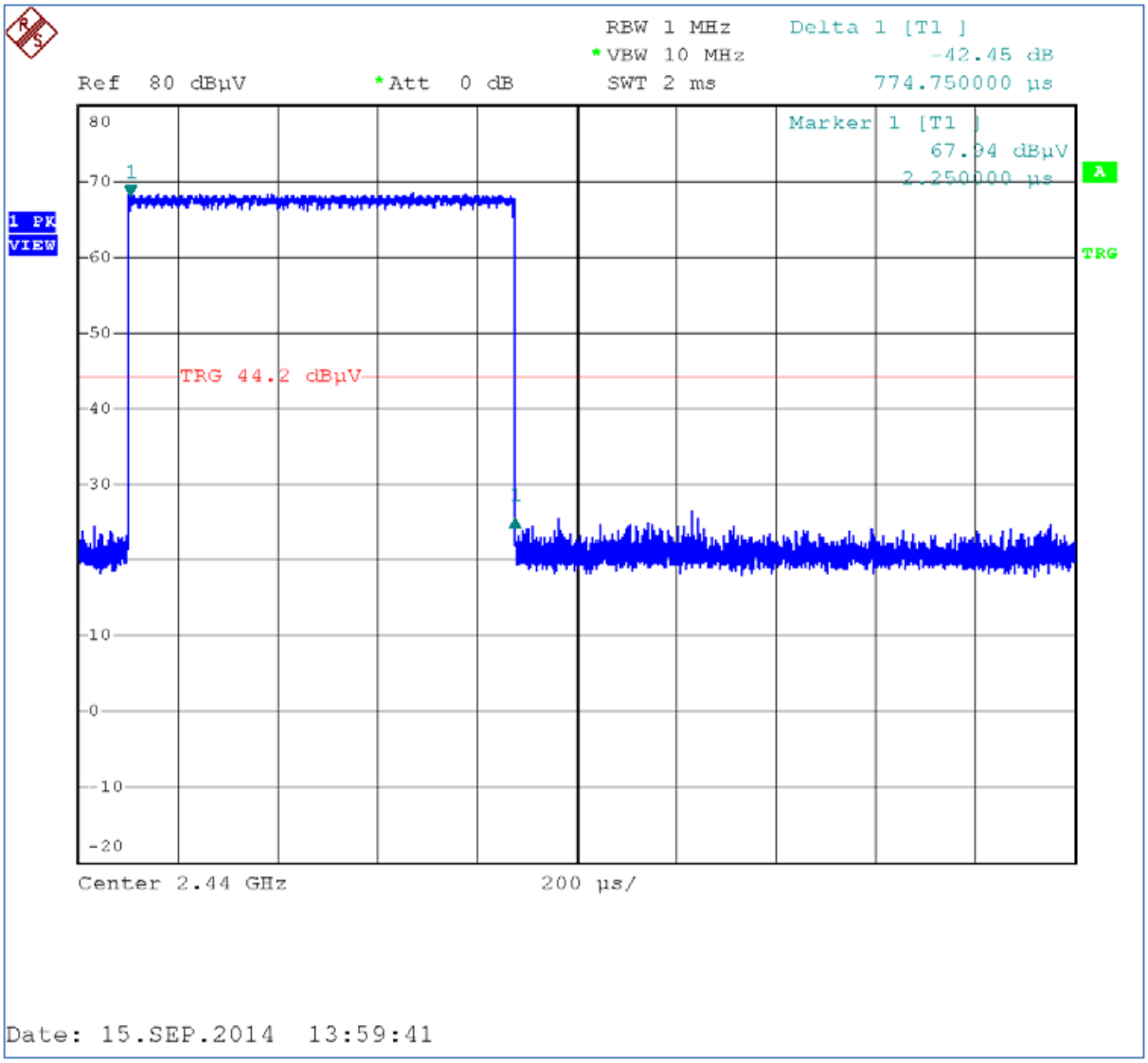
Measured On Time (msec)	Measured Time Interval (msec)	Duty Cycle Factor Calculation	Result (dB)	Duty Cycle Factor Allowed (dB)
0.77475	14.88	= 20 * Log_{10} (0.77475 msec / 14.88 msec)	-25.67	-20

Table 4.3.2 Exposure Source Duty Cycle Results

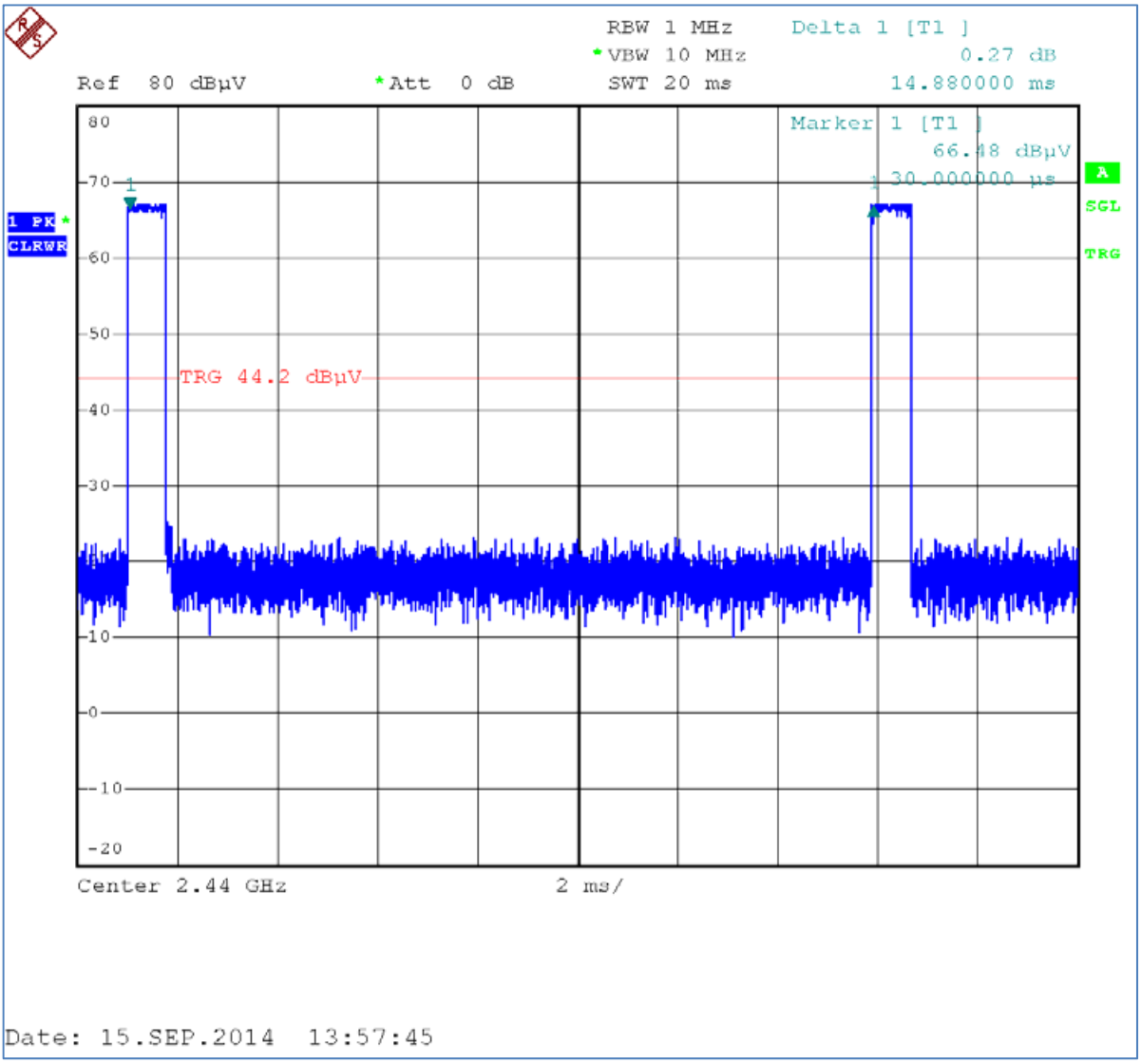
Measured On Time (msec)	Measured Time Interval (msec)	Exposure Duty Cycle Factor Calculation	Result (dB)	Duty Cycle Factor Allowed (dB)
0.77475	14.88	= 10 * Log_{10} (0.77475 msec / 14.88 msec)	-12.83	-12.83

Plotted measurements appear below.

4.3.1 Transmit On Time



4.3.2 Transmit Interval Time



5.0 Occupied Bandwidth

5.1 Test Procedure

Bandwidth is measured by radiated means. A recording of the results is included.

5.2 Test Criteria

47 CFR (USA) // IC (Canada)		
Section Reference	Parameter	Date(s)
14.247(a)(2), 2.1049, KDB 558074 D01 // RSS-Gen Issue 3, 4.6	Bandwidth, 6 dB, 20 dB	2014-09-05

5.3 Test Results

EUT was found to be in compliance with applicable requirements.

Bandwidth 6 dB Minimum 500 kHz

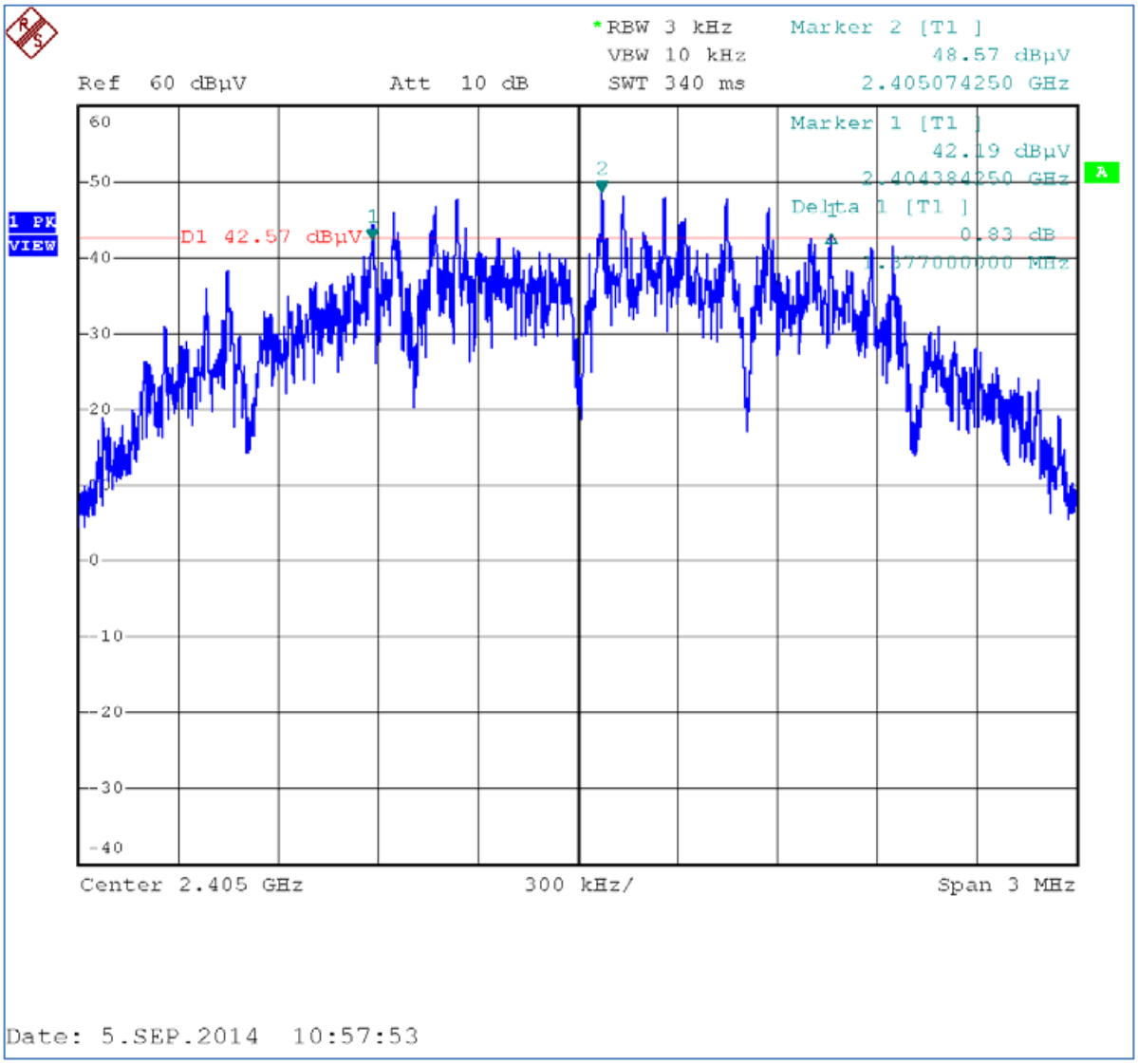
Low Channel Measured BW (kHz)	Mid Channel Measured BW (kHz)	High Channel Measured BW (kHz)	**Minimum BW (kHz)**
1377.0	1377.4	1374.0	**1374**

Bandwidth 20 dB Measure and Report

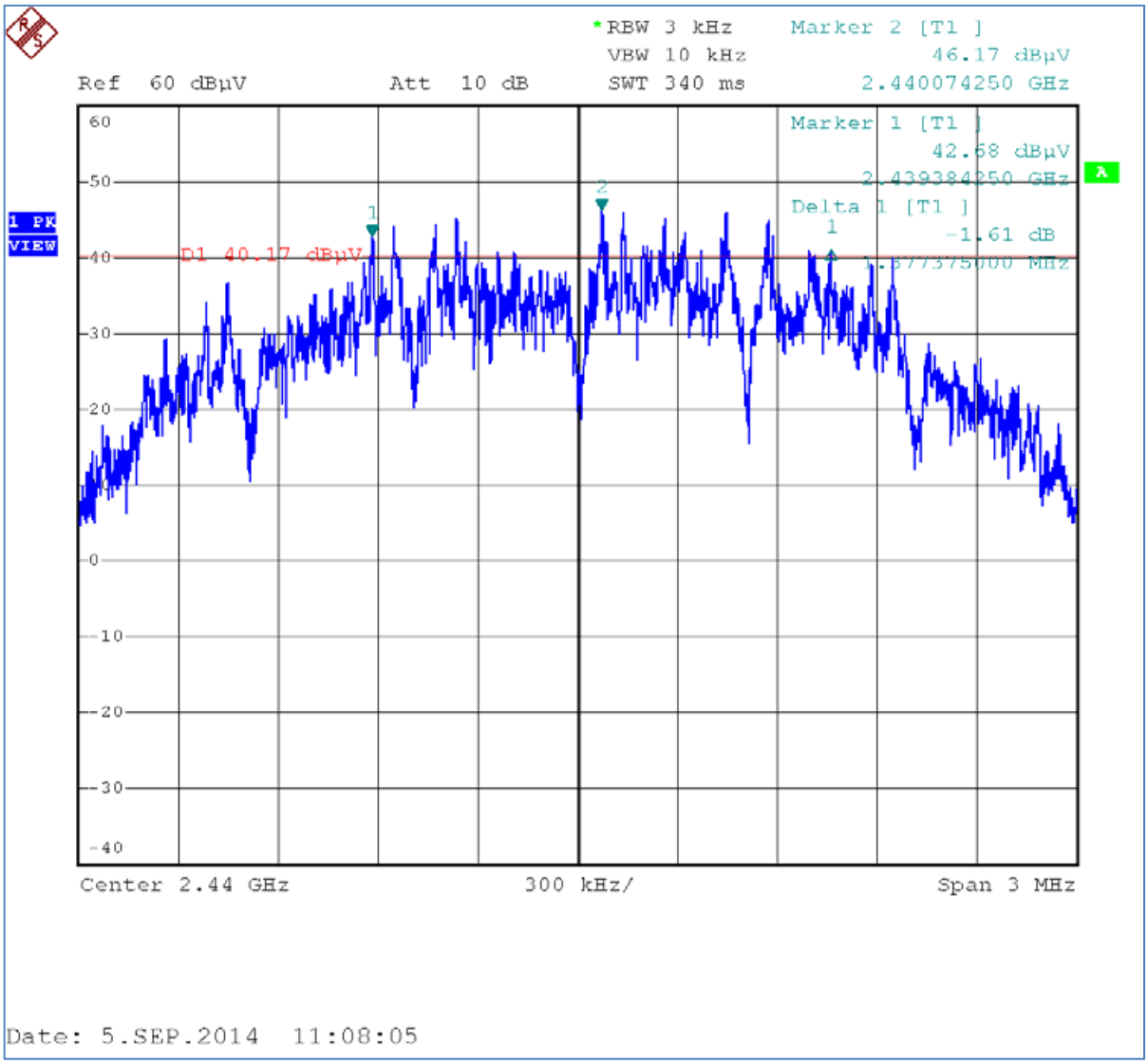
Low Channel Measured BW (kHz)	Mid Channel Measured BW (kHz)	High Channel Measured BW (kHz)	**Reported Maximum BW (kHz)**
2371.9	2450.6	2455.5	**2455.5**

Plotted measurements appear on the following pages.

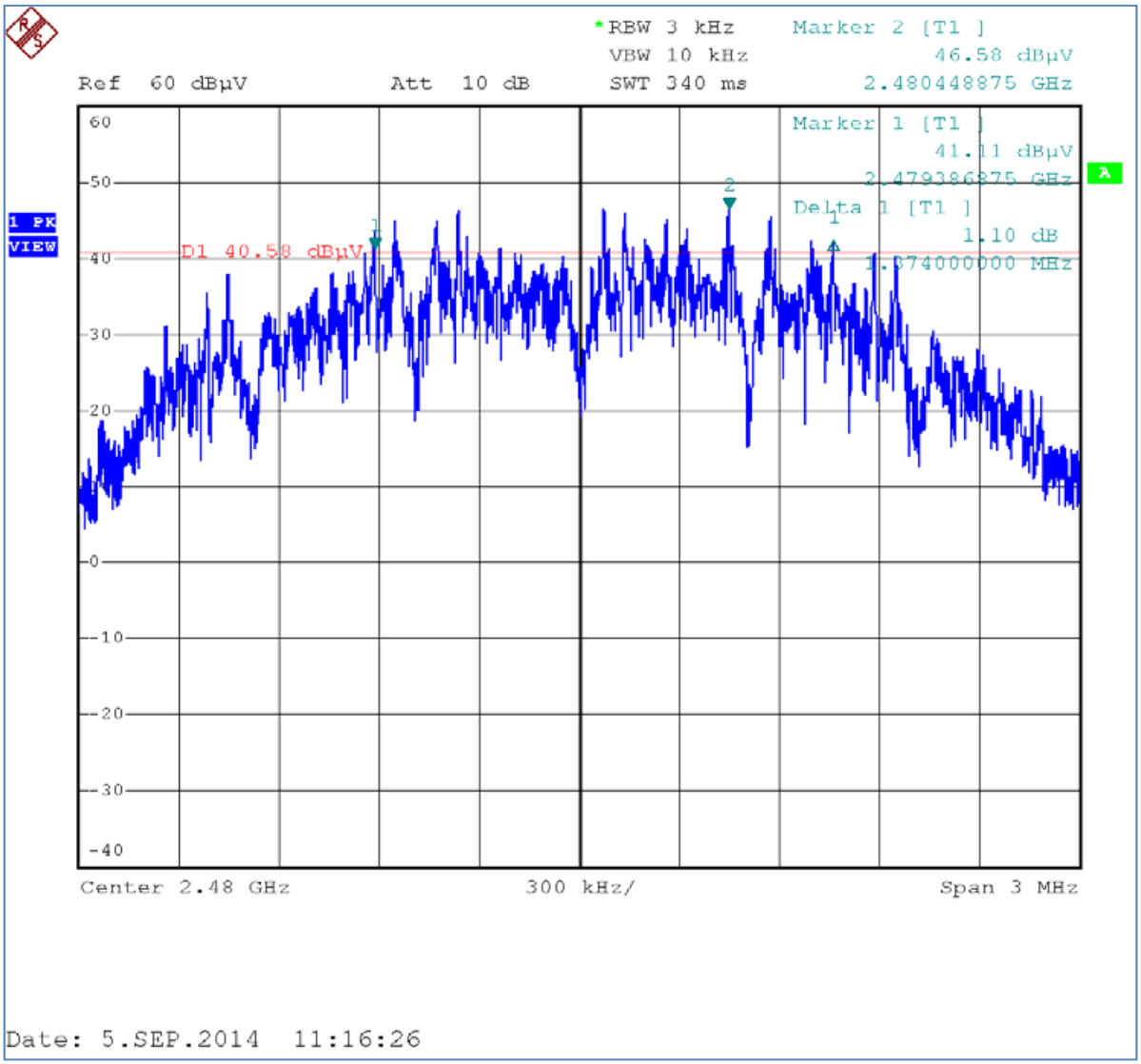
5.3.1 Bandwidth Plots, 6 dB



6 dB, Low Channel

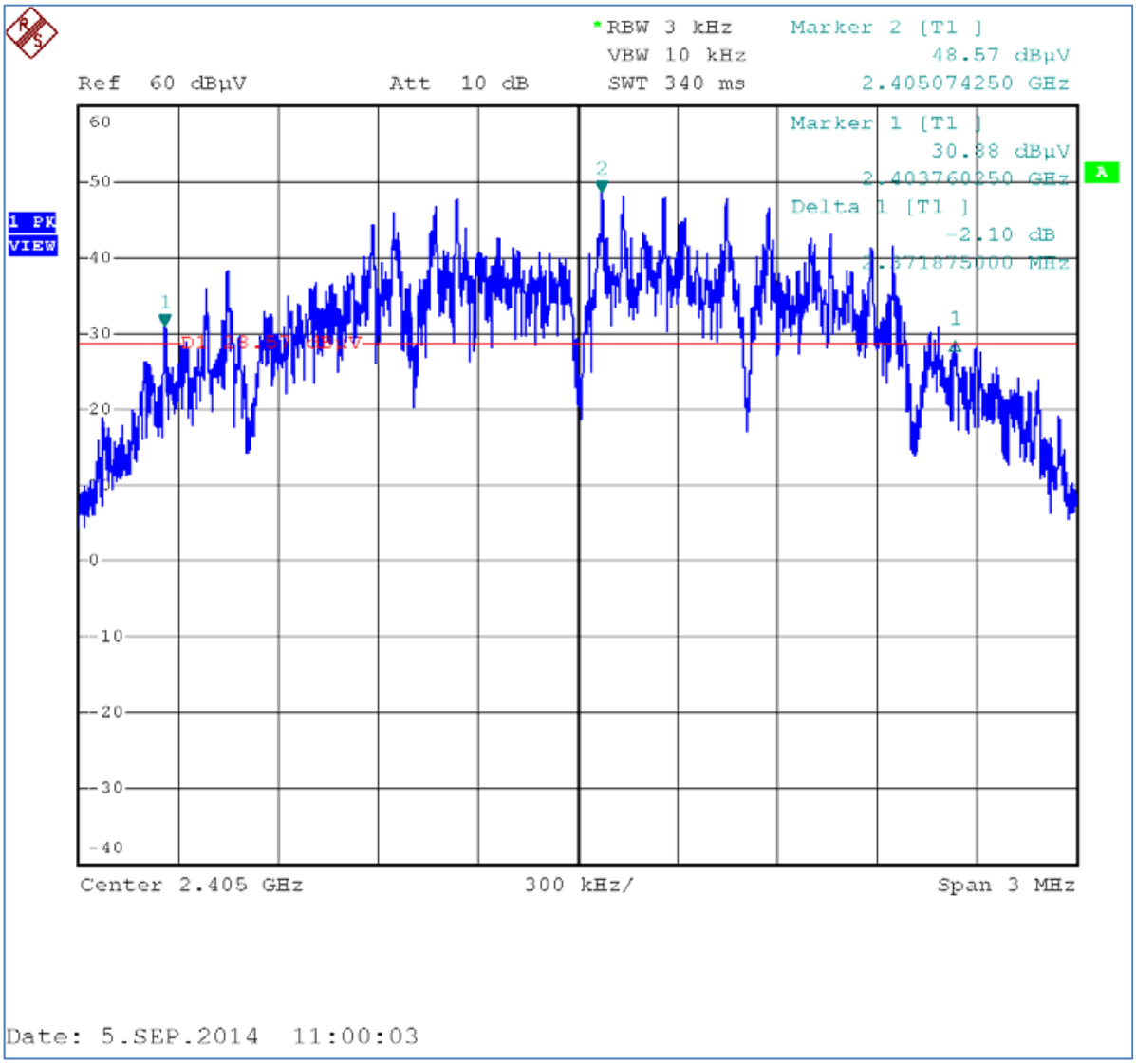


6 dB, Middle Channel

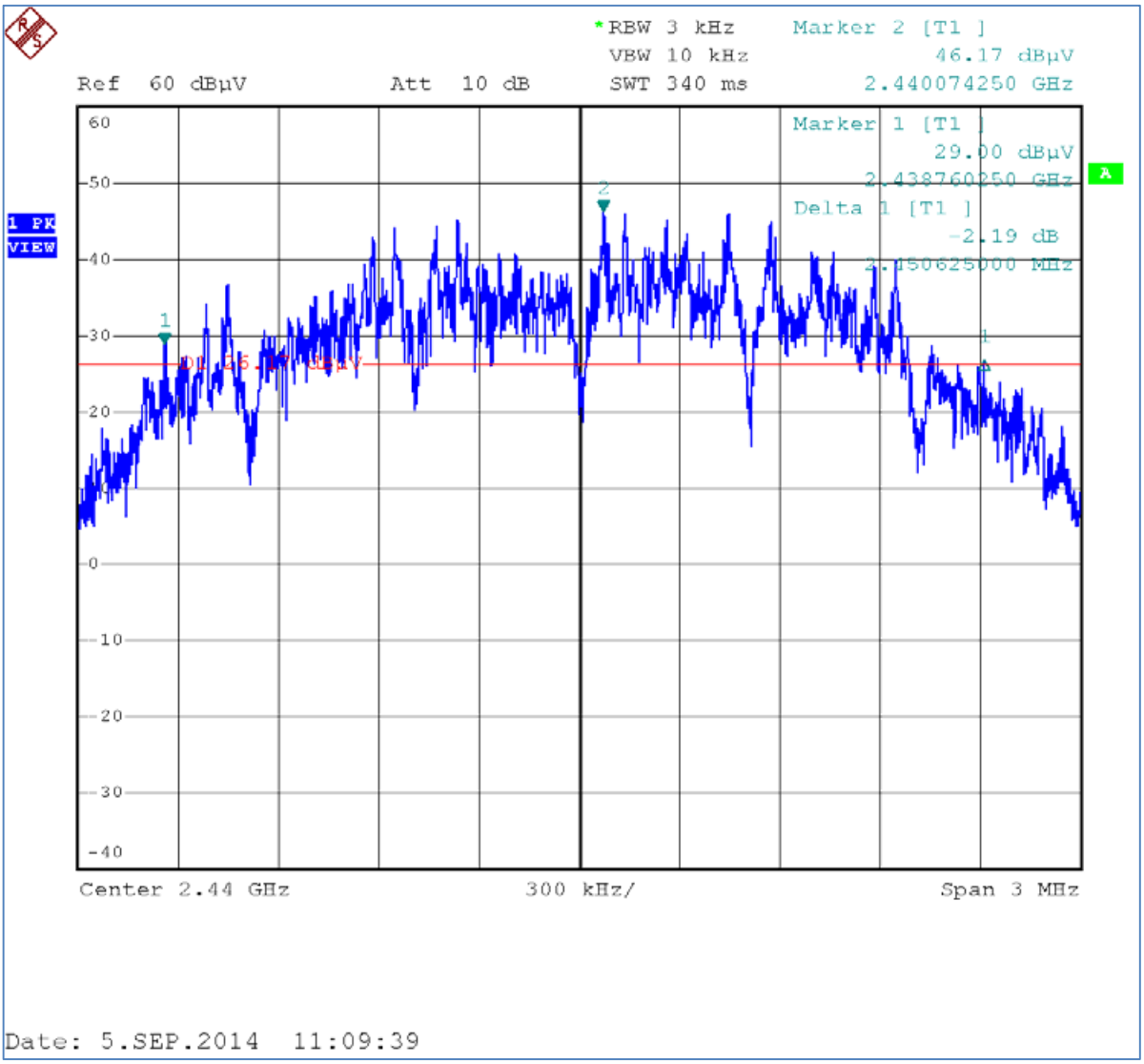


6 dB, High Channel

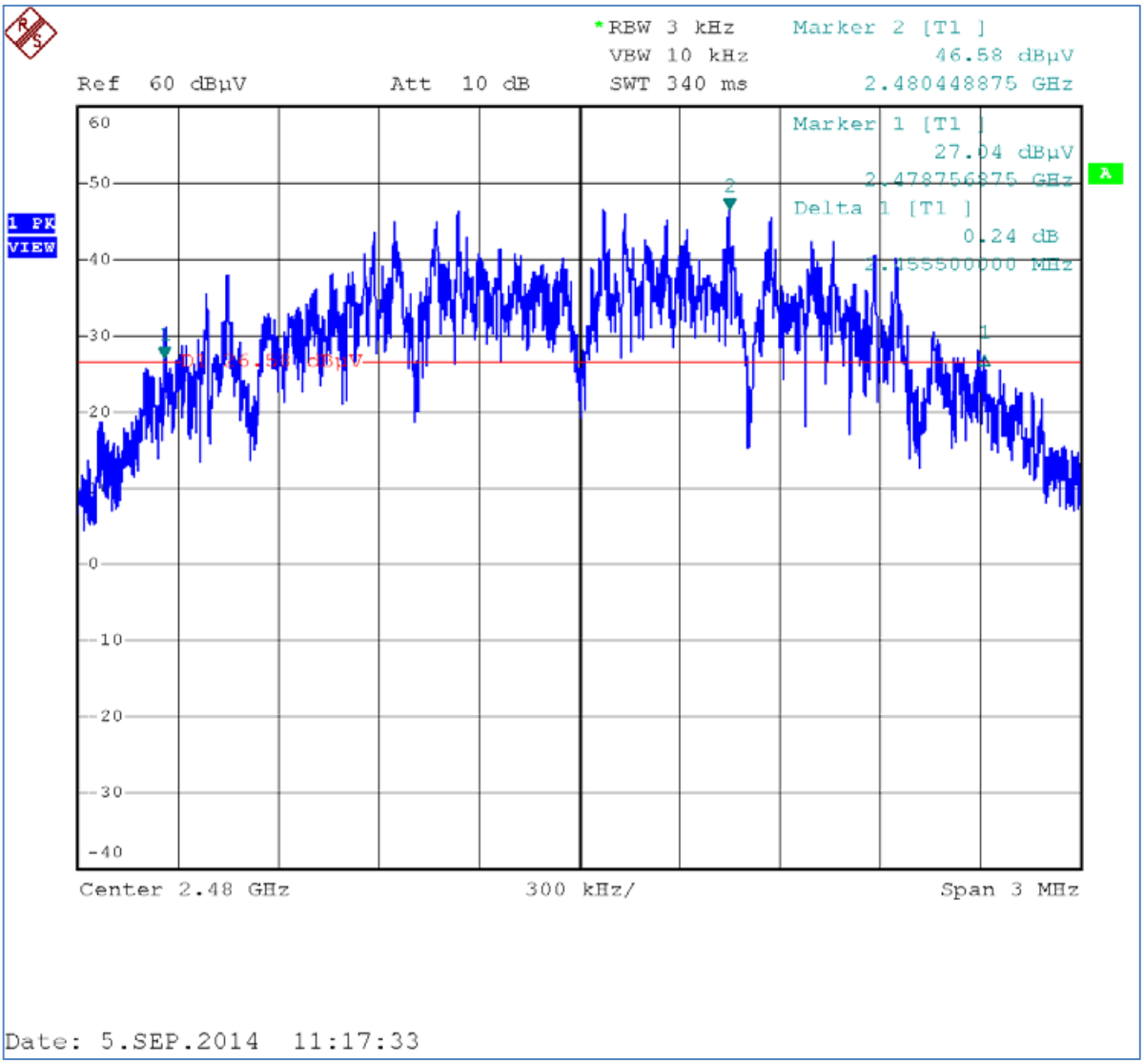
5.3.2 Bandwidth Plots, 20 dB



20 dB, Low Channel



20 dB, Middle Channel



20 dB, High Channel

6.0 Band Edge

6.1 Test Procedure

EUT is placed into normal transmit operation on the nearest band edge channel. The spectrum analyzer is centered on the band edge frequency with span sufficient to include the peak of the adjacent fundamental signal. Measurement includes at least two standard bandwidths from the respective band edge. If required, the band-edge marker-delta method of C63.4 is utilized.

6.2 Test Criteria

47 CFR (USA) // IC (Canada)		
Section Reference	Parameter	Date(s)
15.247, 15.205 // RSS-Gen Issue 3, 4.9	Unwanted Emissions Adjacent to Authorized Band, Radiated	2014-10-04

6.3 Test Results

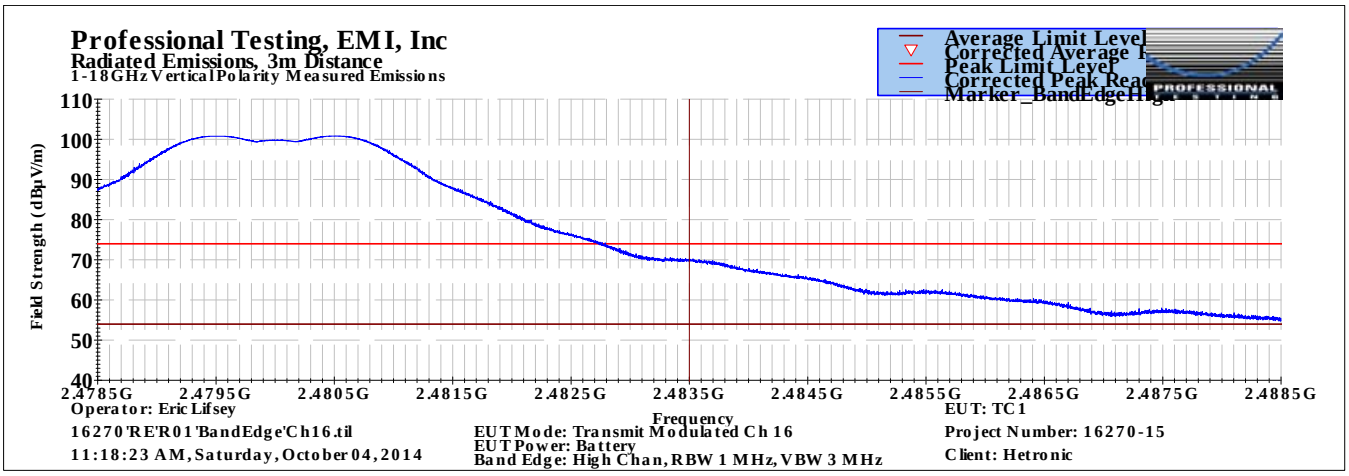
Measurements included more than 2 standard bandwidths (standard bandwidth 100 kHz) from the band edges to provide a clear view of the declining emission levels. Peak detection with max-hold is employed. The general emission (FCC 15.209) limits for peak and average detection are shown.

The average duty cycle factor is -20 dB so the average emission would be 20 dB below the peak detected levels.

Peak detection of emissions at band edges were below the -20 dBc criteria and below the general emission peak limits with worse case margin of -3.8 dB on the high channel. The low channel peak emissions were below the general emission average detection limits.

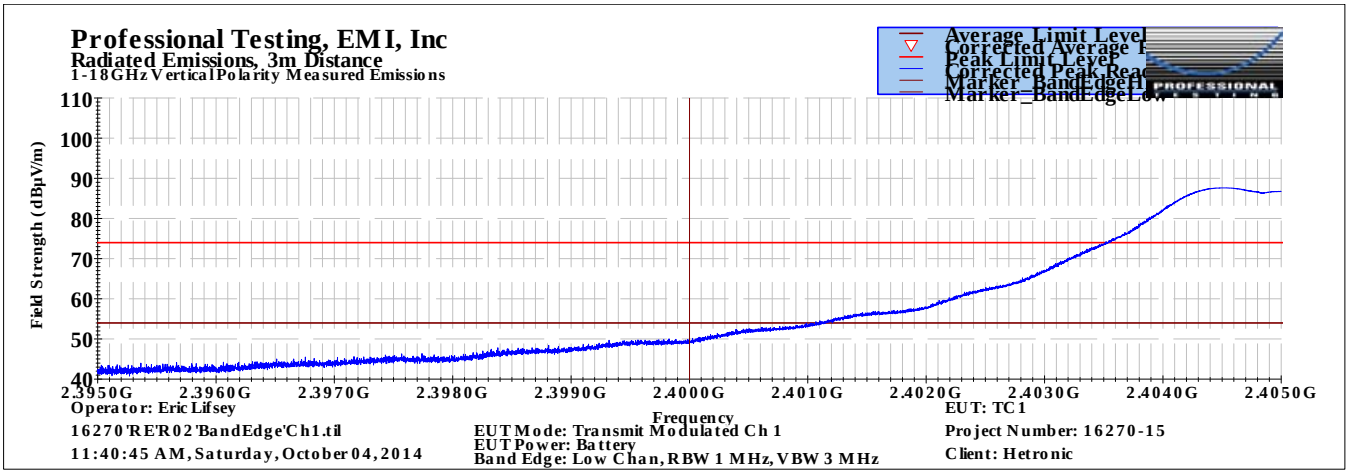
The EUT satisfied the criteria. Plotted results appears on the following pages.

6.3.1 High Channel Band Edge



Band Edge Emission, Satisfies -20dBc and 15.209 Criteria

6.3.2 Low Channel Band Edge



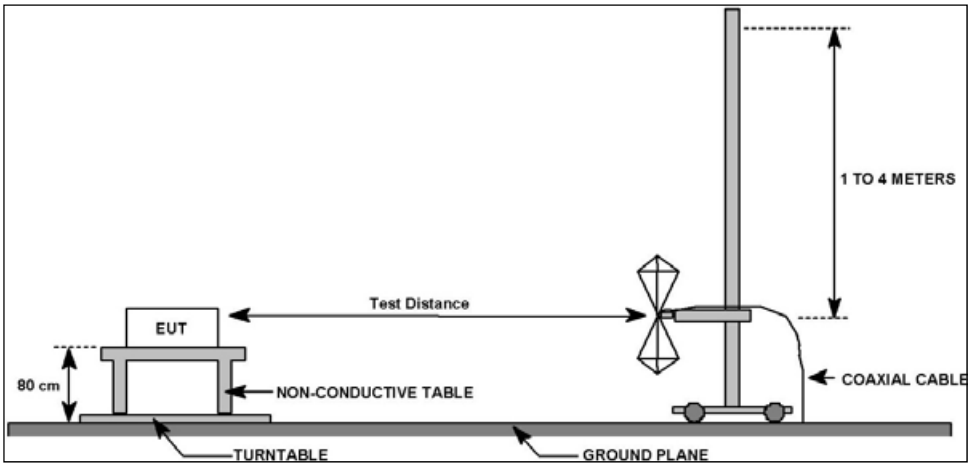
Band Edge Emission, Satisfies -20dBc and 15.209 Criteria

7.0 Radiated Spurious Emissions, Receive Mode

7.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The EUT was centered on a rotating turntable. Measurements below 1 GHz were taken at a test distance of 10 meters from the measurement antenna. Above 1 GHz the measurement distance was 3 meters.

Spurious emissions below 1 GHz were measured with quasi-peak detection with a resolution bandwidth of 120 kHz. Above 1 GHz peak measurements were taken and average measured where appropriate. A diagram showing the test setup appears below.



7.2 Test Criteria

47 CFR (USA) // IC (Canada)		
Section Reference	Parameter	Date(s)
15.247, 15.209 // RSS-Gen Issue 3, 4.9, 4.10	Field Strength of Radiated Spurious/Harmonic Emissions	2014-09-02

7.3 Test Results

The EUT was tuned to the middle channel. In receive mode the EUT occasionally transmits a broadcast signal and this was captured during the scan.

The EUT satisfied the criteria. Recorded data is presented below.

Table 7.3.1: Radiated Spurious Emissions, Receive Mode, Below 1 GHz, Vertical Polarity

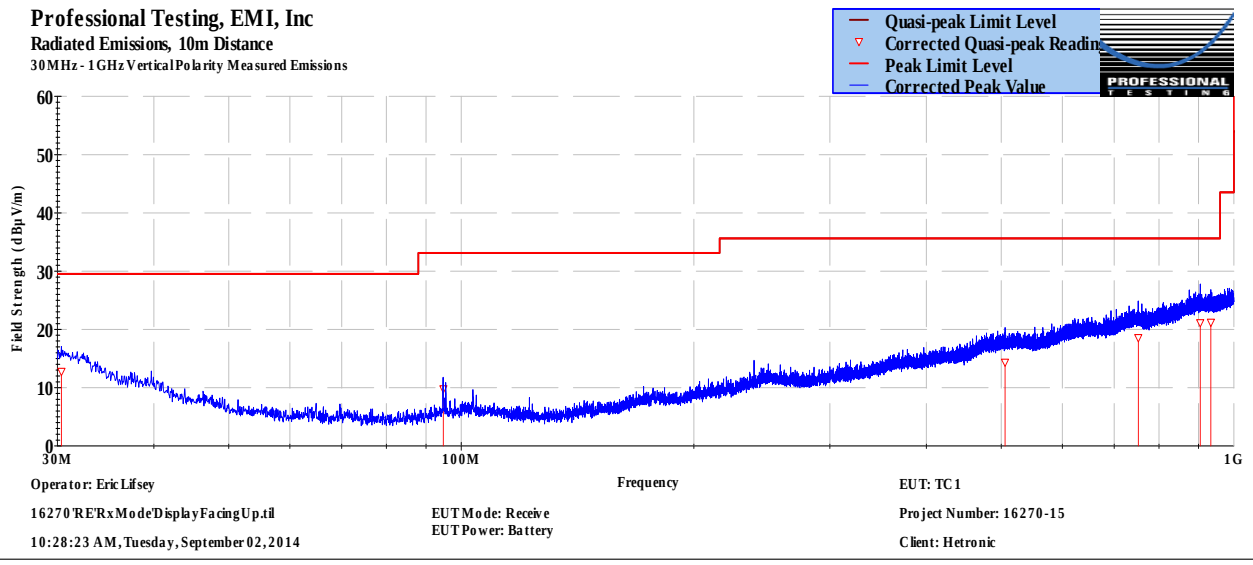
Professional Testing, EMI, Inc.

Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	9/2/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet — **Page: 1 of 1**

EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A
Antenna Orientation:	Vertical		**Frequency Range:**	30MHz to 1GHz	
EUT Mode of Operation:	Receive				

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
30.3624	10	141	3.87	Quasi-peak	24	12.783	29.5	-16.7	Pass
94.8008	10	92	2.68	Quasi-peak	30.3	9.781	33.1	-23.3	Pass
505.758	10	180	3.53	Quasi-peak	22.2	14.348	35.6	-21.3	Pass
752.348	10	285	1.34	Quasi-peak	21.7	18.568	35.6	-17.0	Pass
904.874	10	194	4.03	Quasi-peak	21.3	21.138	35.6	-14.5	Pass
934.076	10	288	3.68	Quasi-peak	21.2	21.21	35.6	-14.4	Pass



≤ 1GHz Vertical Antenna Polarity Measured Emissions

Table 7.3.2: Radiated Spurious Emissions, Receive Mode, Below 1 GHz, Horizontal Polarity

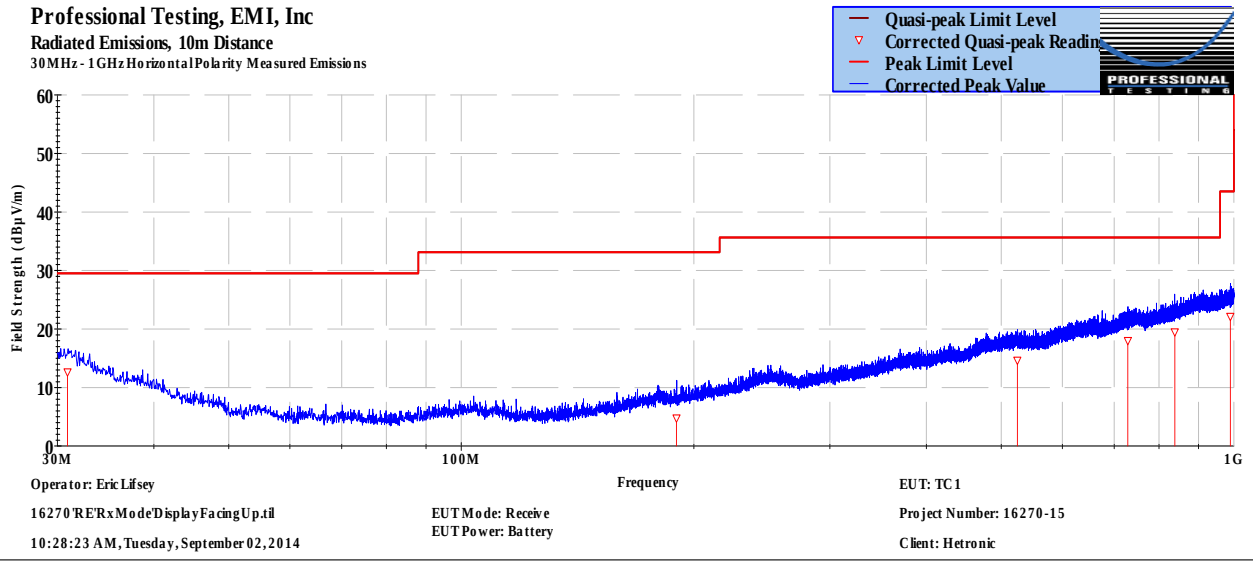
Professional Testing, EMI, Inc.

Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	9/2/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet — **Page: 1 of 1**

EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A
Antenna Orientation:	Horizontal		**Frequency Range:**	30MHz to 1GHz	
EUT Mode of Operation:			Receive		

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
30.9151	10	245	3.45	Quasi-peak	24.2	12.658	29.5	-16.8	Pass
189.928	10	332	1.36	Quasi-peak	22.5	4.785	33.1	-28.3	Pass
524.647	10	344	3.69	Quasi-peak	22.2	14.658	35.6	-20.9	Pass
729.251	10	338	2.84	Quasi-peak	21.7	18.017	35.6	-17.6	Pass
838.733	10	176	1.93	Quasi-peak	21.4	19.472	35.6	-16.1	Pass
989.791	10	10	3.97	Quasi-peak	21.1	22.144	43.5	-21.4	Pass



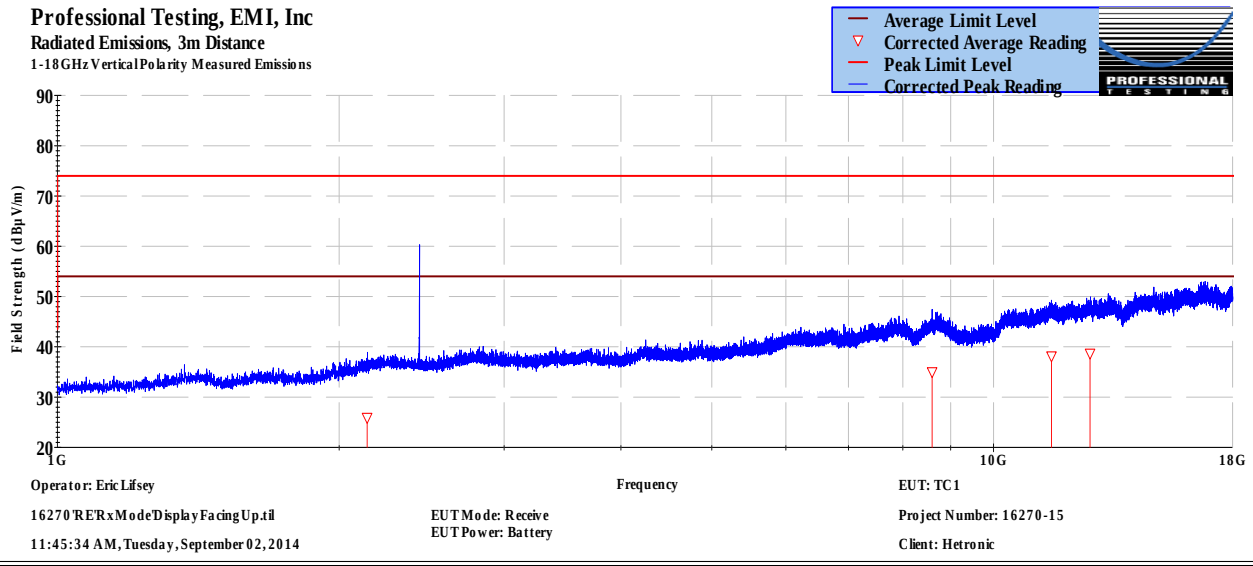
≤ 1GHz Horizontal Antenna Polarity Measured Emissions

Table 7.3.3: Radiated Spurious Emissions, Receive Mode, Above 1 GHz, Vertical Polarity

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	9/2/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1
EUT Line Voltage:	3.3 VDC	EUT Power Frequency:	- N/A
Antenna Orientation:	Vertical	Frequency Range:	Above 1GHz
EUT Mode of Operation:		Receive	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
2142.07	3	155	1	Average	35.3	25.927	54.0	-28.0	Pass
8597.32	3	242	1	Average	26.8	34.999	54.0	-19.0	Pass
11530.4	3	273	1	Average	27	38.152	54.0	-15.8	Pass
12678.7	3	32	1	Average	27.6	38.691	54.0	-15.3	Pass



> 1GHz Vertical Antenna Polarity Measured Emissions

Table 7.3.4: Radiated Spurious Emissions, Receive Mode, Above 1 GHz, Vertical Polarity

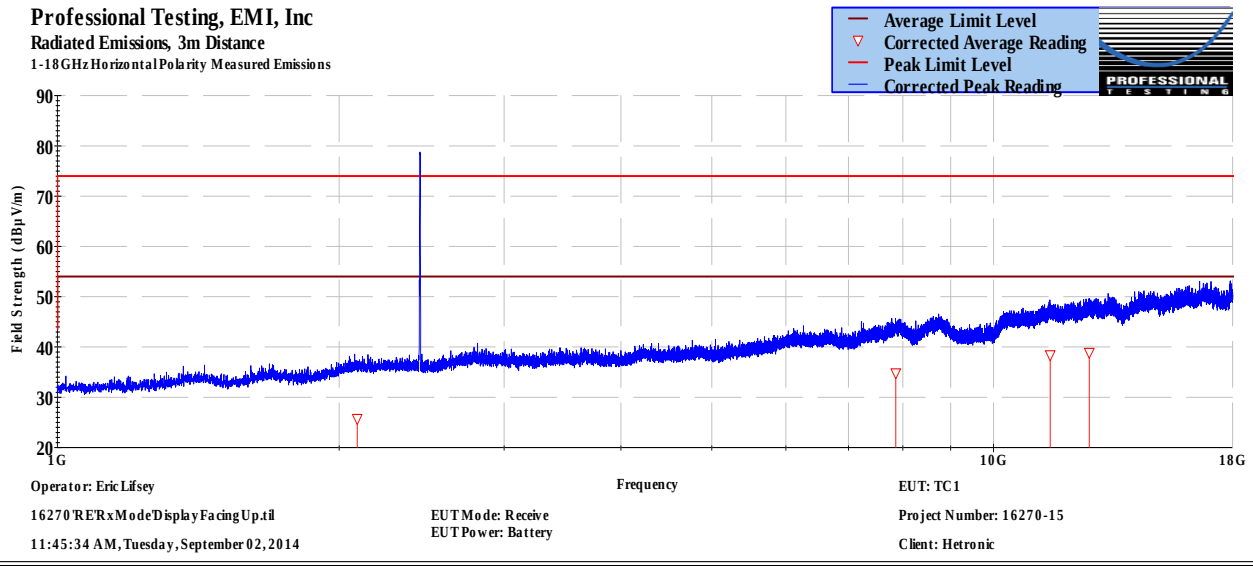
Professional Testing, EMI, Inc.

Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	9/2/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet — **Page: 1 of 1**

EUT Line Voltage:	3.3 VDC	**EUT Power Frequency:**	- N/A
Antenna Orientation:	Horizontal	**Frequency Range:**	Above 1GHz
EUT Mode of Operation:		Receive	

Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Test Results
2090.77	3	258	1	Average	35.4	25.728	54.0	-28.2	Pass
7861.12	3	291	1	Average	28.1	34.82	54.0	-19.1	Pass
11492.1	3	332	1	Average	27.1	38.396	54.0	-15.6	Pass
12654.9	3	248	1	Average	27.9	38.871	54.0	-15.1	Pass



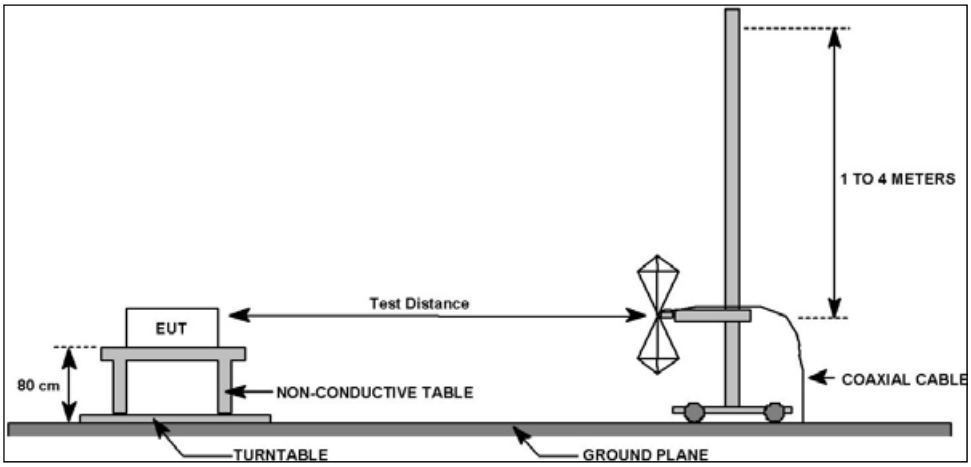
> 1GHz Horizontal Antenna Polarity Measured Emissions

8.0 Radiated Spurious Emissions, Transmit Mode

8.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The EUT was centered on a rotating turntable. Measurements below 1 GHz were taken at a test distance of 10 meters from the measurement antenna. Above 1 GHz the measurement distance was 3 meters.

Spurious emissions below 1 GHz were measured with quasi-peak detection with a resolution bandwidth of 120 kHz. Above 1 GHz peak measurements were taken and average measured where appropriate. A diagram showing the test setup appears below.



8.2 Test Criteria

47 CFR (USA) // IC (Canada)		
Section Reference	Parameter	Date(s)
15.247, 15.209 // RSS-Gen Issue 3, 4.9, 4.10	Field Strength of Radiated Spurious/Harmonic Emissions	2014-09-06

8.3 Test Results

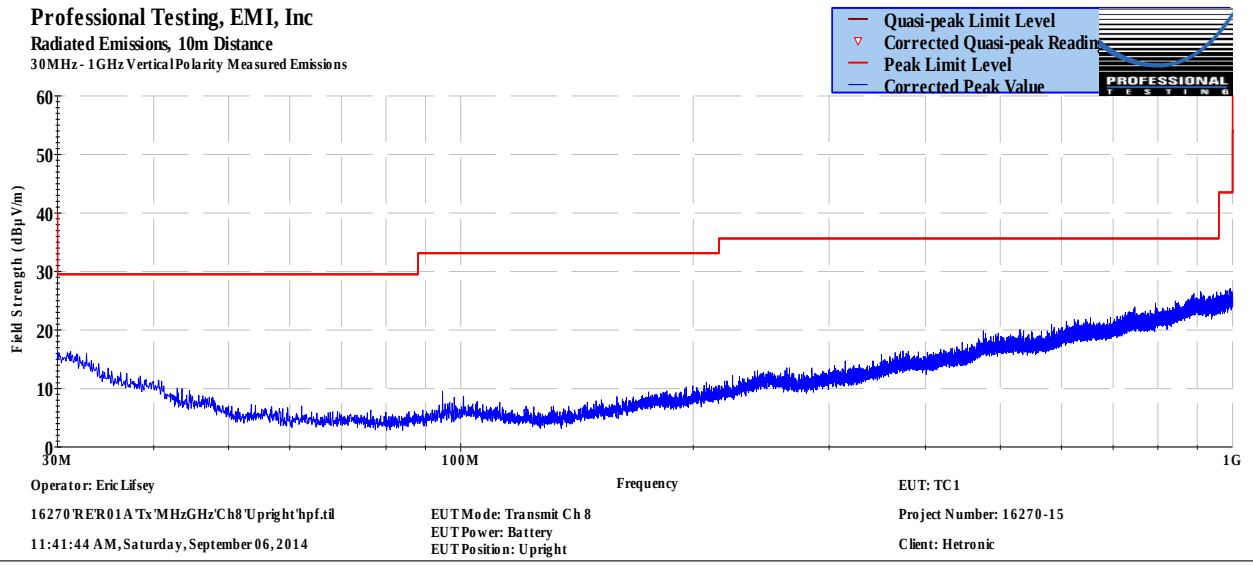
Below 1 GHz measurements were taken in transmit mode on the middle channel. Above 1 GHz measurements were taken on the three standard channels of the band and three orientations of the EUT.

The applicable duty cycle factor for averaging above 1 GHz is -20 dB.

Table 8.3.1: TX Mode, Below 1 GHz, Vertical Polarity, Mid. Channel

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Test Results Data Sheet			Page:	1	of	1
EUT Line Voltage:	3.3	VDC	EUT Power Frequency:	-	N/A	
Antenna Orientation:	Vertical		Frequency Range:	30MHz to 1GHz		
EUT Mode of Operation:			Transmit Mid Chan, Upright Position			

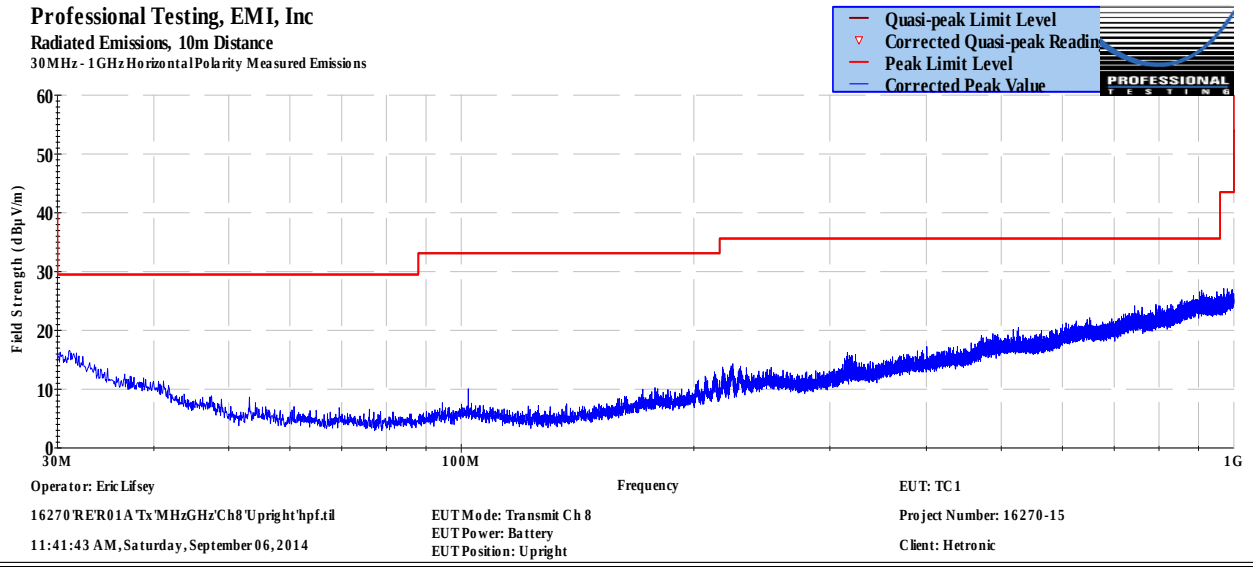


≤ 1GHz Vertical Antenna Polarity Measured Emissions

Table 8.3.2: TX Mode, Below 1 GHz, Horizontal Polarity, Mid. Channel

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None
Radiated Emissions Test Results Data Sheet		**Page:**	1 of 1

EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A
Antenna Orientation:	Horizontal		**Frequency Range:**	30MHz to 1GHz	
EUT Mode of Operation:	Transmit Mid Chan, Upright Position				

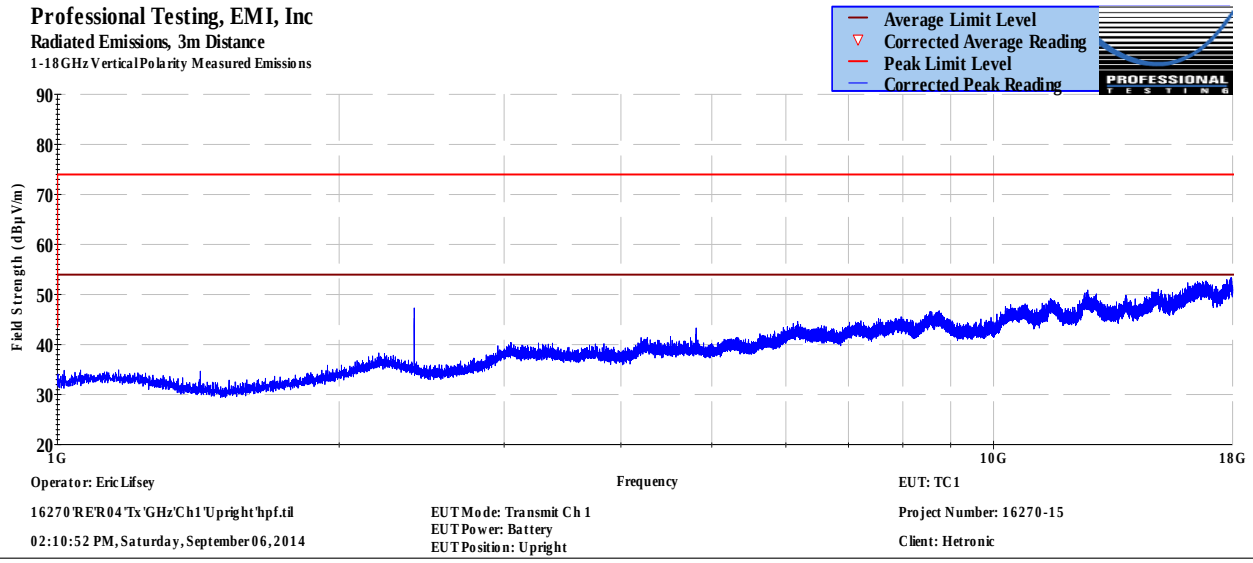


≤ 1GHz Horizontal Antenna Polarity Measured Emissions

Table 8.3.3: TX Mode, Above 1 GHz, Vertical Polarity, Low Channel, Upright

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Test Results Data Sheet			Page:	1	of	1
EUT Line Voltage:	3.3	VDC	EUT Power Frequency:	-	N/A	
Antenna Orientation:	Vertical		Frequency Range:	Above 1GHz		
EUT Mode of Operation:	Transmit Bottom Chan, Upright Position					

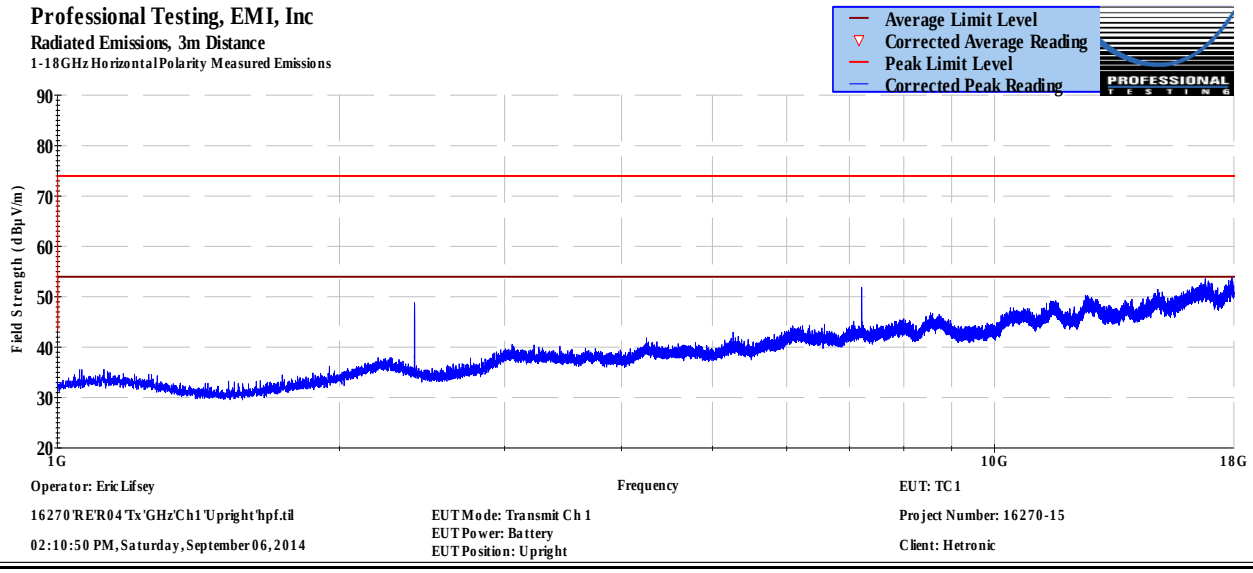


> 1GHz Vertical Antenna Polarity Measured Emissions

Table 8.3.4: TX Mode, Above 1 GHz, Horizontal Polarity, Low Channel, Upright

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1
EUT Line Voltage:	3.3 VDC	**EUT Power Frequency:**	- N/A
Antenna Orientation:	Horizontal	**Frequency Range:**	Above 1GHz
EUT Mode of Operation:		Transmit Bottom Chan, Upright Position	

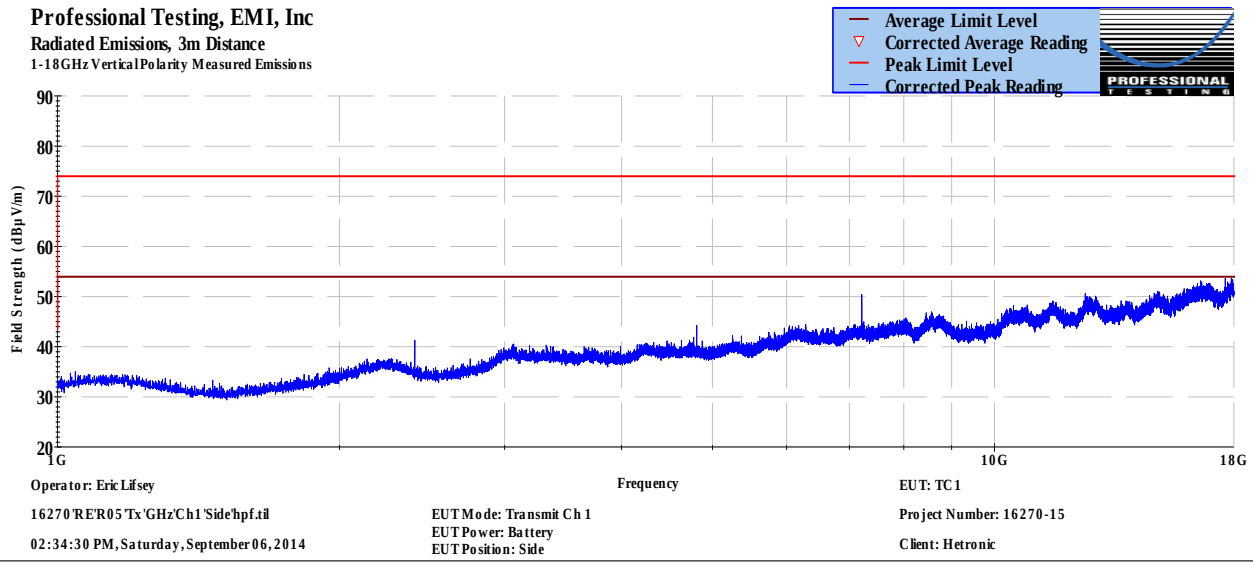


> 1GHz Horizontal Antenna Polarity Measured Emissions

Table 8.3.5: TX Mode, Above 1 GHz, Vertical Polarity, Low Channel, Side

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page:	1	of	1
EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A	
Antenna Orientation:	Vertical		**Frequency Range:**	Above 1GHz		
EUT Mode of Operation:	Transmit Bottom Chan, Side Position					

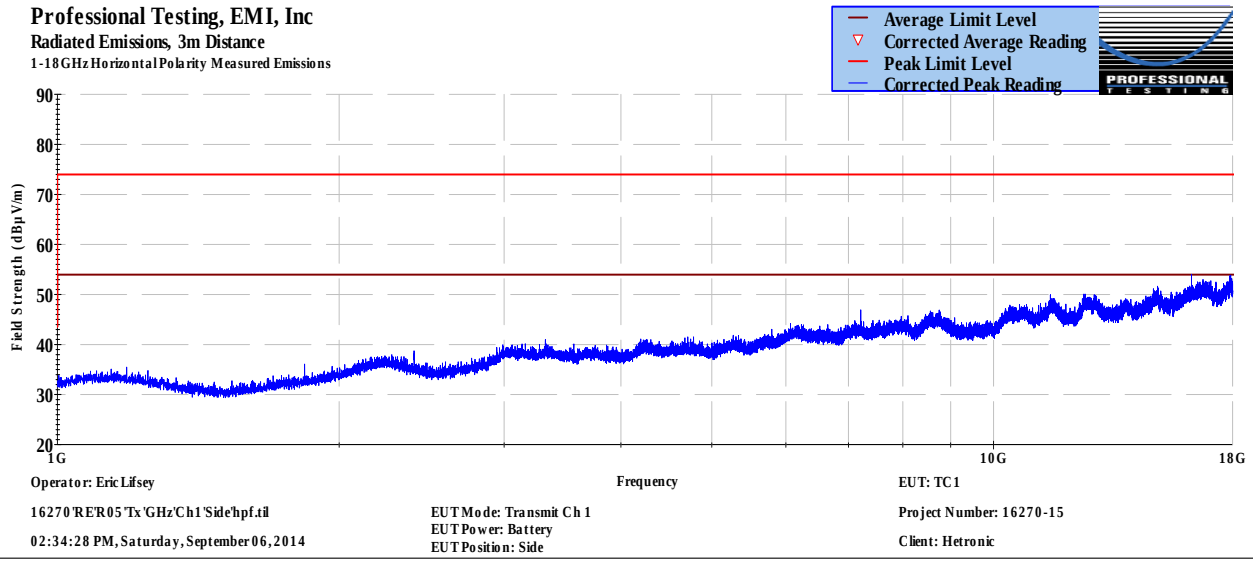


> 1GHz Vertical Antenna Polarity Measured Emissions

Table 8.3.6: TX Mode, Above 1 GHz, Horizontal Polarity, Low Channel, Side

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1
EUT Line Voltage:	3.3 VDC	**EUT Power Frequency:**	- N/A
Antenna Orientation:	Horizontal	**Frequency Range:**	Above 1GHz
EUT Mode of Operation:		Transmit Bottom Chan, Side Position	

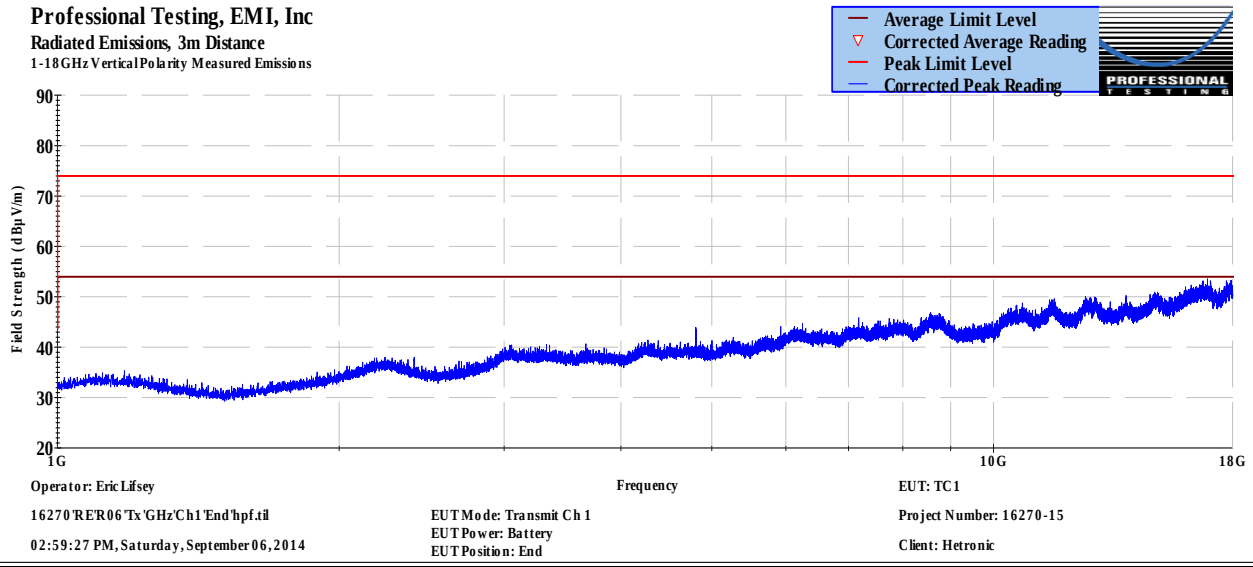


> 1GHz Horizontal Antenna Polarity Measured Emissions

Table 8.3.7: TX Mode, Above 1 GHz, Vertical Polarity, Low Channel, End

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page:	1	of	1
EUT Line Voltage:	3.3 VDC	**EUT Power Frequency:**	-	N/A		
Antenna Orientation:	Vertical	**Frequency Range:**	Above 1GHz			
EUT Mode of Operation:	Transmit Bottom Chan, End Position					

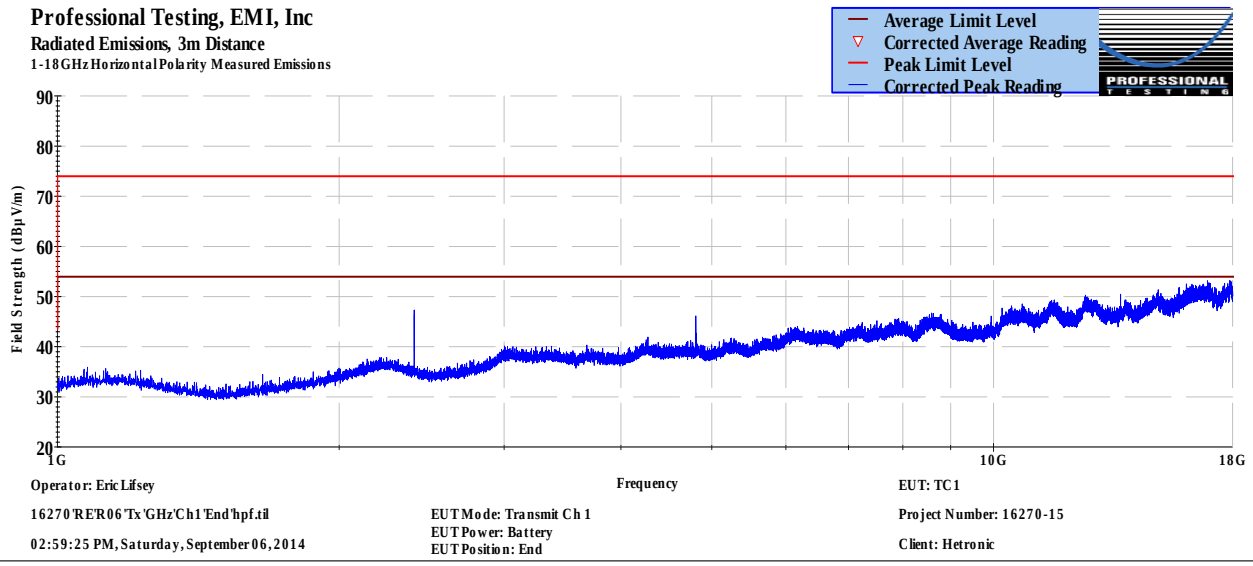


> 1GHz Vertical Antenna Polarity Measured Emissions

Table 8.3.8: TX Mode, Above 1 GHz, Horizontal Polarity, Low Channel, End

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Test Results Data Sheet			Page:	1	of	1
EUT Line Voltage:	3.3	VDC	EUT Power Frequency:	-	N/A	
Antenna Orientation:	Horizontal		Frequency Range:	Above 1GHz		
EUT Mode of Operation:			Transmit Bottom Chan, End Position			

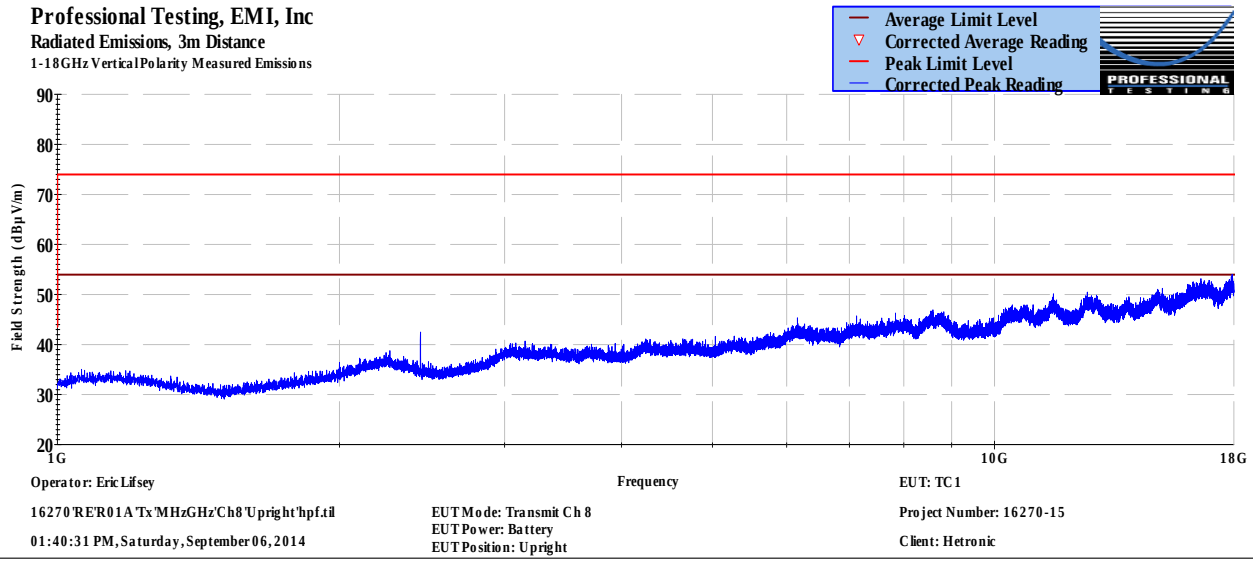


> 1GHz Horizontal Antenna Polarity Measured Emissions

Table 8.3.9: TX Mode, Above 1 GHz, Vertical Polarity, Mid Channel, Upright

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Test Results Data Sheet			Page:	1	of	1
EUT Line Voltage:	3.3	VDC	EUT Power Frequency:	-	N/A	
Antenna Orientation:	Vertical		Frequency Range:	Above 1GHz		
EUT Mode of Operation:	Transmit Mid Chan, Upright Position					

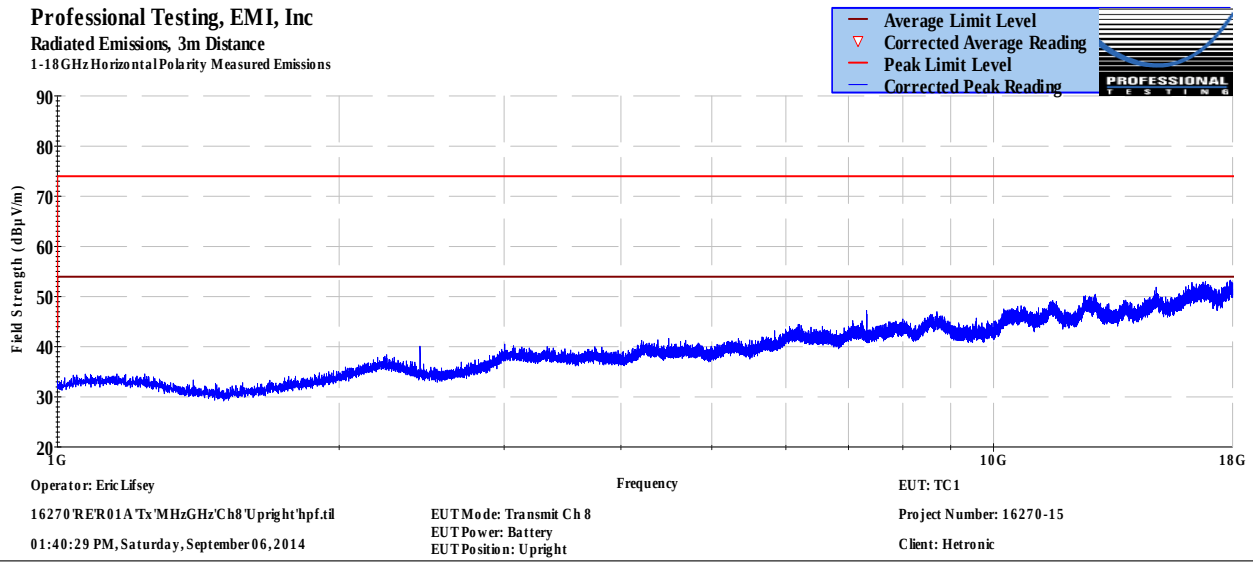


> 1GHz Vertical Antenna Polarity Measured Emissions

8.3.10 TX Mode, Above 1 GHz, Horizontal Polarity, Mid Channel, Upright

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Test Results Data Sheet			Page:	1	of	1
EUT Line Voltage:	3.3	VDC	EUT Power Frequency:	-	N/A	
Antenna Orientation:	Horizontal		Frequency Range:	Above 1GHz		
EUT Mode of Operation:			Transmit Mid Chan, Upright Position			

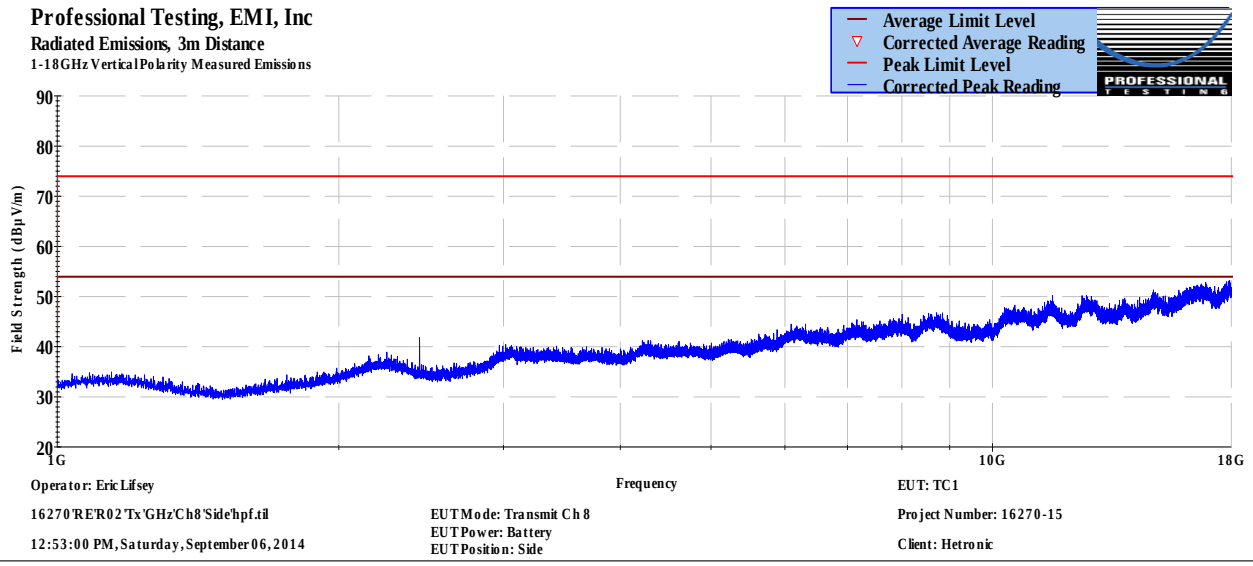


> 1GHz Horizontal Antenna Polarity Measured Emissions

8.3.11 TX Mode, Above 1 GHz, Vertical Polarity, Mid Channel, Side

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1
EUT Line Voltage:	3.3 VDC	**EUT Power Frequency:**	- N/A
Antenna Orientation:	Vertical	**Frequency Range:**	Above 1GHz
EUT Mode of Operation:		Transmit Mid Chan, Side Position	

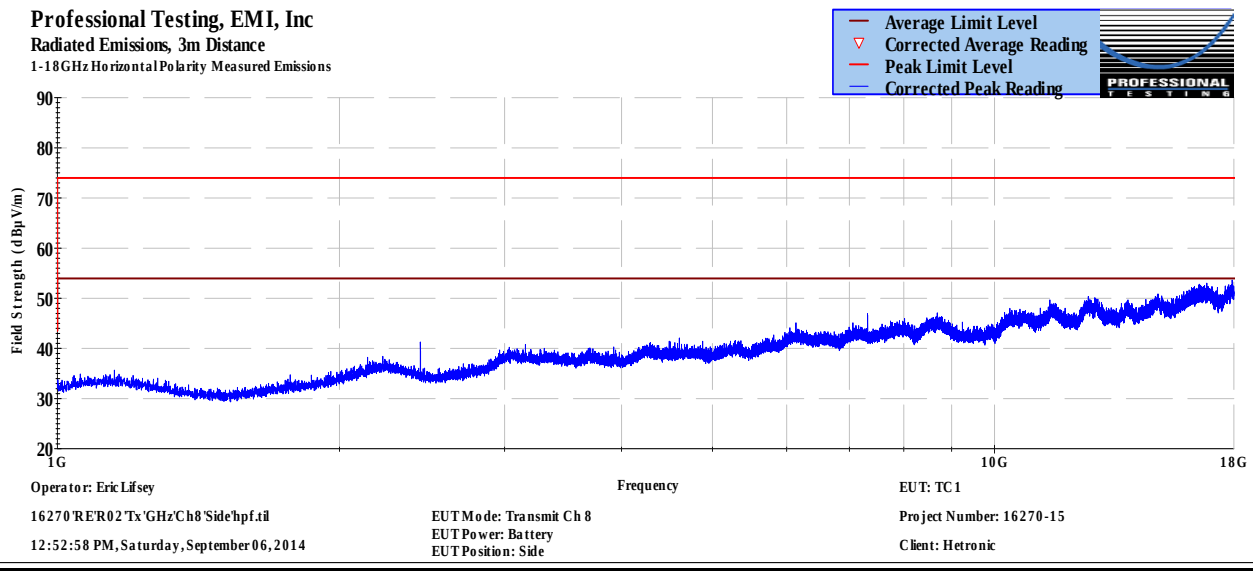


> 1GHz Vertical Antenna Polarity Measured Emissions

8.3.12 TX Mode, Above 1 GHz, Horizontal Polarity, Mid Channel, Side

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1		
EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A
Antenna Orientation:	Horizontal		**Frequency Range:**	Above 1GHz	
EUT Mode of Operation:	Transmit Mid Chan, Side Position				

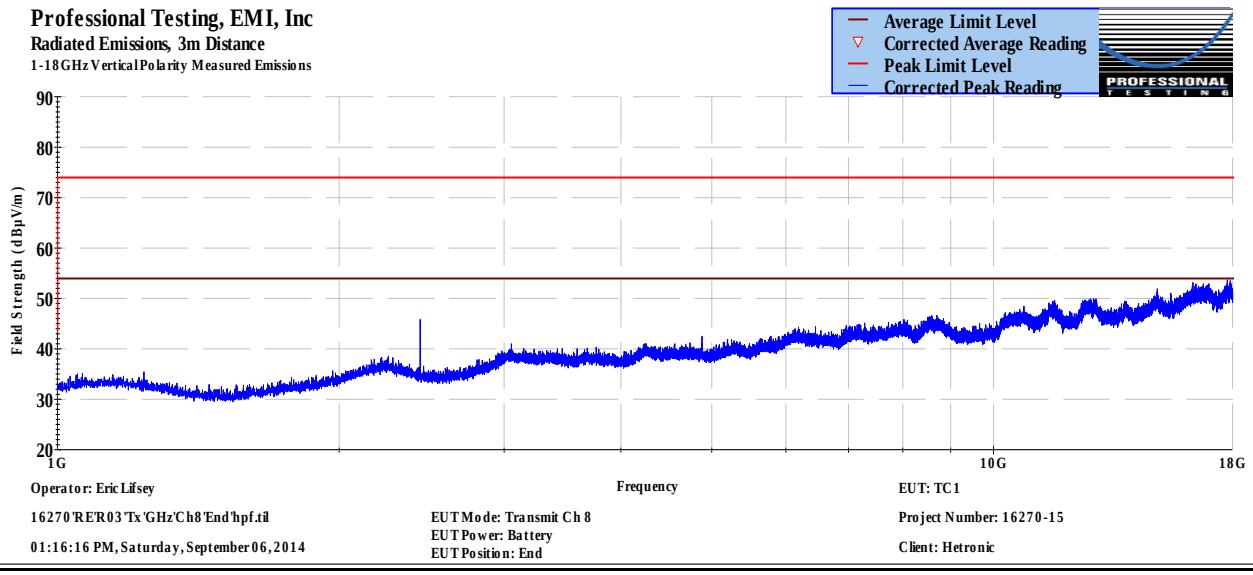


> 1GHz Horizontal Antenna Polarity Measured Emissions

8.3.13 TX Mode, Above 1 GHz, Vertical Polarity, Mid Channel, End

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1		
EUT Line Voltage:	3.3	VDC	EUT Power Frequency:	-	N/A
Antenna Orientation:	Vertical		Frequency Range:	Above 1GHz	
EUT Mode of Operation:			Transmit Mid Chan, End Position		

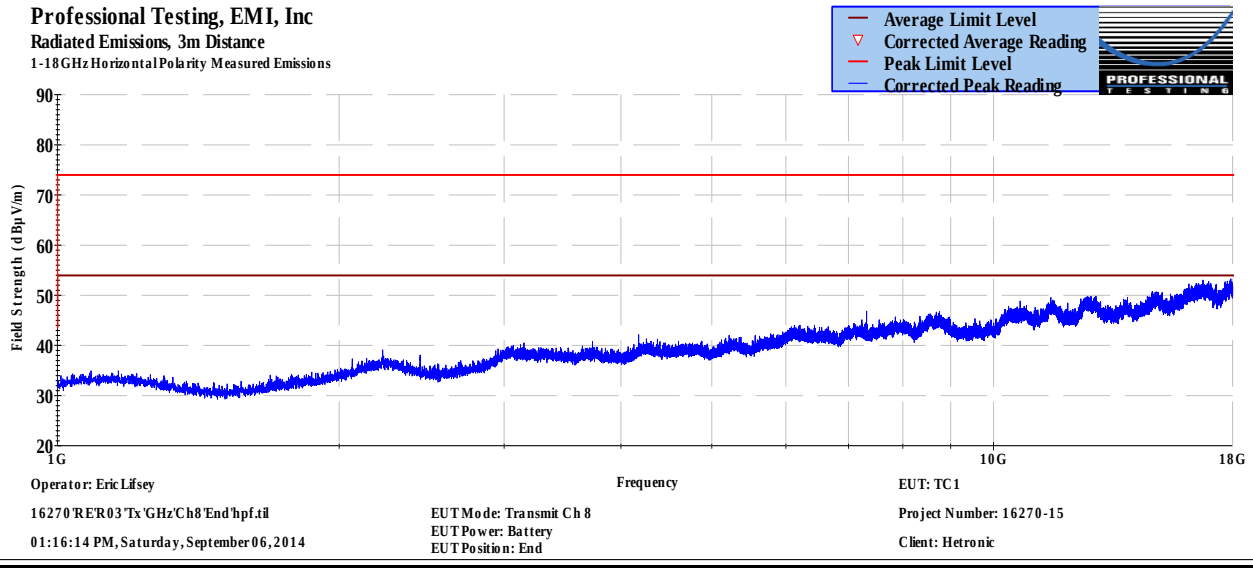


> 1GHz Vertical Antenna Polarity Measured Emissions

8.3.14 TX Mode, Above 1 GHz, Horizontal Polarity, Mid Channel, End

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1		
EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A
Antenna Orientation:	Horizontal		**Frequency Range:**	Above 1GHz	
EUT Mode of Operation:	Transmit Mid Chan, End Position				

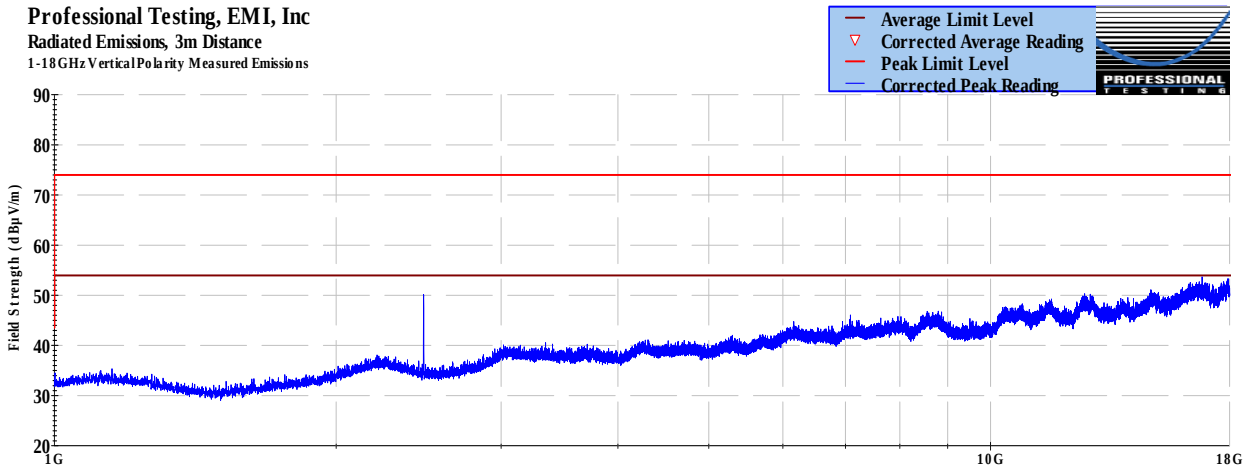


> 1GHz Horizontal Antenna Polarity Measured Emissions

8.3.15 TX Mode, Above 1 GHz, Vertical Polarity, High Channel, Upright

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1		
EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A
Antenna Orientation:	Vertical		**Frequency Range:**	Above 1GHz	
EUT Mode of Operation:	Transmit Top Chan, Upright Position				

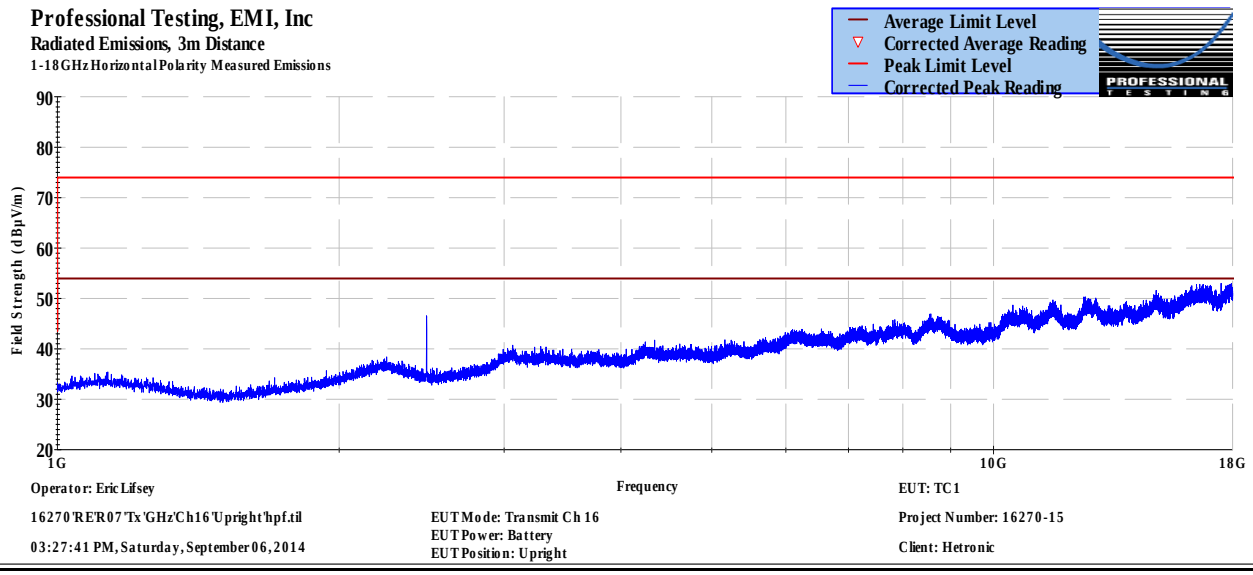


> 1GHz Vertical Antenna Polarity Measured Emissions

8.3.16 TX Mode, Above 1 GHz, Horizontal Polarity, High Channel, Upright

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1		
EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A
Antenna Orientation:	Horizontal		**Frequency Range:**	Above 1GHz	
EUT Mode of Operation:	Transmit Top Chan, Upright Position				

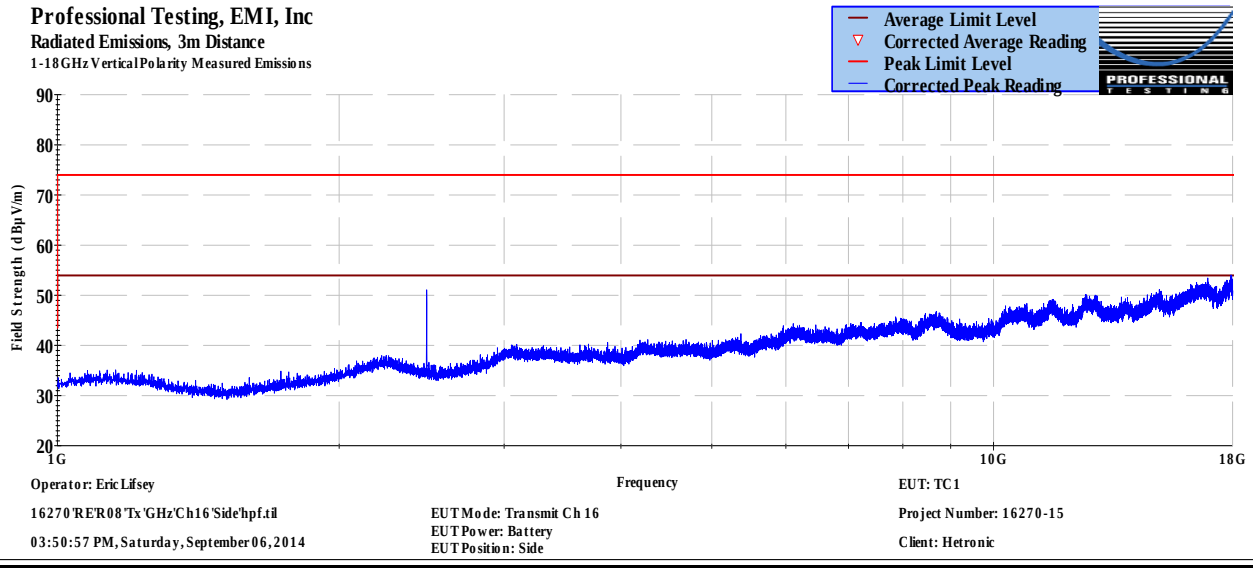


> 1GHz Horizontal Antenna Polarity Measured Emissions

8.3.17 TX Mode, Above 1 GHz, Vertical Polarity, High Channel, Side

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1		
EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A
Antenna Orientation:	Vertical		**Frequency Range:**	Above 1GHz	
EUT Mode of Operation:	Transmit Top Chan, Side Position				

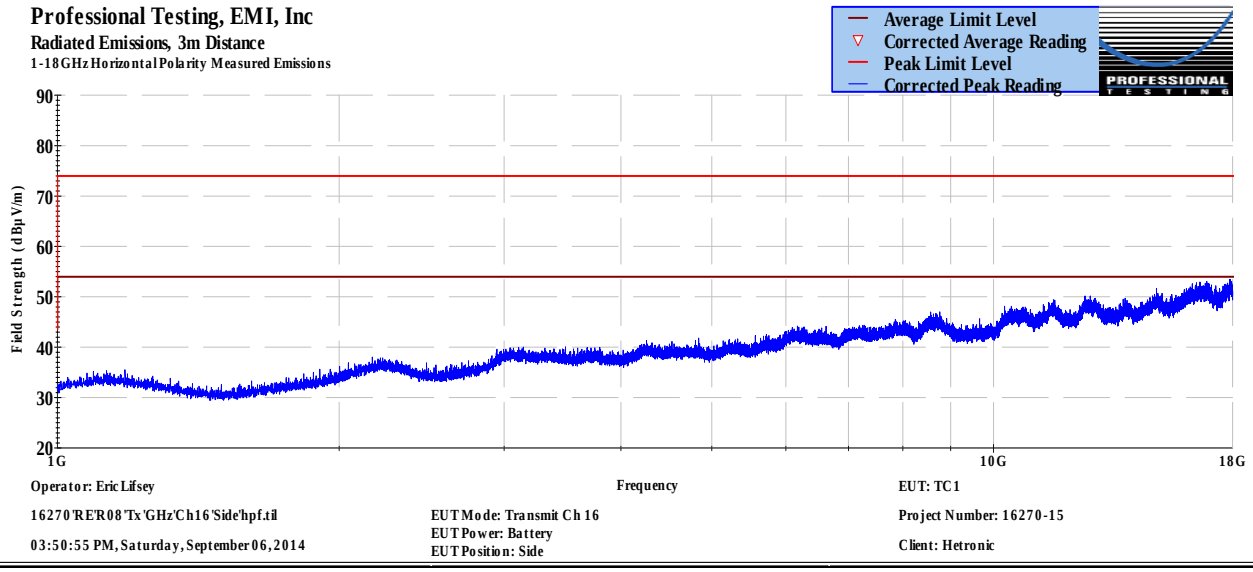


> 1GHz Vertical Antenna Polarity Measured Emissions

8.3.18 TX Mode, Above 1 GHz, Horizontal Polarity, High Channel, Side

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	**EUT Serial #:**	None
Customer:	Hetronic	**EUT Part #:**	None
Project Number:	16270-15	**Test Technician:**	Eric Lifsey
Purchase Order #:	Not Listed	**Supervisor:**	Rob McCollough
Equip. Under Test:	TC1	**Witness' Name:**	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1		
EUT Line Voltage:	3.3	VDC	**EUT Power Frequency:**	-	N/A
Antenna Orientation:	Horizontal		**Frequency Range:**	Above 1GHz	
EUT Mode of Operation:	Transmit Top Chan, Side Position				

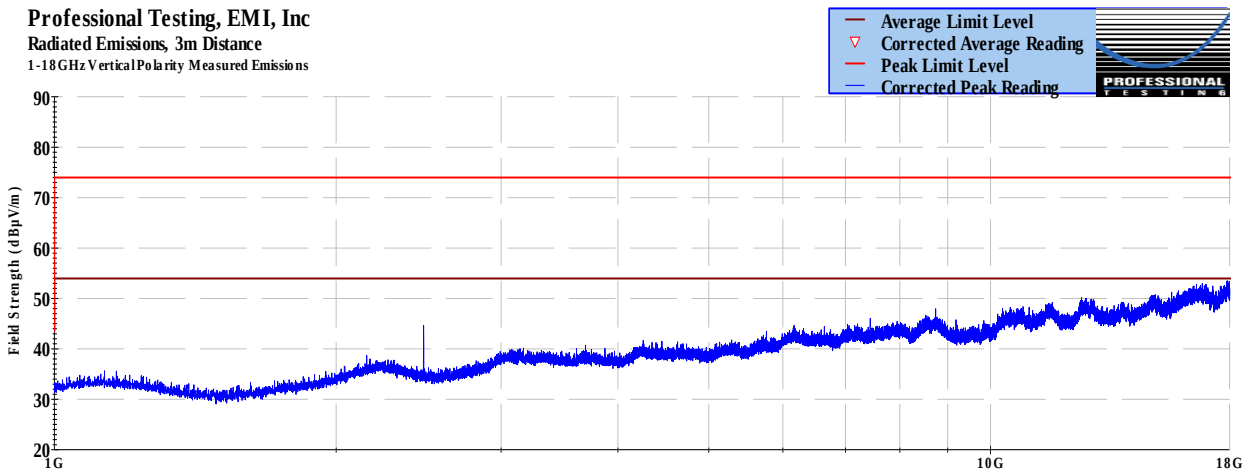


> 1GHz Horizontal Antenna Polarity Measured Emissions

8.3.19 TX Mode, Above 1 GHz, Vertical Polarity, High Channel, End

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Test Results Data Sheet			Page: 1 of 1		
EUT Line Voltage:	3.3	VDC	EUT Power Frequency:	-	N/A
Antenna Orientation:	Vertical		Frequency Range:	Above 1GHz	
EUT Mode of Operation:			Transmit Top Chan, End Position		

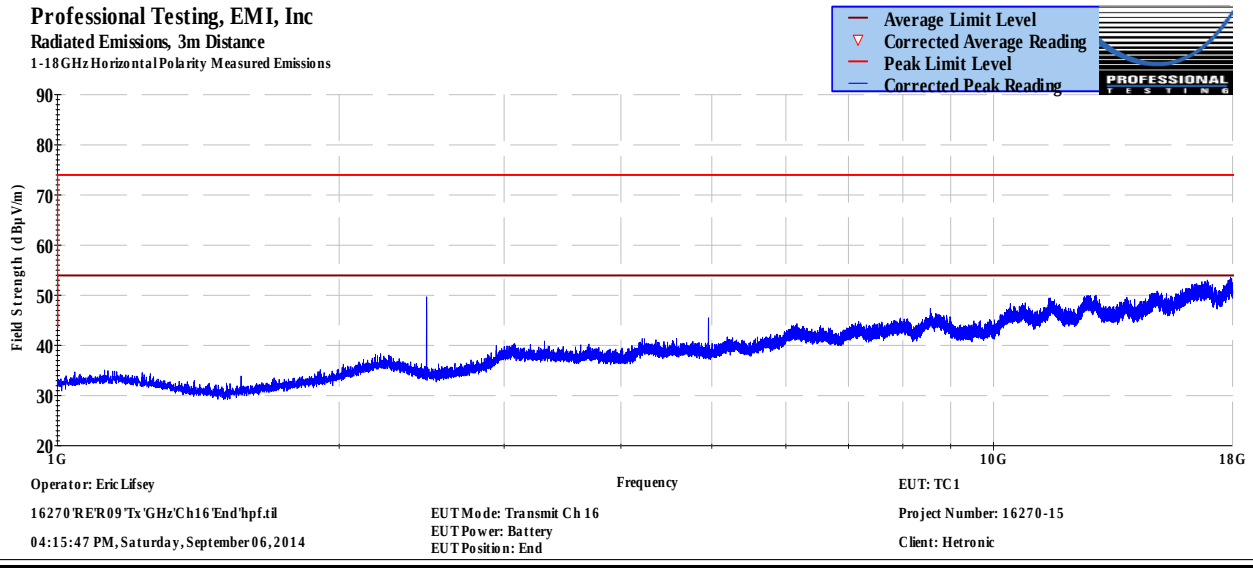


> 1GHz Vertical Antenna Polarity Measured Emissions

8.3.20 TX Mode, Above 1 GHz, Horizontal Polarity, High Channel, End

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference, see §15.38).		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

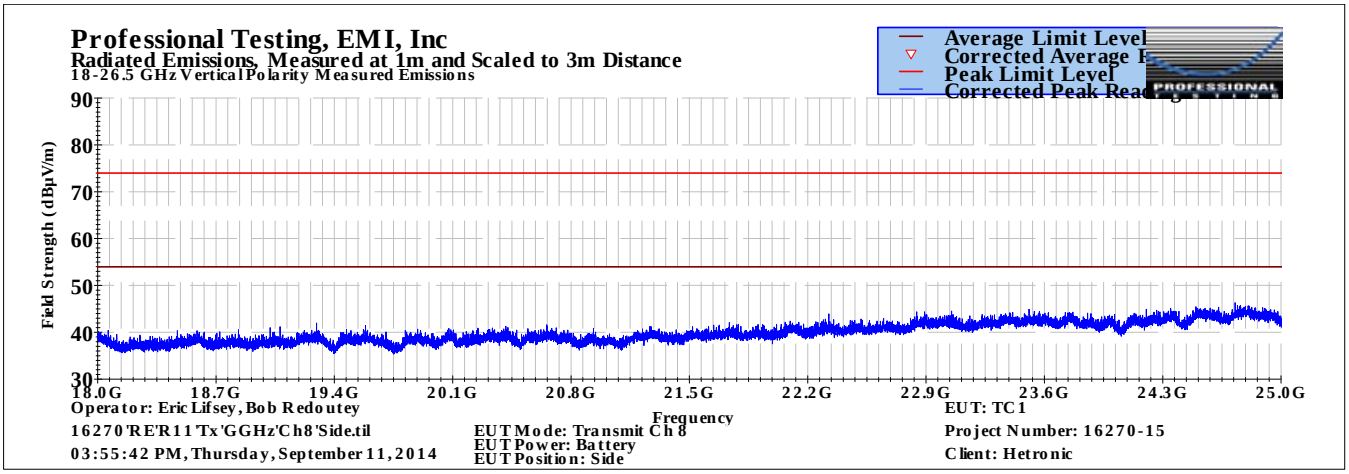
Radiated Emissions Test Results Data Sheet			Page: 1 of 1		
EUT Line Voltage:	3.3	VDC	EUT Power Frequency:	-	N/A
Antenna Orientation:	Horizontal		Frequency Range:	Above 1GHz	
EUT Mode of Operation:			Transmit Top Chan, End Position		

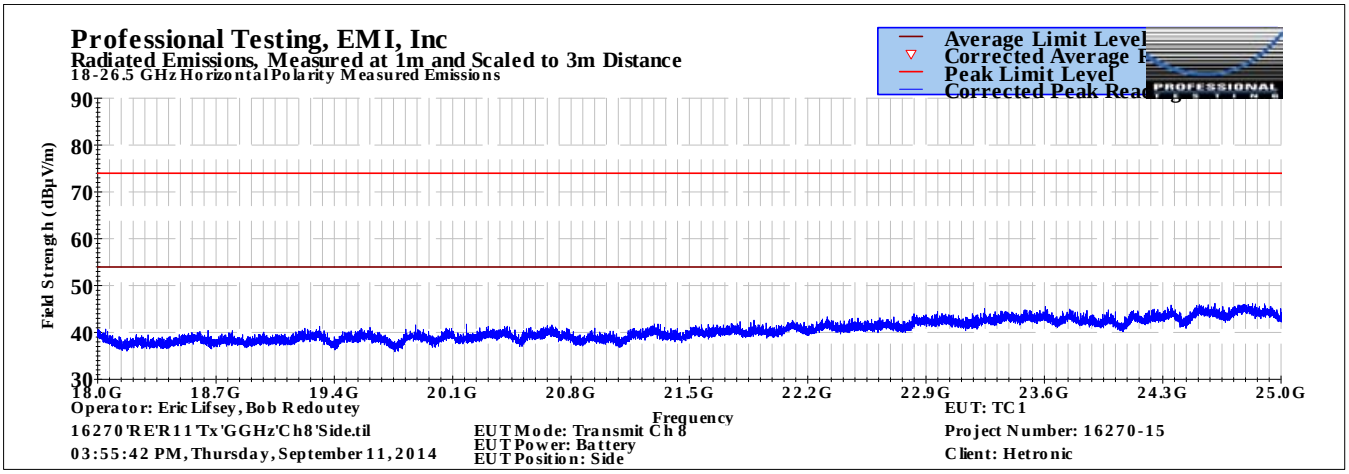


> 1GHz Horizontal Antenna Polarity Measured Emissions

8.3.21 TX Mode, 18 GHz to 25 GHz

No emissions were detected in this range. Measurements of the middle channel in worse-case orientation, side, are presented below.





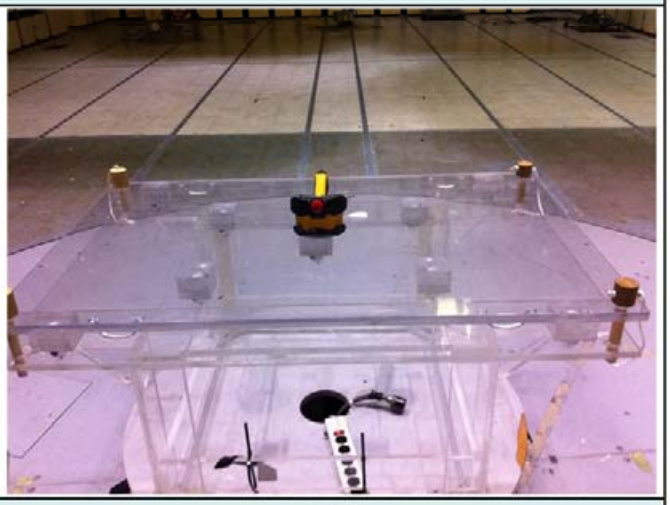
9.0 Setup Photographs

9.1 Receive Mode Spurious

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference,		
In accordance with:	FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	9/2/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Photographs Page: 1 of 1

Front

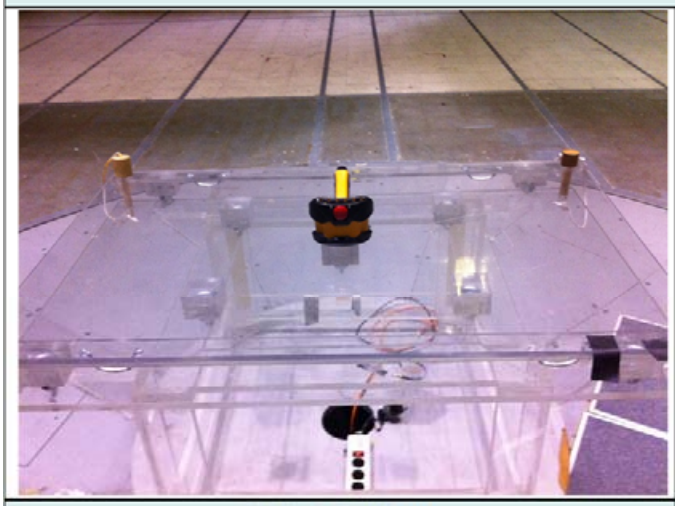


Back

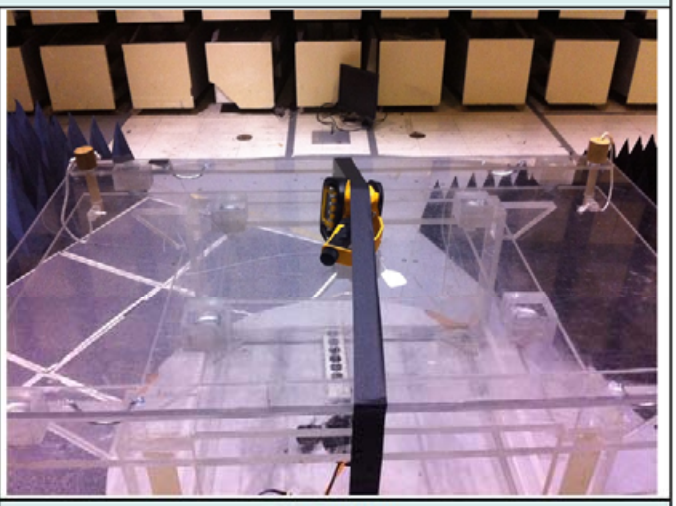
9.2 Transmit Mode Spurious, 30 MHz to 18 GHz

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference,		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

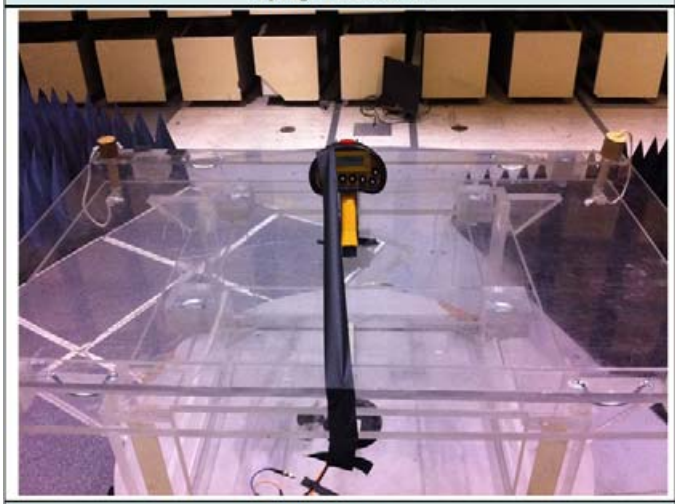
Radiated Emissions Photographs Page: 1 of 1



Upright Position



Side Position



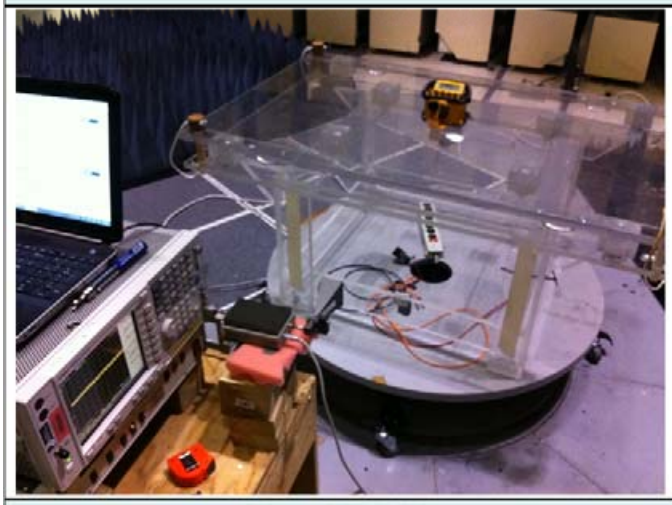
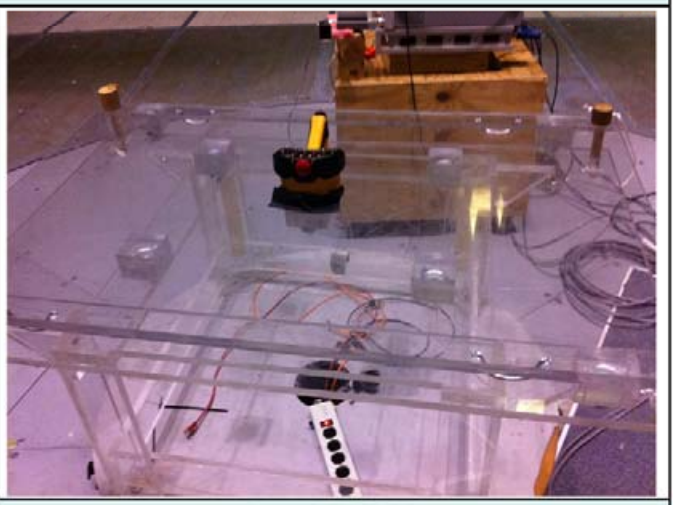
End Position

Closeup

Also applies to tests of 2014-09-11.

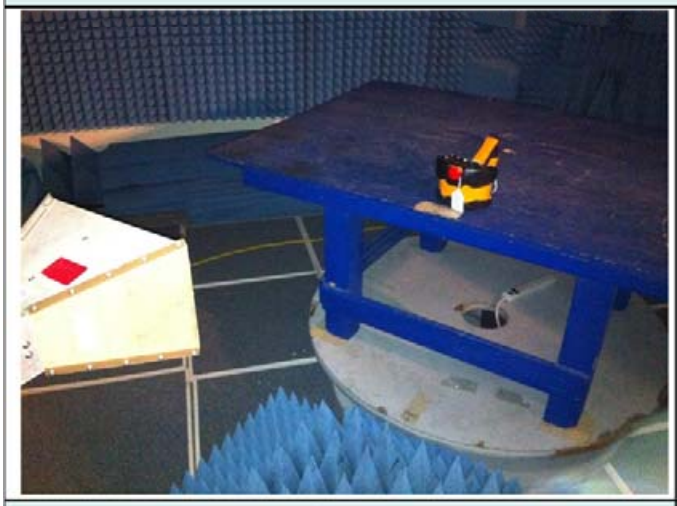
9.3 Transmit Mode Spurious, 18 GHz to 25 GHz

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference,		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Radiated Emissions Photographs	Page: 1 of 1
	
Front 18-25 GHz	Rear 18-25 GHz

9.4 Transmit Timing and Bandwidth

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference,		
In accordance with:	FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits		
Section:	15.209		
Test Date(s):	9/6/2014	EUT Serial #:	None
Customer:	Hetronic	EUT Part #:	None
Project Number:	16270-15	Test Technician:	Eric Lifsey
Purchase Order #:	Not Listed	Supervisor:	Rob McCollough
Equip. Under Test:	TC1	Witness' Name:	None

Bandwidth & Timing Measurement Photographs	Page: 1 of 1
	
Front	

10.0 Antenna Construction Requirements

The design was investigated for meeting the antenna construction requirements of the applicable rules.

10.1 Procedure

A direct examination of the antenna construction is performed and compared to rule criteria that prevent wireless device antennas from being modified by end users in ways that would void their authorization to use the device.

10.2 Criteria

47 CFR (USA) // IC (Canada)		
Section Reference	Parameter	Date(s)
15.203 // RSS-210 Issue 8, A2.9	Antenna Construction	2014-10-04

10.3 Results

Table 9.3.1 Antenna Construction Details	
Antenna Manufacturer and Model	**Specifications**
Hetronic International BOM Reference: ANT_F_2G4_SOLD	Inverted-F style, printed on circuit board.

- Antenna is internal only.
- Antenna is printed on circuit board.
- There is no external antenna connector.

The antenna design above satisfies the requirements of the rules.

11.0 Equipment

11.1 Spurious Radiated Emissions 30 MHz to 25 GHz

Professional Testing, EMI, Inc.			
Test Method:	**ANSI C63.4–2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" (incorporated by reference,**		
In accordance with:	**FCC Part 15.209 - Code of Federal Regulations Part 47, Subpart C - Intentional Radiators, Radiated Emissions Limits**		
Section:	**15.209**		
Test Date(s):	**9/6/2014**	**EUT Serial #:**	**None**
Customer:	**Hetronic**	**EUT Part #:**	**None**
Project Number:	**16270-15**	**Test Technician:**	**Eric Lifsey**
Purchase Order #:	**Not Listed**	**Supervisor:**	**Rob McCollough**
Equip. Under Test:	**TC1**	**Witness' Name:**	**None**

Radiated Emissions Test Equipment List

Tile! Software Version:	**4.2.A, May 23, 2010, 08:38:52 AM**
Test Profile:	**Radiated Emissions_Profile Version October 12, 2011**

Asset #	Manufacturer	Model	Equipment Nomenclature	Serial Number	Calibration Due Date
1509A	Braden	N/A	TDK 10M Chamber, NSA < 1 GHz	DAC-012915-005	11/29/2014
1890	HP	8447F	Preamp/Amp, 9kHz-1300MHz, 28/25dB	3313A05298	1/22/2015
1937	Agilent	E4440A	Spectrum Analyzer, 3 Hz - 26.5 GHz	MY44303298	12/2/2015
1926	ETS-Lindgren	3142D	Antenna, Biconilog, 26 MHz - 6 GHz	00135454	10/29/2014
C027	N/A	RG214	Cable Coax, N-N, 25m	none	10/22/2015
1327	EMCO	1050	Controller, Antenna Mast	none	N/A
0942	EMCO	11968D	Turntable, 4ft.	9510-1835	N/A
1969	HP	11713A	Attenuator/Switch Driver	3748A04113	N/A
1509B	Braden	N/A	TDK 10M Chamber, VSWR > 1 GHz	DAC-012915-005	11/16/2014
2004	Miteq	AFS44-00101800-2S-10P-44	Amplifier, 40dB, .1-18GHz	0	11/19/2014
C030	N/A	0	Cable Coax, N-N, 30m	none	10/10/2015
1780	ETS-Lindgren	3117	Antenna, Double Ridged Guide Horn, 1 - 18 GHz	00110313	1/21/2015
1325	EMCO	1050	Controller, Antenna Mast	9003-1461	N/A

11.2 Timing and Bandwidth Measurements

Asset #	Manufacturer	Model #	Description	Calibration Due
ALN-077	Rohde & Schwarz	FSP-30	Spectrum Analyzer	2015-01-29

12.0 Measurement Bandwidths, Radiated Emissions, Spurious

Radiated Emissions Spectrum Analyzer Bandwidth and Measurement Time - Peak Scan				
Frequency Band Start (MHz)	**Frequency Band Stop (MHz)**	**6 dB Bandwidth (kHz)**	**Number of Ranges Used**	**Measurement Time per Range**
0.009	0.15	0.3	2	Multiple Sweeps
0.15	30	9	6	Multiple Sweeps
30	1000	120	2	Multiple 800 mS Sweeps
1000	6000	1000	2	Multiple Sweeps
6000	18000	300	2	Multiple Sweeps

*Notes:
1. The settings above are specifically calculated for the E4440A series of spectrum analyzers, which have 8,000 data points per range.
2. The measurement receiver resolution bandwidth setting was 300 Hz for quasi-peak measurements from 9-150 kHz.
3. The measurement receiver resolution bandwidth setting was 9 kHz for quasi-peak measurements from 0.15-30 MHz.
4. The measurement receiver resolution bandwidth setting was 120 kHz for quasi-peak measurements from 30-1000 MHz.
5. The measurement receiver resolution bandwidth setting was 1 MHz for average measurements from 1-18 GHz.

Appendix: Policy, Rationale, and Evaluation of EMC Measurement Uncertainty

All uncertainty calculations, estimates and expressions thereof shall be in accordance with NIST policy. Since PTI operates in accordance with NIST (NVLAP) Handbook 150-11: 2007, all instrumentation having an effect on the accuracy or validity of tests shall be periodically calibrated or verified traceable to national standards by a competent calibration laboratory. The certificates of calibration or verification on this instrumentation shall include estimates of uncertainty as required by NIST Handbook 150-11.

1. Rationale and Summary of Expanded Uncertainty.

Each piece of instrumentation at PTI that is used in making measurements for determining conformance to a standard (or limit), shall be assessed to evaluate its contribution to the overall uncertainty of the measurement in which it is used. The assessment of each item will be based on either a type A evaluation or a type B evaluation. Most of the evaluations will be type B, since they will be based on the manufacturer's statements or specifications of the calibration tolerances, or uncertainty will be stated along with a brief rationale for the type of evaluation and the resulting stated uncertainties.

The individual uncertainties included in the combined standard uncertainty for a specific test result will depend on the configuration in which the item of instrumentation is used. The combination will always be based on the law of propagation of uncertainty. Any systematic effects will be accommodated by including their uncertainties, in the calculation of the combined standard uncertainty; except that if the direction and amount of the systematic effect cannot be determined and separated from its uncertainty, the whole effect will be treated as uncertainty and combined along with the other elements of the test setup.

Type A evaluations of standard uncertainty will usually be based on calculating the standard deviation of the mean of a series of independent observations, but may be based on a least-squares curve fit or the analysis of variance for unusual situations. Type B evaluations of standard uncertainty will usually be based on manufacturer's specifications, data provided in calibration reports, and experience. The type of probability distribution used (normal, rectangular, a priori, or u-shaped) will be stated for each Type B evaluation.

In the evaluation of the uncertainty of each type of measurement, the uncertainty caused by the operator will be estimated. One notable operator contribution to measurement uncertainty is the manipulation of cables to maximize the measured values of radiated emissions. The operator contribution to measurement uncertainty is evaluated by having several operators independently repeat the same test. This results in a Type A evaluation of operator-contributed measurement uncertainty.

A summary of the expanded uncertainties of PTI measurements is shown as Table 1. These are the worst-case uncertainties considering all operative influence factors.

Table 1: Summary of Measurement Uncertainties for Site 45

Type of Measurement	Frequency Range	Meas. Dist.	Expanded Uncertainty U, dB (k=2)
Mains Conducted Emissions	150 kHz to 30 MHz	N/A	2.9
Telecom Conducted Emissions	150 kHz to 30 MHz	N/A	2.8
Radiated Emissions	30 to 1,000 MHz	10 m	4.8
	1 to 18 GHz	3 m	5.7

End of Report

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