

The Watt Stopper, Inc.

MRH6

June 16, 2003

Report No. WATT0009

Report Prepared By:



1-888-EMI-CERT

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Test Report



22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Issue Date: June 16, 2003

The Wattstopper, Inc.
Model : MRH6
Report No: WATT0009

Emissions

Description	Pass	Fail
FCC 15.247, Spurious Radiated Emissions	☒	☐
FCC 15.247, Output Power	☒	☐
FCC 15.247, Band Edge Compliance	☒	☐
FCC 15.247, Spurious Conducted Emissions	☒	☐
FCC 15.247, Power Spectral Density	☒	☐
FCC 15.247, Occupied Bandwidth	☒	☐
FCC 15.247, Dwell Time	☒	☐
FCC 15.247, Number of Hopping Frequencies	☒	☐
FCC 15.247, Channel Spacing	☒	☐

The equipment was tested in the configuration and mode(s) of operation provided by the client. The specific tests and test levels were specified by the client. Any additional tests, or product configurations that should be tested are the responsibility of the client. Product compliance is the responsibility of the client.

List of Modifications to equipment under test required to meet the requirements:

- See the modifications page of the report.

Deviations to the test standard

- No deviations were made to the test standard

Test Facility

- The measurement facility used to collect the data is located at:
Northwest EMC, Inc.; 22975 NW Evergreen Parkway, Suite 400; Hillsboro, OR 97124
Phone: (503) 844-4066 Fax: 844-3826
This site has been fully described in a report filed with the FCC (Federal Communications Commission), and accepted by the FCC in a letter maintained in our files.

Approved By:

Greg Kiemel, Director of Engineering

This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested, the specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
00	None		

FCC: The Open Area Test Sites, and conducted measurement facilities, have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files.



TCB: Northwest EMC has been accredited by ANSI to ISO/IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.

A2LA: Accreditation has been granted to Northwest EMC, Inc. to perform the Electromagnetic Compatibility (EMC) tests described in the Scope of Accreditation. Assessment performed to ISO/IEC 17025. Certificate Number: 1936-01, Certificate Number: 1936-02, Certificate Number 1936-03



Australia/New Zealand: The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body. (A2LA)



TÜV Product Service: Included in TÜV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TÜV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TÜV's current Listing of CARAT Laboratories available from TÜV. A certificate was issued to represent that this laboratory continues to meet TÜV's CARAT Program requirements. Certificate No. USA0302C



TÜV Rheinland: Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.



NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



Technology International: Assessed in accordance with ISO Guide 25 defining the general international requirements for the competence of calibration and testing laboratories and with ITI assessment criteria LACO196. Based upon that assessment Interference Technology International, Ltd., has granted approval for specifications implementing the EU Directive on EMC (89/336/EEC and amendments). The scope of the approval was provided on a Schedule of Assessment supplied with the certificate and is available upon request.



Industry Canada: Accredited by Industry Canada for performance of radiated measurements. Our open area test sites comply with RSP 100, Issue 7, section 3.3.



VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (Registration Nos. - Evergreen: C-1071 and R-1025, Trails End: C-694 and R-677, Sultan: C-905, R-871 and R-1172, North Sioux City C-1246, R-1185 and R-1217)



BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.



CAB: Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement



GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



	FCC	NIST	TUV PS	TUV Rheinland	Nemko	Technology International	Industry Canada	BSMI	VCCI	GOST	NATA
IEC 1000-4-2			✓	✓	✓	✓					
IEC 1000-4-3			✓	✓	✓	✓					
IEC 1000-4-4			✓	✓	✓	✓					
IEC 1000-4-5			✓	✓	✓	✓					
IEC 1000-4-6			✓	✓	✓	✓					
IEC 1000-4-8			✓	✓	✓	✓					
IEC 1000-4-11			✓	✓	✓	✓					
IEC 1000-3-2			✓	✓	✓	✓					
IEC 1000-3-3			✓	✓	✓	✓					
AS/NZS 3548											✓
CNS 13438								✓			
ISO/IEC Guide 25			✓	✓	✓	✓		✓			
ISO/IEC17025			✓	✓	✓	✓					
Radiated Emissions			✓	✓	✓	✓	✓	✓	✓	✓	
Conducted Emissions			✓	✓	✓	✓	✓	✓	✓	✓	
OATS Sites	✓		✓	✓	✓	✓	✓	✓	✓	✓	
Hillsboro 5-Meter Chamber (EV01)	✓		✓	✓	✓	✓	✓	✓	✓	✓	
TCB for Licensed Transmitters	✓										
TCB for un-Licensed Transmitters	✓										
Cab for R&TTE		✓									
CAB for EMC		✓									

SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999

NORTHWEST EMC
Evergreen Facility
22975 NW Evergreen Pkwy #400
Hillsboro, OR 97124
David Tolman Phone: 503 844 4066

ELECTRICAL (EMC)

Valid until: July 31, 2004

Certificate Number: 1936-01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following Electromagnetic Compatibility (EMC) tests:

EMC StandardsTitle*Radiated & Conducted Emissions*

CFR 47, FCC Part 15 using ANSI C63.4

American National Standard for methods of measurement of radio-noise emissions for low-voltage electrical and electronic equipment in the range of 9 kHz to 40GHz.

CISPR 22

Limits and methods of measurement of radio disturbance characteristics of information technology equipment.

CNS 13438

Limits and methods of measurement of radio interference characteristics of information technology equipment.

EN 55022

Limits and methods of measurement of radio disturbance characteristics of information technology equipment.

Canada ICES-003

Digital apparatus

AS/NZS 3548

Australian/New Zealand Standard Limits and methods of measurement of radio disturbance characteristics of information technology equipment

Canada ICES-001

Industrial, scientific and medical radio frequency generators

CNS 13803

Industrial, Scientific and Medical Instrument

(A2LA Cert. No. 1936.01) 06/28/02

AS/NZS 2064	Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.
EN 61000-6-3	Electromagnetic capability – Generic emission standard. Part 1: Residential, commercial and light industry. (I.S.)
EN 61000-6-4	Electromagnetic compatibility – Generic emission standard. Part 2: Industrial environment
VCCI V-3/99.05	Technical Requirements
VCCI V-4/99.05	Instruction for Test Conditions for Requirement under Test
CISPR 11	Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.
EN 55011	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.
EN 55103-1	Electromagnetic Compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1: Emission
EN 61000-3-2	Electromagnetic compatibility (EMC). Part 3: Limits Section 2: Limits for harmonic current emissions
EN 61000-3-3	Electromagnetic compatibility (EMC). Part 3: Limits Section 2: Limitation of voltage fluctuations and flicker in low-voltage supply systems.
GR-1089 Section 3 (excluding analog voice band)	Bellcore electromagnetic compatibility and electrical safety – Generic criteria for network telecommunications equipment.
<i>Immunity</i>	
EN 61000-4-2 AS/NZS 61000-4-2	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 2: Electrostatic discharge immunity test – Basic EMC Publication
EN 61000-4-3 AS/NZS 61000-4-3	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 3: Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4 AS/NZS 61000-4-4	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 4: Electrical fast transient/burst immunity test – Basic EMC publication

EN 61000-4-5 AS/NZS 61000-4-5	Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques. Section 5: Surge immunity test.
EN 61000-4-6 AS/NZS 61000-4-6	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 6: Immunity to conducted disturbances, induce by radio-frequency fields.
EN 61000-4-8	Electromagnetic compatibility (EMC). Part 4: Testing and measurement techniques. Section 8: Power frequency magnetic field immunity test.
EN 61000-4-11	Electromagnetic Compatibility (EMC) Part 4: Testing and measurement techniques. Section 11: Voltage dips, short interruptions and voltage. Variations immunity tests.
EN 61000-6-1	Electromagnetic Compatibility (EMC)- Part 6: Generic standards- Section 1: Immunity for residential, commercial and light-industrial environments
EN 61000-6-2	Electromagnetic Compatibility (EMC)- Part 6: Generic standards- Section 2: Immunity for industrial environments
IEEE/ANSI C62.41	IEEE recommended practice on surge voltages in low-voltage AC power circuits
<i>Product Standards</i>	
GR-1089 Section 3 (excluding voice band)	Bellcore electromagnetic compatibility and electrical safety – Generic criteria for network telecommunications equipment.
EN 61326	Electrical equipment for measurement, control and laboratory use – EMC requirements
EN 60601-1-2	Medical electrical equipment Part 1: general requirements for safety Section 2: Collateral standard: Electromagnetic compatibility – requirements and tests
EN 50130-4	Alarm Systems. Part 4: Electromagnetic compatibility. Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.
EN 55103-2	Electromagnetic Compatibility – Product family standard for audio, video, audio-visual and entertainment lighting control professional use. Part 2: Immunity
EN 55024	Immunity Requirements for Information Technology Equipment – ITE Immunity

Other Standards

ETS 300 220	Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices; Technical characteristics and test methods for radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW; Part 1: Parameters intended for regulatory purposes; Part 2: Supplementary parameters not intended for regulatory Purposes
ETS 300 224	Electro Magnetic Compatability and Radio Spectrum Matters; Paging Services; Technical characteristics and test methods for on site paging service devices.
ETS 300 328	Radio Equipment and Systems (RES); Wideband transmission systems; Technical characteristics and test conditions for data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques
ETS 300 489-1	Electro Magnetic Compatability and Radio Spectrum Matters; Common Technical Requirements
ETS 300 489-2	Specific conditions for radio paging equipment
ETS 300 489-3	Specific conditions for Short Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz
Canadian RSS-102	Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields
Canadian RSS-119	Land Mobile and Fixed Radio Transmitters and Receivers, 27.41 to 960 MHz
Canadian RSS-123	Low Power Licensed Radiocommunication Devices
Canadian RSS-139	Licensed Radiocommunications Devices in the Band 2400- 2483.5 MHz
Canadian RSS-210	Industry Canada – Low power license-exempt radio communication devices
SAE J1113-41	Radiated and conducted emissions.
SAE J1113-21	Radiated immunity absorber lined chamber (200 MHz – 1 GHz)
SAE J1113-23	Radiated immunity stripline method (only 10 kHz – 200 MHz @ 80 V/m)

SAE J1113-4
(only substitution method)

Conducted immunity Bulk Current Injection

SAE J1113-13

ESD

FCC 47 Parts 22
(Cellular), 24, 25, 26 & 27

TCB Scope B1 (Excluding SAR testing)

FCC 47 Parts 22
(Non-Cellular), 73,74,90,95 & 97

TCB Scope B2 (Excluding SAR testing)

FCC 47 Parts 80 & 87

TCB Scope B3 (Excluding SAR testing)

FCC 47 Parts 21, 74, 101

TCB Scope B4 (Excluding SAR testing)

Onsite Testing

EN61000-6-2

Generic Immunity Standard for Industrial Applications

EN61000-6-4

Generic Emissions Standard for Industrial Applications

What is measurement uncertainty?

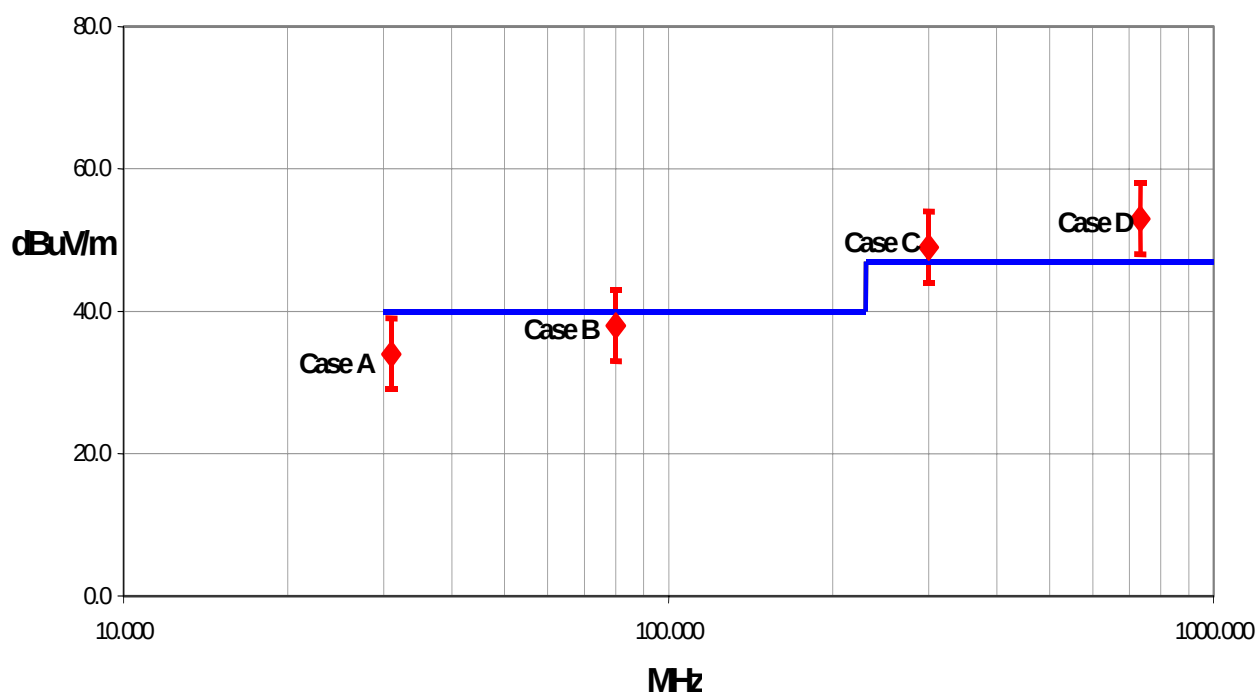
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" value. In the case of transient tests (ESD, EFT, Surge, Voltage Dips and Interruptions), the test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements.

The following documents were the basis for determining the uncertainty levels of our measurements:

- "ISO Guide to the Expression of Uncertainty in Measurements", October 1993
- "NIS81: The Treatment of Uncertainty in EMC Measurements", May 1994
- "IEC CISPR 16-3 A1 f1 Ed.1: Radio-interference measurements and statistical techniques", December 2000

How might measurement uncertainty be applied to test results?

If the diamond marks the measured value for the test and the vertical bars bracket the range of + and – measurement uncertainty, then test results can be interpreted from the diagram below.



Test Result Scenarios:

Case A: Product complies.

Case B: Product conditionally complies. It is not possible to say with 95% confidence that the product complies.

Case C: Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.

Case D: Product does not comply.

Radiated Emissions ≤ 1 GHz

Value (dB)

Test Distance	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86 - 1.88	+ 1.82 - 1.87	+ 2.23 - 1.41	+ 1.29 - 1.26	+ 1.31 - 1.27	+ 1.25 - 1.25
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k=2)	+ 3.72 - 3.77	+ 3.64 - 3.73	+ 4.46 - 2.81	+ 2.59 - 2.52	+ 2.61 - 2.55	+ 2.49 - 2.49

Radiated Emissions > 1 GHz

Value (dB)

Test Distance	Probability Distribution	Without High Pass Filter		With High Pass Filter	
		3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.29 - 1.25	+ 1.29 - 1.25	+ 1.38 - 1.35	+ 1.38 - 1.35
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k=2)	+ 2.57 - 2.51	+ 2.57 - 2.51	+ 2.76 - 2.70	+ 2.76 - 2.70

Conducted Emissions

Test Distance	Probability Distribution	Value (+/- dB)	
		3m	10m
Combined standard uncertainty $u_c(y)$	normal	1.48	1.48
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k = 2)	2.97	2.97

Radiated Immunity

Test Distance	Probability Distribution	Value (+/- dB)	
		3m	10m
Combined standard uncertainty $u_c(y)$	normal	1.05	1.05
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k = 2)	2.11	2.11

Conducted Immunity

Test Distance	Probability Distribution	Value (+/- dB)	
		3m	10m
Combined standard uncertainty $u_c(y)$	normal	1.05	1.05
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k = 2)	2.10	2.10

Legend

$u_c(y)$ = square root of the sum of squares of the individual standard uncertainties

U = combined standard uncertainty multiplied by the coverage factor: k . This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required, then $k=3$ (CL of 99.7%) can be used. Please note that with a coverage factor of one, $u_c(y)$ yields a confidence level of only 68%.

**California****Orange County Facility**

41 Tesla Ave.
Irvine, CA 92618
(888) 364-2378
FAX (503) 844-3826

**Oregon****Evergreen Facility**

22975 NW Evergreen Pkwy.,
Suite 400
Hillsboro, OR 97124
(503) 844-4066
FAX (503) 844-3826

**Oregon****Trails End Facility**

30475 NE Trails End Lane
Newberg, OR 97132
(503) 844-4066
FAX (503) 537-0735

**South Dakota****North Sioux City Facility**

745 N. Derby Lane
P.O. Box 217
North Sioux City, SD 57049
(605) 232-5267
FAX (605) 232-3873

**Washington****Sultan Facility**

14128 339th Ave. SE
Sultan, WA 98294
(888) 364-2378
FAX (360) 793-2536

Party Requesting the Test

Company Name:	The Watt Stopper, Inc.
Address:	6120 Paseo Del Norte, Suite 1-2
City, State, Zip:	Carlsbad, CA 92009
Test Requested By:	Bertrand Debever
Model:	MRH6
First Date of Test:	6-5-03
Last Date of Test:	6-16-03
Receipt Date of Samples:	6-5-03
Equipment Design Stage:	Pre-Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators:	Not provided at time of test.
Ports:	No ports.

Functional Description of the EUT (Equipment Under Test):

Handheld remote control of room lighting operating in the 902-928MHz band as a 15.247(f) hybrid system.

Client Justification for EUT Selection:

The product is an engineering sample, representative of the final product.

Client Justification for Test Selection

These tests satisfy the requirements for FCC Certification of the radio transmitter.

Equipment modifications				
Item #	Test	Date	Modification	Note
1	Occupied Bandwidth	05-20-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
2	Output Power	05-20-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
3	Band Edge Compliance	05-21-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
4	Dwell Time	06-16-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
5	Spurious Conducted Emissions	05-21-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
6	Spurious Radiated Emissions	06-16-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
7	Power Spectral Density	06-06-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
8	Number of Hopping Frequencies	06-12-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
9	Channel Spacing	06-12-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

All

Operating Modes Investigated:

Typical

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

Battery

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
Transmits at all channels.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	The Watt Stopper, Inc.	MRH6	N/A

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

Requirement: Per 47 CFR 15.247(a)(1), the hopping channel carrier frequencies must be separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel. The measurement is made with the spectrum analyzer's resolution bandwidth set to greater than or equal to 1% of the span, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The carrier frequency separation was measured between each of 5 hopping channels in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

Completed by:



EUT: MRH6		Work Order: WATT0009
Serial Number: N/A		Date: 06/12/03
Customer: The Watt Stopper, Inc.		Temperature: 28 °C
Attendees: N/A	Tested by: Rod Peloquin	Humidity: 38% RH
Customer Ref. No.: N/A	Power: Battery	Job Site: EV06

TEST SPECIFICATIONS

Specification: 47 CFR 15.247(a)(1)	Year: 2003	Method: DA 00-705, ANSI C63.4	Year: 1992
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SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Modulated by PRBS at maximum data rate. Hopping carrier.

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

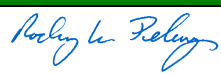
The hopping channel carrier frequencies shall be separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

RESULTS

CHANNEL SPACING

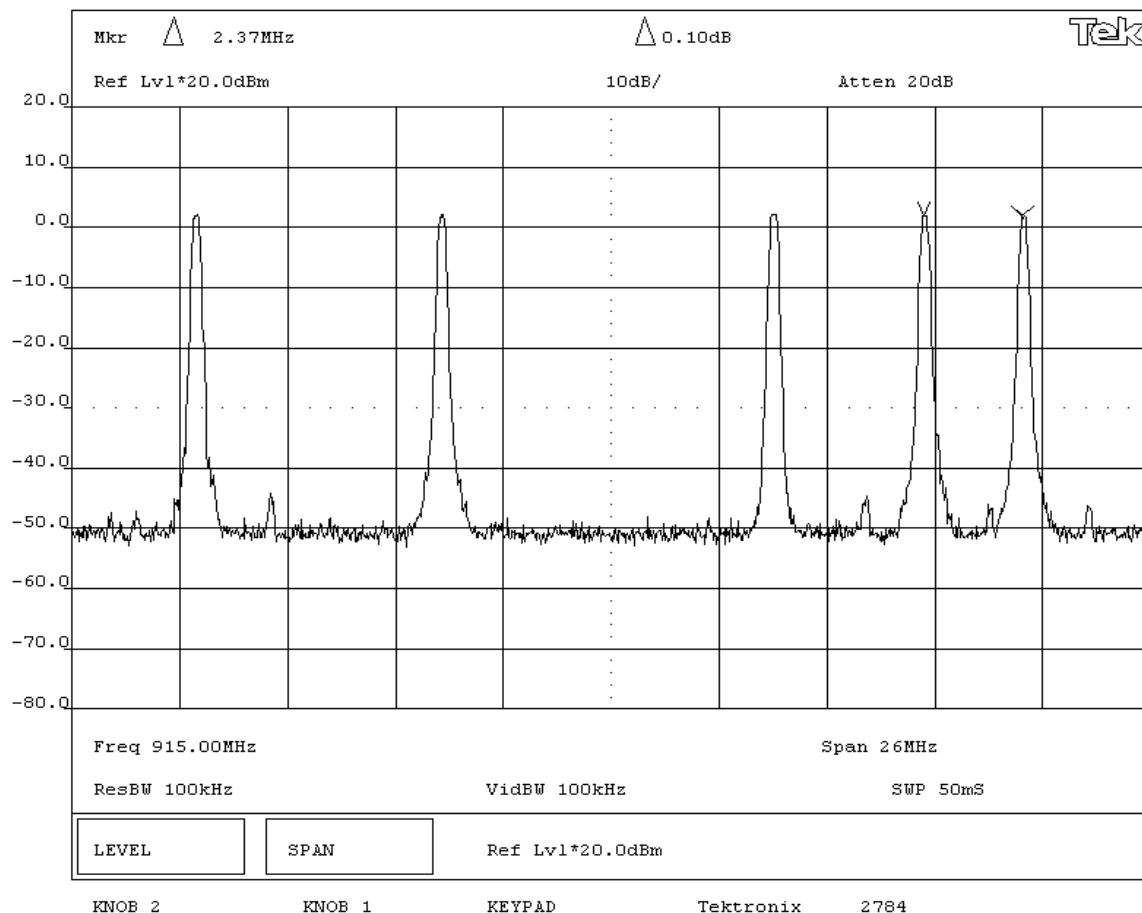
Pass 2.37MHz

SIGNATURE

Tested By: 

DESCRIPTION OF TEST

Carrier Frequency Separation



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Mid

Operating Modes Investigated:

Typical

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

120 VAC, 60 Hz.

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
Transmits all channels.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	The Watt Stopper, Inc.	MRH6	N/A

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	PA	2.2	PA	EUT	AC Adapter

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

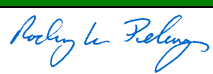
Test Description

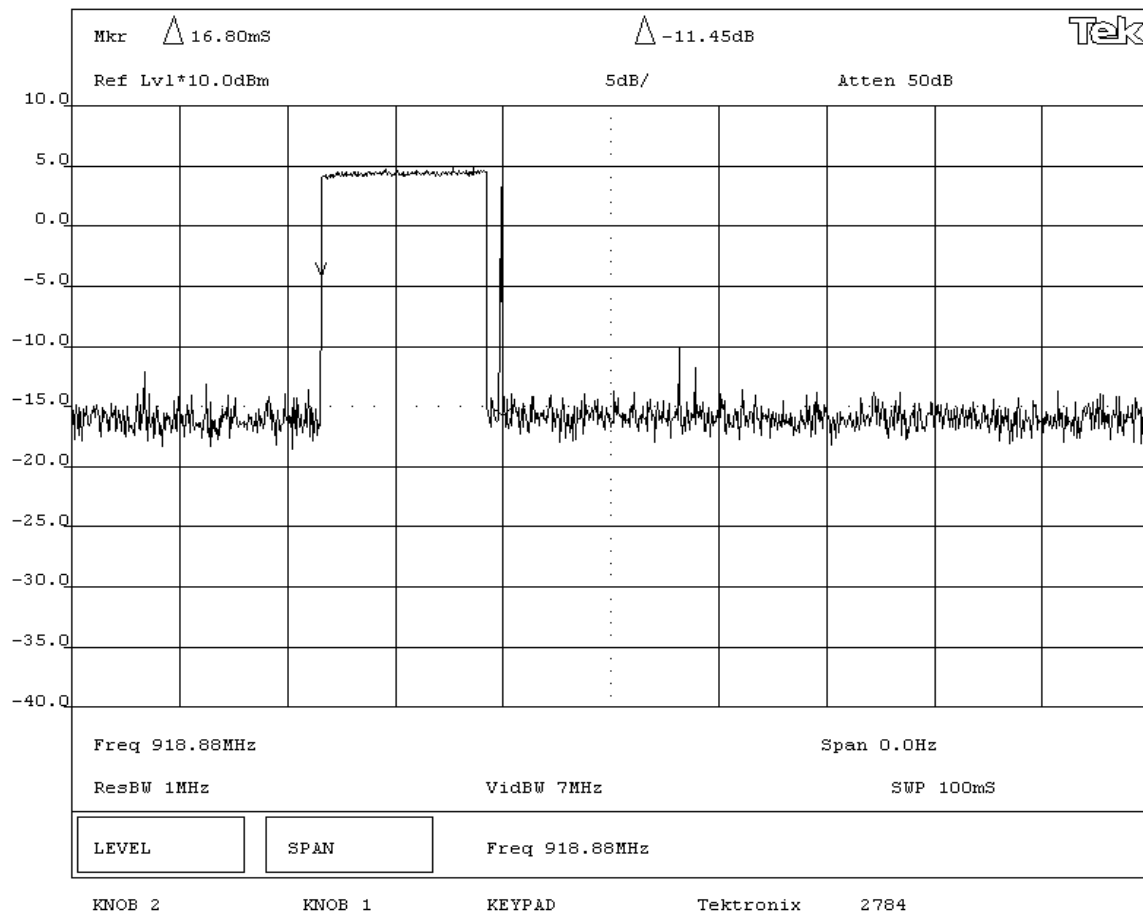
Requirement: Per 47 CFR 15.247(f), The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period in seconds equal to the number of hopping channels employed multiplied by 0.4. The measurement is made with the spectrum analyzer's span set to zero, the resolution bandwidth set to 1 MHz, and the video bandwidth set to 7 MHz. The measurement is made in two steps. First, the sweep speed is adjusted to capture the pulse width or dwell time of a single transmission. Then, the sweep speed is set to 2 seconds to count the number of transmissions during that period. The dwell time of a single transmission multiplied by the number of transmissions during a 2 second period equals the average time of occupancy during a 2 second period.

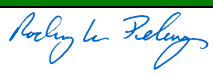
Configuration: The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

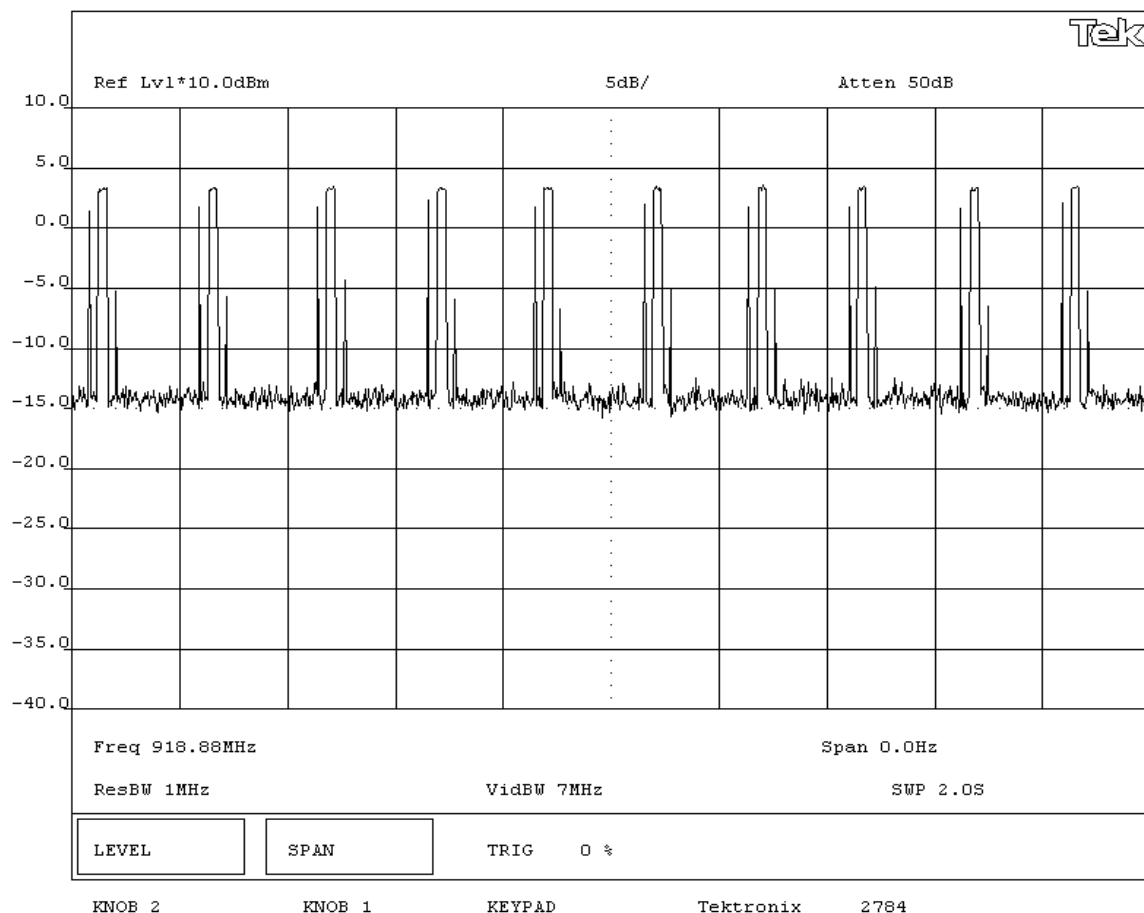
Completed by:



NORTHWEST EMC				EMISSIONS DATA SHEET				Rev BETA 01/30/01	
EUT: MRH6				Work Order: WATT0009					
Serial Number: N/A				Date: 06/16/03					
Customer: The Watt Stopper, Inc.				Temperature: 25 °C					
Attendees: None				Humidity: 34%					
Customer Ref. No.: N/A				Bar. Pressure: 30.15					
Tested by: Rod Peloquin				Power: 120VAC/60Hz				Job Site: EV06	
Specification: 47 CFR 15.247(f)		Year: 2003		Method: DA 00-705, ANSI C63.4		Year: 1992			
SAMPLE CALCULATIONS									
Total Dwell time = (Dwell Time during a single transmission) X (Number of transmissions during a 2 second period)									
COMMENTS									
EUT OPERATING MODES									
Modulated by PRBS at maximum data rate. Hopping carrier.									
DEVIATIONS FROM TEST STANDARD									
None									
REQUIREMENTS									
The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period in seconds equal to the number of hopping channels employed multiplied by 0.4.									
RESULTS									
Total Dwell Time in 2 second period				DWELL TIME DURING A SINGLE TRANSMISSION					
Pass 168mS				16.8mS					
SIGNATURE									
 Tested By: _____									
DESCRIPTION OF TEST									
Time of Occupancy (Dwell Time) - Single Transmission									



NORTHWEST EMC				EMISSIONS DATA SHEET				BETA 01/30/	
EUT: MRH6				Work Order: WATT0009					
Serial Number: N/A				Date: 06/16/03					
Customer: The Watt Stopper, Inc.				Temperature: 25 °C					
Attendees: None				Humidity: 34%					
Customer Ref. No.: N/A				Bar. Pressure: 30.15					
Tested by: Rod Peloquin				Power: 120VAC/60Hz				Job Site: EV06	
Specification: 47 CFR 15.247(f)		Year: 2003		Method: DA 00-705, ANSI C63.4		Year: 1992			
SAMPLE CALCULATIONS									
Total Dwell time = (Dwell Time during a single transmission) X (Number of transmissions during a 2 second period)									
COMMENTS									
5 Hopping channels									
EUT OPERATING MODES									
Modulated by PRBS at maximum data rate. Hopping carrier.									
DEVIATIONS FROM TEST STANDARD									
None									
REQUIREMENTS									
The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period in seconds equal to the number of hopping channels employed multiplied by 0.4.									
RESULTS									
Total Dwell Time in 2 second period				NUMBER OF TRANSMISSIONS DURING A 2 SECOND PERIOD					
Pass 168mS				10					
SIGNATURE									
 Tested By: _____									
DESCRIPTION OF TEST									
Time of Occupancy (Dwell Time) - Number of transmissions during a 2 second period									



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

All

Operating Modes Investigated:

Typical

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

Battery

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
Transmits at all channels.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	The Watt Stopper, Inc.	MRH6	N/A

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

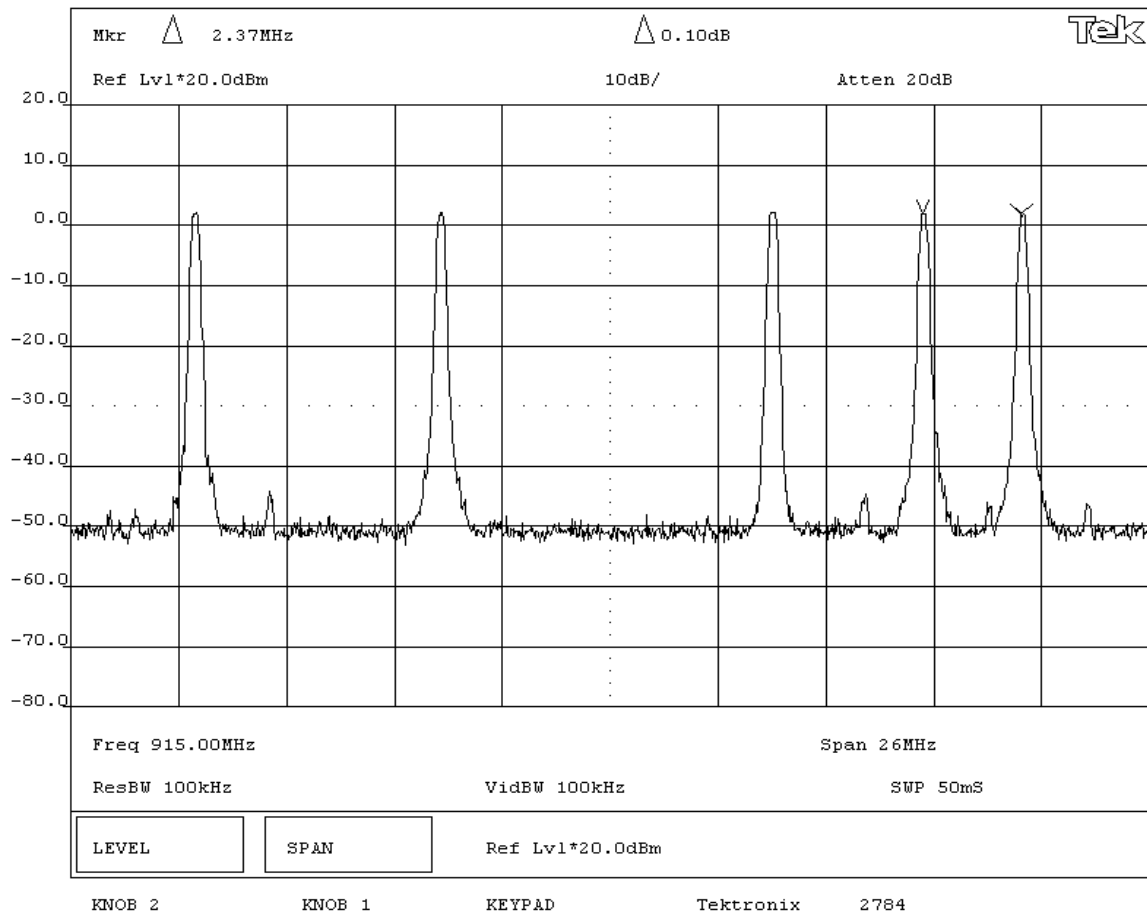
Requirement: The number of hopping channels is required to be measured to allow calculation of total dwell time per 47 CFR 15.247(f). The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The number of hopping frequencies was measured across the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer.

Completed by:



NORTHWEST EMC EMISSIONS DATA SHEET				Rev BETA 01/30/01
EUT: MRH6		Work Order: WATT0009		
Serial Number: N/A		Date: 06/12/03		
Customer: The Watt Stopper, Inc.		Temperature: 23 °C		
Attendees: N/A		Tested by: Rod Peloquin		Humidity: 38% RH
Customer Ref. No.: N/A		Power: Battery		Job Site: EV06
TEST SPECIFICATIONS				
Specification: CFR 47 Part 15.247(f)	Year: 2003	Method: DA 00-705, ANSI C63.4	Year: 1992	
SAMPLE CALCULATIONS				
COMMENTS				
EUT OPERATING MODES				
Modulated by PRBS at maximum data rate. Hopping carrier.				
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
To determine dwell time per 15.247(f) the total number of hopping frequencies must be determined				
RESULTS		NUMBER OF HOPPING FREQUENCIES		
Pass		5		
SIGNATURE				
 Tested By: _____				
DESCRIPTION OF TEST				
HOPPING CHANNELS				



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

High

Mid

Low

Operating Modes Investigated:

Typical

Data Rates Investigated:

Typical

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

Battery

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
Transmits at low, mid, and high channels.			

Equipment Modifications

No EMI suppression devices were added or modified. The EUT was tested as delivered.

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	The Watt Stopper, Inc.	MRH6	N/A

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

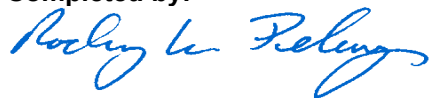
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

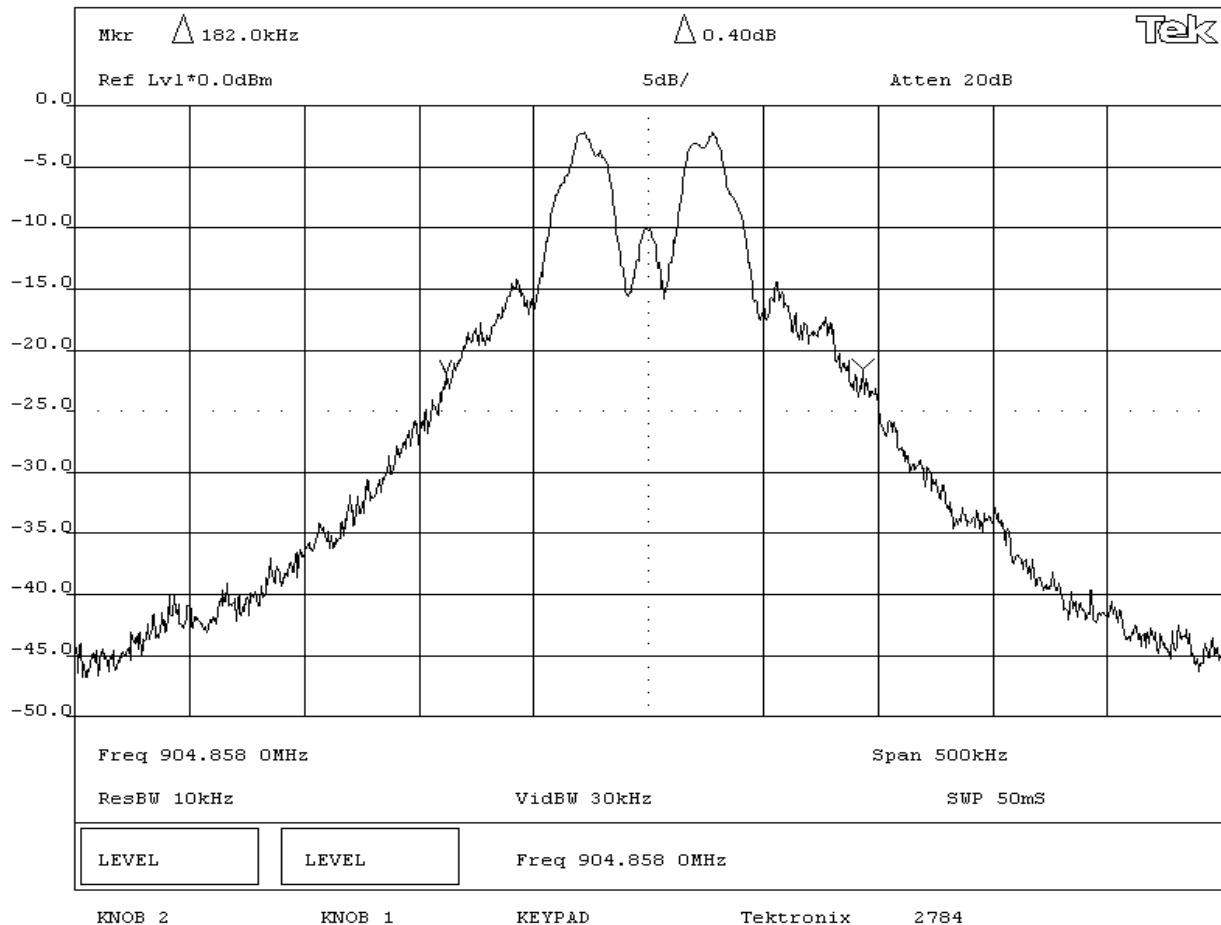
Requirement: Per 47 CFR 15.247(a)(1)(i), the 20 dB bandwidth of a hopping channel must be less than 500 kHz. The measurement is made with the spectrum analyzer's resolution bandwidth set to $\geq 1\%$ of the 20dB bandwidth, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The occupied bandwidth was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

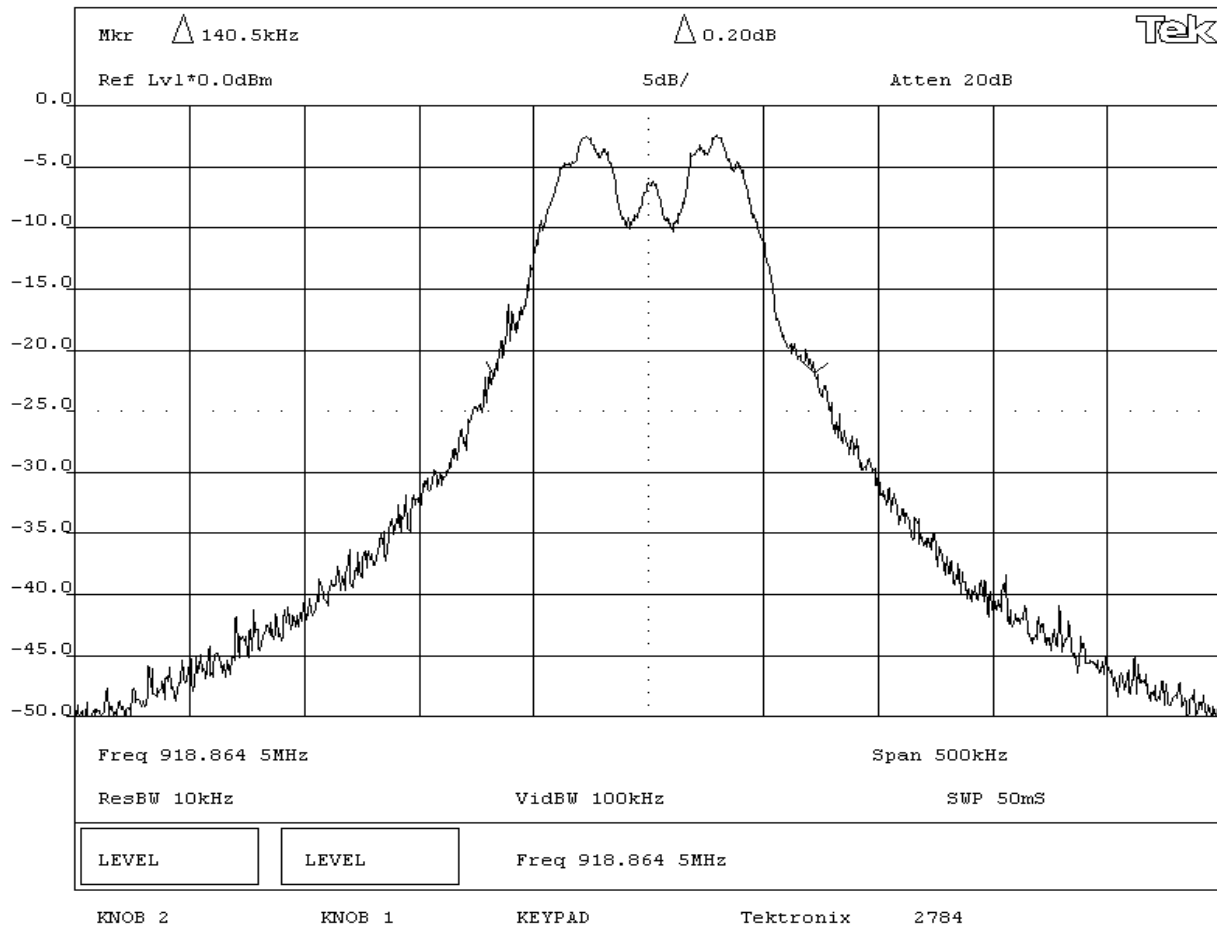
Completed by:



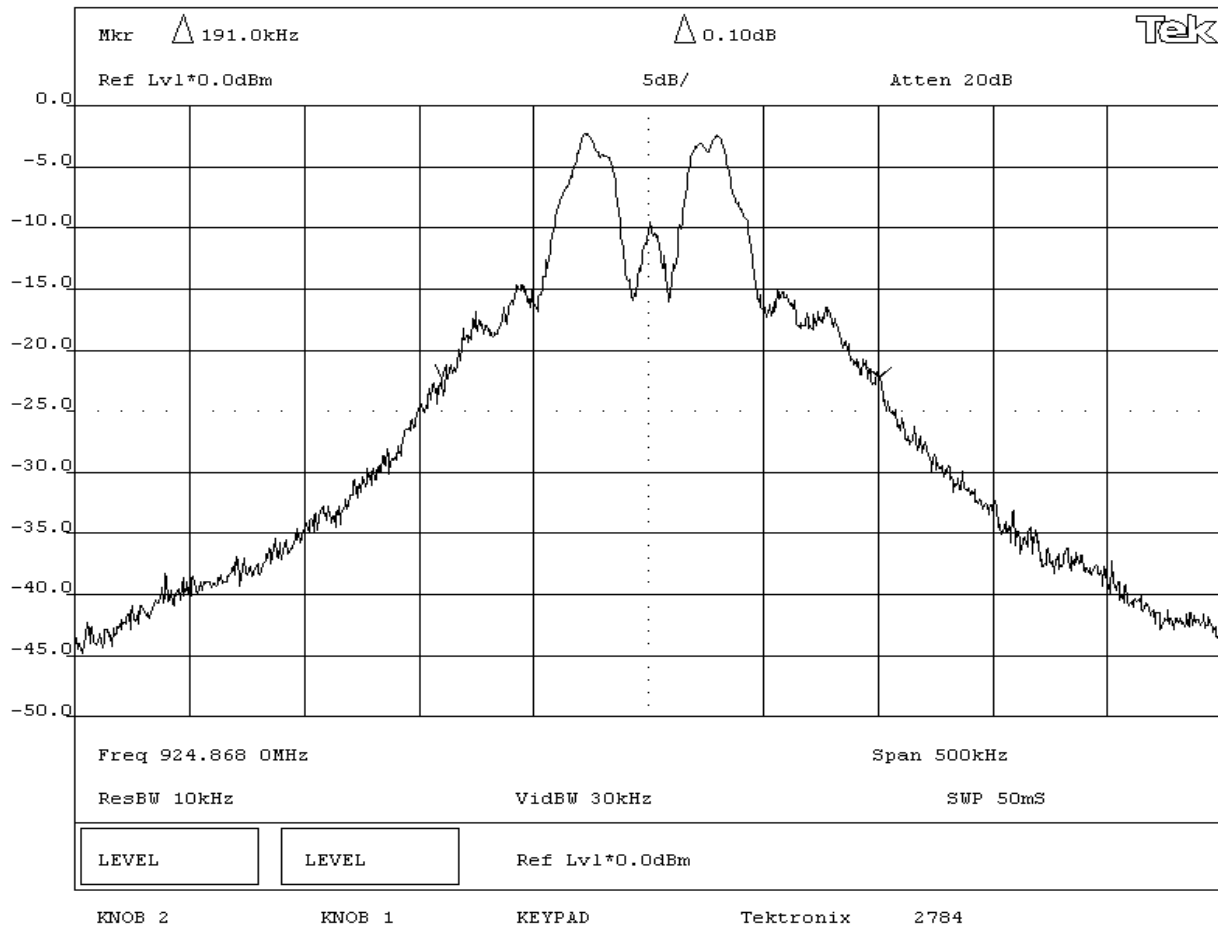
NORTHWEST		EMISSIONS DATA SHEET		Transmitters	
EMC		Occupied Bandwidth			
		Rev dt11/15/02			
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/20/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	29.89		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV01
TEST SPECIFICATIONS					
Specification:	CFR 47 Part 15.247(a)(1)	Year:	2003	Method:	DA 00-705, ANSI C63.4
				Year:	1992
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
BANDWIDTH					
Pass			182KHz		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Low Channel					



EMISSIONS DATA SHEET				Transmitters	
Occupied Bandwidth				Rev dt11/15/02	
NORTHWEST		EUT: MRH6		Work Order: WATT0009	
EMC		Serial Number: N/A		Date: 05/20/03	
		Customer: The Watt Stopper, Inc.		Temperature: 25 °C	
		Attendees: None		Humidity: 34%	
		Customer Ref. No.: N/A		Bar. Pressure: 29.89	
		Tested by: Rod Peloquin		Power: Battery	
				Job Site: EV01	
TEST SPECIFICATIONS					
Specification: CFR 47 Part 15.247(a)(1)		Year: 2003		Method: DA 00-705, ANSI C63.4	
				Year: 1992	
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
BANDWIDTH					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Mid Channel					



NORTHWEST		EMISSIONS DATA SHEET		Transmitters	
EMC		Occupied Bandwidth			
		Rev dt11/15/02			
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/20/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	29.89		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV01
TEST SPECIFICATIONS					
Specification:	CFR 47 Part 15.247(a)(1)	Year:	2003	Method:	DA 00-705, ANSI C63.4
				Year:	1992
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass			BANDWIDTH		
			191KHz		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
High Channel					



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

High

Mid

Low

Operating Modes Investigated:

Typical

Data Rates Investigated:

Typical

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

Battery

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
Transmits at low, mid, and high channels.			

Equipment Modifications

No EMI suppression devices were added or modified. The EUT was tested as delivered.

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	The Watt Stopper, Inc.	MRH6	N/A

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo
Power Meter	Hewlett Packard	E4418A	SPA	06/21/2002	24 mo
Signal Generator	Hewlett Packard	8341B	TGN	12/20/2002	12 mo

Test Description

Requirement: Per 47 CFR 15.247(b)(3), the maximum peak output power must not exceed 1 Watt. The measurement is made using either a peak power meter, or a spectrum analyzer using the following settings:

- Resolution bandwidth set to greater than the 6 dB bandwidth of the modulated carrier, and
- The video bandwidth set to greater than or equal to the resolution bandwidth.

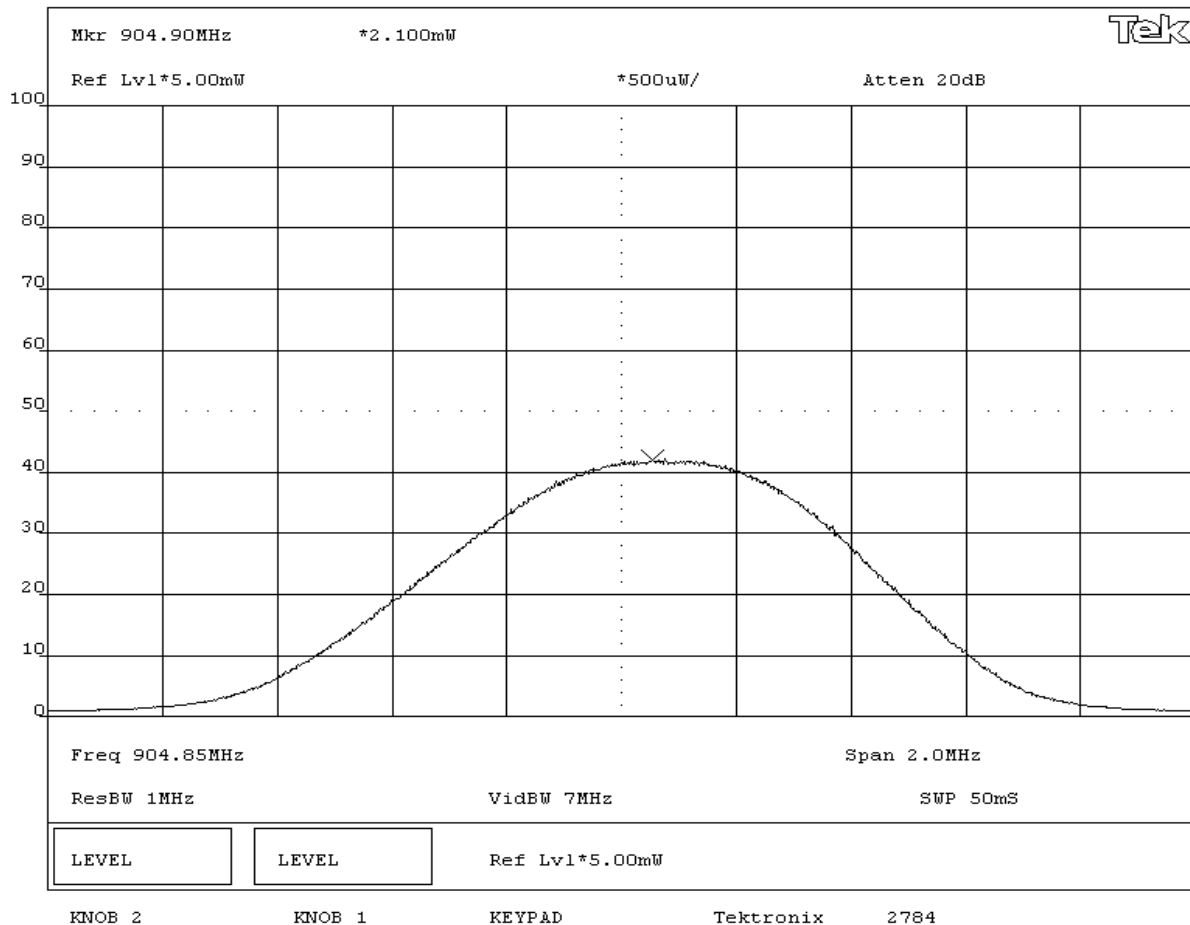
Configuration: The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(4), the EUT meets the de facto EIRP limit of +36dBm.

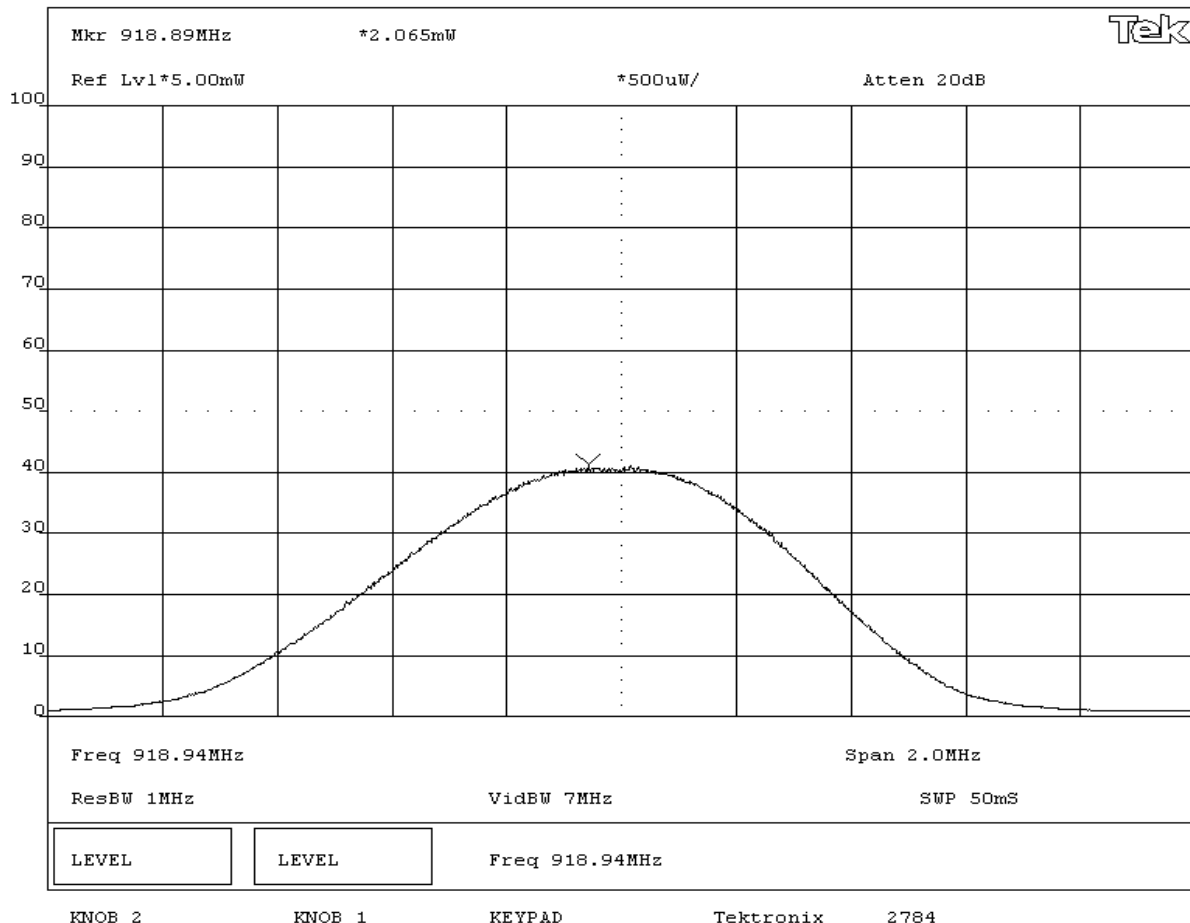
Completed by:



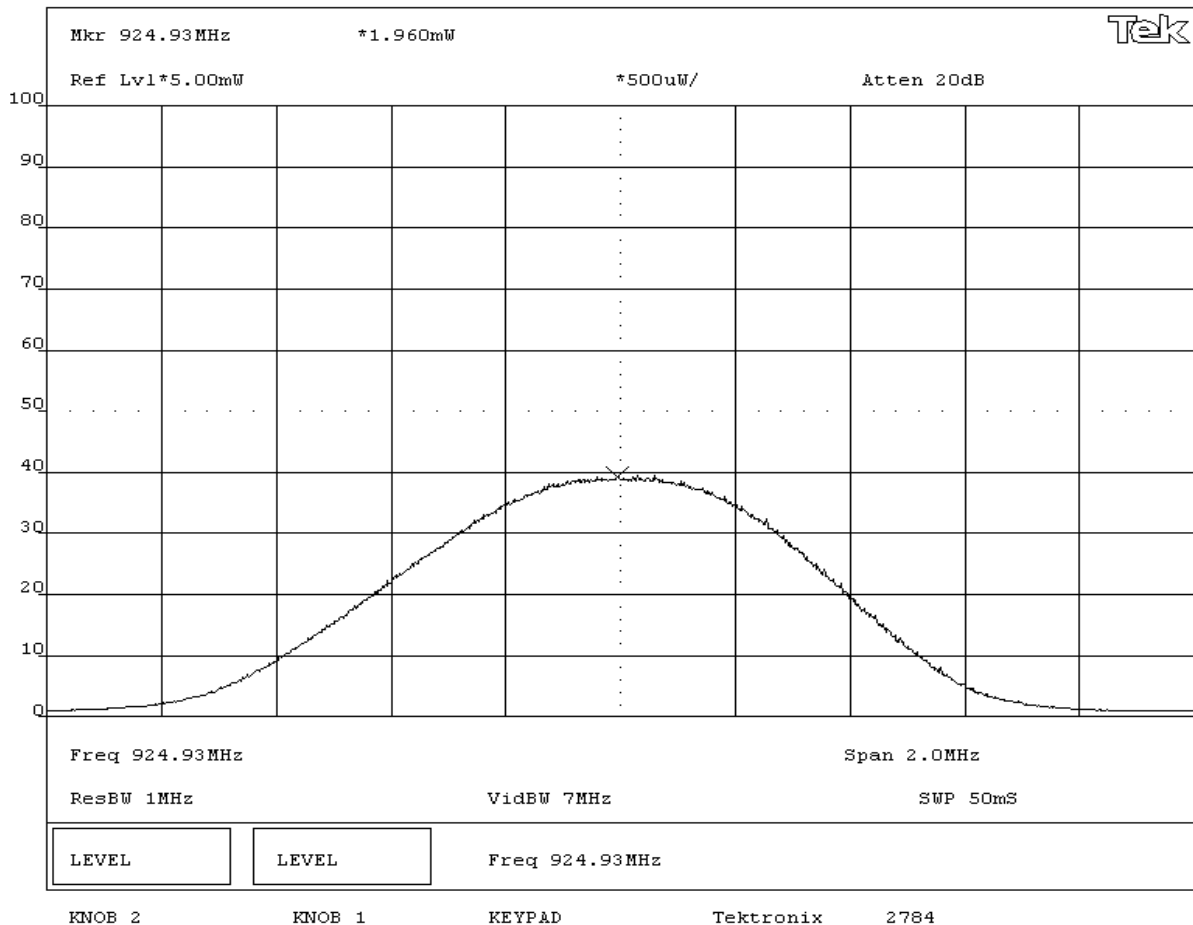
EMISSIONS DATA SHEET				Transmitters	
Output Power				Rev df11/15/02	
EUT: MRH6			Work Order: WATT0009		
Serial Number: N/A			Date: 05/20/03		
Customer: The Watt Stopper, Inc.			Temperature: 25 °C		
Attendees: None			Humidity: 34%		
Customer Ref. No.: N/A			Bar. Pressure: 29.89		
Tested by: Rod Peloquin		Power: Battery	Job Site: EV01		
TEST SPECIFICATIONS					
Specification: CFR 47 Part 15.247(b)(3)		Year: 2003	Method: DA 00-705, ANSI C63.4		Year: 1992
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Peak Output Power cannot exceed .25 Watt					
RESULTS			AMPLITUDE		
Pass			2.1mW		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Low Channel					



NORTHWEST		EMISSIONS DATA SHEET		Transmitters	
EMC		Output Power		Rev dt11/15/02	
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/20/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	29.89		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV01
TEST SPECIFICATIONS					
Specification:	CFR 47 Part 15.247(b)(3)	Year:	2003	Method:	DA 00-705, ANSI C63.4
		Year:	1992		
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Peak Output Power cannot exceed .25 Watt					
RESULTS			AMPLITUDE		
Pass			2.065mW		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Mid Channel					



NORTHWEST		EMISSIONS DATA SHEET		Transmitters	
EMC		Output Power		Rev dt11/15/02	
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/20/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	29.89		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV01
TEST SPECIFICATIONS					
Specification:	CFR 47 Part 15.247(b)(3)	Year:	2003	Method:	DA 00-705, ANSI C63.4
		Year:	1992		
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Peak Output Power cannot exceed .25 Watt					
RESULTS			AMPLITUDE		
Pass			1.96mW		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
High Channel					



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

High

Low

Operating Modes Investigated:

Typical

Data Rates Investigated:

Typical

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

Battery

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
Transmits at specified channels.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	The Watt Stopper, Inc.	MRH6	N/A

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

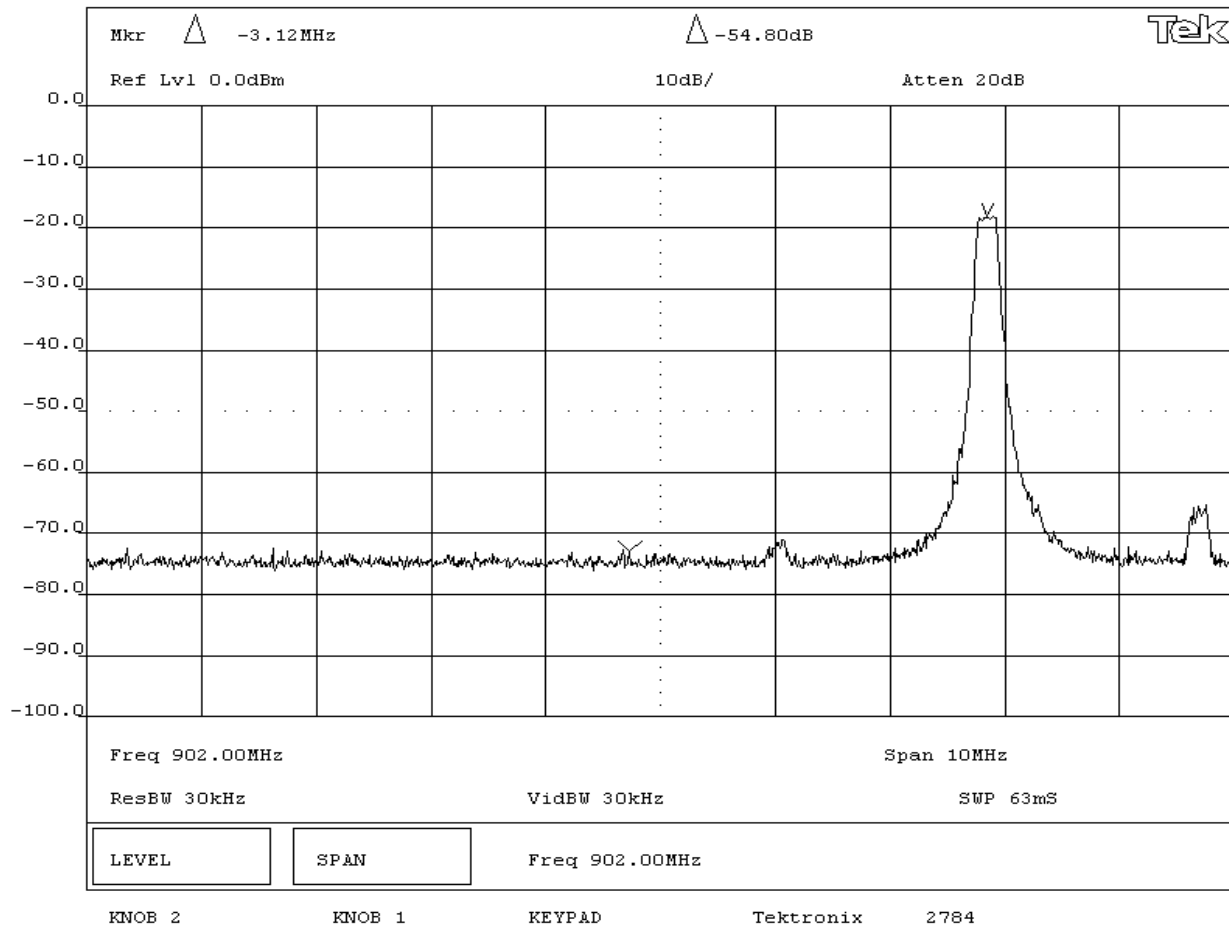
Requirement: Per 47 CFR 15.247(c), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power must be at least 20dB down from the highest emission level within the authorized band. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode. The channels closest to the band edges were selected. The spectrum was scanned across each band edge from 5 MHz below the band edge to 5 MHz above the band edge.

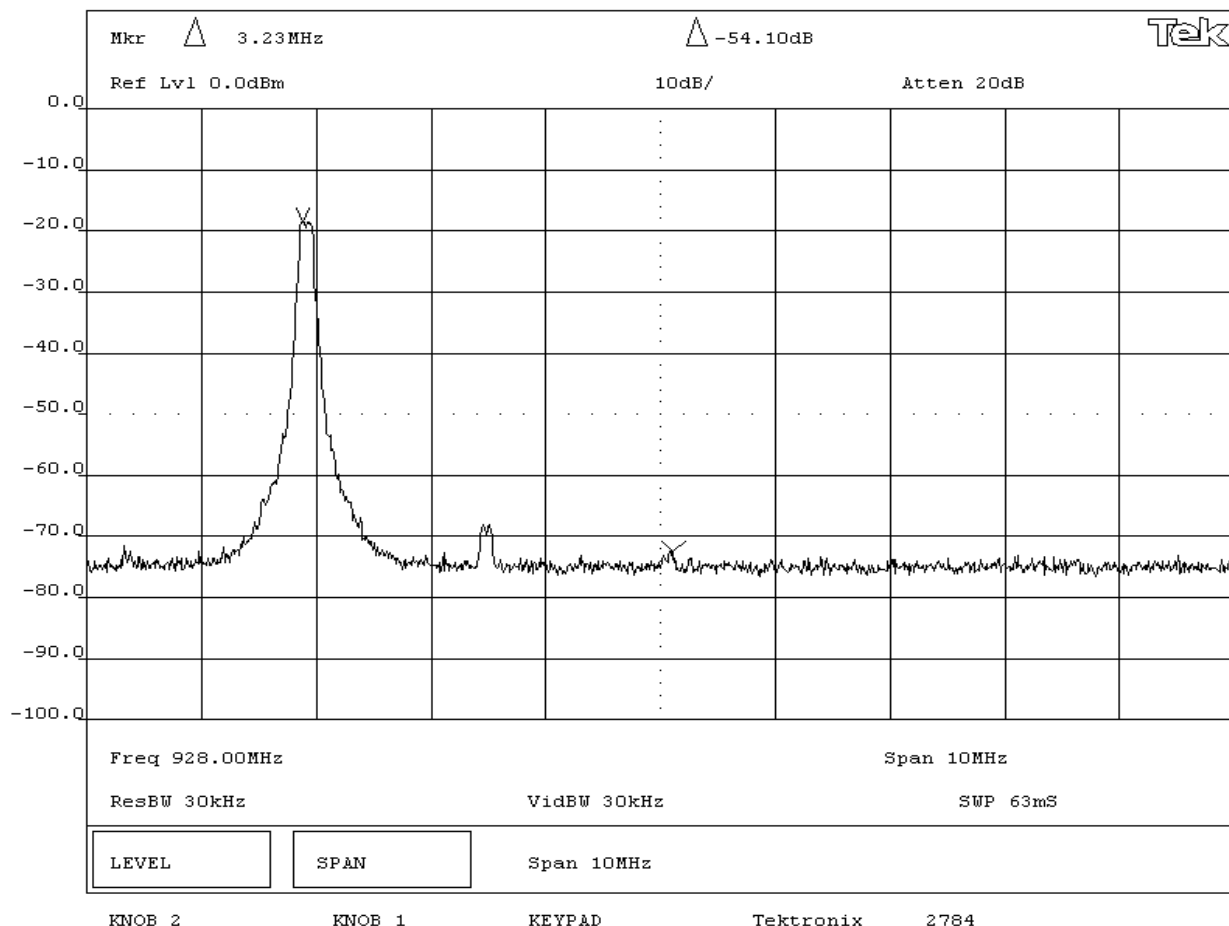
Completed by:



NORTHWEST		EMISSIONS DATA SHEET		Transmitters	
EMC		Band Edge Compliance			
		Rev dt11/15/02			
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/21/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	30.15		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV06
TEST SPECIFICATIONS					
Specification:	CFR 47 Part 15.247 (c)	Year:	2003	Method:	DA 00-705, ANSI C63.4
				Year:	1992
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass			AMPLITUDE		
			-54.8db		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Low Channel					



NORTHWEST		EMISSIONS DATA SHEET		Transmitters	
EMC		Band Edge Compliance			
		Rev dt11/15/02			
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/21/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	30.15		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV06
TEST SPECIFICATIONS					
Specification:	CFR 47 Part 15.247 (c)	Year:	2003	Method:	DA 00-705, ANSI C63.4
				Year:	1992
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass		AMPLITUDE			
		-54.1dB			
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
High Channel					



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Low

Mid

High

Operating Modes Investigated:

Typical

Data Rates Investigated:

Typical

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

Battery

Frequency Range Investigated

Start Frequency

0 MHz

Stop Frequency

10 GHz

Software\Firmware Applied During Test

Exercise software

Standard Production
Software

Version

Unknown

Description

Transmits at low, mid, and high channels.

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	The Watt Stopper, Inc.	MRH6	N/A

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

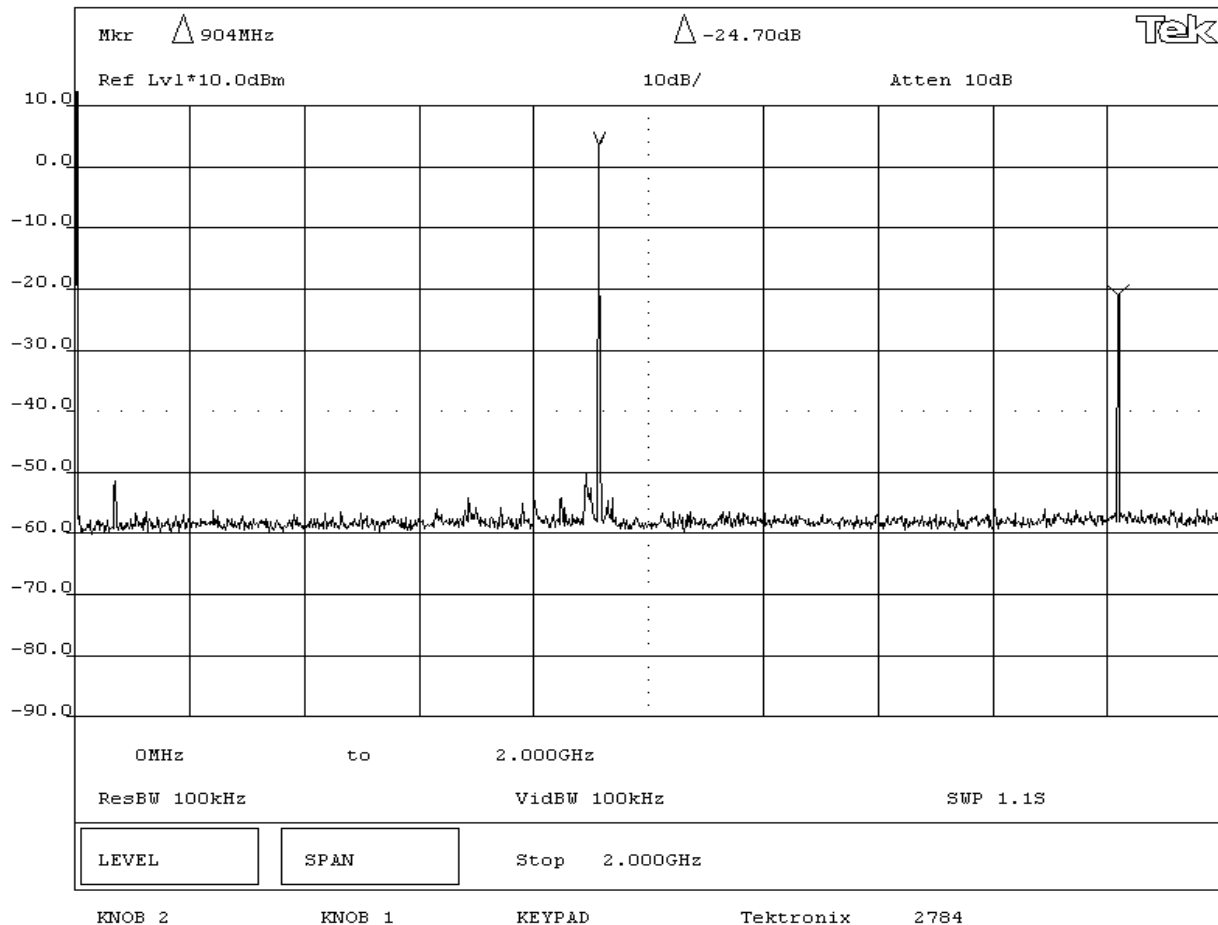
Requirement: Per 47 CFR 15.247(c), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power must be at least 20dB down from the highest emission level within the authorized band. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The spurious RF conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency.

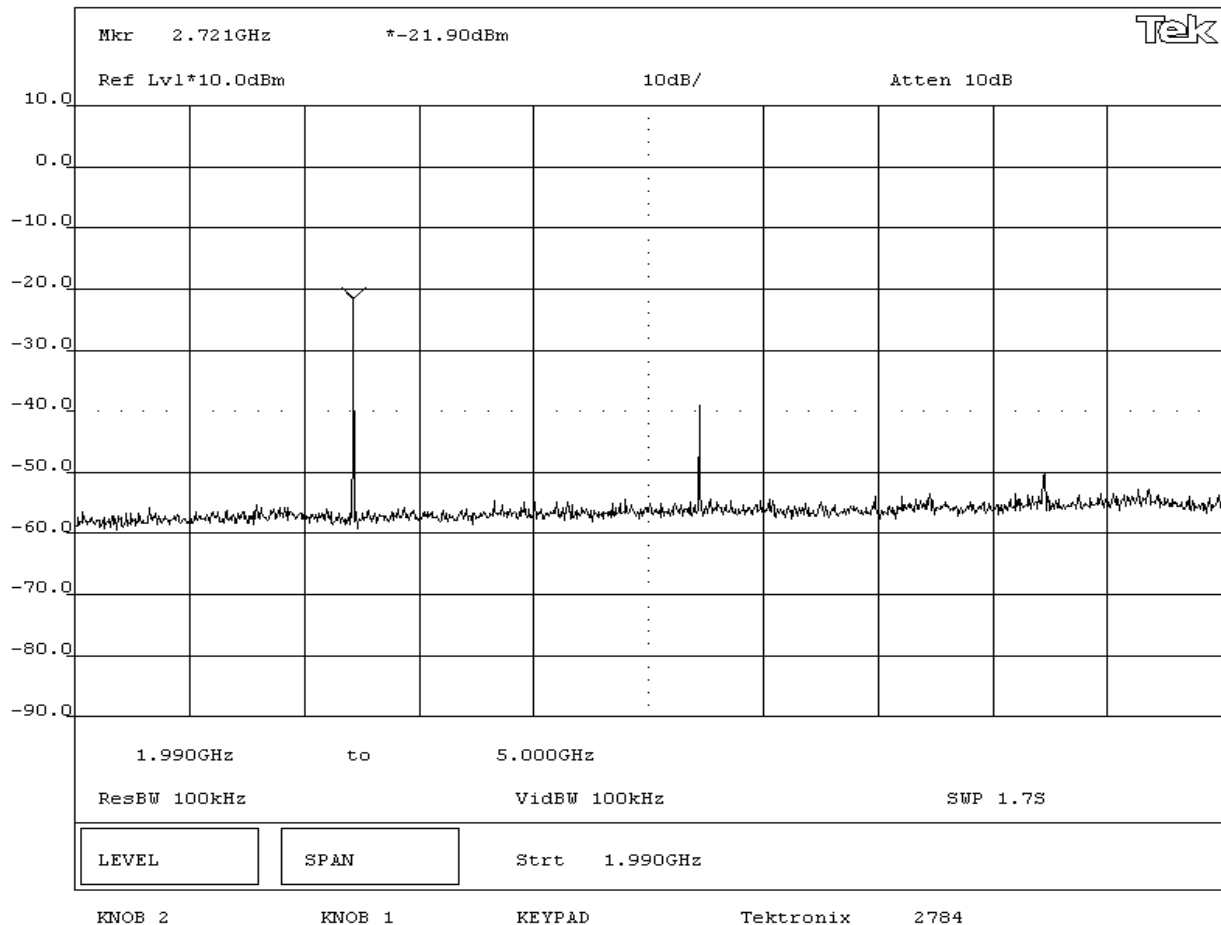
Completed by:



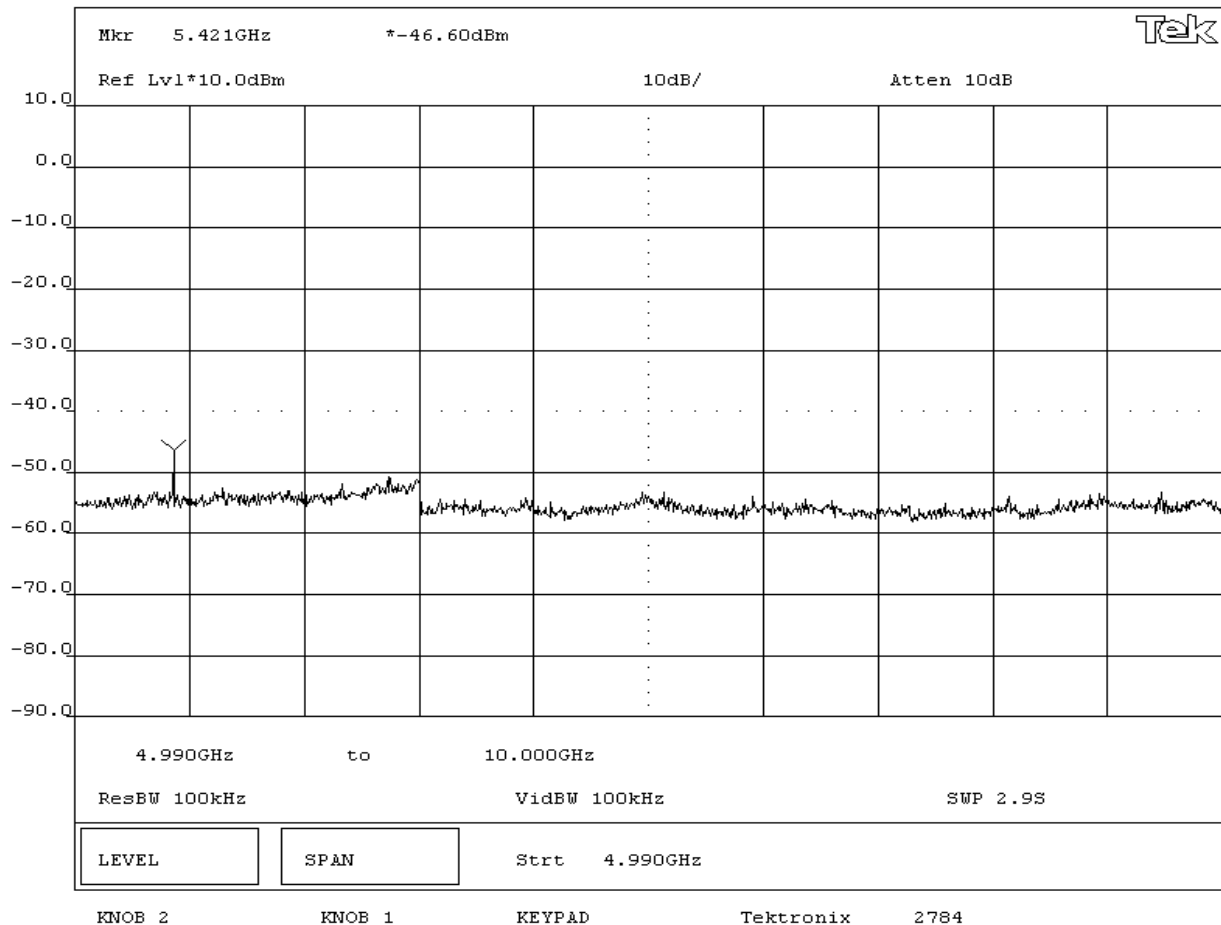
NORTHWEST EMC		EMISSIONS DATA SHEET Antenna Conducted Spurious		Transmitters Rev dt11/15/02	
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/21/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	30.15		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV06
TEST SPECIFICATIONS					
Specification:	CFR 15.247 (c)	Year:	2003	Method:	DA 00-705, ANSI C63.4
		Year:	1992		
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Low Channel 0MHz-2GHz					



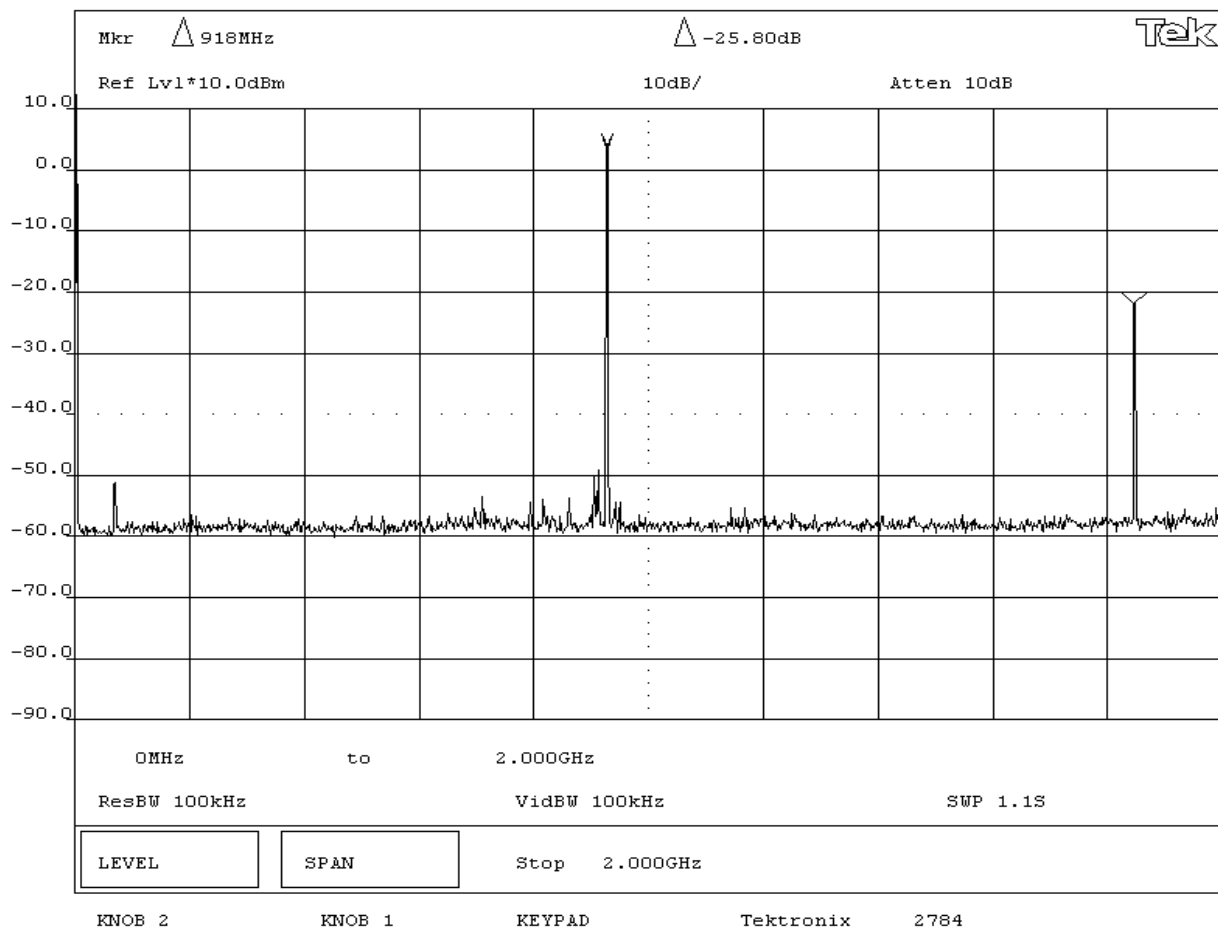
NORTHWEST EMC		EMISSIONS DATA SHEET Antenna Conducted Spurious		Transmitters Rev dt11/15/02	
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/21/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	30.15		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV06
TEST SPECIFICATIONS					
Specification:	CFR 15.247 (c)	Year:	2003	Method:	DA 00-705, ANSI C63.4
		Year:	1992		
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Low Channel 2GHz-5GHz					



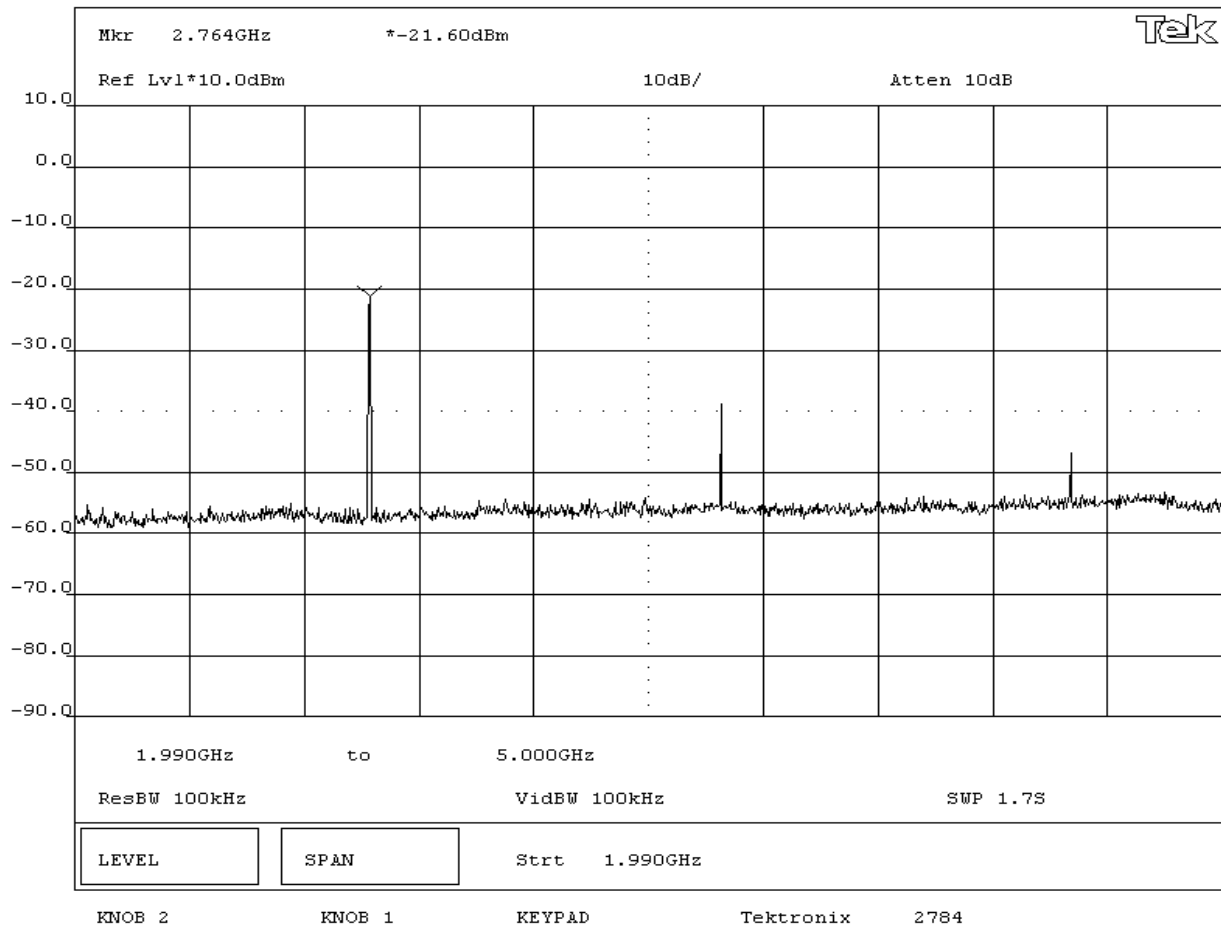
NORTHWEST		EMISSIONS DATA SHEET		Transmitters	
EMC		Antenna Conducted Spurious			
		Rev dt11/15/02			
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/21/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	30.15		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV06
TEST SPECIFICATIONS					
Specification:	CFR 15.247 (c)	Year:	2003	Method:	DA 00-705, ANSI C63.4
				Year:	1992
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Low Channel 5GHz-10GHz					



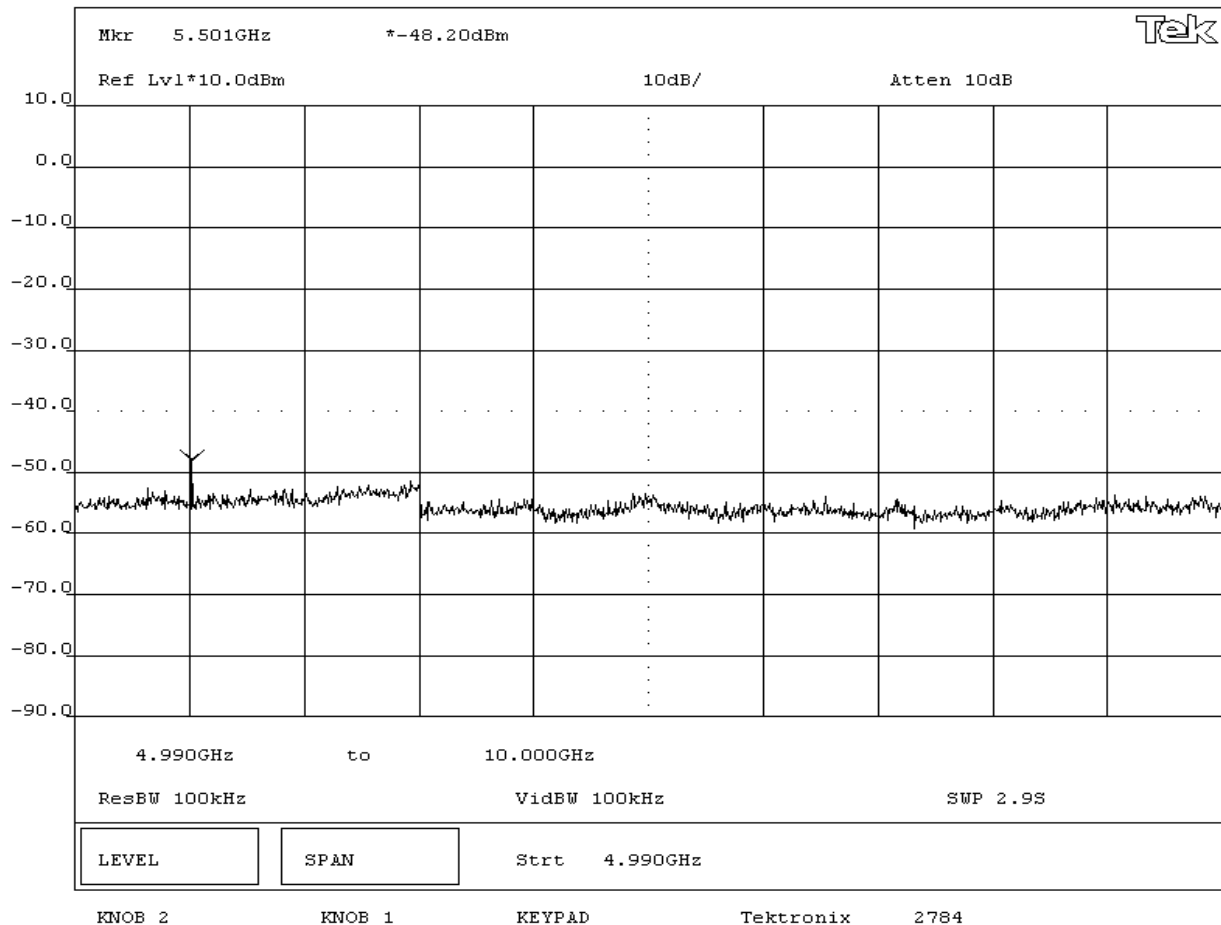
NORTHWEST		EMISSIONS DATA SHEET		Transmitters	
EMC		Antenna Conducted Spurious		Rev dt11/15/02	
EUT: MRH6		Work Order: WATT0009			
Serial Number: N/A		Date: 05/21/03			
Customer: The Watt Stopper, Inc.		Temperature: 25 °C			
Attendees: None		Humidity: 34%			
Customer Ref. No.: N/A		Bar. Pressure: 30.15			
Tested by: Rod Peloquin		Power: Battery		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: CFR 15.247 (c)		Year: 2003		Method: DA 00-705, ANSI C63.4	
				Year: 1992	
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Mid Channel 0MHz-2GHz					



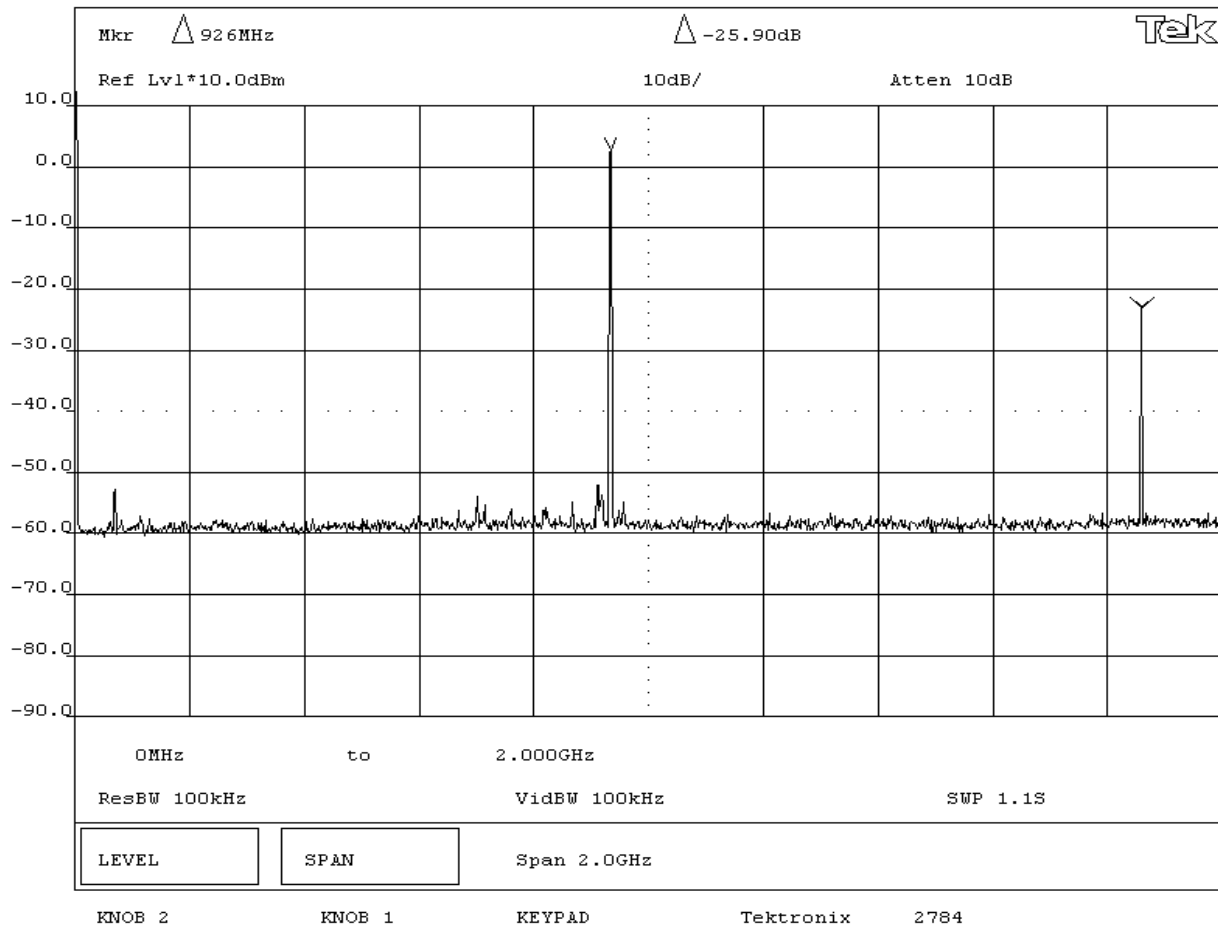
NORTHWEST EMC				EMISSIONS DATA SHEET Antenna Conducted Spurious				Transmitters Rev dt11/15/02	
EUT: MRH6				Work Order: WATT0009					
Serial Number: N/A				Date: 05/21/03					
Customer: The Watt Stopper, Inc.				Temperature: 25 °C					
Attendees: None				Humidity: 34%					
Customer Ref. No.: N/A				Bar. Pressure: 30.15					
Tested by: Rod Peloquin				Power: Battery				Job Site: EV06	
TEST SPECIFICATIONS									
Specification: CFR 15.247 (c)				Year: 2003		Method: DA 00-705, ANSI C63.4		Year: 1992	
SAMPLE CALCULATIONS									
COMMENTS									
None									
EUT OPERATING MODES									
No hop mode									
DEVIATIONS FROM TEST STANDARD									
REQUIREMENTS									
RESULTS									
Pass									
SIGNATURE									
 Tested By: _____									
DESCRIPTION OF TEST									
Mid Channel 2GHz-5GHz									



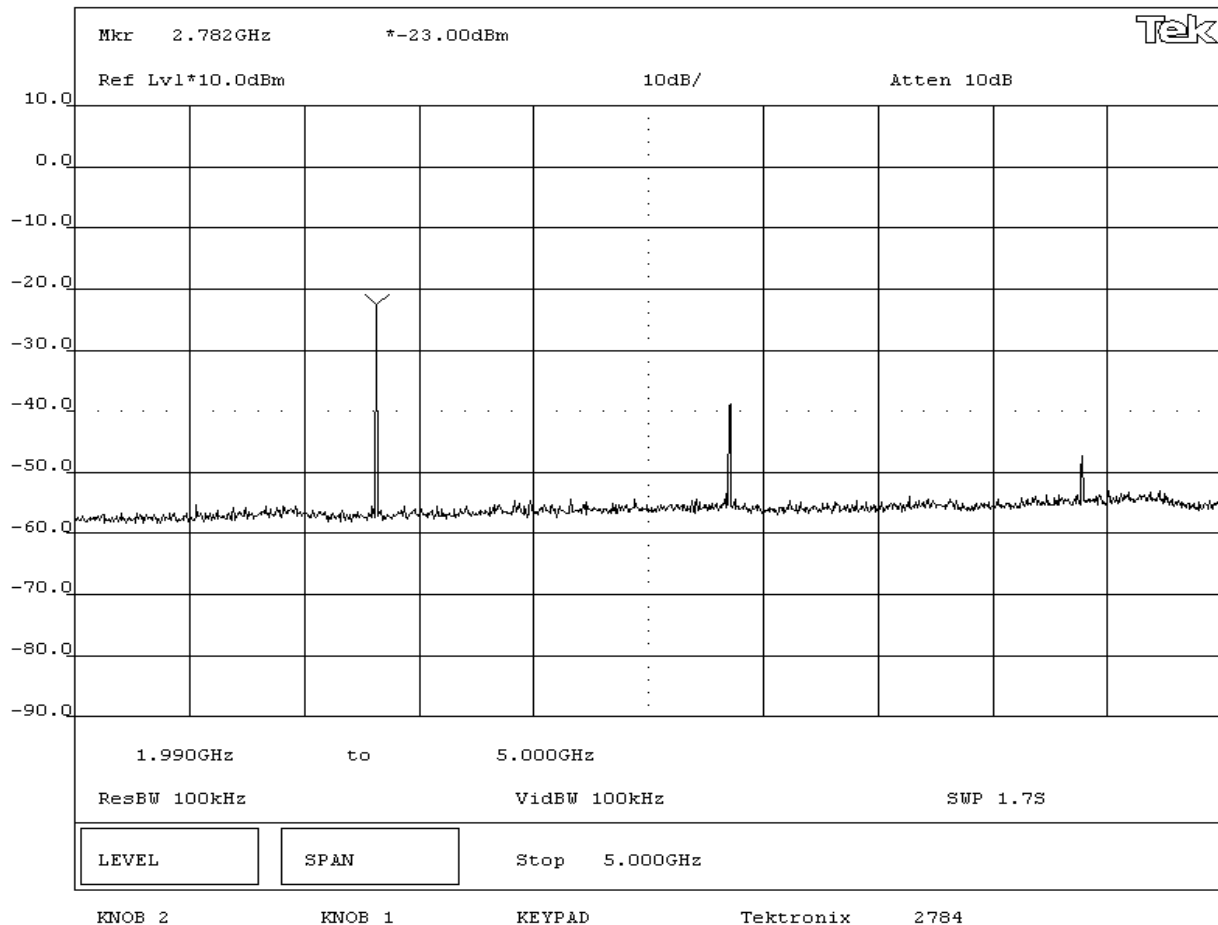
NORTHWEST EMC		EMISSIONS DATA SHEET Antenna Conducted Spurious		Transmitters Rev dt11/15/02	
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/21/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	30.15		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV06
TEST SPECIFICATIONS					
Specification:	CFR 15.247 (c)	Year:	2003	Method:	DA 00-705, ANSI C63.4
		Year:	1992		
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Mid Channel 5GHz-10GHz					



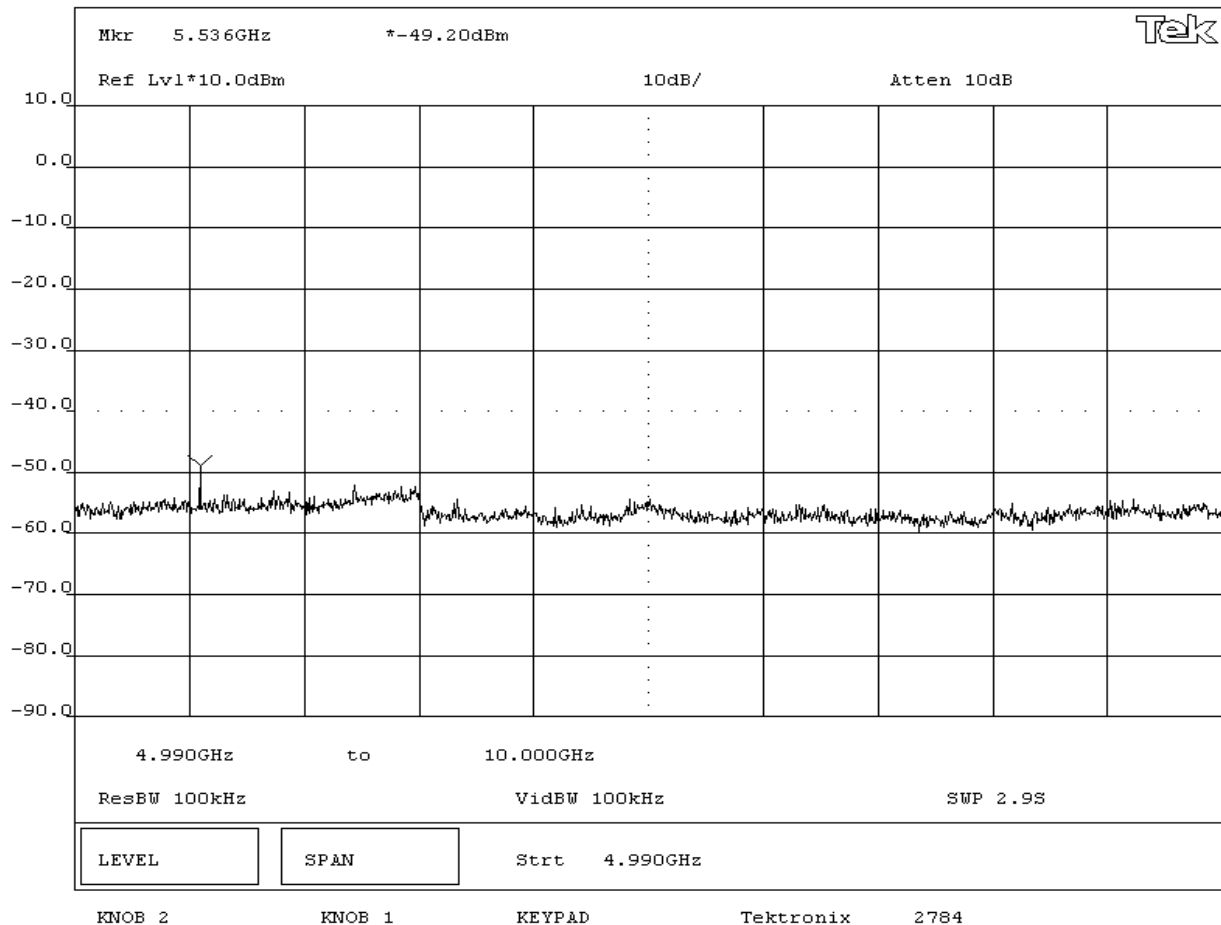
NORTHWEST EMC		EMISSIONS DATA SHEET Antenna Conducted Spurious		Transmitters Rev dt11/15/02	
EUT:	MRH6	Work Order:	WATT0009		
Serial Number:	N/A	Date:	05/21/03		
Customer:	The Watt Stopper, Inc.	Temperature:	25 °C		
Attendees:	None	Humidity:	34%		
Customer Ref. No.:	N/A	Bar. Pressure:	30.15		
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV06
TEST SPECIFICATIONS					
Specification:	CFR 15.247 (c)	Year:	2003	Method:	DA 00-705, ANSI C63.4
		Year:	1992		
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
High Channel 0MHz-2GHz					



NORTHWEST EMC				EMISSIONS DATA SHEET Antenna Conducted Spurious				Transmitters Rev dt11/15/02	
EUT: MRH6				Work Order: WATT0009					
Serial Number: N/A				Date: 05/21/03					
Customer: The Watt Stopper, Inc.				Temperature: 25 °C					
Attendees: None				Humidity: 34%					
Customer Ref. No.: N/A				Bar. Pressure: 30.15					
Tested by: Rod Peloquin				Power: Battery				Job Site: EV06	
TEST SPECIFICATIONS									
Specification: CFR 15.247 (c)				Year: 2003		Method: DA 00-705, ANSI C63.4		Year: 1992	
SAMPLE CALCULATIONS									
COMMENTS									
None									
EUT OPERATING MODES									
No hop mode									
DEVIATIONS FROM TEST STANDARD									
REQUIREMENTS									
RESULTS									
Pass									
SIGNATURE									
 Tested By: _____									
DESCRIPTION OF TEST									
High Channel 2GHz-5GHz									



NORTHWEST		EMISSIONS DATA SHEET		Transmitters	
EMC		Antenna Conducted Spurious		Rev dt11/15/02	
EUT: MRH6		Work Order: WATT0009			
Serial Number: N/A		Date: 05/21/03			
Customer: The Watt Stopper, Inc.		Temperature: 25 °C			
Attendees: None		Humidity: 34%			
Customer Ref. No.: N/A		Bar. Pressure: 30.15			
Tested by: Rod Peloquin		Power: Battery		Job Site: EV06	
TEST SPECIFICATIONS					
Specification: CFR 15.247 (c)		Year: 2003		Method: DA 00-705, ANSI C63.4	
				Year: 1992	
SAMPLE CALCULATIONS					
COMMENTS					
None					
EUT OPERATING MODES					
No hop mode					
DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS					
RESULTS					
Pass					
SIGNATURE					
Tested By: 					
DESCRIPTION OF TEST					
High Channel 5GHz-10GHz					



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

High

Mid

Low

Operating Modes Investigated:

Typical

Data Rates Investigated:

Typical

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

Battery

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
Transmits at low, mid, and high channels.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	The Watt Stopper, Inc.	MRH6	N/A

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

Requirement: Per 47 CFR 15.247(d), the peak power spectral density conducted from the antenna port of a direct sequence transmitter must not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission.

Configuration: The peak power spectral density measurements were measured with the EUT set to low, mid, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate using direct sequence modulation. Per the procedure outlined in FCC 97-114, the spectrum analyzer was used as follows:

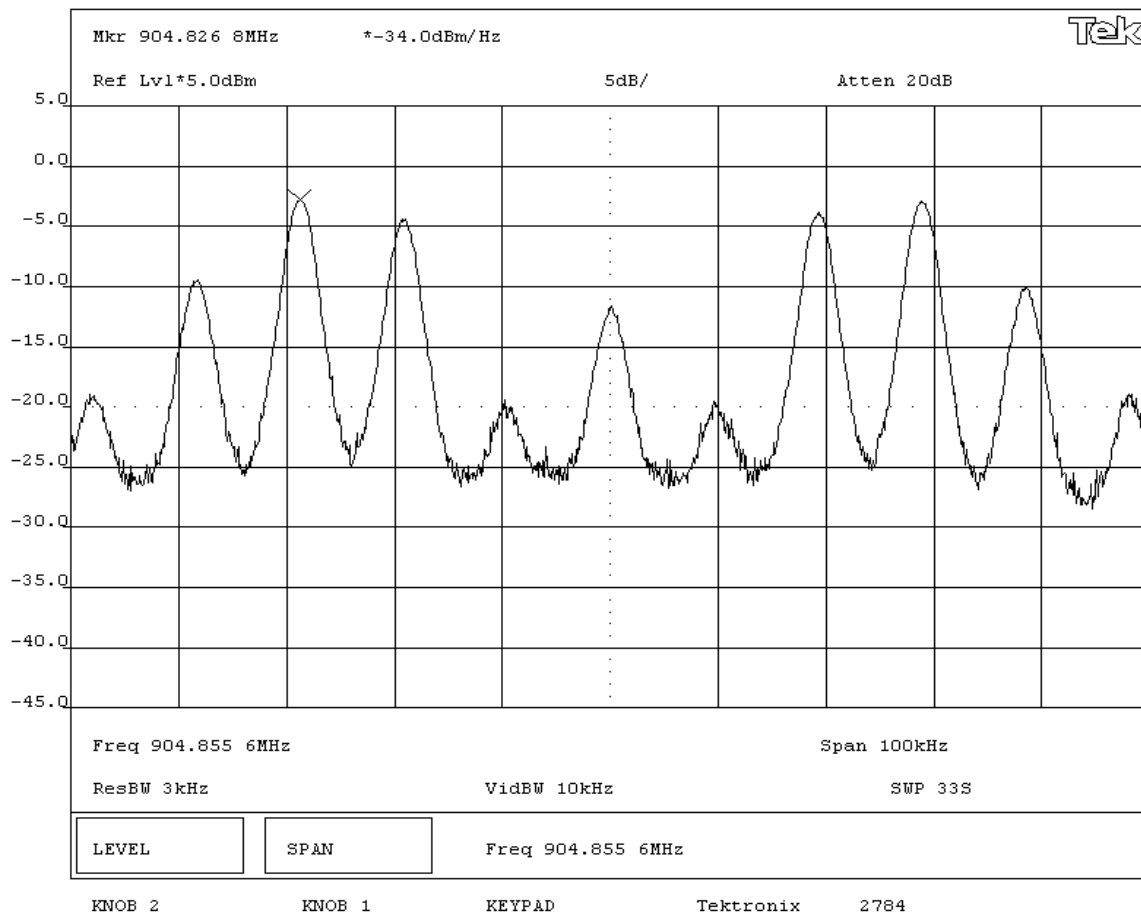
The emission peak(s) were located and zoom in on within the passband. The resolution bandwidth was set to 3 kHz, the video bandwidth was set to greater than or equal to the resolution bandwidth. The sweep speed was set equal to the span divided by 3 kHz (sweep = $(SPAN/3 \text{ kHz})$). For example, given a span of 1.5 MHz, the sweep should be $1.5 \times 10^6 \div 3 \times 10^3 = 500$ seconds. External attenuation was used and added to the reading. The following FCC procedure was used for modifying the power spectral density measurements:

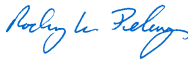
"If the spectrum line spacing cannot be resolved on the available spectrum analyzer, the noise density function on most modern conventional spectrum analyzers will directly measure the noise power density normalized to a 1 Hz noise power bandwidth. Add 34.8 dB for correction to 3 kHz."

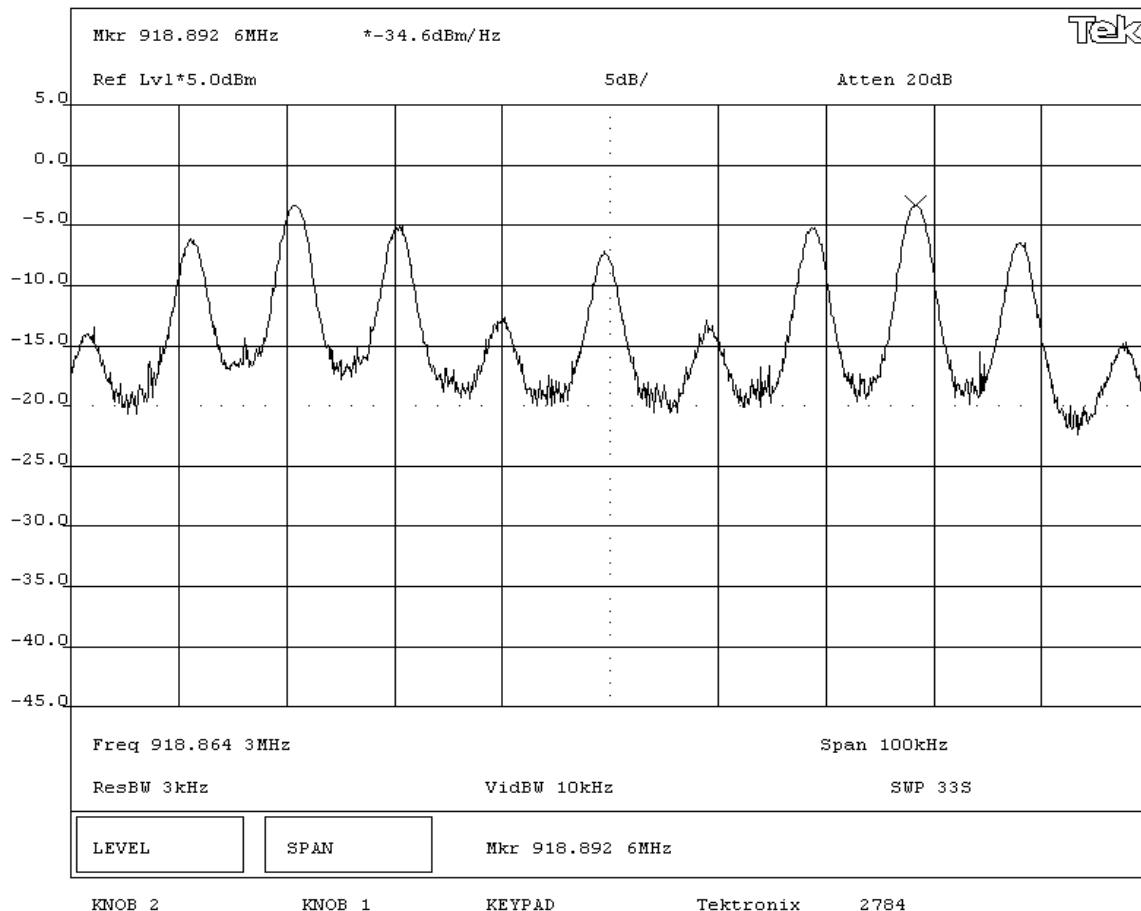
Completed by:



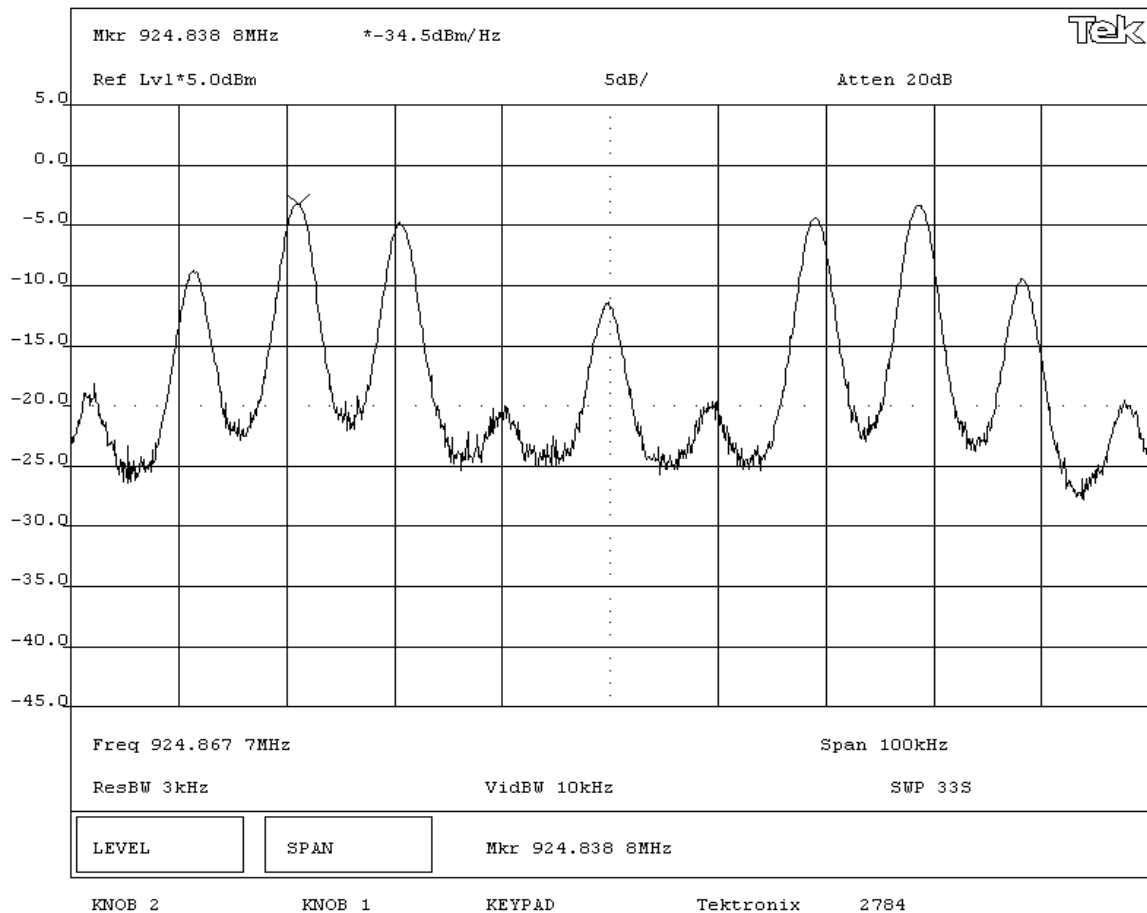
NORTHWEST EMC				EMISSIONS DATA SHEET				Rev BETA 01/30/01	
EUT: MRH6				Work Order: WATT0009					
Serial Number: N/A				Date: 06/06/03					
Customer: The Watt Stopper, Inc.				Temperature: 25 °C					
Attendees: None				Humidity: 34%					
Customer Ref. No.: N/A				Bar. Pressure: 29.89					
Tested by: Rod Peloquin				Power: Battery		Job Site: EV06			
Specification: CFR 47 Part 15.247(d)		Year: 2003		Method: FCC 97-114, ANSI C63.4		Year: 1992			
SAMPLE CALCULATIONS									
Meter reading on spectrum analyzer is internally compensated for cable loss and external attenuation.									
Power Spectral Density per 3kHz bandwidth = Power Spectral Density per 1 Hz bandwidth + Bandwidth Correction Factor.									
Bandwidth Correction Factor = $10 \cdot \log(3\text{kHz}/1\text{Hz})$									
COMMENTS									
EUT OPERATING MODES									
Modulated by PRBS at maximum data rate									
DEVIATIONS FROM TEST STANDARD									
None									
REQUIREMENTS									
Maximum peak power spectral density conducted from a DSSS transmitter does not exceed 8 dBm in any 3 kHz band									
RESULTS									
AMPLITUDE									
Pass Power Spectral Density = 0.8 dBm / 3kHz									
SIGNATURE									
 Tested By: _____									
DESCRIPTION OF TEST									
Power Spectral Density - Low Channel									



NORTHWEST EMC				EMISSIONS DATA SHEET				Rev BETA 01/30/01	
EUT: MRH6				Work Order: WATT0009					
Serial Number: N/A				Date: 06/06/03					
Customer: The Watt Stopper, Inc.				Temperature: 25 °C					
Attendees: None				Humidity: 34%					
Customer Ref. No.: N/A				Bar. Pressure: 29.89					
Tested by: Rod Peloquin				Power: Battery		Job Site: EV06			
Specification: CFR 47 Part 15.247(d)		Year: 2003		Method: FCC 97-114, ANSI C63.4		Year: 1992			
SAMPLE CALCULATIONS									
Meter reading on spectrum analyzer is internally compensated for cable loss and external attenuation									
Power Spectral Density per 3kHz bandwidth = Power Spectral Density per 1 Hz bandwidth + Bandwidth Correction Factor.									
Bandwidth Correction Factor = $10 \cdot \log(3\text{kHz}/1\text{Hz})$									
COMMENTS									
EUT OPERATING MODES									
Modulated by PRBS at maximum data rate									
DEVIATIONS FROM TEST STANDARD									
None									
REQUIREMENTS									
Maximum peak power spectral density conducted from a DSSS transmitter does not exceed 8 dBm in any 3 kHz band									
RESULTS									
AMPLITUDE									
Pass Power Spectral Density = 0.2 dBm / 3kHz									
SIGNATURE									
 Tested By: _____									
DESCRIPTION OF TEST									
Power Spectral Density - Mid Channel									



NORTHWEST EMC				EMISSIONS DATA SHEET				Rev BETA 01/30/01	
EUT: MRH6				Work Order: WATT0009					
Serial Number: N/A				Date: 06/06/03					
Customer: The Watt Stopper, Inc.				Temperature: 25 °C					
Attendees: None				Humidity: 34%					
Customer Ref. No.: N/A				Bar. Pressure: 29.89					
Tested by: Rod Peloquin				Power: Battery		Job Site: EV06			
Specification: CFR 47 Part 15.247(d)		Year: 2003		Method: FCC 97-114, ANSI C63.4		Year: 1992			
SAMPLE CALCULATIONS									
Meter reading on spectrum analyzer is internally compensated for cable loss and external attenuation									
Power Spectral Density per 3kHz bandwidth = Power Spectral Density per 1 Hz bandwidth + Bandwidth Correction Factor.									
Bandwidth Correction Factor = $10 \cdot \log(3\text{kHz}/1\text{Hz})$									
COMMENTS									
EUT OPERATING MODES									
Modulated by PRBS at maximum data rate									
DEVIATIONS FROM TEST STANDARD									
None									
REQUIREMENTS									
Maximum peak power spectral density conducted from a DSSS transmitter does not exceed 8 dBm in any 3 kHz band									
RESULTS									
AMPLITUDE									
Pass Power Spectral Density = 0.3 dBm / 3kHz									
SIGNATURE									
 Tested By: _____									
DESCRIPTION OF TEST									
Power Spectral Density - High Channel									



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

High

Mid

Low

Operating Modes Investigated:

Typical

Data Rates Investigated:

Typical

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

Battery

Frequency Range Investigated

Start Frequency

30 MHz

Stop Frequency

10 GHz

Software\Firmware Applied During Test

Exercise software

Standard Production
Software

Version

Unknown

Description

Transmits at low, mid, and high channels.

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	The Watt Stopper, Inc.	MRH6	N/A

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
N/A	N/A	N/A	N/A	N/A	N/A

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	01/07/2003	12 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	01/07/2003	12 mo
Antenna, Biconilog	EMCO	3141	AXE	12/31/2001	36 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	01/06/2003	12 mo
Antenna, Horn	EMCO	3115	AHC	08/12/2002	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APJ	01/06/2003	12 mo
High Pass Filter	Hewlett Packard	84300-80037	HFE	05/01/2003	12 mo

Test Description

Requirement: The field strength of any spurious emissions or modulation products that fall in a restricted band, as defined in 47 CFR 15.205, is measured. The peak level must comply with the limits specified in 47 CFR 15.35(b). The average level (taken with a 10Hz VBW) must comply with the limits specified in 15.209.

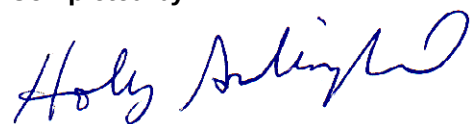
Configuration: The only type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. The EUT was transmitting at its maximum data rate in a no hop mode. For each configuration, the spectrum was scanned from 30 MHz to 10 GHz. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:1992). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity. Since the dwell time per channel of the hopping signal was less than 100 ms, the readings obtained with the 10 Hz VBW were further reduced by a "duty cycle correction factor" of 15.5 dB, derived from $20\log(\text{dwell time}/100\text{ms})$, where the EUT's maximum dwell time in any 100ms period was measured to be 16.8 ms.

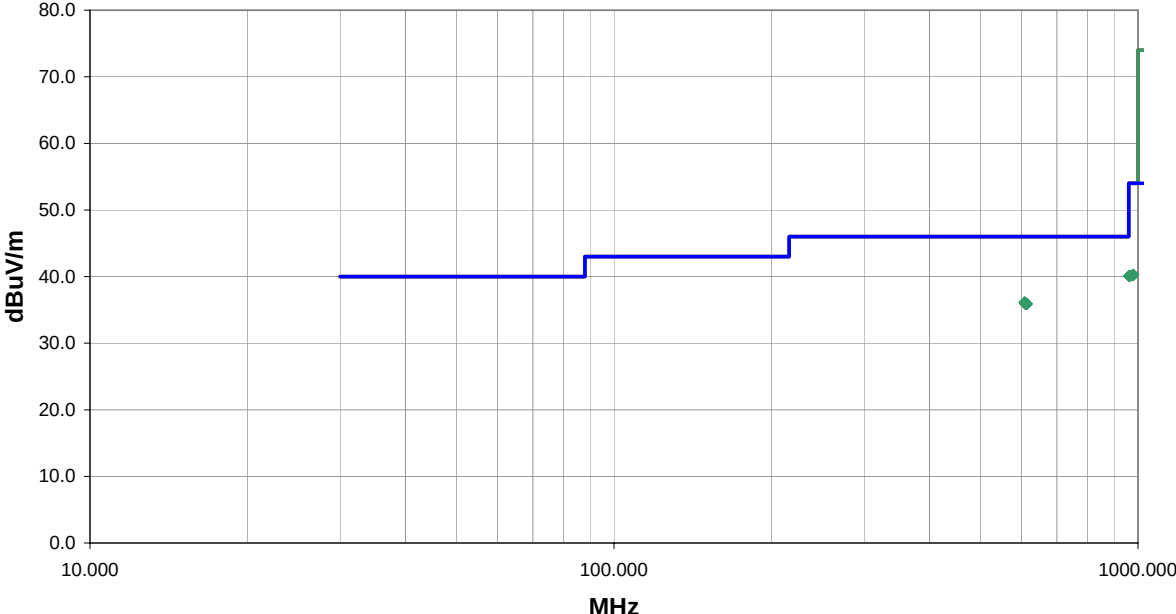
Bandwidths Used for Measurements

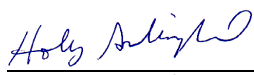
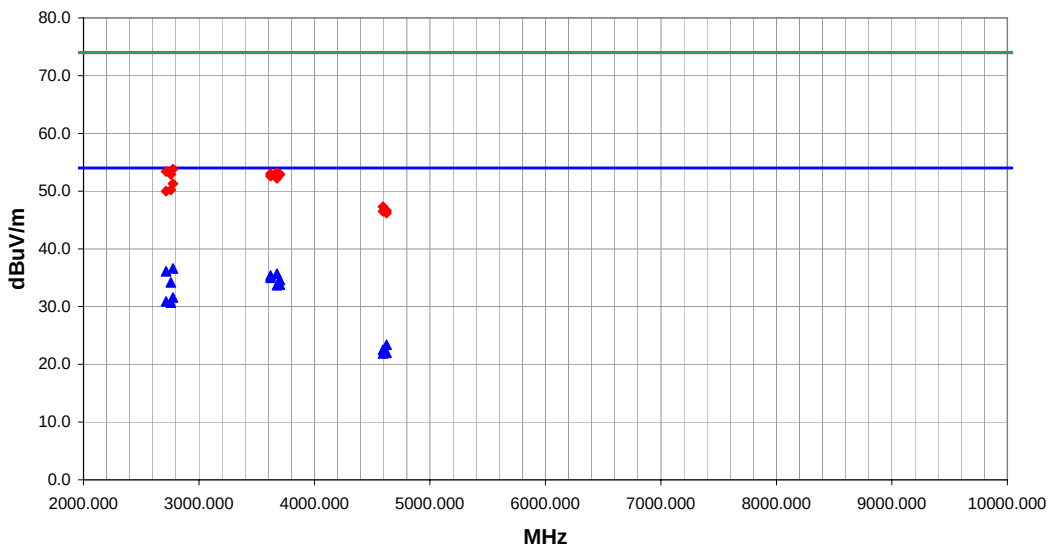
Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 – 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

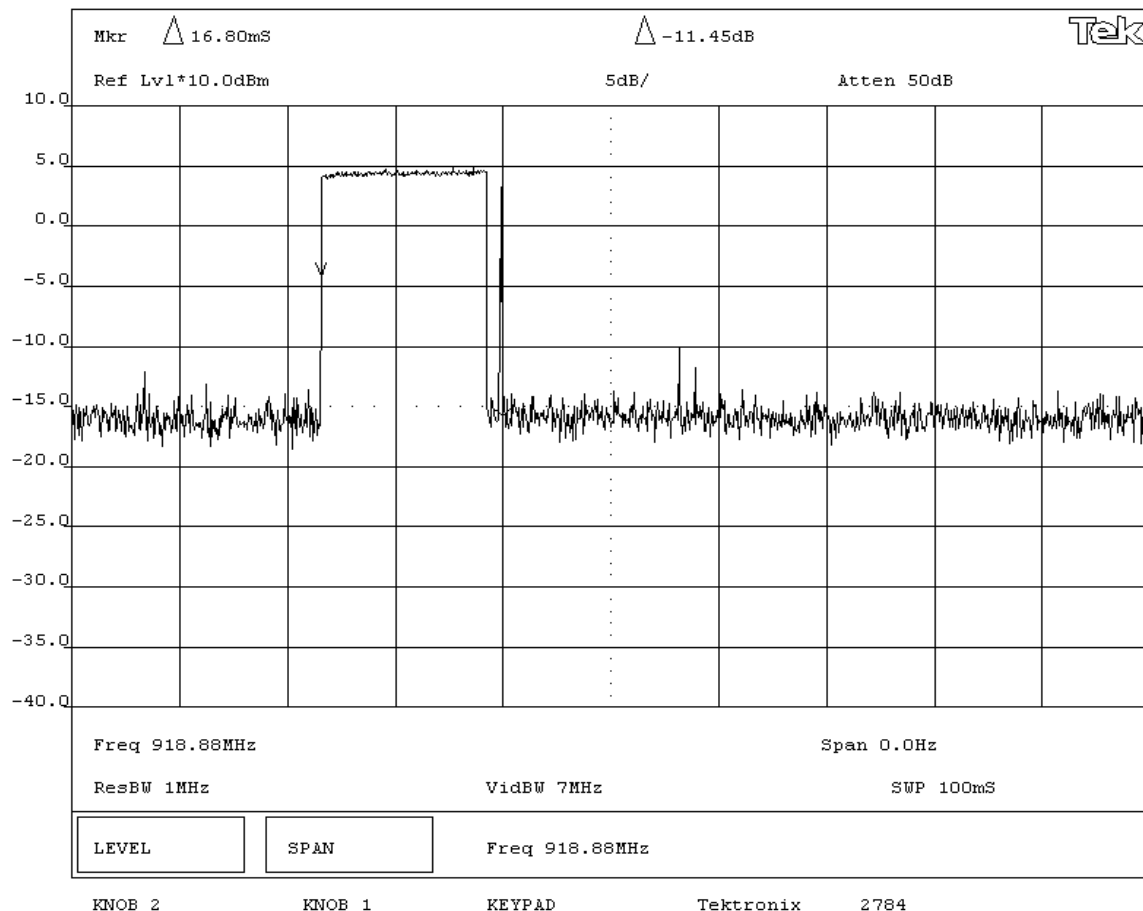
Completed by:



NORTHWEST										REV df3.10 03/10/2003			
EMC										OATS DATA SHEET			
EUT: MRH6					Work Order: WATT0009								
Serial Number: N/A					Date: 06/05/03								
Customer: The Watt Stopper, Inc.					Temperature: 73								
Attendees: None					Humidity: 33%								
Cust. Ref. No.: N/A					Barometric Pressure: 30.15								
Tested by: Holly Ashkannejhad			Power: Battery		Job Site: EV01								
TEST SPECIFICATIONS													
Specification: FCC Part 15.247(c)										Year: 2001			
Method: ANSI C63.4										Year: 1992			
SAMPLE CALCULATIONS													
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation													
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator													
COMMENTS													
EUT OPERATING MODES													
Transmitting low, mid, high channels													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
RESULTS												Run #	
Pass												2	
Other													
										 Tested By:			
													
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
607.709	23.2	-7.1	118.0	1.4	3.0	20.0	V-Bilog	QP	0.0	36.1	46.0	-9.9	Mid channel
607.770	23.2	-7.1	90.0	1.2	3.0	20.0	H-Bilog	QP	0.0	36.1	46.0	-9.9	Mid channel
609.629	23.1	-7.1	360.0	1.7	3.0	20.0	V-Bilog	QP	0.0	36.0	46.0	-10.0	Low channel
609.869	23.0	-7.1	331.0	1.2	3.0	20.0	H-Bilog	QP	0.0	35.9	46.0	-10.1	Low channel
612.877	22.9	-7.0	23.0	1.2	3.0	20.0	H-Bilog	QP	0.0	35.9	46.0	-10.1	High channel
613.455	22.9	-7.0	59.0	1.9	3.0	20.0	V-Bilog	QP	0.0	35.9	46.0	-10.1	High channel
979.360	23.2	-2.9	2.0	1.2	3.0	20.0	V-Bilog	QP	0.0	40.3	54.0	-13.7	High channel
978.515	23.1	-2.9	187.0	4.0	3.0	20.0	H-Bilog	QP	0.0	40.2	54.0	-13.8	High channel
962.983	23.3	-3.2	165.0	2.5	3.0	20.0	V-Bilog	QP	0.0	40.1	54.0	-13.9	Low channel
963.304	23.3	-3.2	186.0	1.0	3.0	20.0	H-Bilog	QP	0.0	40.1	54.0	-13.9	Mid channel
963.455	23.3	-3.2	181.0	1.2	3.0	20.0	V-Bilog	QP	0.0	40.1	54.0	-13.9	Mid channel
963.683	23.3	-3.2	345.0	1.0	3.0	20.0	H-Bilog	QP	0.0	40.1	54.0	-13.9	Low channel

NORTHWEST EMC										OATS DATA SHEET										REV d13.10 03/10/2003	
EUT: MRH6										Work Order: WATT0009											
Serial Number: N/A										Date: 06/05/03											
Customer: The Watt Stopper, Inc.										Temperature: 73											
Attendees: None										Humidity: 33%											
Cust. Ref. No.: N/A										Barometric Pressure: 30.15											
Tested by: Holly Ashkannejhad										Power: Battery										Job Site: EV01	
TEST SPECIFICATIONS																					
Specification: FCC Part 15.247(c)										Year: 2001											
Method: ANSI C63.4										Year: 1992											
SAMPLE CALCULATIONS																					
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation																					
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator																					
COMMENTS																					
EUT OPERATING MODES																					
Transmitting low, mid, high channels																					
DEVIATIONS FROM TEST STANDARD																					
No deviations.																					
RESULTS														Run #							
Pass														4							
Other																					
														 Tested By:							
																					
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments								
2774.506	50.2	1.9	217.0	1.2	15.5	0.0	H-Horn	AV	0.0	36.6	54.0	-17.4	High channel								
2714.633	49.8	1.8	242.0	1.3	15.5	0.0	H-Horn	AV	0.0	36.1	54.0	-17.9	Low channel								
3675.328	47.4	3.8	232.0	1.3	15.5	0.0	H-Horn	AV	0.0	35.7	54.0	-18.3	Mid channel								
3619.310	47.3	3.6	227.0	1.3	15.5	0.0	H-Horn	AV	0.0	35.4	54.0	-18.6	Low channel								
3619.310	46.9	3.6	201.0	1.2	15.5	0.0	V-Horn	AV	0.0	35.0	54.0	-19.0	Low channel								
3699.354	46.2	3.9	224.0	1.2	15.5	0.0	V-Horn	AV	0.0	34.6	54.0	-19.4	High channel								
2756.657	47.8	1.9	182.0	1.8	15.5	0.0	H-Horn	AV	0.0	34.2	54.0	-19.8	Mid channel								
3699.354	45.4	3.9	202.0	1.3	15.5	0.0	H-Horn	AV	0.0	33.8	54.0	-20.2	High channel								
3675.328	45.4	3.8	208.0	1.2	15.5	0.0	V-Horn	AV	0.0	33.7	54.0	-20.3	Mid channel								
2774.506	45.2	1.9	82.0	1.7	15.5	0.0	V-Horn	AV	0.0	31.6	54.0	-22.4	High channel								
2714.633	44.6	1.8	286.0	1.7	15.5	0.0	V-Horn	AV	0.0	30.9	54.0	-23.1	Low channel								
2756.657	44.3	1.9	329.0	1.2	15.5	0.0	V-Horn	AV	0.0	30.7	54.0	-23.3	Mid channel								
4624.184	33.5	5.4	12.0	1.2	15.5	0.0	V-Horn	AV	0.0	23.4	54.0	-30.6	High channel								
4594.167	32.7	5.3	129.0	1.1	15.5	0.0	V-Horn	AV	0.0	22.5	54.0	-31.5	Mid channel								
4624.184	32.1	5.4	214.0	2.3	15.5	0.0	H-Horn	AV	0.0	22.0	54.0	-32.0	High channel								
4594.167	32.1	5.3	187.0	1.4	15.5	0.0	H-Horn	AV	0.0	21.9	54.0	-32.1	Mid channel								
2774.506	51.9	1.9	217.0	1.2	0.0	0.0	H-Horn	PK	0.0	53.8	74.0	-20.2	High channel								
2714.633	51.6	1.8	242.0	1.3	0.0	0.0	H-Horn	PK	0.0	53.4	74.0	-20.6	Low channel								
3675.328	49.4	3.8	232.0	1.3	0.0	0.0	H-Horn	PK	0.0	53.2	74.0	-20.8	Mid channel								
3619.310	49.4	3.6	227.0	1.3	0.0	0.0	H-Horn	PK	0.0	53.0	74.0	-21.0	Low channel								
2756.657	51.0	1.9	182.0	1.8	0.0	0.0	H-Horn	PK	0.0	52.9	74.0	-21.1	Mid channel								
3699.354	49.0	3.9	202.0	1.3	0.0	0.0	H-Horn	PK	0.0	52.9	74.0	-21.1	High channel								
3699.354	49.0	3.9	224.0	1.2	0.0	0.0	V-Horn	PK	0.0	52.9	74.0	-21.1	High channel								
3619.310	49.0	3.6	201.0	1.2	0.0	0.0	V-Horn	PK	0.0	52.6	74.0	-21.4	Low channel								
3675.328	48.4	3.8	208.0	1.2	0.0	0.0	V-Horn	PK	0.0	52.2	74.0	-21.8	Mid channel								
2774.506	49.4	1.9	82.0	1.7	0.0	0.0	V-Horn	PK	0.0	51.3	74.0	-22.7	High channel								
2756.657	48.3	1.9	329.0	1.2	0.0	0.0	V-Horn	PK	0.0	50.2	74.0	-23.8	Mid channel								
2714.633	48.2	1.8	286.0	1.7	0.0	0.0	V-Horn	PK	0.0	50.0	74.0	-24.0	Low channel								
4594.167	42.0	5.3	129.0	1.1	0.0	0.0	V-Horn	PK	0.0	47.3	74.0	-26.7	Mid channel								
4624.184	41.2	5.4	12.0	1.2	0.0	0.0	V-Horn	PK	0.0	46.6	74.0	-27.4	High channel								
4594.167	41.2	5.3	187.0	1.4	0.0	0.0	H-Horn	PK	0.0	46.5	74.0	-27.5	Mid channel								
4624.184	40.8	5.4	214.0	2.3	0.0	0.0	H-Horn	PK	0.0	46.2	74.0	-27.8	High channel								

NORTHWEST EMC				EMISSIONS DATA SHEET				Rev BETA 01/30/01	
EUT: MRH6				Work Order: WATT0009					
Serial Number: N/A				Date: 06/16/03					
Customer: The Watt Stopper, Inc.				Temperature: 25 °C					
Attendees: None				Humidity: 34%					
Customer Ref. No.: N/A				Bar. Pressure: 30.15					
Tested by: Rod Peloquin				Power: 120VAC/60Hz				Job Site: EV06	
Specification: 47 CFR 15.235(c)		Year: 2003		Method: DA 00-705, ANSI C63.4		Year: 1992			
SAMPLE CALCULATIONS									
Duty cycle correction factor (dB) = 20*log (worst case high time / any 100mS period)									
COMMENTS									
EUT OPERATING MODES									
Modulated by PRBS at maximum data rate. Hopping carrier.									
DEVIATIONS FROM TEST STANDARD									
None									
REQUIREMENTS									
The average value of radiated emissions can be reduced by a duty cycle correction factor for comparison to the limit. The duty cycle correction factor is calculated as shown above:									
RESULTS									
Pass				DWELL TIME DURING A SINGLE TRANSMISSION 16.8mS					
SIGNATURE									
Tested By: _____									
DESCRIPTION OF TEST									
Time of Occupancy (Dwell Time) - Single Transmission									



NORTHWEST EMC				EMISSIONS DATA SHEET				BETA 01/30/0	
EUT: MRH6				Work Order: WATT0009					
Serial Number: N/A				Date: 06/16/03					
Customer: The Watt Stopper, Inc.				Temperature: 25 °C					
Attendees: None				Humidity: 34%					
Customer Ref. No.: N/A				Bar. Pressure: 30.15					
Tested by: Rod Peloquin				Power: 120VAC/60Hz				Job Site: EV06	
Specification: 47 CFR 15.235(c)		Year: 2003		Method: DA 00-705, ANSI C63.4		Year: 1992			
SAMPLE CALCULATIONS									
Duty cycle correction factor (dB) = 20*log (worst case high time/ any 100mS period)									
COMMENTS									
EUT OPERATING MODES									
Modulated by PRBS at maximum data rate. Hopping carrier.									
DEVIATIONS FROM TEST STANDARD									
None									
REQUIREMENTS									
The average value of radiated emissions can be reduced by a duty cycle correction factor for comparison to the limit. The duty cycle correction factor is calculated as shown above:									
RESULTS									
				NUMBER OF TRANSMISSIONS DURING A 100mS PERIOD					
Pass				1					
SIGNATURE									
Tested By: _____									
DESCRIPTION OF TEST									
Maximum high time during a 100mS period									

