ThinkEco, Inc.

modlet BN

Report #: THKE0018

Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Last Date of Test: March 29, 2012
ThinkEco, Inc.
Model: modlet BN

Emissions

Test Description	Specification	Test Method	Pass/Fail
Occupied Bandwidth	FCC 15.247:2012	ANSI C63.10:2009	**Pass**
Output Power	FCC 15.247:2012	ANSI C63.10:2009	**Pass**
Band Edge Compliance	FCC 15.247:2012	ANSI C63.10:2009	**Pass**
Spurious Conducted Emissions	FCC 15.247:2012	ANSI C63.10:2009	**Pass**
Power Spectral Density	FCC 15.247:2012	ANSI C63.10:2009	**Pass**
Duty Cycle	FCC 15.247:2012	ANSI C63.10:2009	**Pass**
Spurious Radiated Emissions	FCC 15.247:2012	ANSI C63.10:2009	**Pass**
AC Powerline Conducted Emissions	FCC 15.207:2012	ANSI C63.10:2009	**Pass**

Deviations From Test Standards

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200630-0

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 and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834D-1).

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. 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 History

Revision Number	Description	Date	Page Number
00	None		

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025. The scope includes radio, ITE, and medical standards from around the world. See: http://www.nwemc.com/accreditations/

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

KCC / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Hong Kong

OFTA – Recognized by OFTA as a CAB for the acceptance of test data.

Vietnam

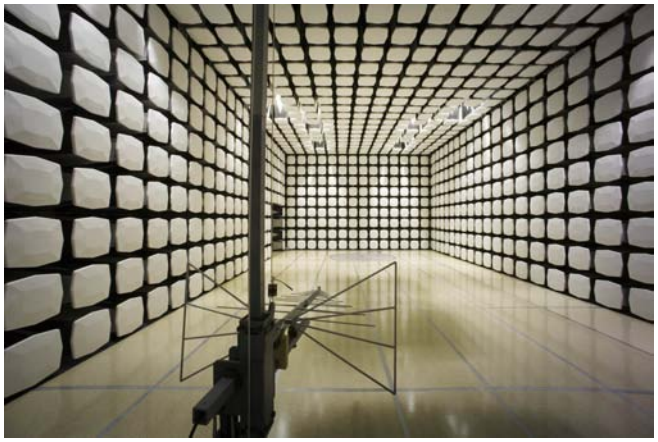
MIC – Recognized by MIC as a CAB for the acceptance of test data.

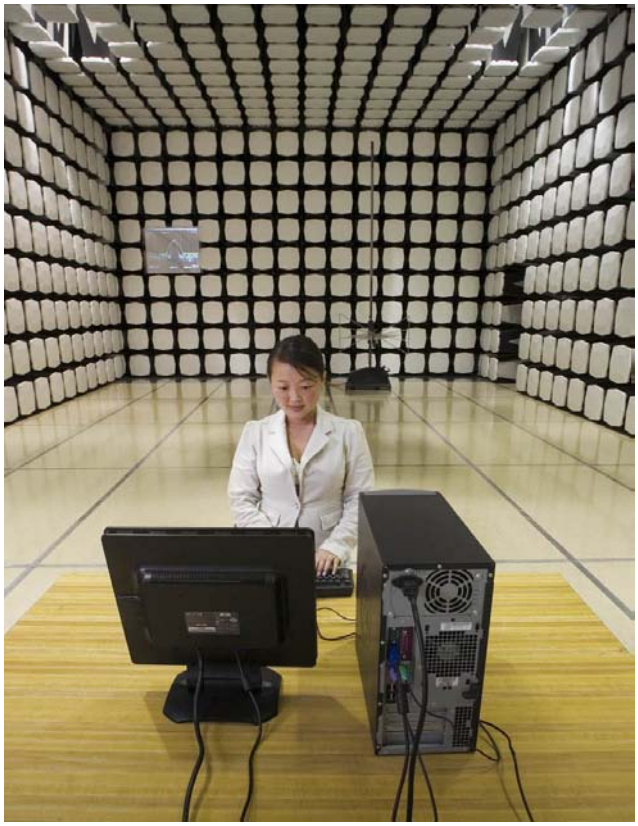
Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards**.**

Locations

Oregon	California	New York	Minnesota	Washington
Labs EV01-EV12 22975 NW Evergreen Pkwy, #400 Hillsboro, OR 97124 (503) 844-4066	Labs OC01-OC13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs WA01-WA04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Labs MN01-MN08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Labs SU01-SU07 14128 339th Ave. SE Sultan, WA 98294 (360) 793-8675
VCCI				
C-1071, R-1025, G-84, C-2687, T-1658, R-2318	R-1943, G-85, C-2766, T-1659, G-548		R-3125, G-86, G-141, C-3464, T-1634	R-871, G-83, C-3265, T-1511
Industry Canada				
2834D-1, 2834D-*2*	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1





Product Description

Client and Equipment Under Test (EUT) Information

Company Name:	ThinkEco, Inc.
Address:	148 Madison Avenue, 8th Floor
City, State, Zip:	New York, NY 10016
Test Requested By:	Max Rosenblatt
Model:	modlet BN
First Date of Test:	March 26, 2012
Last Date of Test:	March 29, 2012
Receipt Date of Samples:	March 26, 2012
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
2.4 GHz ISM radio, 802.15.4

Testing Objective:
To demonstrate compliance to FCC 15.247 requirements

Configurations

Configuration 1 THKE0018

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Module	ThinkEco, Inc.	modlet BN	0038

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
DC Adapter	Triad	WSU120-0700	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Leads	No	1.6m	No	EUT	Wall adapter
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration 3 THKE0018

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Module	ThinkEco, Inc.	modlet BN	FCC CT-0045

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power Cable	PA	1.85m	No	Unterminated	AC Module
AC Power Cable	PA	3.0m	No	AC Mains	AC Module
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Modifications

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	3/26/2012	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	3/26/2012	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	3/26/2012	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	3/26/2012	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	3/26/2012	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	3/26/2012	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	3/28/2012	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	3/29/2012	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Occupied Bandwidth

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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 only data rate available.

Occupied Bandwidth

EUT:	modlet BN			**Work Order:**	THKE0018
Serial Number:	0038			**Date:**	03/26/12
Customer:	ThinkEco, Inc.			**Temperature:**	22.5c°C
Attendees:	None			**Humidity:**	32%
Project:	None			**Barometric Pres.:**	1011
Tested by:	Ethan Schoonover	**Power:**	120VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Tx at 100% duty cycle

DEVIATIONS FROM TEST STANDARD

None

Configuration #	1	Signature

Channel	Value	Limit	Result
Low	1.458 MHz	> 500 kHz	Pass
High	1.45 MHz	> 500 kHz	Pass
Mid	1.449 MHz	> 500 kHz	Pass

Occupied Bandwidth

Low

				Value	Limit	Result
				1.458 MHz	> 500 kHz	Pass

High

				Value	Limit	Result
				1.45 MHz	> 500 kHz	Pass

Occupied Bandwidth

Mid						
				Value	Limit	Result
				1.449 MHz	> 500 kHz	Pass

Output Power

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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 only data rate available.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36dBm.

Output Power

EUT:	modlet BN			**Work Order:**	THKE0018
Serial Number:	0038			**Date:**	03/26/12
Customer:	ThinkEco, Inc.			**Temperature:**	22.5c°C
Attendees:	None			**Humidity:**	32%
Project:	None			**Barometric Pres.:**	1011
Tested by:	Ethan Schoonover	**Power:**	120VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Tx at 100% duty cycle

DEVIATIONS FROM TEST STANDARD

None

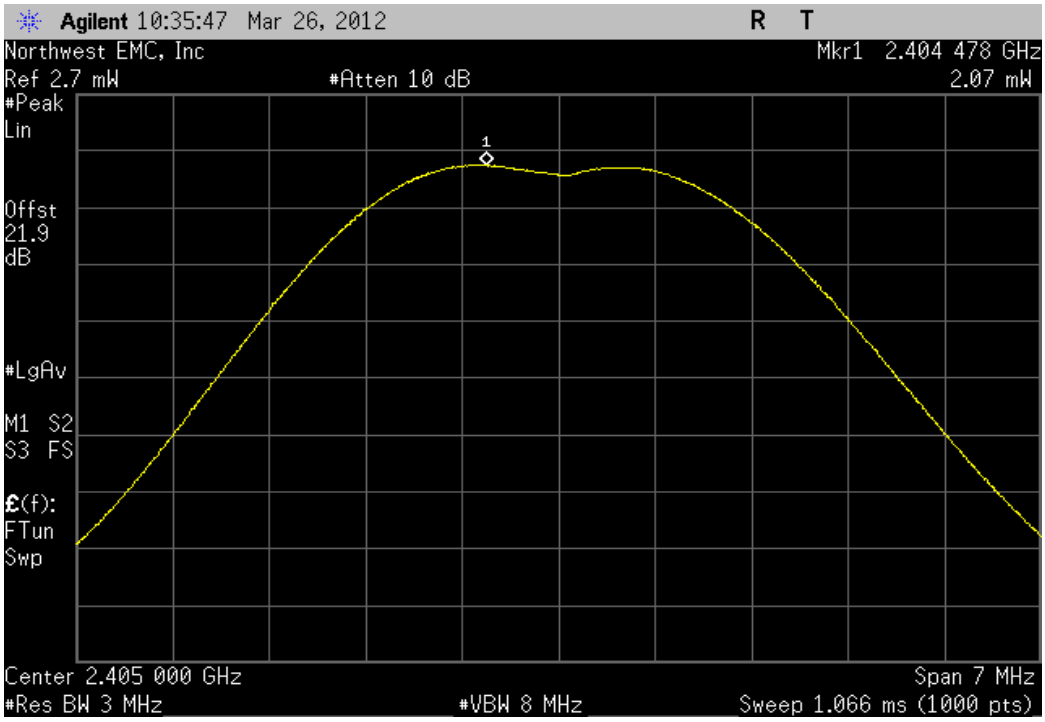
Configuration #	1	Signature

Channel	Value	Limit	Result
Low	2.067 mW	< 1 W	Pass
High	2.104 mW	< 1 W	Pass
Mid	2.064 mW	< 1 W	Pass

Output Power

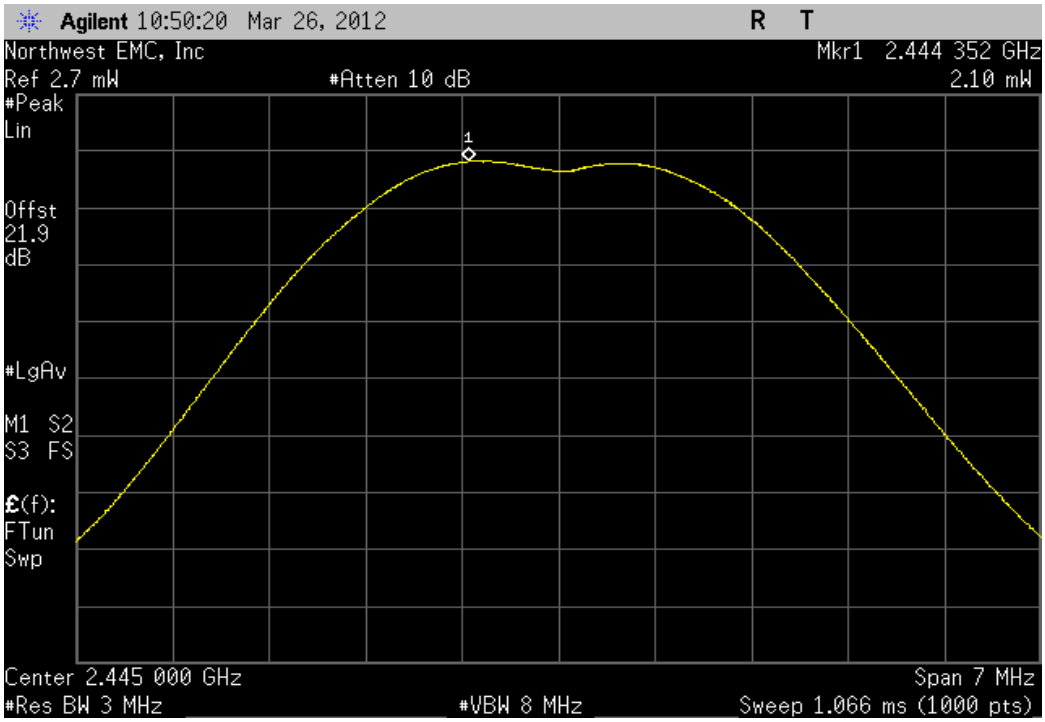
Low

				Value	Limit	Result
				2.067 mW	< 1 W	Pass



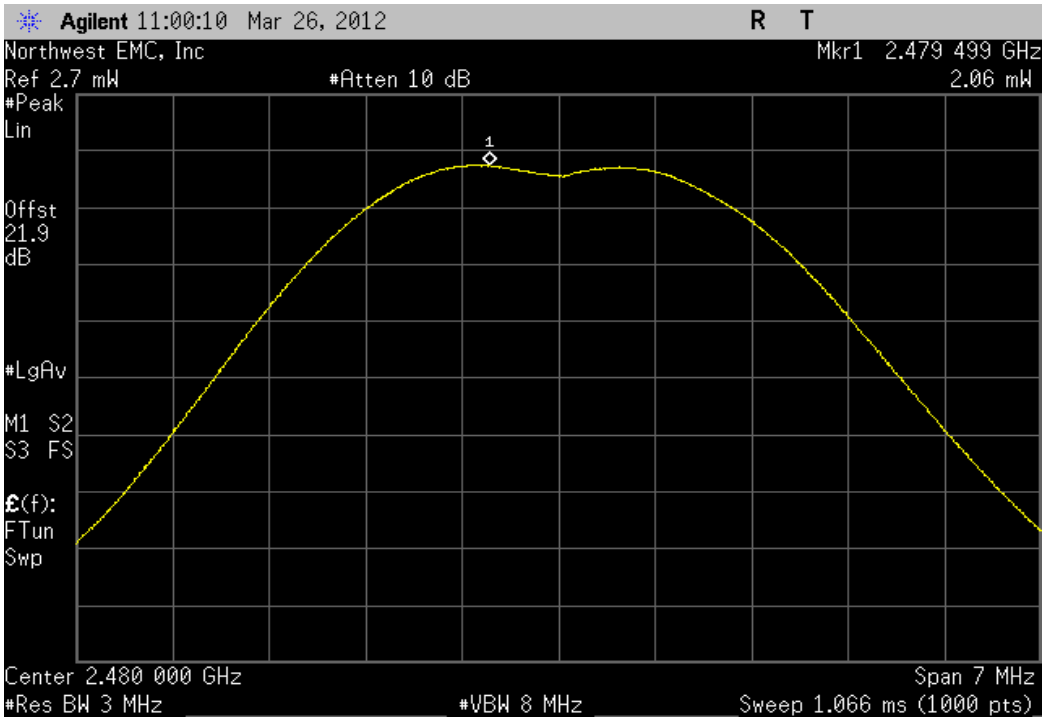
High

				Value	Limit	Result
				2.104 mW	< 1 W	Pass



Output Power

Mid							
					Value	Limit	Result
					2.064 mW	< 1 W	Pass



Band Edge Compliance

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. 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 only data rate available.

The spectrum was scanned across each band edge from at least 10 MHz below the band edge to 10 MHz above the band edge.

Band Edge Compliance

EUT:	modlet BN			**Work Order:**	THKE0018
Serial Number:	0038			**Date:**	03/26/12
Customer:	ThinkEco, Inc.			**Temperature:**	22.5c°C
Attendees:	None			**Humidity:**	32%
Project:	None			**Barometric Pres.:**	1011
Tested by:	Ethan Schoonover	**Power:**	120VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Tx at 100% duty cycle

DEVIATIONS FROM TEST STANDARD

None

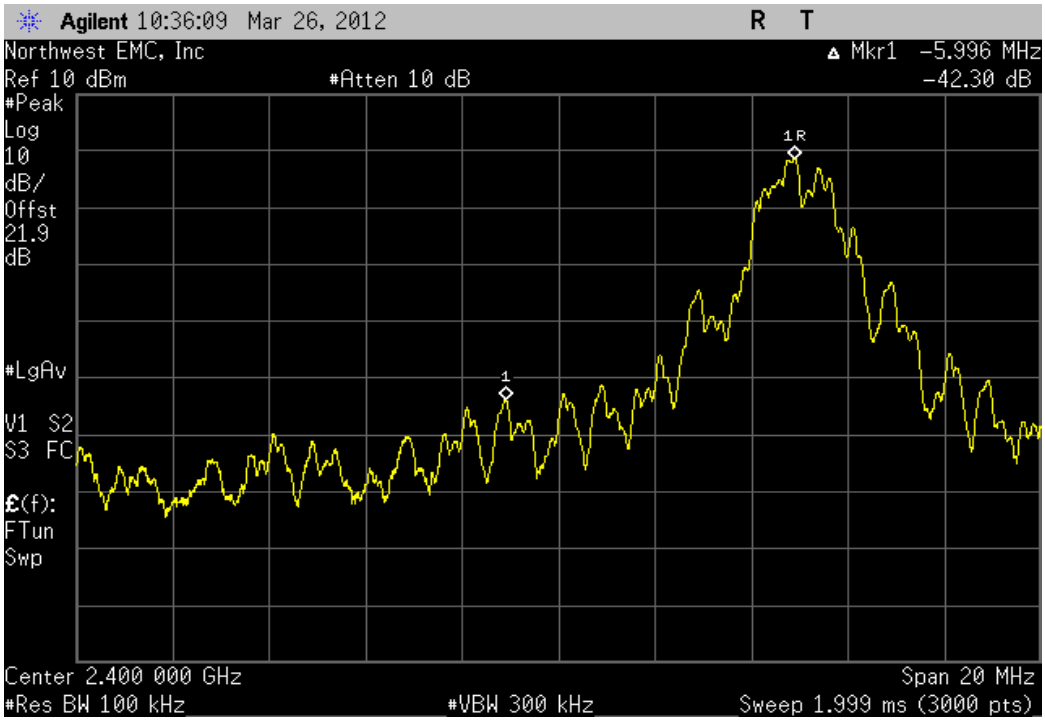
Configuration #	1	Signature

Channel	Value	Limit	Result
Low	-42.3 dBc	≤ -20 dBc	Pass
High	-39.47 dBc	≤ -20 dBc	Pass

Band Edge Compliance

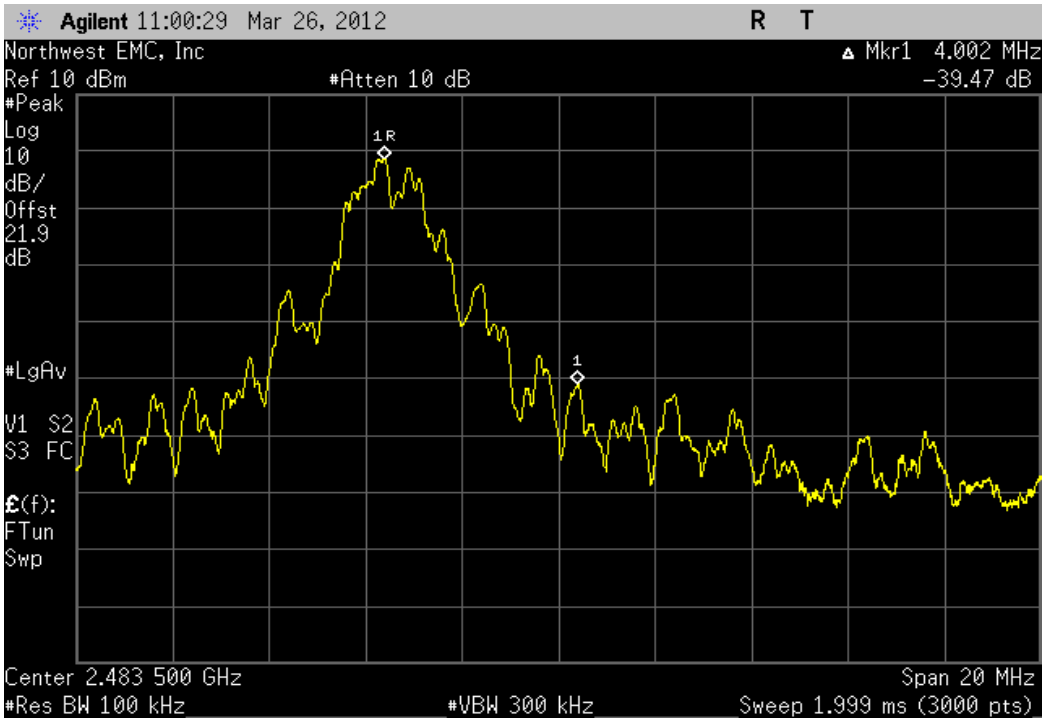
Low

				Value	Limit	Result
				-42.3 dBc	≤ -20 dBc	Pass



High

				Value	Limit	Result
				-39.47 dBc	≤ -20 dBc	Pass



Spurious Conducted Emissions

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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 only data rate available. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

Spurious Conducted Emissions

EUT:	modlet BN			**Work Order:**	THKE0018
Serial Number:	0038			**Date:**	03/26/12
Customer:	ThinkEco, Inc.			**Temperature:**	22.5c°C
Attendees:	None			**Humidity:**	32%
Project:	None			**Barometric Pres.:**	1011
Tested by:	Ethan Schoonover	**Power:**	120VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Tx at 100% duty cycle

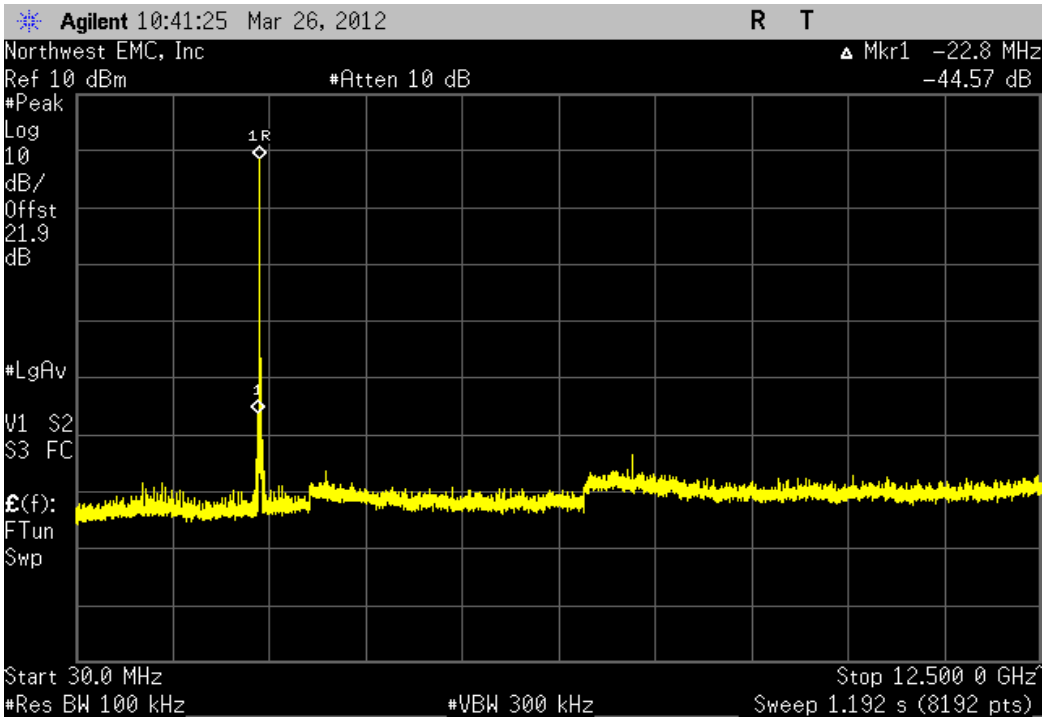
DEVIATIONS FROM TEST STANDARD

None

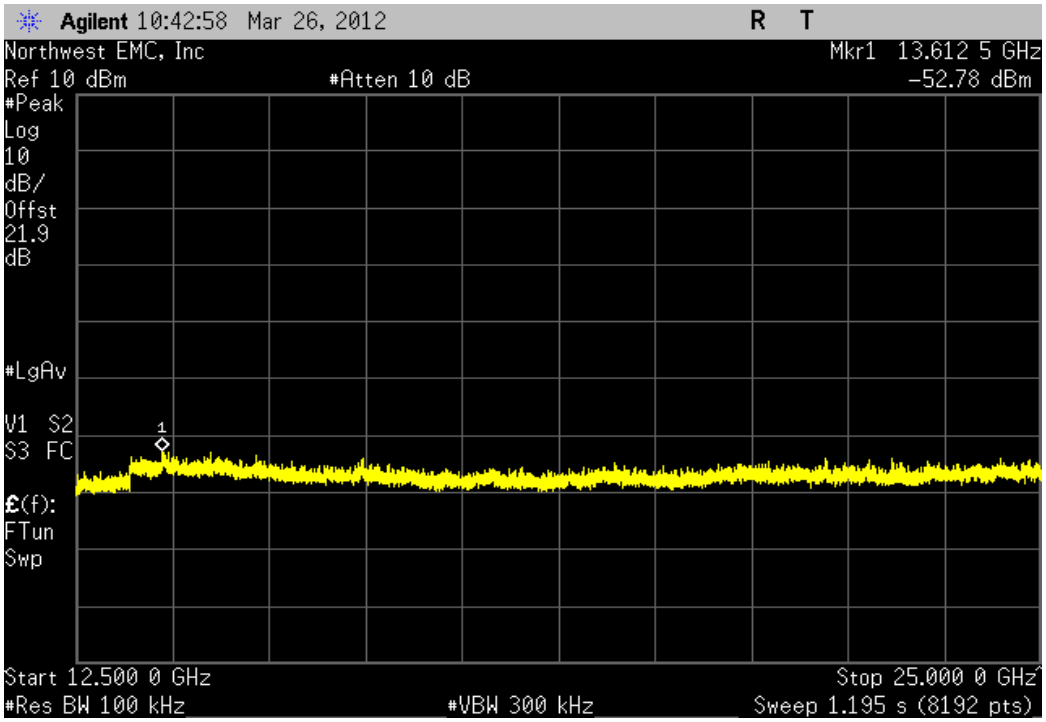
Configuration #	1	Signature

Channel	Frequency Range	Value	Limit	Result
Low	30 MHz - 12.5 GHz	-44.57 dBc	≤ -20 dBc	Pass
Low	12.5 GHz - 25 GHz	-51.26 dBc	≤ -20 dBc	Pass
High	30 MHz - 12.5 GHz	-52.24 dBc	≤ -20 dBc	Pass
High	12.5 GHz - 25 GHz	-51.58 dBc	≤ -20 dBc	Pass
Mid	30 MHz - 12.5 GHz	-44.06 dBc	≤ -20 dBc	Pass
Mid	12.5 GHz - 25 GHz	-51.24 dBc	≤ -20 dBc	Pass

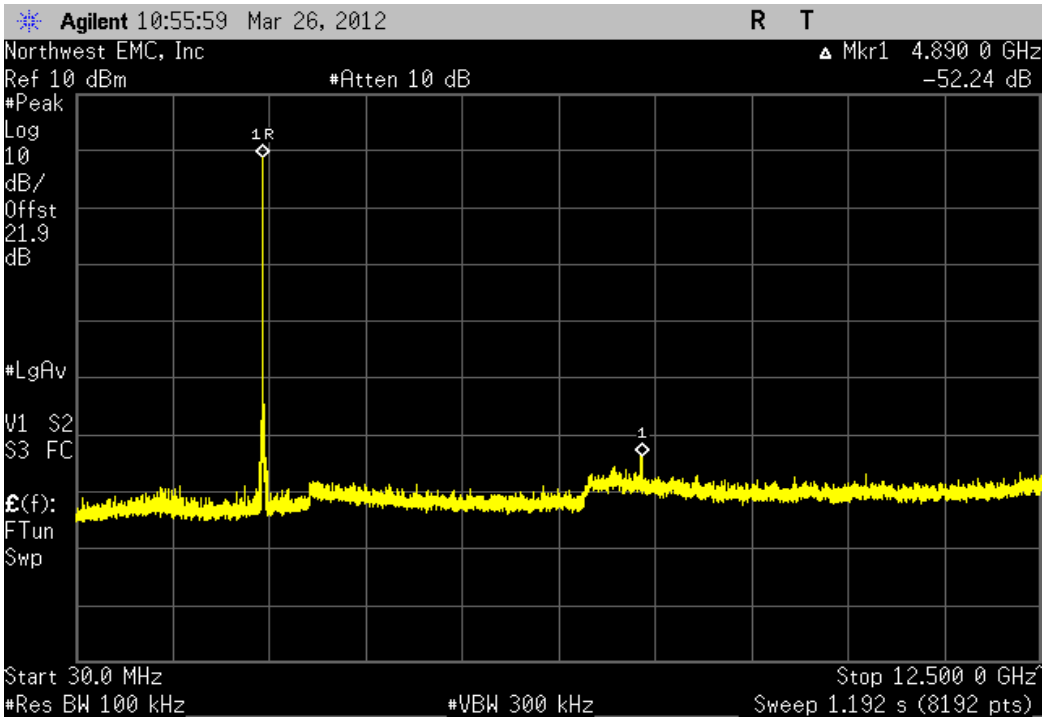
Low				
Frequency Range		**Value**	**Limit**	**Result**
30 MHz - 12.5 GHz		-44.57 dBc	≤ -20 dBc	Pass



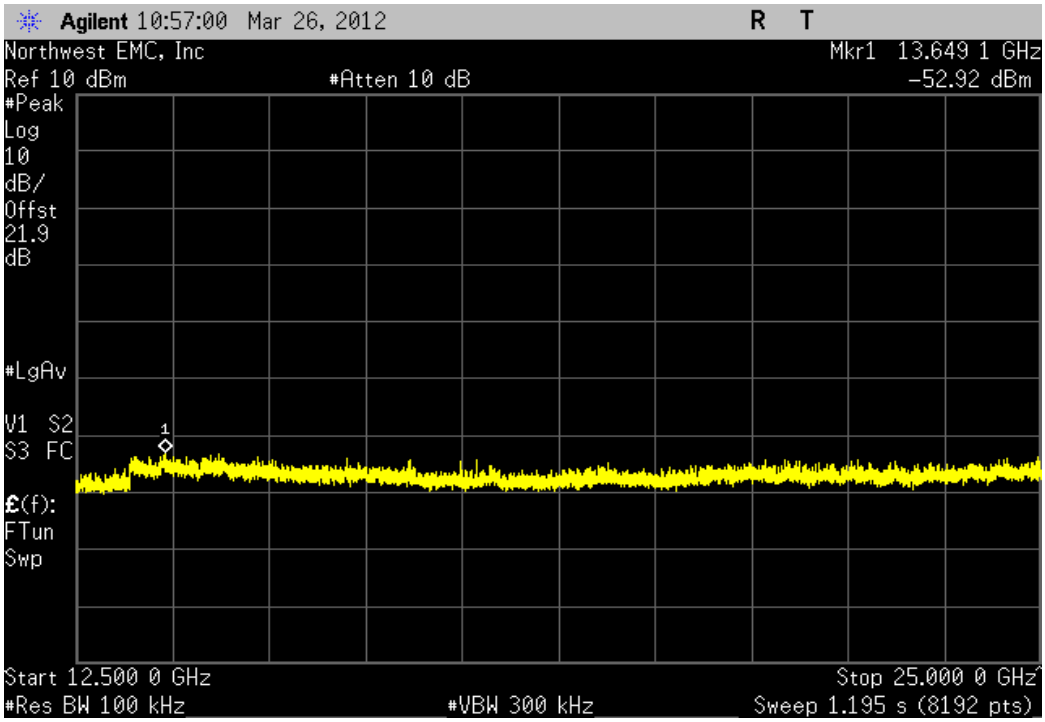
Low				
Frequency Range		**Value**	**Limit**	**Result**
12.5 GHz - 25 GHz		-51.26 dBc	≤ -20 dBc	Pass



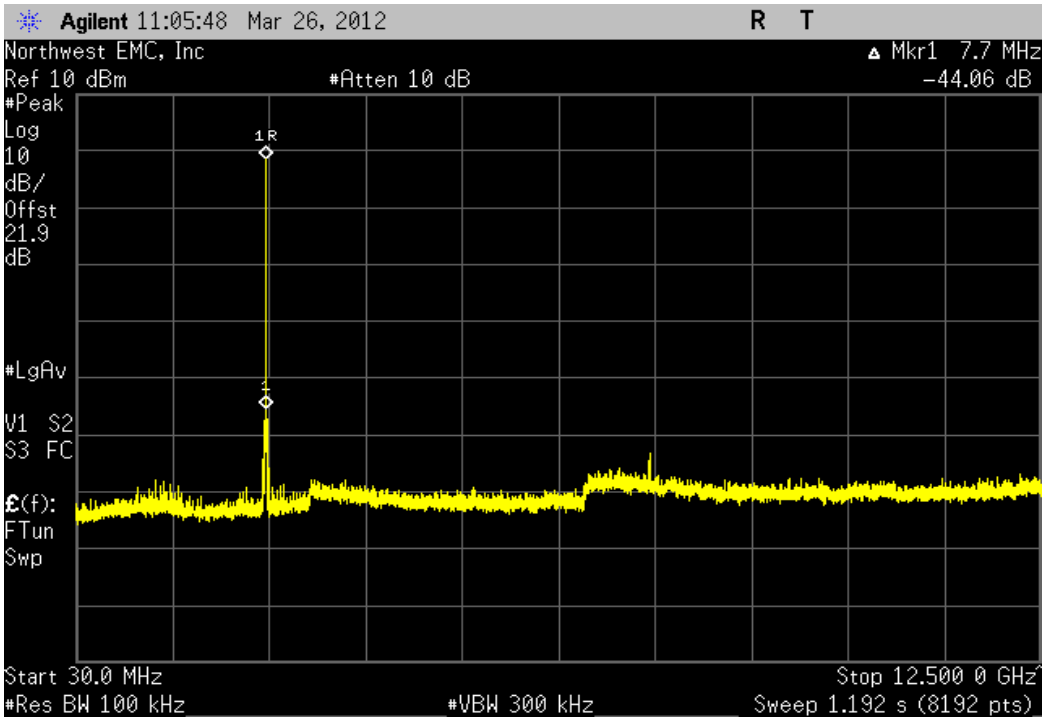
High				
Frequency Range		**Value**	**Limit**	**Result**
30 MHz - 12.5 GHz		-52.24 dBc	≤ -20 dBc	Pass



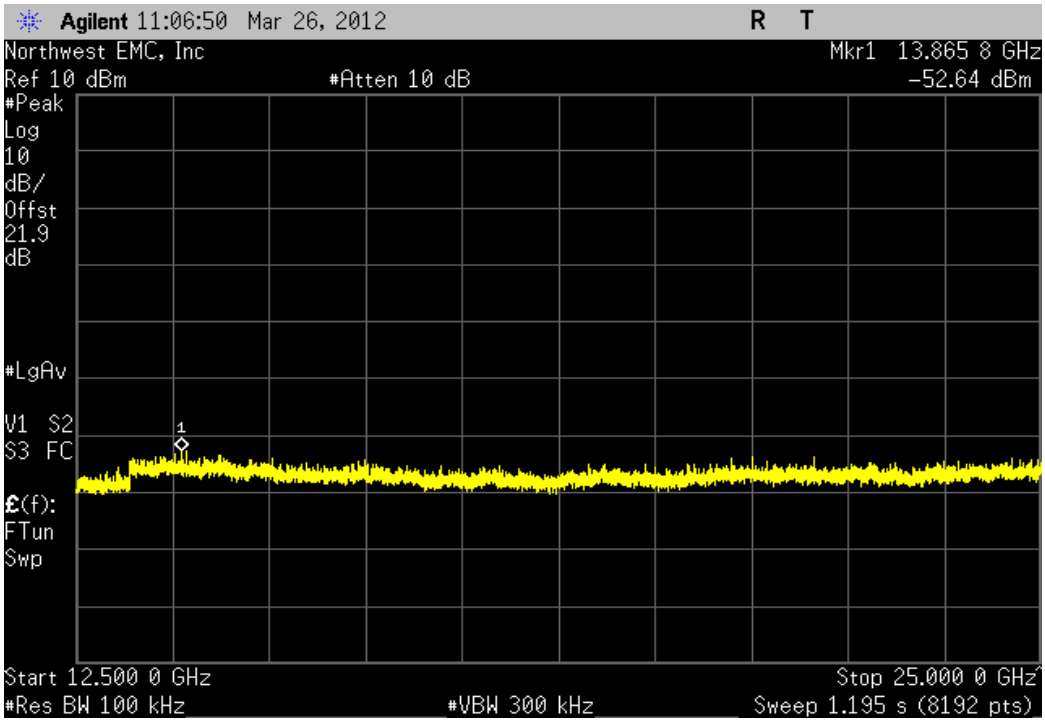
High				
Frequency Range		**Value**	**Limit**	**Result**
12.5 GHz - 25 GHz		-51.58 dBc	≤ -20 dBc	Pass



Mid				
Frequency Range		**Value**	**Limit**	**Result**
30 MHz - 12.5 GHz		-44.06 dBc	≤ -20 dBc	Pass



Mid				
Frequency Range		**Value**	**Limit**	**Result**
12.5 GHz - 25 GHz		-51.24 dBc	≤ -20 dBc	Pass



Power Spectral Density

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The 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 only data rate available. Since the average output power was measured as defined in section ANSI C63.10:2009, section 6.10.2.2, the procedure outlined in section 6.11.2.4 was used. The spectrum analyzer was set as follows:

Locate and zoom in on emission peak(s) within the passband.

a) Set RBW = 3 kHz

b) Set VBW = 9 kHz

c) Set Sweep time to Automatic

d) Use a peak detector. A sample detector mode can be used only if the following conditions can be achieved with automatic sweep time and adjusting the bin width.

1) Bin width (i.e., span/number of points in spectrum display) < 0.5 RBW.

2) The transmission pulse or sequence of pulses remains at maximum transmit power throughout each of the 100 sweeps of averaging and that the interval between pulses is not included in any of the sweeps.

e) Use a video trigger (or RF gating) with the trigger level set to enable the sweep only during full power pulses. Transmitter shall operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run.”

f) Trace average 100 traces in power averaging mode. Do not use video averaging mode.

Power Spectral Density

EUT:	modlet BN			**Work Order:**	THKE0018
Serial Number:	0038			**Date:**	03/26/12
Customer:	ThinkEco, Inc.			**Temperature:**	22.5c°C
Attendees:	None			**Humidity:**	32%
Project:	None			**Barometric Pres.:**	1011
Tested by:	Ethan Schoonover	**Power:**	120VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Tx at 100% duty cycle

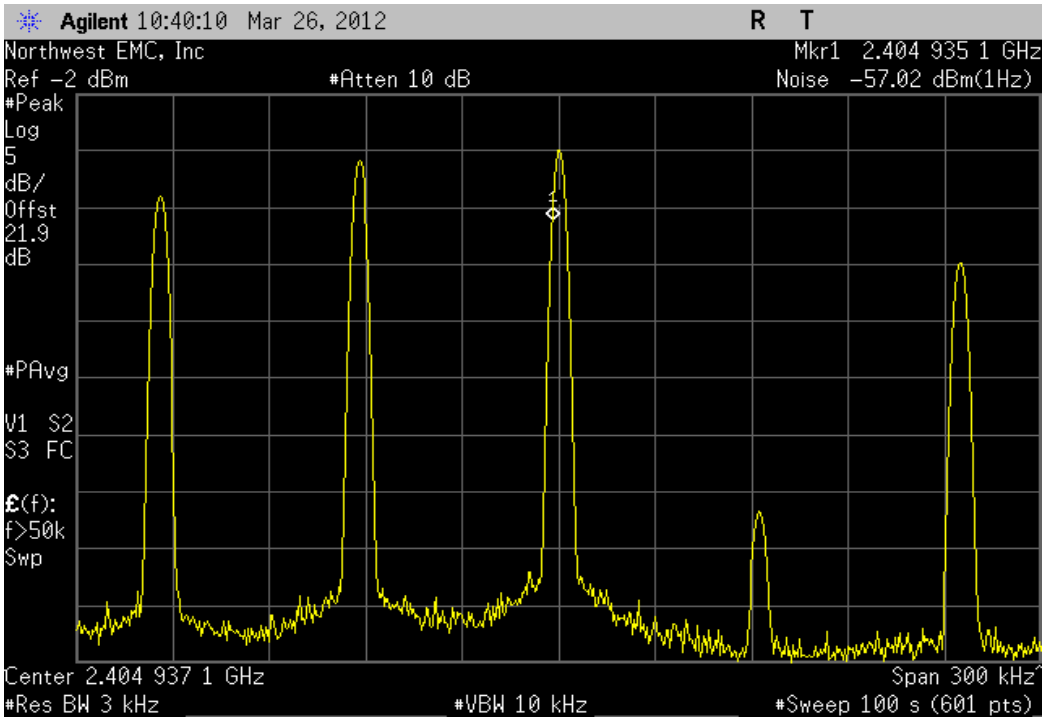
DEVIATIONS FROM TEST STANDARD

None

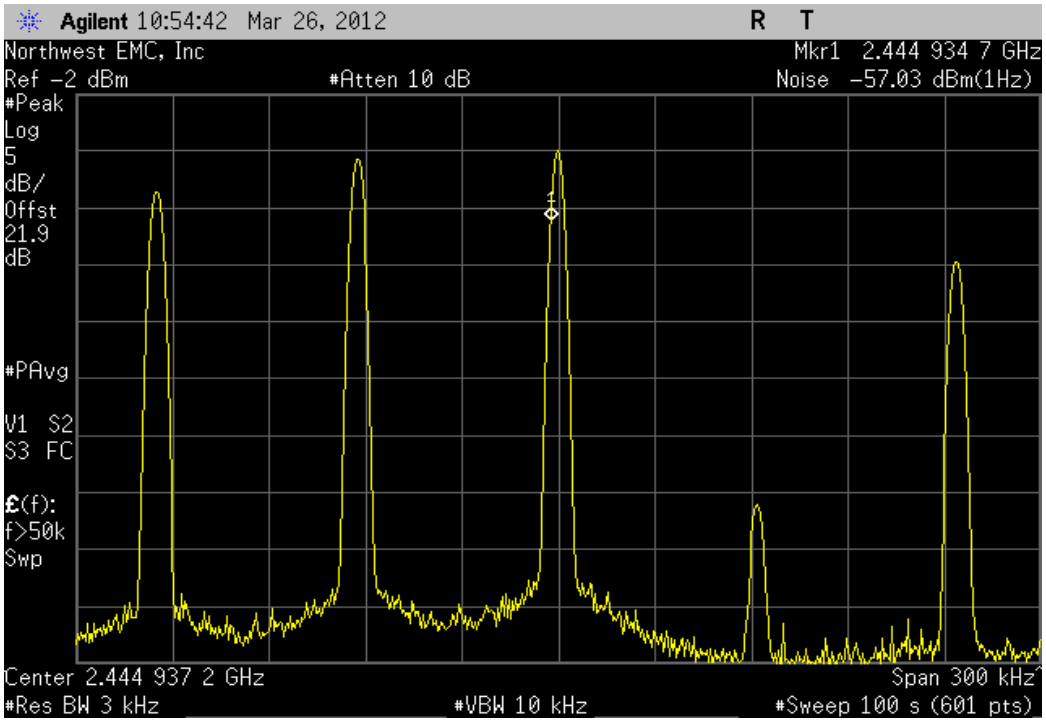
Configuration #	1	Signature

Channel	Value (dBm / Hz)	(dBm / Hz) To (dBm / 3 kHz)	Value (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Result
Low	-57.023	34.8	-22.223	8	Pass
High	-57.03	34.8	-22.23	8	Pass
Mid	-57.241	34.8	-22.441	8	Pass

Low						
		Value (dBm / Hz)	(dBm / Hz) To (dBm / 3 kHz)	Value (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Result
		-57.023	34.8	-22.223	8	Pass

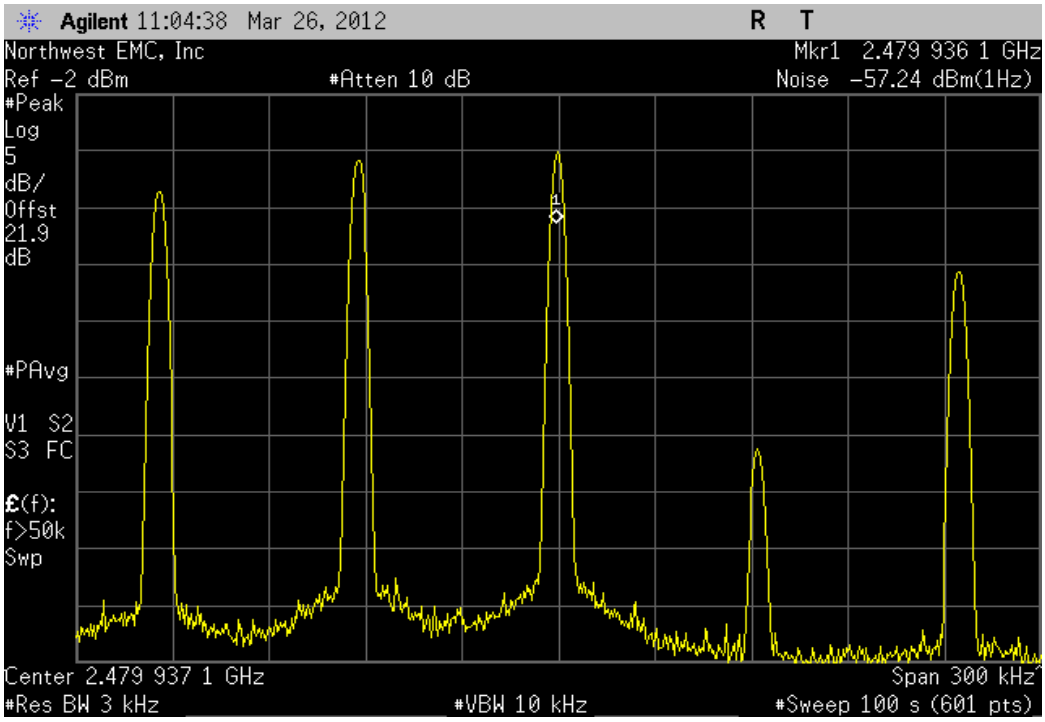


High						
		Value (dBm / Hz)	(dBm / Hz) To (dBm / 3 kHz)	Value (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Result
		-57.03	34.8	-22.23	8	Pass



Power Spectral Density

Mid						
		Value (dBm / Hz)	(dBm / Hz) To (dBm / 3 kHz)	Value (dBm / 3 kHz)	Limit (dBm / 3 kHz)	Result
		-57.241	34.8	-22.441	8	Pass



Duty Cycle

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MXG Vector Signal Generator	Agilent	N5182A	TIF	NCR	0
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

For software controlled or pre-programmed devices, the manufacturer shall declare the duty cycle class or classes for the equipment under test. For manually operated or event dependant devices, with or without software controlled functions, the manufacturer shall declare whether the device once triggered, follows a pre-programmed cycle, or whether the transmission is constant until the trigger is released or manually reset. The manufacturer shall also give a description of the application for the device and include a typical usage pattern. The typical usage pattern as declared by the manufacturer shall be used to determine the duty cycle and hence the duty class.

Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.

To derive average emission measurements, a duty cycle correction factor per 15.35(c) was utilized:

Duty Cycle = On time/100 milliseconds

Where “On time” = N1L1 +N2L2 +….

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +…)/100mS

The measured values for the EUT’s pulse train are as follows:

Period = 100 mSec

Pulsewidth of Pulse= 2.61 mSec

Number of Pulses = 8

Duty Cycle = 20 log [(8)(2.61)/100]= -13.6 dB

The duty cycle correction factor of –13.6 dB was added to the Average measurements from Radiated Spurious Emissions

Duty Cycle

EUT:	modlet BN			**Work Order:**	THKE0018
Serial Number:	0038			**Date:**	03/26/12
Customer:	ThinkEco, Inc.			**Temperature:**	22.5c°C
Attendees:	None			**Humidity:**	32%
Project:	None			**Barometric Pres.:**	1011
Tested by:	Ethan Schoonover	**Power:**	120VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Tx at maximum duty cycle

DEVIATIONS FROM TEST STANDARD

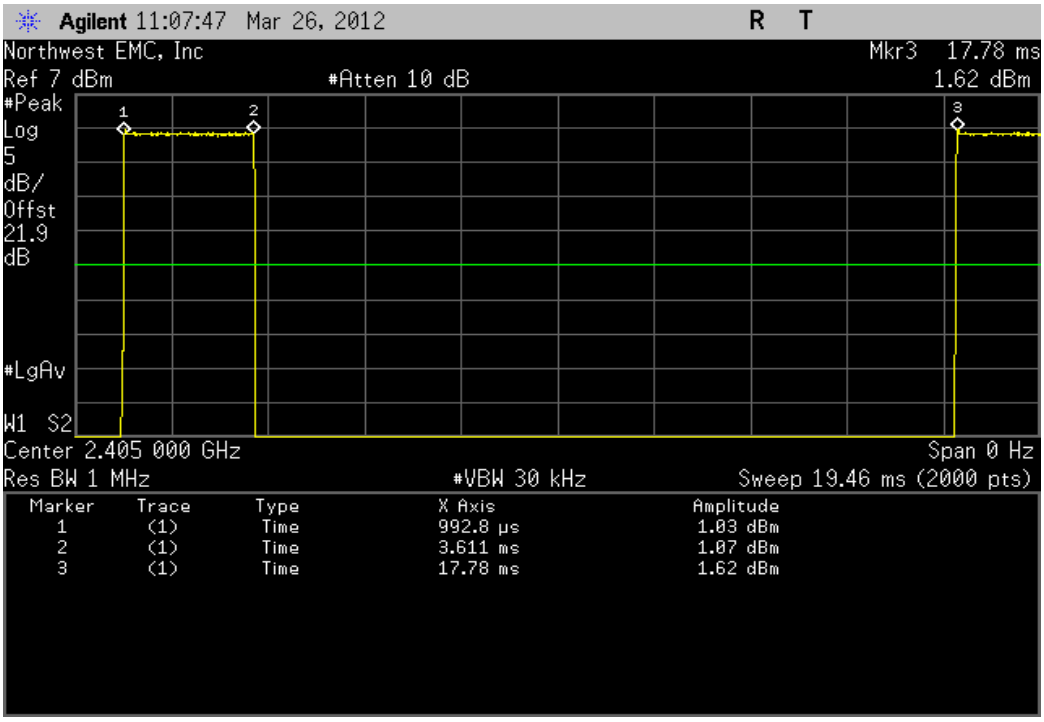
None

Configuration #	1	Signature

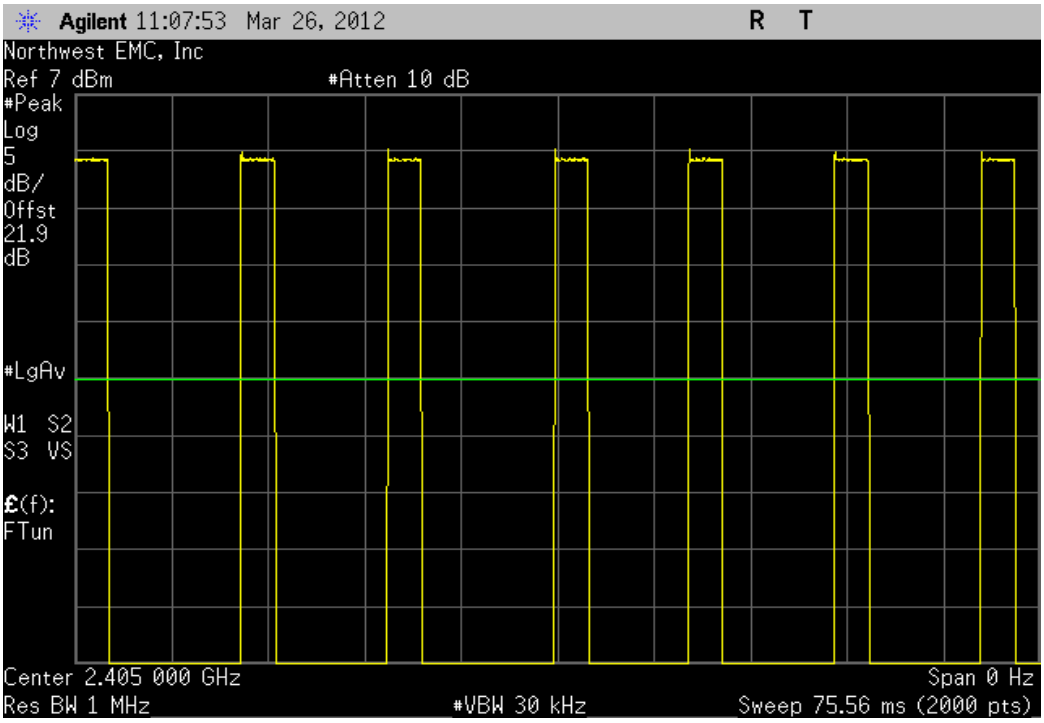
Channel	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
Low	2.618 mS	16.79 mS	1	0.156	N/A	N/A
Low			7		N/A	N/A
High	2.618 mS	13.052 mS	1	0.201	N/A	N/A
High			5		N/A	N/A
Mid	2.609 mS	13.393 mS	1	0.195	N/A	N/A
Mid			6		N/A	N/A

Duty Cycle

Low						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	2.618 mS	16.79 mS	1	15.60%	N/A	N/A

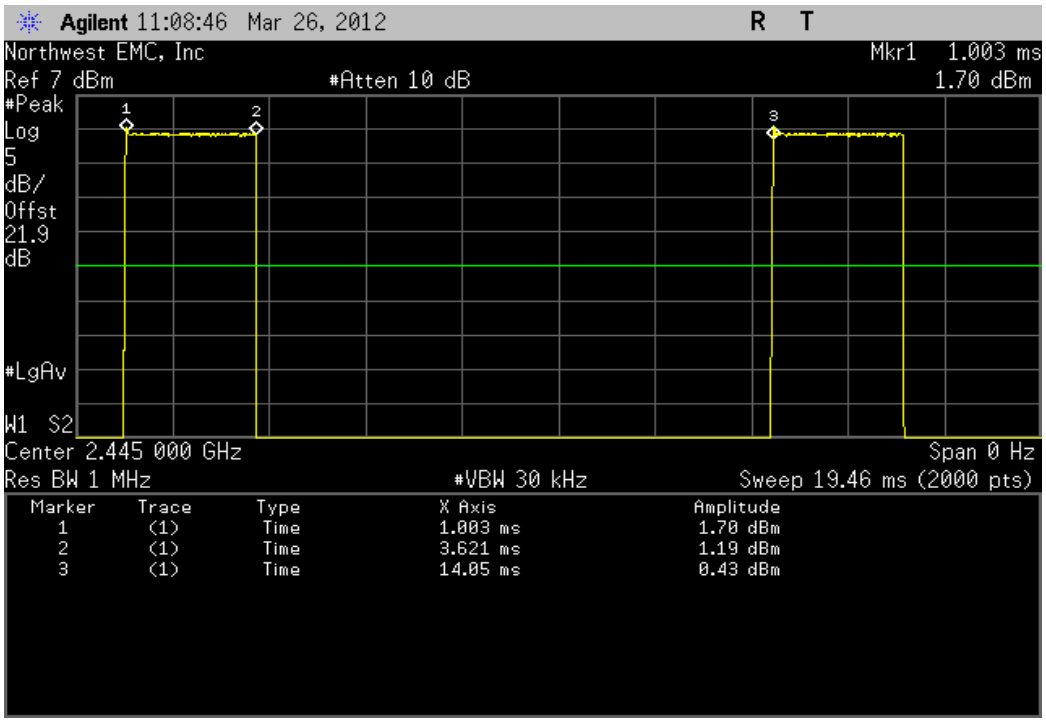


Low						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
			7		N/A	N/A

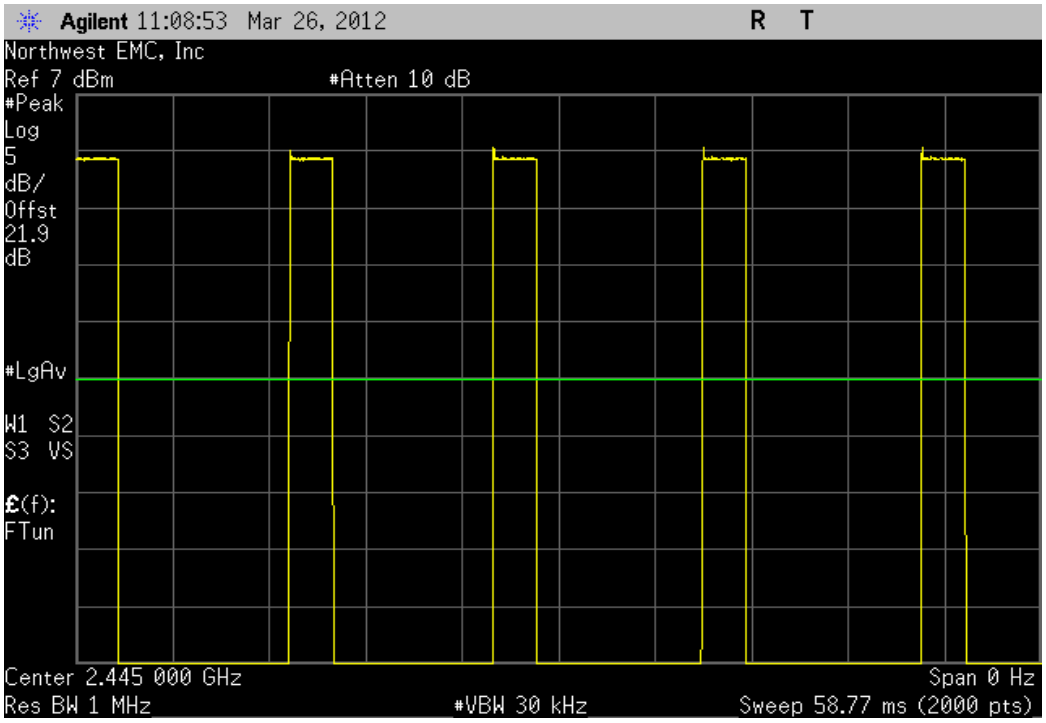


Duty Cycle

High						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	2.618 mS	13.052 mS	1	20.10%	N/A	N/A

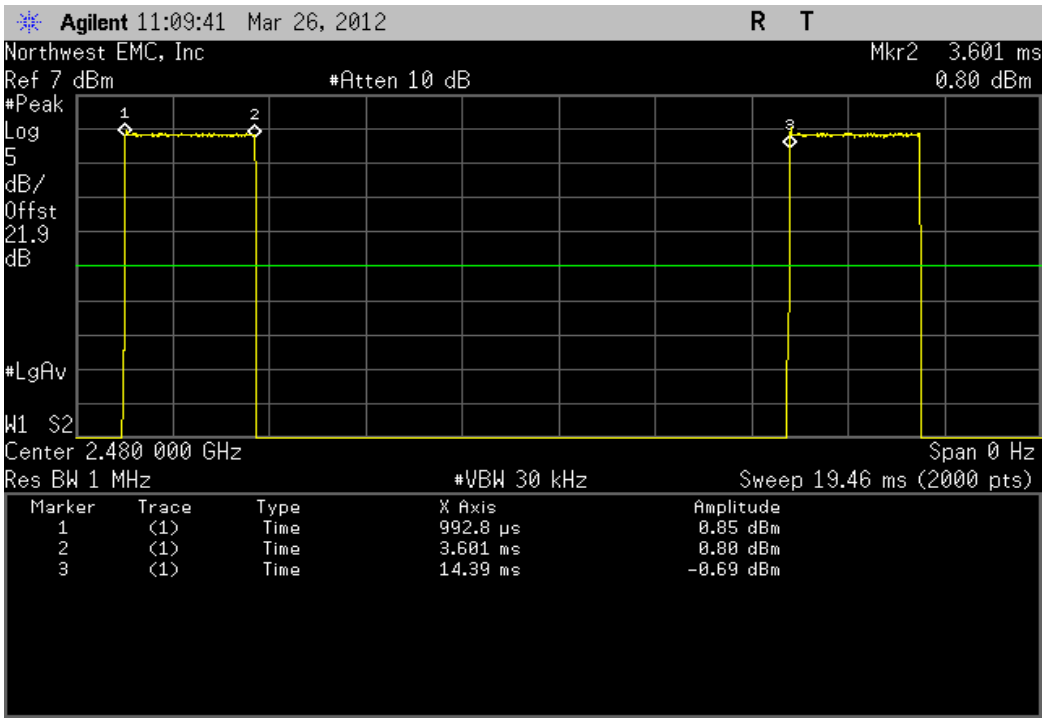


High						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
			5		N/A	N/A

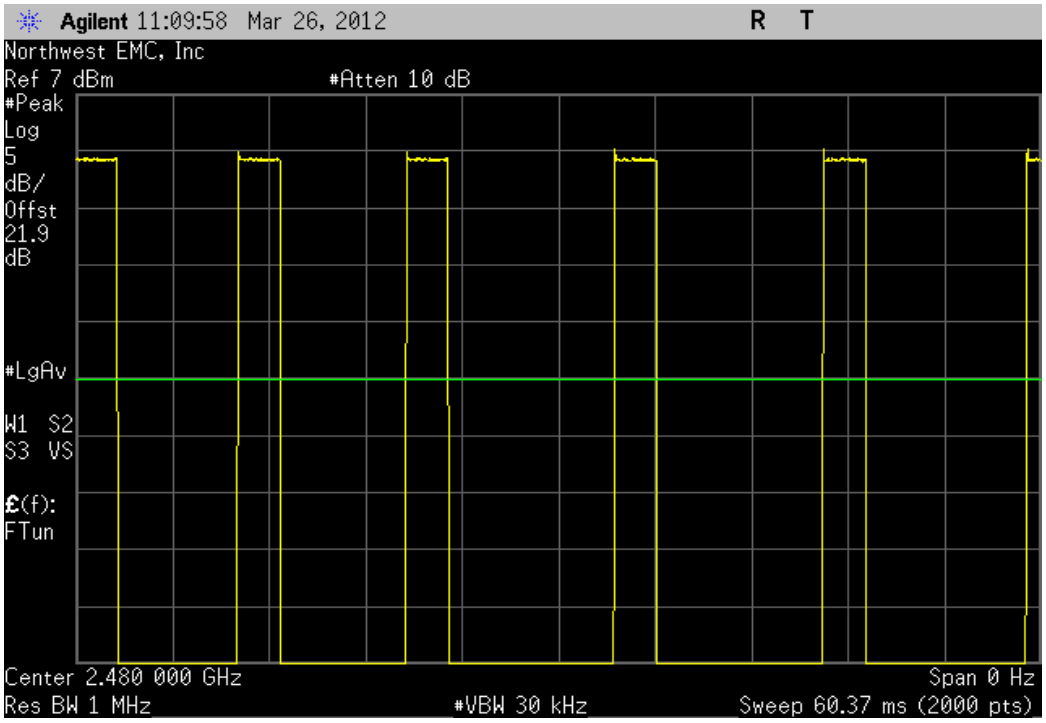


Duty Cycle

Mid						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
	2.609 mS	13.393 mS	1	19.50%	N/A	N/A



Mid						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit	Result
			6		N/A	N/A



SPURIOUS RADIATED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting 100% duty cycle, high channel
Transmitting 100% duty cycle, mid channel
Transmitting 100% duty cycle, low channel

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

THKE0018 - 3

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	25 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	12
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/28/2011	12
EV01 Cables	N/A	Bilog Cables	EVA	6/28/2011	12
Antenna, Biconilog	EMCO	3142	AXJ	5/17/2011	12
High Pass Filter	Micro-Tronics	HPM50111	HFO	8/9/2010	24
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/28/2011	12
Antenna, Horn	ETS	3115	AIZ	1/24/2011	24
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/28/2011	12
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	2/28/2012	12
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	2/28/2012	12
Antenna, Horn	ETS	3160-07	AHU	NCR	0
Antenna, Horn	ETS	3160-08	AHV	NCR	0
EV01 Cables	N/A	Standard Gain Horns Cables	EVF	2/28/2012	12
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/12/2011	12
Cable	ESM Cable Corp.	KMKM-72	EVY	9/12/2011	12

MEASUREMENT BANDWIDTHS

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 IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

SPURIOUS RADIATED EMISSIONS

EUT:	modlet BN			**Work Order:**	THKE0018
Serial Number:	FCC CT-0045			**Date:**	03/28/12
Customer:	ThinkEco, Inc.			**Temperature:**	23
Attendees:	None			**Humidity:**	35%
Project:	None			**Barometric Pres.:**	29.72
Tested by:	Rod Peloquin	**Power:**	120VAC/60Hz	**Job Site:**	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m)	1 - 4	**Test Distance (m)**	3

COMMENTS

None

EUT OPERATING MODES

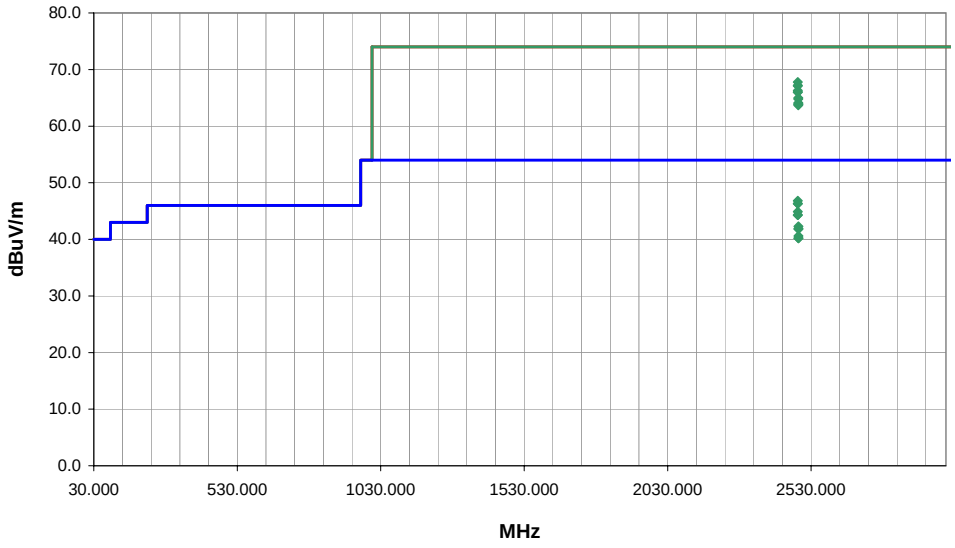
Transmitting 100% duty cycle, high channel

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	3
Results	Pass

Signature



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
2483.608	45.5	2.3	93.0	1.0	0.0	20.0	V-Horn	PK	0.0	67.8	74.0	-6.2	High Channel, EUT horizontal
2483.578	44.9	2.3	148.0	1.2	0.0	20.0	H-Horn	PK	0.0	67.2	74.0	-6.8	High Channel, EUT on side
2483.718	44.8	2.3	109.0	1.2	0.0	20.0	H-Horn	PK	0.0	67.1	74.0	-6.9	High Channel, EUT horizontal
2483.512	38.1	2.3	93.0	1.0	-13.6	20.0	V-Horn	AV	0.0	46.8	54.0	-7.2	High Channel, EUT horizontal
2483.595	44.0	2.3	343.0	1.0	0.0	20.0	V-Horn	PK	0.0	66.3	74.0	-7.7	High Channel, EUT on side
2483.500	37.6	2.3	109.0	1.2	-13.6	20.0	H-Horn	AV	0.0	46.3	54.0	-7.7	High Channel, EUT horizontal
2483.510	37.6	2.3	148.0	1.2	-13.6	20.0	H-Horn	AV	0.0	46.3	54.0	-7.7	High Channel, EUT on side
2483.537	43.7	2.3	226.0	1.0	0.0	20.0	H-Horn	PK	0.0	66.0	74.0	-8.0	High Channel, EUT vertical
2483.582	43.7	2.3	75.0	1.0	0.0	20.0	V-Horn	PK	0.0	66.0	74.0	-8.0	High Channel, EUT vertical
2485.533	42.7	2.3	93.0	1.0	0.0	20.0	V-Horn	PK	0.0	65.0	74.0	-9.0	High Channel, EUT horizontal
2483.502	36.2	2.3	343.0	1.0	-13.6	20.0	V-Horn	AV	0.0	44.9	54.0	-9.1	High Channel, EUT on side
2485.371	42.5	2.3	148.0	1.2	0.0	20.0	H-Horn	PK	0.0	64.8	74.0	-9.2	High Channel, EUT on side
2483.505	35.6	2.3	226.0	1.0	-13.6	20.0	H-Horn	AV	0.0	44.3	54.0	-9.7	High Channel, EUT vertical
2483.507	35.6	2.3	75.0	1.0	-13.6	20.0	V-Horn	AV	0.0	44.3	54.0	-9.7	High Channel, EUT vertical
2485.567	41.8	2.3	343.0	1.0	0.0	20.0	V-Horn	PK	0.0	64.1	74.0	-9.9	High Channel, EUT on side
2485.437	41.6	2.3	226.0	1.0	0.0	20.0	H-Horn	PK	0.0	63.9	74.0	-10.1	High Channel, EUT vertical
2485.770	41.6	2.3	108.0	1.0	0.0	20.0	H-Horn	PK	0.0	63.9	74.0	-10.1	High Channel, EUT horizontal
2485.423	41.4	2.3	75.0	1.0	0.0	20.0	V-Horn	PK	0.0	63.7	74.0	-10.3	High Channel, EUT vertical
2485.740	33.6	2.3	93.0	1.0	-13.6	20.0	V-Horn	AV	0.0	42.3	54.0	-11.7	High Channel, EUT horizontal
2485.616	33.2	2.3	109.0	1.2	-13.6	20.0	H-Horn	AV	0.0	41.9	54.0	-12.1	High Channel, EUT horizontal

SPURIOUS RADIATED EMISSIONS

EUT:	modlet BN			**Work Order:**	THKE0018
Serial Number:	FCC CT-0045			**Date:**	03/28/12
Customer:	ThinkEco, Inc.			**Temperature:**	23
Attendees:	None			**Humidity:**	35%
Project:	None			**Barometric Pres.:**	29.72
Tested by:	Rod Peloquin	**Power:**	120VAC/60Hz	**Job Site:**	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m)	1 - 4	**Test Distance (m)**	3

COMMENTS

None

EUT OPERATING MODES

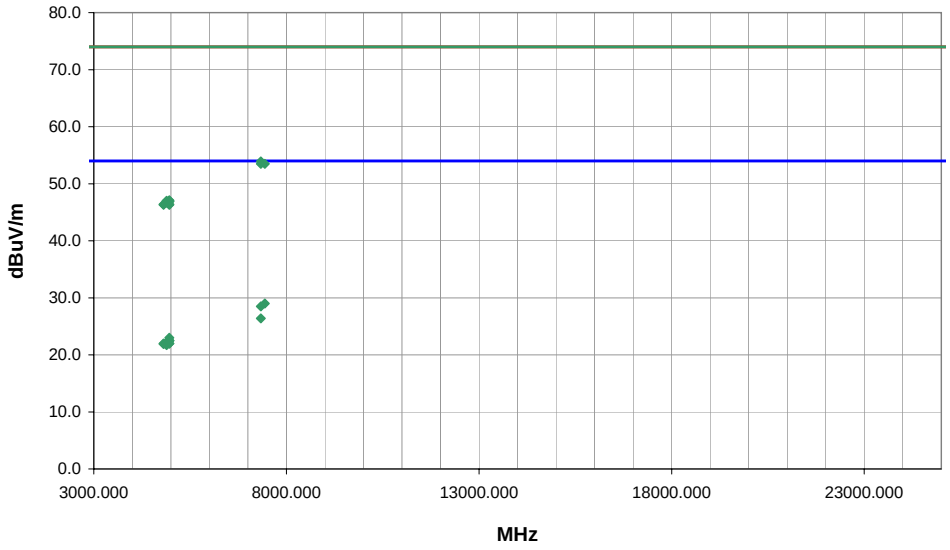
Transmitting 100% duty cycle

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	2
Configuration #	3
Results	Pass

Signature



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
7334.133	37.3	16.6	172.0	1.0	0.0	0.0	H-Horn	PK	0.0	53.9	74.0	-20.1	Mid Channel, EUT horizontal
7335.870	36.9	16.6	98.0	1.0	0.0	0.0	V-Horn	PK	0.0	53.5	74.0	-20.5	Mid Channel, EUT vertical
7440.527	36.8	16.7	290.0	1.0	0.0	0.0	V-Horn	PK	0.0	53.5	74.0	-20.5	High Channel, EUT horizontal
7439.127	25.9	16.7	290.0	1.0	-13.6	0.0	V-Horn	AV	0.0	29.0	54.0	-25.0	High Channel, EUT horizontal
7334.807	25.5	16.6	98.0	1.0	-13.6	0.0	V-Horn	AV	0.0	28.5	54.0	-25.5	Mid Channel, EUT vertical
4959.927	37.6	9.5	245.0	2.1	0.0	0.0	V-Horn	PK	0.0	47.1	74.0	-26.9	High Channel, EUT on side
4960.130	37.5	9.5	317.0	1.6	0.0	0.0	H-Horn	PK	0.0	47.0	74.0	-27.0	High Channel, EUT horizontal
4890.057	37.6	9.4	220.0	1.0	0.0	0.0	V-Horn	PK	0.0	47.0	74.0	-27.0	Mid Channel, EUT vertical
4959.640	37.4	9.5	161.0	1.8	0.0	0.0	V-Horn	PK	0.0	46.9	74.0	-27.1	High Channel, EUT horizontal
4959.937	37.4	9.5	227.0	1.0	0.0	0.0	H-Horn	PK	0.0	46.9	74.0	-27.1	High Channel, EUT vertical
4889.373	37.3	9.4	234.0	1.0	0.0	0.0	H-Horn	PK	0.0	46.7	74.0	-27.3	Mid Channel, EUT horizontal
4960.053	36.9	9.5	202.0	2.0	0.0	0.0	V-Horn	PK	0.0	46.4	74.0	-27.6	High Channel, EUT vertical
7335.217	23.4	16.6	171.0	1.0	-13.6	0.0	H-Horn	AV	0.0	26.4	54.0	-27.6	Mid Channel, EUT horizontal
4810.110	37.0	9.4	222.0	1.0	0.0	0.0	V-Horn	PK	0.0	46.4	74.0	-27.6	Low Channel, EUT vertical
4809.857	36.9	9.4	290.0	1.0	0.0	0.0	H-Horn	PK	0.0	46.3	74.0	-27.7	Low Channel, EUT horizontal
4960.870	36.8	9.5	179.0	1.0	0.0	0.0	H-Horn	PK	0.0	46.3	74.0	-27.7	High Channel, EUT on side
4960.053	27.1	9.5	227.0	1.0	-13.6	0.0	H-Horn	AV	0.0	23.0	54.0	-31.0	High Channel, EUT vertical
4959.740	26.6	9.5	317.0	1.6	-13.6	0.0	H-Horn	AV	0.0	22.5	54.0	-31.5	High Channel, EUT horizontal
4960.150	26.6	9.5	161.0	1.8	-13.6	0.0	V-Horn	AV	0.0	22.5	54.0	-31.5	High Channel, EUT horizontal
4960.220	26.6	9.5	244.0	2.1	-13.6	0.0	V-Horn	AV	0.0	22.5	54.0	-31.5	High Channel, EUT on side

AC POWERLINE CONDUCTED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Transmitting ch 26 100% duty cycle
Transmitting ch 19 100% duty cycle
Transmitting ch 11 100% duty cycle

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

THKE0018 - 3

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	Coaxicom	66702 2910-20	RBR	8/3/2011	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HFX	2/9/2011	24 mo
EV07 Cables	N/A	Conducted Cables	EVG	6/17/2011	12 mo
LISN	Solar	9252-50-R-24-BNC	LIR	11/4/2011	12 mo
Spectrum Analyzer	Agilent	E4440	AFE	1/23/2012	12 mo

MEASUREMENT BANDWIDTHS

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.

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was transmitting at its only data rate available. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10-2009.

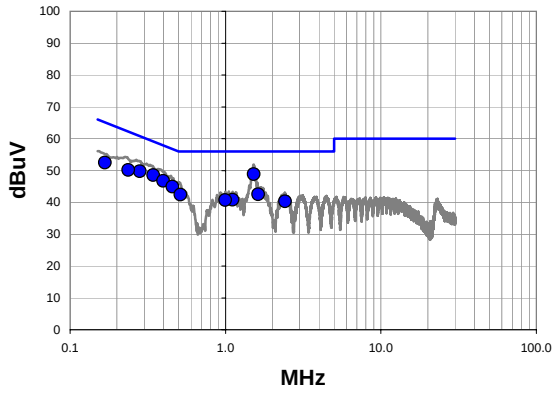
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	THKE0018	**Date:**	03/29/12		
Project:	None	**Temperature:**	21.5 °C		
Job Site:	EV07	**Humidity:**	37.5% RH		
Serial Number:	FCC CT-0045	**Barometric Pres.:**	1015 mbar	**Tested by:**	Ethan Schoonover
EUT:	modlet BN				
Configuration:	3				
Customer:	ThinkEco, Inc.				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting ch 11 100% duty cycle				
Deviations:	No deviations.				
Comments:	None				

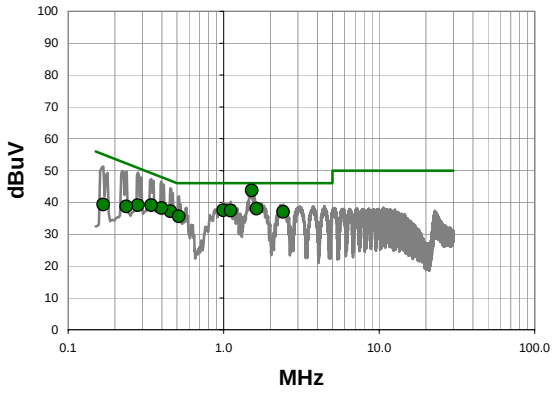
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	2	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.517	28.7	20.1	48.8	56.0	-7.2
0.343	28.4	20.1	48.5	59.1	-10.6
0.281	29.6	20.1	49.7	60.8	-11.1
0.398	26.6	20.1	46.7	57.9	-11.2
0.456	24.8	20.1	44.9	56.8	-11.9
0.237	30.1	20.1	50.2	62.2	-12.0
0.168	32.4	20.1	52.5	65.1	-12.6
1.626	22.4	20.1	42.5	56.0	-13.5
0.514	22.3	20.1	42.4	56.0	-13.6
1.112	20.7	20.1	40.8	56.0	-15.2
0.995	20.6	20.1	40.7	56.0	-15.3
2.417	20.2	20.1	40.3	56.0	-15.7

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.517	23.6	20.1	43.7	46.0	-2.3
1.626	17.9	20.1	38.0	46.0	-8.0
0.995	17.4	20.1	37.5	46.0	-8.5
1.112	17.3	20.1	37.4	46.0	-8.6
2.417	16.9	20.1	37.0	46.0	-9.0
0.456	17.1	20.1	37.2	46.8	-9.6
0.398	18.1	20.1	38.2	47.9	-9.7
0.343	19.0	20.1	39.1	49.1	-10.0
0.514	15.5	20.1	35.6	46.0	-10.4
0.281	19.0	20.1	39.1	50.8	-11.7
0.237	18.6	20.1	38.7	52.2	-13.5
0.168	19.2	20.1	39.3	55.1	-15.8

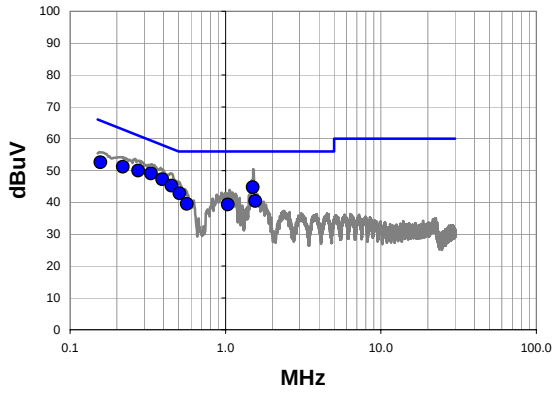
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	THKE0018	**Date:**	03/29/12		
Project:	None	**Temperature:**	21.5 °C		
Job Site:	EV07	**Humidity:**	37.5% RH		
Serial Number:	FCC CT-0045	**Barometric Pres.:**	1015 mbar	**Tested by:**	Ethan Schoonover
EUT:	modlet BN				
Configuration:	3				
Customer:	ThinkEco, Inc.				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting ch 11 100% duty cycle				
Deviations:	No deviations.				
Comments:	None				

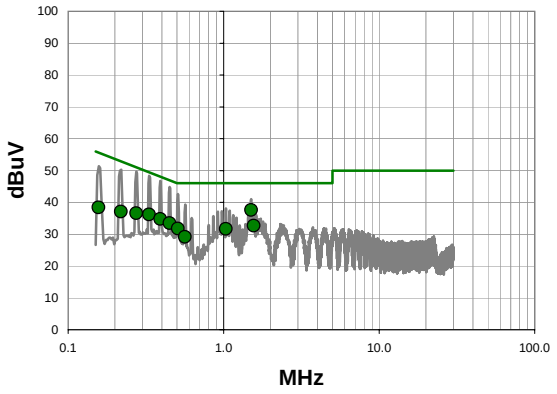
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	3	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.332	28.9	20.1	49.0	59.4	-10.4
0.391	27.1	20.1	47.2	58.0	-10.8
0.274	29.9	20.1	50.0	61.0	-11.0
1.502	24.6	20.1	44.7	56.0	-11.3
0.219	31.1	20.1	51.2	62.9	-11.7
0.449	25.1	20.1	45.2	56.9	-11.7
0.157	32.5	20.1	52.6	65.6	-13.0
0.507	22.7	20.1	42.8	56.0	-13.2
1.560	20.3	20.1	40.4	56.0	-15.6
0.565	19.4	20.1	39.5	56.0	-16.5
1.036	19.2	20.1	39.3	56.0	-16.7

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.502	17.5	20.1	37.6	46.0	-8.4
0.332	16.1	20.1	36.2	49.4	-13.2
0.391	14.7	20.1	34.8	48.0	-13.2
1.560	12.6	20.1	32.7	46.0	-13.3
0.449	13.4	20.1	33.5	46.9	-13.4
0.507	11.7	20.1	31.8	46.0	-14.2
1.036	11.6	20.1	31.7	46.0	-14.3
0.274	16.5	20.1	36.6	51.0	-14.4
0.219	17.0	20.1	37.1	52.9	-15.8
0.565	9.0	20.1	29.1	46.0	-16.9
0.157	18.3	20.1	38.4	55.6	-17.2

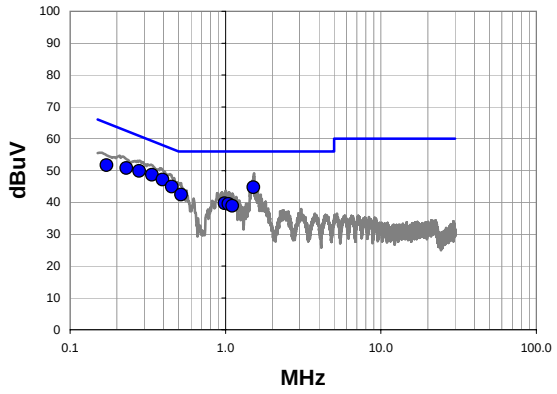
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	THKE0018	**Date:**	03/29/12		
Project:	None	**Temperature:**	21.5 °C		
Job Site:	EV07	**Humidity:**	37.5% RH		
Serial Number:	FCC CT-0045	**Barometric Pres.:**	1015 mbar	**Tested by:**	Ethan Schoonover
EUT:	modlet BN				
Configuration:	3				
Customer:	ThinkEco, Inc.				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting ch 19 100% duty cycle				
Deviations:	No deviations.				
Comments:	None				

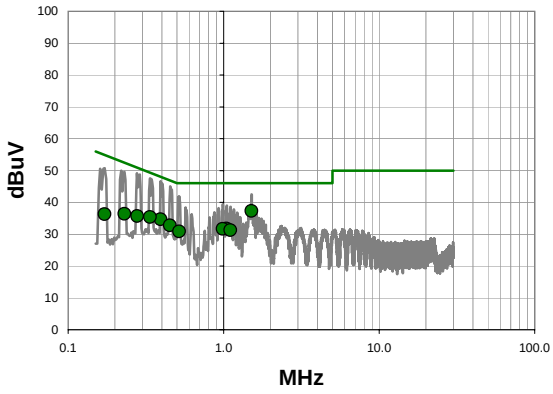
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	4	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.336	28.5	20.1	48.6	59.3	-10.7
0.394	27.0	20.1	47.1	58.0	-10.9
0.278	29.7	20.1	49.8	60.9	-11.1
1.513	24.6	20.1	44.7	56.0	-11.3
0.230	30.7	20.1	50.8	62.4	-11.6
0.452	24.8	20.1	44.9	56.8	-11.9
0.172	31.6	20.1	51.7	64.9	-13.2
0.518	22.3	20.1	42.4	56.0	-13.6
0.988	19.6	20.1	39.7	56.0	-16.3
1.046	19.4	20.1	39.5	56.0	-16.5
1.105	18.8	20.1	38.9	56.0	-17.1

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.513	17.2	20.1	37.3	46.0	-8.7
0.394	14.6	20.1	34.7	48.0	-13.3
0.336	15.3	20.1	35.4	49.3	-13.9
0.452	12.7	20.1	32.8	46.8	-14.0
1.046	11.7	20.1	31.8	46.0	-14.2
0.988	11.6	20.1	31.7	46.0	-14.3
1.105	11.2	20.1	31.3	46.0	-14.7
0.518	10.8	20.1	30.9	46.0	-15.1
0.278	15.6	20.1	35.7	50.9	-15.2
0.230	16.3	20.1	36.4	52.4	-16.0
0.172	16.2	20.1	36.3	54.9	-18.6

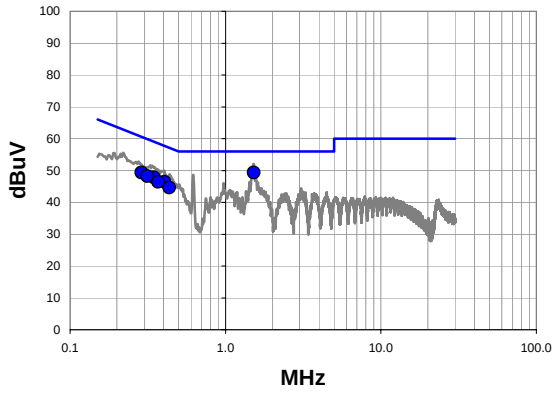
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	THKE0018	**Date:**	03/29/12		
Project:	None	**Temperature:**	21.5 °C		
Job Site:	EV07	**Humidity:**	37.5% RH		
Serial Number:	FCC CT-0045	**Barometric Pres.:**	1015 mbar	**Tested by:**	Ethan Schoonover
EUT:	modlet BN				
Configuration:	3				
Customer:	ThinkEco, Inc.				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting ch 19 100% duty cycle				
Deviations:	No deviations.				
Comments:	None				

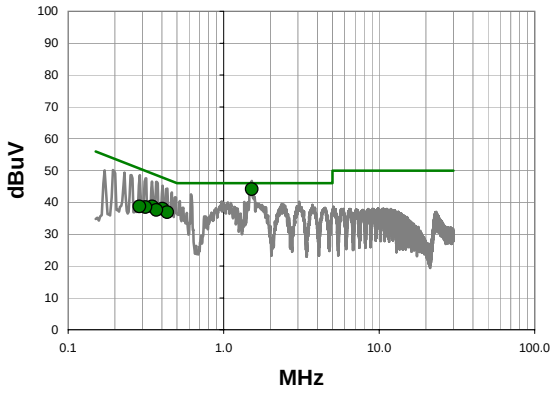
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	5	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.517	29.2	20.1	49.3	56.0	-6.7
0.347	27.7	20.1	47.8	59.0	-11.2
0.288	29.2	20.1	49.3	60.6	-11.3
0.405	26.3	20.1	46.4	57.8	-11.4
0.314	28.1	20.1	48.2	59.9	-11.7
0.369	26.3	20.1	46.4	58.5	-12.1
0.434	24.5	20.1	44.6	57.2	-12.6

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.517	24.0	20.1	44.1	46.0	-1.9
0.405	17.9	20.1	38.0	47.8	-9.8
0.434	16.8	20.1	36.9	47.2	-10.3
0.347	18.6	20.1	38.7	49.0	-10.3
0.369	17.5	20.1	37.6	48.5	-10.9
0.314	18.4	20.1	38.5	49.9	-11.4
0.288	18.6	20.1	38.7	50.6	-11.9

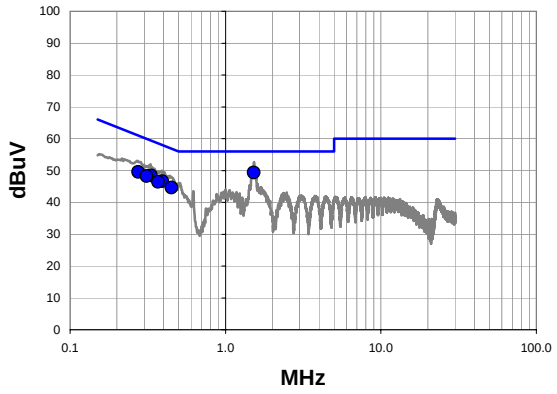
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	THKE0018	**Date:**	03/29/12		
Project:	None	**Temperature:**	21.5 °C		
Job Site:	EV07	**Humidity:**	37.5% RH		
Serial Number:	FCC CT-0045	**Barometric Pres.:**	1015 mbar	**Tested by:**	Ethan Schoonover
EUT:	modlet BN				
Configuration:	3				
Customer:	ThinkEco, Inc.				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting ch 26 100% duty cycle				
Deviations:	No deviations.				
Comments:	None				

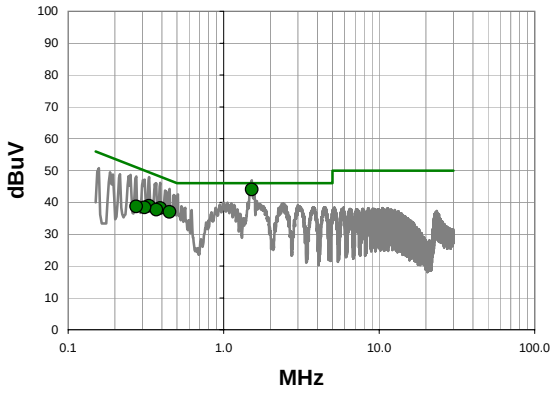
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	6	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.517	29.2	20.1	49.3	56.0	-6.7
0.332	28.3	20.1	48.4	59.4	-11.0
0.391	26.5	20.1	46.6	58.0	-11.4
0.274	29.4	20.1	49.5	61.0	-11.5
0.310	28.1	20.1	48.2	60.0	-11.8
0.369	26.3	20.1	46.4	58.5	-12.1
0.449	24.5	20.1	44.6	56.9	-12.3

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.517	23.9	20.1	44.0	46.0	-2.0
0.391	18.1	20.1	38.2	48.0	-9.8
0.449	16.9	20.1	37.0	46.9	-9.9
0.332	18.8	20.1	38.9	49.4	-10.5
0.369	17.6	20.1	37.7	48.5	-10.8
0.310	18.3	20.1	38.4	50.0	-11.6
0.274	18.6	20.1	38.7	51.0	-12.3

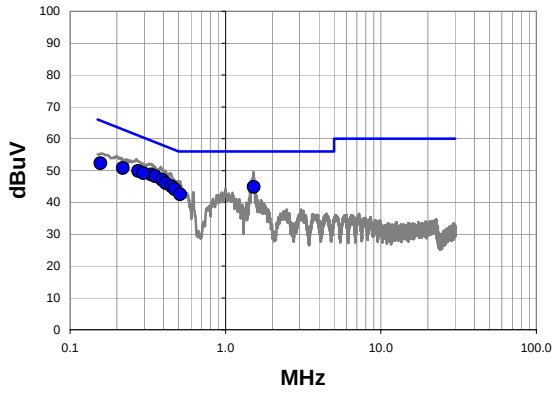
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	THKE0018	**Date:**	03/29/12		
Project:	None	**Temperature:**	21.5 °C		
Job Site:	EV07	**Humidity:**	37.5% RH		
Serial Number:	FCC CT-0045	**Barometric Pres.:**	1015 mbar	**Tested by:**	Ethan Schoonover
EUT:	modlet BN				
Configuration:	3				
Customer:	ThinkEco, Inc.				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting ch 26 100% duty cycle				
Deviations:	No deviations.				
Comments:	None				

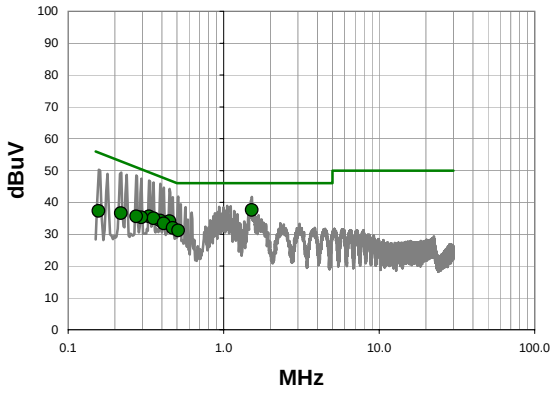
Test Specifications	**Test Method**
FCC 15.207:2012	ANSI C63.10:2009

Run #	7	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.332	28.6	20.1	48.7	59.4	-10.7
0.354	28.0	20.1	48.1	58.9	-10.8
0.391	26.9	20.1	47.0	58.0	-11.0
0.274	29.7	20.1	49.8	61.0	-11.2
1.520	24.7	20.1	44.8	56.0	-11.2
0.296	29.0	20.1	49.1	60.4	-11.3
0.412	25.9	20.1	46.0	57.6	-11.6
0.449	24.9	20.1	45.0	56.9	-11.9
0.219	30.7	20.1	50.8	62.9	-12.1
0.471	24.0	20.1	44.1	56.5	-12.4
0.157	32.2	20.1	52.3	65.6	-13.3
0.511	22.4	20.1	42.5	56.0	-13.5

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.520	17.5	20.1	37.6	46.0	-8.4
0.449	14.0	20.1	34.1	46.9	-12.8
0.391	14.2	20.1	34.3	48.0	-13.7
0.332	15.5	20.1	35.6	49.4	-13.8
0.354	14.9	20.1	35.0	48.9	-13.9
0.412	13.3	20.1	33.4	47.6	-14.2
0.471	11.9	20.1	32.0	46.5	-14.5
0.511	11.1	20.1	31.2	46.0	-14.8
0.296	15.2	20.1	35.3	50.4	-15.1
0.274	15.5	20.1	35.6	51.0	-15.4
0.219	16.5	20.1	36.6	52.9	-16.3
0.157	17.2	20.1	37.3	55.6	-18.3