

FreeWave Technologies, Inc.

FGRM FCC 15.247:2013 FCC 15.207:2013

Report #: FREW0013



Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington



CERTIFICATE OF TEST

Last Date of Test: October 15, 2013 FreeWave Technologies, Inc. Model: FGRM

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Duty Cycle	FCC 15.247:2013	ANSI C63.10:2009	Pass
Output Power	FCC 15.247:2013	ANSI C63.10:2009	Pass
Occupied Bandwidth	FCC 15.247:2013	ANSI C63.10:2009	Pass
Spurious Conducted Emissions	FCC 15.247:2013	ANSI C63.10:2009	Pass
Band Edge Compliance	FCC 15.247:2013	ANSI C63.10:2009	Pass
Channel Separation	FCC 15.247:2013	ANSI C63.10:2009	Pass
Number of Hopping Channels	FCC 15.247:2013	ANSI C63.10:2009	Pass
Dwell Time	FCC 15.247:2013	ANSI C63.10:2009	Pass
Band Edge Compliance-Hopping Mode	FCC 15.247:2013	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.247:2013	ANSI C63.10:2009	Pass
Powerline Conducted Emissions	FCC 15.207:2013	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200629-0 NVLAP Lab Code: 200630-0

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			

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.



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

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.

SCOPE

For details on the Scopes of our Accreditations, please visit: http://www.nwemc.com/accreditations/



MEASUREMENT UNCERTAINTY

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. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

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 (K=2) for each test is listed below. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-1 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy (Hz)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94



FACILITIES



Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Minnesota Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs NC01-05,SU02,SU07 19201 120 th Ave. NE Bothell, WA 98011 (425) 984-6600
		VCCI		
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-2	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1
NVLAP				
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0









PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	FreeWave Technologies, Inc.
Address:	5395 Pearl Parkway, Suite 100
City, State, Zip:	Boulder, CO 80301
Test Requested By:	Dean Busch
Model:	FGRM
First Date of Test:	October 10, 2013
Last Date of Test:	October 15, 2013
Receipt Date of Samples:	October 10, 2013
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test): 900 MHz FHSS radio module with 1 antenna(s). Max power is 1 W

Testing Objective:

To demonstrate compliance to FCC 15.247 requirements.



Configuration FREW0011-1

Software/Firmware Running during test	
Description	Version
Putty	1.0

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Industrial Radio	FreeWave Technologies, Inc.	FGRM	956-8447

Remote Equipment Outside of Test Setup Boundary				
Description	Manufacturer	Model/Part Number	Serial Number	
Remote Laptop	Dell	Inspiron 6000	J5896 A04	
AC/DC Adapter	Dell	DA90PS0-00	CN-0XD75748661-6BIMCKA	

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial to USB Adapter	No	1.3m	No	Remote Laptop	Serial to I/O Adapter
Serial to I/O Adapter	No	.5m	No	Serial to USB Adapter	EUT
DC Power Lead x2	No	.5m	No	DC Power supply	EUT
AC Power Cable	No	1.8m	No	AC mains	DC Power Supply
AC Power Cable	No	1m	No	AC/DC Power Adapter	AC mains
DC Power Cable	No	1.2m	Yes	Remote Laptop	AC/DC Power Adapter
PA = Cable is	PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.				



Configuration FREW0013-1

Software/Firmware Running during test		
Description	Version	
Putty	1.0	

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Industrial Radio	FreeWave Technologies, Inc.	FGRM	956-8447

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Remote Laptop	Dell	Inspiron 6000	J5896 A04	
AC/DC Adapter	Dell	DA90PS0-00	CN-0XD75748661-6BIMCKA	

Cables	Cables							
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2			
Serial to USB Adapter	No	1.3m	No	Remote Laptop	Serial to I/O Adapter			
Serial to I/O Adapter	No	.5m	No	Serial to USB Adapter	EUT			
DC Power Lead x2	No	.5m	No	DC Power supply	EUT			
AC Power Cable	No	1.8m	No	AC mains	DC Power Supply			
AC Power Cable	No	1m	No	AC/DC Power Adapter	AC mains			
DC Power Cable	No	1.2m	Yes	Remote Laptop	AC/DC Power Adapter			
PA = Cable is	PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.							



Configuration FREW0013-2

Software/Firmware Running during test	
Description	Version
Embedded	2.7 B

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Industrial Radio	FreeWave Technologies, Inc.	FGRM	956-8447

Peripherals in test setup boundary						
Description	Manufacturer	Model/Part Number	Serial Number			
DC Power Supply	HP	HP 6266B	2549A-05642			
6dB Gain Omni-Directional Antenna	Laird	FG9026	05091306			

Cables						
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2	
AC Power Cable	No	1.8m	No	AC mains	DC Power Supply	
Coaxial Cable	Yes	6m	No	Industrial Radio	Antenna	
DC Power Leads	No	1m	No	DC Power Supply	Serial I/O Adapter Power Connector	
Serial to I/O Adapter	No	0.5m	No	DC Power Leads Connector	Industrial Radio	
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.						



Configuration FREW0013-3

Software/Firmware Running during test	
Description	Version
Embedded	2.7 B

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Industrial Radio	FreeWave Technologies, Inc.	FGRM	956-8447

Peripherals in test setup boundary						
Description	Manufacturer	Model/Part Number	Serial Number			
DC Power Supply	HP	HP 6266B	2549A-05642			
6dB Gain Omni-Directional Antenna	Laird	FG9026	05091306			

Cables							
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2		
AC Power Cable	No	1.8m	No	AC mains	DC Power Supply		
Coaxial Cable	Yes	6m	No	Industrial Radio	Antenna		
DC Power Leads	No	1m	No	DC Power Supply	Serial I/O Adapter Power Connector		
Serial to I/O Adapter	No	0.5m	No	DC Power Leads Connector	Industrial Radio		
PA = Cable is p	ermanently	attached to the de	vice. Shiel	ding and/or presence of ferrite may	be unknown.		



MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
		Number of	Tested as	No EMI suppression	EUT remained at
1	10/10/2013	Hopping	delivered to	devices were added or	Northwest EMC
		Channels	Test Station.	modified during this test.	following the test.
			Tested as	No EMI suppression	EUT remained at
2	10/10/2013	Duty Cycle	delivered to	devices were added or	Northwest EMC
			Test Station.	modified during this test.	following the test.
		Occupied	Tested as	No EMI suppression	EUT remained at
3	10/10/2013	Bandwidth	delivered to	devices were added or	Northwest EMC
		Danawiatin	Test Station.	modified during this test.	following the test.
		Channel	Tested as	No EMI suppression	EUT remained at
4	10/10/2013	Separation	delivered to	devices were added or	Northwest EMC
		Ocparation	Test Station.	modified during this test.	following the test.
			Tested as	No EMI suppression	EUT remained at
5	10/10/2013	Dwell Time	delivered to	devices were added or	Northwest EMC
			Test Station.	modified during this test.	following the test.
		Band Edge	Tested as	No FMI suppression	FLIT remained at
6	10/10/2013	Compliance-	delivered to	devices were added or	Northwest EMC
0	10/10/2010	Hopping	Test Station	modified during this test	following the test
		Mode			
_		Band Edge	Tested as	No EMI suppression	EUT remained at
7	10/10/2013	Compliance	delivered to	devices were added or	Northwest EMC
		Compliance	Test Station.	modified during this test.	following the test.
		Spurious	Tested as	No EMI suppression	EUT remained at
8	10/10/2013	Conducted	delivered to	devices were added or	Northwest EMC
		Emissions	Test Station.	modified during this test.	following the test.
		Output	Tested as	No EMI suppression	EUT remained at
9	10/10/2013	Power	delivered to	devices were added or	Northwest EMC
		1 0 1 01	Test Station.	modified during this test.	following the test.
		Powerline	Tested as	No EMI suppression	EUT remained at
10	10/15/2013	Conducted	delivered to	devices were added or	Northwest EMC
		Emissions	Test Station.	modified during this test.	following the test.
		Spurious	Tested as	No EMI suppression	Scheduled testing
11	10/15/2013	Radiated	delivered to	devices were added or	was completed
		Emissions	Test Station.	modified during this test.	nae completed.

EMC

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
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
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	36
EV06 Direct Connect Cable	ESM Cable Corp.	ТТ	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

TEST DESCRIPTION

The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating was used during some of the other tests in this report to only measure during the burst duration.



EUT:	FGRM						Work Order:	FREW0011	
Serial Number:	956-8447						Date:	10/10/13	
Customer:	FreeWave Technologies,	Inc.					Temperature:	22.1°C	
Attendees:	None						Humidity:	40%	
Project: None						Barometric Pres.:	1015.9		
Tested by:	Brandon Hobbs		Power:	12 VDC			Job Site:	EV06	
TEST SPECIFICATIONS Test Method									
FCC 15.247:2013 ANSI C63.10:2009									
COMMENTS									
An added 10 dB 5w	vattenuator was used whil	le under test. All cable losse	s were accounted for prior	to testing. Output p	oower level at 10, F	ull Power.			
DEVIATIONS FROM	TEST STANDARD								
None									
				_					
Configuration #	1	Signature	Fire	Jar					
						Number of	Value		
				Pulse Width	Period	Pulses	(%)	Limit	Result
GFSK									
	115.2 kbps								
	Low Channel	, 902.2464 MHz		12.48 mS	16.529 mS	1	75.5	N/A	N/A
	Low Channel	, 902.2464 MHz		N/A	N/A	5	N/A	N/A	N/A
	Mid Channel,	916.0704 MHz		12.484 mS	16.529 mS	1	75.5	N/A	N/A
	Mid Channel,	916.0704 MHz		N/A	N/A	5	N/A	N/A	N/A
	High Channel	l, 927.8208 MHz		12.484 mS	16.529 mS	1	75.5	N/A	N/A
	High Channel	l, 927.8208 MHz		N/A	N/A	5	N/A	N/A	N/A
	153.6 kbps								
	Low Channel	, 902.2464 MHz		12.616 mS	16.525 mS	1	76.3	N/A	N/A
	Low Channel	, 902.2464 MHz		N/A	N/A	5	N/A	N/A	N/A
	Mid Channel,	916.0704 MHz		12.621 mS	16.529 mS	1	76.4	N/A	N/A
	Mid Channel,	916.0704 MHz		N/A	N/A	4	N/A	N/A	N/A
	High Channel	l, 927.8208 MHz		12.621 mS	16.529 mS	1	76.4	N/A	N/A
	High Channel	l, 927.8208 MHz		N/A	N/A	5	N/A	N/A	N/A





		GESK 115 2 kh	ns Low Chann	al 002 2464 MHz			
		01 5K, 115.2 Kb	Number of	Value			
	Pulse Width	Period	Pulses	(%)	Limit	Result	
	N/A	N/A	5	N/Á	N/A	N/A	
🔆 Agilent 08:3	4:12 Oct 9, 3	2013			RT		
Northwest EMC, I	nc						
Ref 31.25 dBm		#Atten 10 d	B				
#Peak							
Log							
5							
dB/							
Offst							
31.2							
dB							
#LgAv							
W1 S2							
S3 VS							
£ (f):							
FTun							
Center 902 246 1	MHz					Span	0 Нт
Res RW 1 MW-			#VRU 30_44	7	Sween 74	65 ms (5000	i ntel
Nes DM I MHZ				4	74.	03-1113 (3000	, hra)





					GESK 115 2 4	ne M	id Channe	016 0704	MHZ						_
					0100, 110.2 0	Nu	mber of	Valu	Je						
			Pulse	Width	Period	F	Pulses	(%))		Limit		Res	sult	
			N	I/A	N/A		5	N/A	Á		N/A		N/	A	
*	Ą	gilent 09:1	10:22	Oct 9,	2013					R	₹ T				
Nor Ref	thwe 31.	st EMC, 25 dBm	Inc		#Atten 10 c	B									
#Pe	ak [_		
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5	ŀ									\rightarrow					
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Pulse Width Period Pulses (%) Limit Result	
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Agient 09:18:34 Uct 9, 2013	
Northwest EMC, Inc	
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*Peak / /	
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31.2	
#LgHV	
N1 52	
sa vs	
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FTun	
Center 927.821 MHz Span	0 Hz
Res BW 1 MHz #VBW 30 kHz Sweep 74.65 ms (5000	pts)_





					-1.000.0404.0411-			
			GFSK, 153.0 KD	Number of				
		Pulse Width	Period	Pulses	(%)	Limit	Popult	
		N/A	N/A	5	N/A	N/A	N/A	
Nic A.	nilont 00.2	0.11 Oct 9	2012			РТ		
Sik.	gilent 03.5	0.44 ULL 3,	2015			N I		
Northwe	est EMC, I	nc						
Ref 31.	.25 dBm		#Atten 10 d	В				
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	G	CK 1526 kb	nc Mid Channe				_
	0	SIX, 155.0 KD	Number of	Value			
	Pulse Width	Period	Pulses	(%)	Limit	Result	
	N/A	N/A	4	N/Á	N/A	N/A	
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Agriefit 03.53	9.J0 OCC 3, 20.	15			K I		
Northwest EML, In	10		_				
Ref 31.25 dBm	#F	itten 10 d	B				
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5							
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Offst							
31.2							
aB							
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W1 S2							
S3 VS							
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FTun							
Center 916.070 M	1Hz					Span 0	1Z
Res BW 1 MHz		1	≢VBW 30 kH:	Z	_Sweep 74.65	5 ms (5000 pt	6)_



		GFSK, 153.6 kb	ps, High Channel	, 927.8208 MF	lz				
			Number of	Value					
	Pulse Width	Period	Pulses	(%)	Limit	Result			
	12.621 mS	16.529 mS	1	76.4	N/A	N/A			
🔆 🔆 Agilent 09:	:44:52 Oct 9,	2013			RT				
Northwest EMC,	Inc					Mkr3 17.54 m			
Ref 31.25 dBm		#Atten 10 c	B		23.86 dBm				
#Peak									
Log									
5 -									
dB/									
Uffst									
31.Z									
#L @Ou									
#L9HV									
W1 S2									
Center 927.821	MHz	1	II			Span 0 Hz			
Res BW 1 MHz			#VBW 30 kHz		Sween 25	.6 ms (6000 nts)			
Marker Tra	се Туре	X	Axis	Ĥ	mplitude				
1 (1	.) Time	1	.007 ms	22	2.46 dBm				
	.) Time	1	3.63 ms 7 54 ma	16	3.78 dBm 2.96 dBm				
5 (1		T	r.J4 MS	۷.	J.00 UDM				

				GESK 153.6 k	hns Hi	gh Channe	927 8208 M	1H7					
					Nu	mber of	Value						
		Pu	lse Width	Period	Í	Pulses	(%)		Limit		Res	ult	
			N/A	N/A		5	N/Á		N/A		N/	A	
莱	Agilent	t 09:45:06	6 Oct 9,	, 2013					RT				
Nor	thwest E	MC, Inc											
Ref	31 . 25 d	:lBm		#Atten 10	dB								
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Log	;												
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Res	5 DW I M	HZ			_#VDŀ	। SØ KHZ			Sweep ∕4	.05 N	is (5	ooo pts	2_

EMC

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
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
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	36
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

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 in a no hop mode at the data rate(s) listed in the datasheet.

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



EUT	FGRM	Work Order: F	REW0011				
Serial Number	: 956-8447	Date: 1	0/10/13				
Customer	FreeWave Technologies, Inc.	Temperature: 2	2.1°C				
Attendees	None	Humidity: 4	0%				
Project	None	Barometric Pres.: 1015.9					
Tested by	Brandon Hobbs Power: 12 VDC	Job Site: E	V06				
TEST SPECIFICAT	10NS Test Method						
FCC 15.247:2013	ANSI C63.10:2009						
COMMENTS							
An added 10 dB 5	v attenuator was used while under test. All cable losses were accounted for prior to testing. Output power level at 10,	Full Power.					
DEVIATIONS FRO	M TEST STANDARD						
None							
Configuration #							
	Signature						
		Value	Limit	Result			
GFSK							
	115.2 kbps						
	Low Channel, 902.2464 MHz	915.588 mW	< 1 W	Pass			
	Mid Channel, 916.0704 MHz	955.873 mW	< 1 W	Pass			
	High Channel, 927.8208 MHz	965.162 mW	< 1 W	Pass			
	153.6 kbps						
	Low Channel, 902.2464 MHz	901.986 mW	< 1 W	Pass			
	Mid Channel, 916.0704 MHz	948.2 mW	< 1 W	Pass			
	High Channel, 927.8208 MHz	962.498 mW	< 1 W	Pass			



Center 916.070 4 MHz

#Res BW 1 MHz

Span 1 MHz

Sweep 1.066 ms (1000 pts)



#VBW 3 MHz



#LgAv

M1 S2 S3 FS

£(f): FTun Swp



l Center	902.246	4 MHz						Spa	an 1 MHz
#Res B	W 1 MHz_			#VBW 3 M	Hz	S	weep 1.00	66 ms (10	000 pts)



#LgAv

M1 S2 S3 FS

£(f): FTun Swp

Center 927.820 8 MHz #Res BW 390 kHz

			GFS	K, 153.6 kb	ps, Mid Char	nel, 916.070	04 MHz						
						Va	lue	Limit	Result				
						948.2	2 mW	< 1 W	Pass				
	🗧 Agiler	it 09:42:10	Oct 9, 2013	3				RT					
No	rthwest	EMC, Inc				Mkr1 916.117 0 MHz							
Re #D	ef 1.2 W		#At	ten 10 d	B				948.2	20 mW			
Lir	1						1						
							<u>ک</u>						
04	(a)								and a second				
31	.2									and the second			
dE	}												
#L	gAv 🔔												
641	0.0												
S3	1 32 3 FS												
£	(f):												
F Sv	n –												
										<u></u>			
L.e #D	enter 910 Dec BW 41	5.0/0 4 MHZ Ra L⊔⊸			URL 1 3 M	1⊔⊸	C	waan 1 0	Տpan 45 ԲԲ տո (1000	0 kHz			
	.C3 DM 4.	JU NHZ		<u>"</u>	VDM 1.5 P	102		weep 1.0	00 1115 (1000	pt3/			
			GFS	K, 153.6 kbr	os, High Cha	nnel, 927.82	08 MHz						
								Limit	Pocult				
						962.49	98 mW	< 1 W	Pass				
	🗧 Agiler	it 09:46:56	Oct 9, 2013	3				RT					
No	rthwest	EMC, Inc						Mkr	1 927.864	6 MHz			
Re #B	ef 1.2 W		#At	ten 10 d	B				962.5	50 mW			
±r Lir							1						
				-			<u>م</u>		~				
04	fet												
31	2												
dE	3 –												

#VBW 1.2 MHz

Span 400 kHz Sweep 1.066 ms (1000 pts)

EMC

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
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
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	36
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

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 the data rate(s) listed in the datasheet in a no-hop mode.



Occupied Bandwidth

	E CODII					ED ELVIGO / /				
EUT	FGRM				Work Order:	FREW0011				
Serial Number	r: 956-8447	-			Date:	10/10/13				
Customer	r: FreeWave Technologies,	, Inc.			Temperature:	Temperature: 22.1°C				
Attendees	s: None				Humidity:	40%				
Project	t: None			-	Barometric Pres.:	1015.9				
Tested by	: Brandon Hobbs		Power:	: 12 VDC	Job Site:	EV06				
FEST SPECIFICA	TIONS			Test Method						
FCC 15.247:2013				ANSI C63.10:2009						
COMMENTS				-						
An added 10 dB 5	w attenuator was used whi	ile under test. All cable losse	es were accounted for prior	to testing. Output power level at 10	. Full Power.					
			•	3 • • • • • • • •						
DEVIATIONS FRO	M TEST STANDARD									
Nono										
None										
Configuration #	1			1 1						
Configuration #	1	Signature	Any	Jar						
Configuration #	1	Signature	Ang	Gal	Value	Limit	Result			
Configuration #	1	Signature	Any	Jar	Value	Limit	Result			
Configuration # GFSK	1 115.2 kbps	Signature	Any	Jal	Value	Limit	Result			
Configuration #	1 115.2 kbps Low Channel	Signature	Any	Jul	Value 231.642 kHz	Limit < 500 kHz	Result Pass			
Configuration #	1 115.2 kbps Low Channel Mid Channel	Signature I, 902.2464 MHz , 916.0704 MHz	Any	J-1	Value 231.642 kHz 194.802 kHz	Limit < 500 kHz < 500 kHz	Result Pass Pass			
Configuration #	1 115.2 kbps Low Channel Mid Channel Hidh Channel	Signature I, 902.2464 MHz , 916.0704 MHz I, 927.8208 MHz	Juy	Jar	Value 231.642 kHz 194.802 kHz 192.298 kHz	Limit < 500 kHz < 500 kHz < 500 kHz	Result Pass Pass Pass			
GFSK	1 115.2 kbps Low Channel High Channel High Channel	Signature I, 902.2464 MHz , 916.0704 MHz J, 927.8208 MHz	Any	Jul	Value 231.642 kHz 194.802 kHz 192.298 kHz	Limit < 500 kHz < 500 kHz < 500 kHz	Result Pass Pass Pass Pass			
GFSK	1 115.2 kbps Low Channel Mid Channel High Channe High Channel Low Channel Low Channel	Signature 1, 902.2464 MHz , 916.0704 MHz 1, 927.8208 MHz 1, 902.2464 MHz	- Jay	J.	Value 231.642 kHz 194.802 kHz 192.298 kHz 397.421 kHz	Limit < 500 kHz < 500 kHz < 500 kHz < 500 kHz	Result Pass Pass Pass Pass Pass			
GFSK	1 115.2 kbps Low Channel High Channel High Channel 153.6 kbps Low Channel Mid Channel	Signature I, 902.2464 MHz , 916.0704 MHz J, 927.8208 MHz I, 902.2464 MHz 916 0704 MHz	Juy	Jar	Value 231.642 kHz 194.802 kHz 192.298 kHz 397.421 kHz 202 412 kHz	Limit < 500 kHz < 500 kHz < 500 kHz < 500 kHz	Result Pass Pass Pass Pass			
Configuration #	1 115.2 kbps Low Channel Mid Channel High Channe Sight Channel Mid Channel Mid Channel Hidh Channel Hidh Channel	Signature 1, 902.2464 MHz , 916.0704 MHz 1, 927.8208 MHz 1, 902.2464 MHz , 916.0704 MHz , 927.8208 MHz	Juy	J.	Value 231.642 kHz 194.802 kHz 192.298 kHz 397.421 kHz 202.412 kHz 188.149 kHz	Limit < 500 kHz < 500 kHz < 500 kHz < 500 kHz < 500 kHz	Result Pass Pass Pass Pass Pass Pass			

XMit 2013.08.15 PsaTx 2013.07.11



















Transmit Freq Error 851.004 Hz Occupied Bandwidth 188.149 kHz

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
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
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	36
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

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 the data rate(s) listed in the datasheet in a no-hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.



Spurious Conducted Emissions

EUT	FGRM			Work Order:	FREW0011	
Serial Number	r: 956-8447			Date:	10/10/13	
Customer	: FreeWave Technologies,	, Inc.		Temperature:	22.1°C	
Attendees	None			Humidity:	40%	
Project	t: None			Barometric Pres.:	1015.9	
Tested by	: Brandon Hobbs		Power: 12 VDC	Job Site:	EV06	
TEST SPECIFICAT	TIONS		Test Method			
FCC 15.247:2013			ANSI C63.10:2009			
COMMENTS						
An added 10 dB 5	w attenuator was used whi	ile under test. All cable loss	ses were accounted for prior to testing. Output power level at 10	, Full Power.		
DEVIATIONS EPO						
News	ILST STANDARD					
None		1				
Configuration #	1	Signature	2. Jal			
			Frequency			
			Range	Value	Limit	Result
GFSK						
0.01	115.2 kbps					
	Low Channel	I. 902.2464 MHz	30 MHz - 12.5 GHz	-58.02 dBc	≤ -20 dBc	Pass
	Low Channel	I. 902.2464 MHz	12.5 GHz - 25 GHz	-73.86 dBc	≤ -20 dBc	Pass
	Mid Channel.	. 916.0704 MHz	30 MHz - 12.5 GHz	-54.26 dBc	≤ -20 dBc	Pass
	Mid Channel	916.0704 MHz	12.5 GHz - 25 GHz	-73.7 dBc	≤ -20 dBc	Pass
	High Channe	l. 927.8208 MHz	30 MHz - 12.5 GHz	-56.34 dBc	≤ -20 dBc	Pass
	High Channe	el. 927.8208 MHz	12.5 GHz - 25 GHz	-74.25 dBc	≤ -20 dBc	Pass
	153.6 kbps	·				
	Low Channel	I, 902.2464 MHz	30 MHz - 12.5 GHz	-58.27 dBc	≤ -20 dBc	Pass
	Low Channel	I, 902.2464 MHz	12.5 GHz - 25 GHz	-73.21 dBc	≤ -20 dBc	Pass
	Mid Channel,	, 916.0704 MHz	30 MHz - 12.5 GHz	-54.65 dBc	≤ -20 dBc	Pass
	Mid Channel,	, 916.0704 MHz	12.5 GHz - 25 GHz	-74.21 dBc	≤ -20 dBc	Pass
	High Channe	el, 927.8208 MHz	30 MHz - 12.5 GHz	-56.47 dBc	≤ -20 dBc	Pass
	High Channe	el, 927.8208 MHz	12.5 GHz - 25 GHz	-73.02 dBc	≤ -20 dBc	Pass





			GFS	SK, 115.2 kb	ps, Low Cha	nnel, 902.24	464 MHz			
		Freque	ency			v	ماليم	Limit	Po	eult
		12.5 GHz -	- 25 GHz			-73.	86 dBc	≤ -20 dBc	Pa	ass
莱	Agilent 08	3:47:49 0)ct 9, 2013	3				RΤ		
Nor	thwest EMC,	, Inc		-				М	kr1 13.	437 0 GHz
Ref	10 dBm		#At	ten 10 d:	В				-4	13.65 dBm
#Pe	ak									
LU9 10										
đ₿∕	/									
Off	st									
31. dB	2									
GD										
#Lg										
V1	S2 S2		a de la companya de l	and the state to m	And the Head of the Local of	and the state	a man an tail a	ha bat a such the such	an digada anali	
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f. (f	y.									
FTu	ín									
Swp										
S+0	r+ 12 500 0							<	+on 25 (
ara #Re	s BW 100 k	Hz		#	VBW 300	kHz		Sween 1.	195 s (8	8192 nts)





			GFS	K, 115.2 kb	ps, Mid Char	nnel, 916.07	04 MHz				
		Frequer	ncy					Limit	Por		
	12	2.5 GHz - 2	25 GHz			-73.	7 dBc	≤ -20 dBc	Pa	ISS	
Nie .	ailant 00.17	7.22 0.	+ Q 2013	>				DΤ			
Northur	ynent 63.17 Set EMC - Ir	.22 UL	ι 3, 201.)				м	/r1 120	352 7 CU-	
Dof 10	dRm		#O+	ton 10 d	R			PI	NI ID.0 _/	2 88 ABm	
#Peak			#rit						-4	3.00 dDm	
Log											
10											
dB/											
Offst											
31.2 dB											
dD											
#LgAv	1_										
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c /0.											
ETun											
Swn											
0110											
Start 1	2.500 0 GI							S	ton 25.0	100 0 GHzî	
#Res B	W 100 kHz			#	VBW 300	kHz		Sweep 1.	195 s (8	3192 pts)	





Frequency Value Limit Result 12.5 GHz -74.25 dBc 5-20 dBc Pass		GFSK, 115.2 kbps, Hig	h Channel, 927.8208 MHz		
Kange value Limit Result 12.5 GHz -74.25 dBc 5-20 dBc Pass	Freq	uency	Malua	Linde D	
** Agilent 09:29:21 Oct 9, 2013 R T Northwest EMC, Inc Mkr1 13:658 3 GHz Ref 10 dBm *Atten 10 dB ** Peak	12.5 GH	nge 7 - 25 GHz	-74.25 dBc	Limit R	esult
Agilent 09:29:21 Oct 9, 2013 R I Northwest EMC, Inc Mkr1 13.658 3 GHz Ref 10 dBm #Atten 10 dB *Peak			-74.25 dDC		833
Northwest EMC, Inc Mkr1 13.658 3 GHz Ref 10 dBm #Atten 10 dB -44.40 dBm #Peak -44.40 dBm Log -44.40 dBm 0 -44.40 dBm #Peak -44.40 dBm 10 -44.40 dBm 4B/ -44.40 dBm 0 -44.40 dBm 4B/ -44.40 dBm 0 -44.40 dBm 4B/ -44.40 dBm 0 -44.40 dBm +LgRv -44.40 dBm +LgRv -44.40 dBm +LgRv -44.40 dBm *LgRv -44.40 dBm *LgRv <td>Agilent 09:29:21</td> <td>Oct 9,2013</td> <td></td> <td>R I</td> <td></td>	Agilent 09:29:21	Oct 9,2013		R I	
Ref 10 dBm #Atten 10 dB -44.40 dBm #Peak Image: Image	Northwest EMC, Inc			Mkr1 13	8.658 3 GHz
<pre>#Peak Log 10 dB/ Offst 31.2 dB #LgAv V1 S2 S3 FC £(f): FTun Swp</pre>	Ret 10 dBm	#Atten 10 dB			44.40 dBm
10 dB/ 0ffst 31.2 dB *LgAv	#Peak				
Image: Constraint of the second se	10				
OFfst 31.2 dB Image: state of the sta					
31.2 dB #LgAv 1 #LgAv 1 \$\$35 FC 1 \$\$2 st. down which is the interval of a structure of the interval of a structure	Offst				
dB #LgAv V1 S2 S3 FC £(f): FTun Swp	31.2				
<pre>#LgAv #LgAv #LgAv % *LgAv % *LgAv</pre>	dB				
<pre>#LgAv #LgAv #</pre>					
<pre>#LgAv</pre>					
#LgAv					
V1 S2 S3 FC FTun Swp	#LgAv1				
V1 S2 S3 FC £(f): FTun Swp		deficitions the second of the second second	I I SALE STRATE	ويربيه المراجع والمعرفة المتحر والمتحر	ويعد أيضي واللادم ورجاده
S3 FC " £(f): FTun Swp		the late of the second descent on the second s		and a supervision of the second s	تلقده الكم والأدريب وإير
£(f): Image: Constraint of the second seco	53 FL "				
FTun Swp	P (E):				
Swp	ETun				
	Swn				
Start 12 500 0 GHz	Start 12 500 0 GHz			Stop 25	ANA A CH-2
#Res BW 100 kHz #VBW 300 kHz Sween 1 195 s (8192 nts)	#Res BW 100 kHz	#\/RW	300 kHz	Sween 1 195 su	(81.92 nts)





	GFSK, 153.6 kb	ps, Low Channe	l, 902.2464 MHz			
Fre	equency		Value	Limit	Popult	
12.5 G	Hz - 25 GHz		-73.21 dBc	≤ -20 dBc	Pass	
Anilant (00.22.21	0et 9 2012			DT		
Northwast EMC Inc.	000 3, 2013			N I MLs	.1 12627 8 CU→	
Ref 10 dBm	#0++on 10 d	IR		PIKI	_/3/3 dBm	
#Peak					-43.43 GDIII	
Log						
10						
dB/						
Offst						
31.2 dB						
#LgAv						
V1 S2 Leaded				idea an dille nates data National di States de la companya	بيد أراد والمالية وماد ويتماطي ويواد الأراد. معالم معالم ومناسب ويعام ويعام ويعام والماد	
S3 FC						
E (†):						
Swn						
onp						
Start 12 500 0 GHz				St	on 25 000 0 GHz	
#Res BW 100 kHz	#	ŧVBW 300 kH:	Z	Sween 1.1	95 s (8192 pts)	




				GFS	K, 153.6 kbj	ps, Mid Char	nnel, 916.07	04 MHz			
			Frequer Rang	ncy e			v	alue	Limit	Re	sult
			12.5 GHz - 2	- 25 GHz			-74.	21 dBc	≤ -20 dBc	Pa	ass
*	Ag	ilent 09:4	43 : 14 Oc	t 9,2013	3				RT		
Nort	hwe	st EMC,	Inc						М	kr1 24.	366 7 GHz
Ref	10	dBm		#At	ten 10 dl	B			_		4.12 dBm
#Pea	ak										
10											
dB/											
Offs	t										
31.2 dB											
#LgF											
V1	\$2 <mark>#</mark>	da da da Antonio <mark>a da secola</mark>			alati di kanalar	had a start of the	J. e. a. M. Balandar	and a state		i dhe di dhe t	
\$3	FC					and the state of the second					
e (1)	. -										
ET ur	'. n										
Swp	. F										
<u>_</u>											
Star #Dec	t 12 . рн	2.500 0 1 1 0 0 1 1	GHZ			บอน วดด	LU-		Swaap 1	top 25.0	000 0 GHz
#Res	5 DM	1 I U U KH	2		#	VDW 300	КПИ		Sweep I.	192 S (oraz pts)





	GFSK, 153.6 kb	ps, High Channel, 927	.8208 MHz		
Fr	equency				
12.5.0	Hz - 25 GHz	-7	Value Limit	Result	
				Fd55	
💥 Agilent 09:50:21	L Oct 9,2013		K I		
Northwest EMC, Inc			N N	lkr1 17.830 5 GHz	
Ref 10 dBm	#Atten 10 d	B		-43.23 dBm	
#Peak					
L09					
067					
31.2					
dB					
#LgAv		1			
مالك هام البريديد			Il	and the first state of the could be block	
V1 S2 Martin Martin				and a second	
S3 FC					
Sup					
Out of the second se					
C					
Start 12.500 0 GHZ			S	105 - (0100 - 6HZ	
#Res BW 100 KHZ	#	NDW SOU KHZ	SWeep 1	.195 S (6192 pts)_	

EMC

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
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
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	36
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

TEST DESCRIPTION

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 the data rate(s) listed in the datasheet in a no hop mode. The channels closest to the band edges were selected. The measurements were taken per ANSI C63.10.2009 section 7.7.9.

Span = wide enough to capture the peak level of the emission operating on the channel closest to theband edge, as well as any modulation products which fall outside of the authorized band of operation

RBW ≥ 1 % of spectrum analyzer display span VBW ≥ RBW Sweep = auto Detector function = peak

Trace = max hold

The spectrum was scanned below the lower band edge and above the higher band edge.



EUT	T: FGRM				Work Order:	FREW0011	
Serial Number	r: 956-8447				Date:	10/10/13	
Custome	r: FreeWave Technologi	es, Inc.			Temperature:	22.1°C	
Attendees	s: None				Humidity:	40%	
Projec	t: None				Barometric Pres.:	1015.9	
Tested by	y: Brandon Hobbs		Power	12 VDC	Job Site:	EV06	
TEST SPECIFICA	TIONS			Test Method			
FCC 15.247:2013				ANSI C63.10:2009			
COMMENTS							
An added 10 dB 5	w attenuator was used	while under test. All cable losses	s were accounted for prior	to testing Output power level at 10 E	ull Power		
	was used	while under test. All cubic losses	s were accounted for prior	to testing. Output power lever at 10,1			
DEVIATIONS FRU	JMI IESI STANDARD						
None		-					
				1.			
Configuration #	1		1-1	1 and			
		Signature	7 6				
					Value	Limit	Result
GFSK							
	115.2 kbps						
	Low Char	nel, 902.2464 MHz			-41.87 dBc	≤ -20 dBc	Pass
	High Channel, 927,8208 MHz				-25.04 dBc	≤ -20 dBc	Pass
	153.6 kbps						
	Low Char	nel 902 2464 MHz			-52.86 dBc	< -20 dBc	Pass
	High Cha	nnel 927 8208 MHz			-27.68 dBc	< -20 dBc	Pass
	riigii Olia	1101, 021.0200 10112			-27.00 uDc	= 20 ubc	1 433













EMC

Channel Separation

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
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
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	36
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

TEST DESCRIPTION

The channel carrier frequencies in the 902-928MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.



EUT	FGRM	Work Order:	FREW0011						
Serial Number:	956-8447	Date:	10/10/13						
Customer	FreeWave Technologies, Inc.	Temperature:	22.1°C						
Attendees	None	Humidity:	40%						
Project:	None	Barometric Pres.:	1015.9						
Tested by:	Brandon Hobbs Power: 12 VDC	Job Site:	EV06						
TEST SPECIFICATIONS Test Method									
FCC 15.247:2013 ANSI C63.10:2009									
COMMENTS									
An added 10 dB 5v	v attenuator was used while under test. All cable losses were accounted for prior to testing. Output power level a	t 10, Full Power.							
DEVIATIONS FROM	I TEST STANDARD								
None									
Configuration #	1 2 1 1								
comgutation #	Signature								
		Value	Limit	Pocult					
CESK		Value	Linik	Result					
GF3K	115.2 kbps								
	Mid Chappel 914 6880 MHz 50 Hopping Chappels	220 kHz	> 188 kHz	Page					
	Mid Channel 914 6880 MHz 30 Hopping Channels	223 KHz	> 188 kHz	Pass					
	Mid Channel, 914,6880 MHz, 112 Honping Channels	227 KHz	> 188 kHz	Pase					
	152 6 kbpe	223 KHZ	= 100 KHZ	1 455					
	Mid Chappel 914 6880 MHz 50 Hopping Chappels	227 kHz	> 188 kHz	Pass					
	Mid Channel, 914,6900 MHz, 90 Happing Channels	227 KHZ	> 100 KHZ	i daa					
	wild charmer, 914.0000 winz ou hupping charmers	231 KHZ	⊆ 100 KHZ	FdSS					
	Mid Channel 014 6990 MHz, 112 Hanning Channels	242 14	> 100 LU-	Doco					



Center 914.688 0 MHz

#Res BW 200 kHz

Span 3 MHz

Sweep 1.2 ms (3000 pts)



₩VBW 10 kHz









EMC

Number of Hopping Channels

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
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
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	36
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

TEST DESCRIPTION

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. The hopping function of the EUT was enabled.





FUT	EGRM				Work Order	FRFW0013	
Serial Number:	956-8447				Date:	10/10/13	
Customer:	FreeWaye Technologies	s. Inc.			Temperature:	22.1°C	
Attendees:	None	,			Humidity:	40%	
Project:	None				Barometric Pres.:	1015.9	
Tested by:	Brandon Hobbs		Power:	12 VDC	Job Site:	EV06	
TEST SPECIFICATI	IONS			Test Method		·	
FCC 15.247:2013				ANSI C63.10:2009			
COMMENTS							
An added 10 dB 5w	v attenuator was used wh	nile under test. All cable losses were ac	counted for prior t	o testing. Output power level at 10, F	ull Power.		
DEVIATIONS FROM	M TEST STANDARD						
None							
Configuration #	1		Zar	Jar			
		Signature	6				
					Value	Limit	Result
GFSK							
	115.2 kbps						
	Mid Channe	l, 914.6880 MHz 50 Hopping Channels					
		902.000 MHz - 913.780 MHz			N/A	≥ 50	N/A
		902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz			N/A 50	≥ 50 ≥ 50	N/A Pass
	Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz II, 914.6880 MHz 80 Hopping Channels			N/A 50	≥ 50 ≥ 50	N/A Pass
	Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz II, 914.6880 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz			N/A 50 N/A	≥ 50 ≥ 50 ≥ 50	N/A Pass N/A
	Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 4, 914.6880 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz			N/A 50 N/A 80	≥ 50 ≥ 50 ≥ 50 ≥ 50	N/A Pass N/A Pass
	Mid Channe Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 1, 914.6880 MHz 112 Hopping Channels			N/A 50 N/A 80	≥ 50 ≥ 50 ≥ 50 ≥ 50	N/A Pass N/A Pass
	Mid Channe Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.6880 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.6880 MHz 112 Hopping Channels 902.000 MHz - 913.780 MHz			N/A 50 N/A 80 N/A	≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50	N/A Pass N/A Pass N/A
	Mid Channe Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 91, 914.6880 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.6880 MHz - 928.000 MHz 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz			N/A 50 N/A 80 N/A 112	≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50	N/A Pass N/A Pass N/A Pass
	Mid Channe Mid Channe 153.6 kbps	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.680 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.6880 MHz 112 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz	_		N/A 50 N/A 80 N/A 112	≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50	N/A Pass N/A Pass N/A Pass
	Mid Channe Mid Channe 153.6 kbps Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.6880 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz 12 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.6880 MHz 50 Hopping Channels			N/A 50 N/A 80 N/A 112	≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50	N/A Pass N/A Pass N/A Pass
	Mid Channe Mid Channe 153.6 kbps Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.6880 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.6880 MHz 112 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 1, 914.6880 MHz 50 Hopping Channels 902.000 MHz - 913.780 MHz			N/A 50 N/A 80 N/A 112 N/A	≥ 50	N/A Pass N/A Pass N/A Pass
	Mid Channe Mid Channe 153.6 kbps Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 914.680 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 913.780 MHz	_		N/A 50 N/A 80 N/A 112 N/A 50	≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50 ≥ 50	N/A Pass N/A Pass N/A Pass N/A Pass
	Mid Channe Mid Channe 153.6 kbps Mid Channe Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz			N/A 50 N/A 80 N/A 112 N/A 50	≥ 50	N/A Pass N/A Pass N/A Pass N/A
	Mid Channe Mid Channe 153.6 kbps Mid Channe Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz II, 914.6880 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz 50 Hopping Channels 902.000 MHz - 913.780 MHz 914.6880 MHz 50 Hopping Channels 902.000 MHz - 913.780 MHz 914.6880 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz			N/A 50 N/A 80 N/A 112 N/A 50 N/A	≥ 50 ≥ 50	N/A Pass N/A Pass N/A Pass N/A Pass
	Mid Channe Mid Channe 153.6 kbps Mid Channe Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 914.6880 MHz 80 Hopping Channels 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 93.780 MHz 913.780 MHz - 93.80 MHz			N/A 50 N/A 80 N/A 112 N/A 50 N/A 80	≥ 50 ≥ 50	N/A Pass N/A Pass N/A Pass N/A Pass N/A Pass
	Mid Channe Mid Channe 153.6 kbps Mid Channe Mid Channe Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz			N/A 50 N/A 80 N/A 112 N/A 50 N/A 80	≥ 50 ≥ 50	N/A Pass N/A Pass N/A Pass N/A Pass
	Mid Channe Mid Channe 153.6 kbps Mid Channe Mid Channe Mid Channe	902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 902.000 MHz - 913.780 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 928.000 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 913.780 MHz 914.6880 MHz 194 MHz 913.780 MHz - 913.780 MHz 914.6880 MHz - 913.780 MHz 914.6880 MHz - 913.780 MHz 914.6880 MHz - 913.780 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 913.780 MHz 913.780 MHz - 913.780 MHz			N/A 50 N/A 80 N/A 112 N/A 50 N/A 80 N/A	≥ 50 ≥ 50 = 50 = 50	N/A Pass N/A Pass N/A Pass N/A Pass N/A Pass N/A











M1 S2 S3 FC

€(f): FTun Swp

Start 913.780 MHz #Res BW 300 kHz

				Value	Limit	Result
	0.54.00	. 4.0. 004.0		IN/A	≥ 50	IN/A
🔆 Agilent 08	8:51:02 Oc	t 10,2013			RI	
NORTHWEST EMU AF 31-2 dBm	., INC	O++on	10 JB			
Peak				00000000000		00000000
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1D7)ffst						
31.2						
яв ———						
gAv						
11 S2						
E(f):						
Tun						
Swp						
Start 902.000	MHz				S	top 913.780 MHz
Res BW 300 k	(Hz		#VBW 10	kHz	_Sweep 3.19	9 ms (3000 pts)_
GFSł	K, 115.2 kbps, I	Vid Channel, 914	.6880 MHz 112 I	Hopping Channels, 913	3.780 MHz - 928.0	00 MHz
				Value	Limit	Result
				112	≥ 50	Pass
斗 🖌 👬	8:54:59 Oc	t 10,2013			RT	
	Inc					
Northwest EMC Ref 31 2 dBm	,, 100	Atten	10 dB			
Northwest EMC Ref 31.2 dBm Peak		Atten	10 dB		~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Northwest EMC Ref 31.2 dBm Peak	······	Atten	10 dB	·····	~~~~~	mmm
Northwest EMC Ref 31.2 dBm Peak .og	·····	Atten	10 dB	······	······	
Northwest EMC Ref 31.2 dBm PPeak 5 JB/ JB/	······	Atten	10 dB	······	~~~~~	
Northwest EMC Ref 31.2 dBm Peak -og BB/ Dffst 31.2	·····	Atten	10 dB	·····	~~~~~	·····
Northwest EMC Ref 31.2 dBm Peak Jog dB/ dB/ dB/ dB/ dB/ dB/ dB/	·····	Atten	10 dB		·······	······

₩VBW 10 kHz

Stop 928.000 MHz Sweep 3.799 ms (3000 pts)







FTun Swp

Start 913.780 MHz

#Res BW 300 kHz





GFSK, 153.6 kl	bps, Mid Channel, 914.	6880 MHz 112 Hoppir	ig Channels, 902	2.000 MHz - 913.78	30 MHz
			Value	Limit	Result
			N/A	≥ 50	N/A
Agilent 09:39:12	Oct 10, 2013			RT	
Northwest EML, Inc Ref 31 2 dRm	Atten 1	ЙdВ			
#Peak		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Log					
dB/					
Offst					
31.2 #B					
LgAv					
M1 S2 S3 FC					
E(f):					
Swp					
Start 902 000 MHz				St	оп 913 780 МН г
#Res BW 300 kHz		#VBW 10 kHz) ms (3000 pts)_
GFSK, 153.6 kl	bps, Mid Channel, 914.	6880 MHz 112 Hoppir	ig Channels, 913	3.780 MHz - 928.00	00 MHz
r			Value	Limit	Result
Anilant 00-21-25	0~+ 10 2012		112	250 D T	Pass
orthwest EMC, Inc	000 10, 2013			n i	
Ref 31.2 dBm	Atten 1	.0 dB			
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5					

531.2 dBm	Atten 10 dl	3					
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rt 913.780MHz						Stop 928.	.000 MHz

EMC

Dwell Time

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
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
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	36
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

TEST DESCRIPTION

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 analyze.

The hopping function of the EUT was enabled. The number of hopping channels provided a range from 50 to 112. The EUT was hopping on 50, 80 and 112 channels as seen in the datasheets.

The dwell time limit is 0.4 Sec (400mS) in a 20 Sec period.

The calculation is based on taking a measurement of the pulse on time for each data rate and hopping set, then taking captures of 5 pulses. The sweep time required to capture the five pulses is divided into the 20 Sec required period and a scaling factor determined. The final calculation is:

Pulse Width * Average Number of Pulses * Scale Factor



Dwell Time

FUT	EGRM			1		Work Order: F	RFW0011	
Serial Number	1956-8447					Date: 1	0/10/13	
Customer	FreeWave Technologies Inc					Temperature: 2	2 1°C	
Attendeer	Nene					Lumiditure. 2	2.1 0	
Attendees	None					Humaty: 4	070	
Project	: None	_				Barometric Pres.: 1	015.9	
lested by	Brandon Hobbs	Power:	12 VDC			Job Site:	2006	
TEST SPECIFICA	lions		lest Method					
FCC 15.247:2013			ANSI C63.10:2009					
COMMENTS								
An added 10 dB 5	w attenuator was used while under test. All cable losses were a	ccounted for prior	to testing. Output	power level at 10, Fu	III Power.			
DEVIATIONS FRO	M TEST STANDARD							
None								
Configuration #	1 Signature	7.7	Jar					
		Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
GESK		(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result
OF OK	115.2 kbps							
	Mid Channel, 914.6880 MHz 50 Hopping Channels	12.492	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.6880 MHz 50 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.6880 MHz 50 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914,6880 MHz 50 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914,6880 MHz 50 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914,6880 MHz, 50 Hopping Channels	12,492	N/A	5	5	312.3	400	Pass
	Mid Channel, 914,6880 MHz 80 Hopping Channels	12.492	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914,6880 MHz 80 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914 6880 MHz 80 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914 6880 MHz 80 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914 6880 MHz, 80 Honning Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914,6880 MHz, 80 Hopping Channels	12 492	N/A	5	3 125	195.2	400	Pass
	Mid Channel, 914,6880 MHz, 112 Honning Channels	12.402	N/A	N/A	N/A	N/A	-400 N/Δ	N/A
	Mid Channel, 914.0000 Miliz 112 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.0000 MHz 112 Hopping Channels Mid Channel 014 6990 MHz 112 Hopping Channels	N/A	5	N/A	N/A	N/A N/A	N/A	N/A N/A
	Mid Channel, 914.0000 MHz 112 Hopping Channels	N/A	5	IN/A	IN/A	IN/A	IN/A	N/A
	Mid Channel, 914.0000 MHz 112 Hopping Channels Mid Channel 014 6990 MHz 112 Hopping Channels	N/A	5	N/A	N/A	N/A N/A	N/A	N/A N/A
	Mid Channel, 914.0000 MHz 112 Hopping Channels	10,400	5	IN/A	N/A	120.2	100	N/A Deee
	Mid Channel, 914.6880 MHZ 112 Hopping Channels	12.492	N/A	5	2.23	139.3	400	Pass
	Mid Channel 914 6880 MHz 50 Honning Channels	12 622	NI/A	NI/A	N/A	NI/A	NI/A	NI/A
	Mid Channel, 914,6880 MHz 50 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel 914 6880 MHz 50 Hopping Channels	N/A	5	N/A	N/A	N/A N/A	N/A	N/A
	Mid Channel, 914 6880 MHz 50 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.0000 MHz 50 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.0000 Minz 50 Honnies	IN/A 12 622	D N/A	IN/A	IN/A	N/A 215 55	IN/A 400	IN/A Dooo
	Mid Channel, 914.0000 Mile 20 Hopping Channels	12.022	IN/A	D N/A	D N/A	313.33	400	Pass
	Mid Channel, 914.6880 MHz 80 Hopping Channels	12.622	N/A	N/A	N/A	N/A	IN/A	N/A
	Mid Channel, 914.6880 MHz, 80 Hopping Channels	IN/A	5	IN/A	N/A	IN/A	IN/A	IN/A
	Mid Channel, 914.6880 MHz 80 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.6880 MHz 80 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.6880 MHz 80 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.6880 MHz 80 Hopping Channels	12.622	N/A	5	3.125	197.2	400	Pass
	Mid Channel, 914.6880 MHz 112 Hopping Channels	12.622	N/A	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.6880 MHz 112 Hopping Channels	s N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.6880 MHz 112 Hopping Channels	s N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.6880 MHz 112 Hopping Channels	s N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel, 914.6880 MHz 112 Hopping Channels	N/A	5	N/A	N/A	N/A	N/A	N/A
	Mid Channel 914 6880 MHz 112 Honning Channels	12 622	NI/A	5	2.23	140 74	400	Pass



		GFSK, 11	15.2 kbps, Mid Cha	nnel, 914.6880	0 MHz 50 Hopping	Channels	
P	Pulse Width	Number of	Average No.	Scale Eactor	On Time (ms)	Limit (ms)	Pecult
	12.492	N/A	N/A	N/A	N/A	N/A	N/A
- X	ailent 11.0	12·58 Oct 9.	2013			RT	· · · · ·
Northw	est EMC. 1	nc	2010				▲ Mkr1 1249 ms
Ref 31	.25 dBm		#Atten 10 d	В			-5.08 dB
#Peak							
Log	1 R						
5 407	^						
ab/ Affst				·			
31.2				· · · · · · · · · · · · · · · · · · ·	>		
dB							
#LaQu							
*Lau							
M1 S2							
S3 VS							
0 (0).							
ETun							
r run	\vdash						
Center	914.688	MHz					Span 0 Hz
Res Bk	√ 300 kHz			ŧVBW 30 k⊦	z	_Sweep 26.	12 ms (2000 pts)

		GESK 11	5.2 kbps Mid Cha	annel 01/ 6880	MHz 50 Hopping	Channels		
	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit		
	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result	
	N/A	5	N/A	N/A	N/A	N/A	N/A	
*	Agilent 11:09	5:35 Oct 9,	2013			RT		
Nort	hwest EMC, In	nc						
Ref	31 <u>.25 dBm</u>		#Atten 10 d	B				
#Pea	ik 👘							÷
Log								*
2 dR7								
ab/ Affs							 	
31.2								
dB				↓				
				┼─┟──┼─			<mark></mark>	
#LgF	<u>ا</u> ۷							
LI1	<>							
S3								
Ň	· · ·							
£ (f)	:							
f>50)k							
		^						
Cent	er 914.688 N	1Hz					Span Ø	Hz
Res	BW 20 kHz			#VBW 30 kH	Z	Swee	p 4 s (8192 p	ts)_



		GFSK, 11	5.2 kbps, Mid Cha	annel, 914.6880	MHz 50 Hopping	Channels		
	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit		
	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result	
	N/A	5	N/A	N/A	N/A	N/A	N/A	
*	Agilent 11:0)5:47 Oct 9,	2013			RT		
Nor	thwest EMC,	Inc		ID.				
Ket #Po	31.25 dBm		#Htten 10 d	IR I				1
203								
dB≠	/							
Offs	st 🖌							
31.2	2							
ab								1
#La	Av							
*L9					l l l l l l l l l l l l l l l l l l l			
W1	S2							
\$3	VS							1
£(f								
t>5	ØK							1
								1
~		MU_						Į
Len	DU 20 UL-	MHZ				S	>pan 0 Hz	1
Kes	DN ZU KHZ			₩VDW 30 KHZ			4 S (0192 pts)	1

		GESK 11	5.2 kbps Mid Char	nol 014 6990		a Channals		
	Pulse Width	Number of	Average No.	Scale	On Time (ms)) Limit		
	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result	
	N/A	5	N/A	N/A	N/A	N/A	N/A	
*	Agilent 11:0)6:00 Oct 9,	2013			RT		
North	hwest EMC, I	lnc						
Ref	31.25 dBm		#Atten 10 dE	3				
#Pea	ik 🔽 🗌							
Log								
2								
dB/								
0ttst	t i i i i i i i i i i i i i i i i i i i							
dB								
a.e.								
#LgA	iv L							
Ŭ								
W1 3	\$2							
S3 (VS							
£(†))								
t>50	ик							
_	01.4.000							
Lent	er 914.688	MHZ				¢	Span k	J HZ
Kes	DW ZU KHZ		#	⊽БМ З⊍ КН	Z	SWee	ep 4 s (8192 p	Jts)_



	GFSK, 11	5.2 kbps, Mid Cha	annel, 914.6880	MHz 50 Hopping	g Channels	
Pulse Wi	dth Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result N/A
IN/A	5	N/A	N/A	IN/A	N/A	IN/A
🔆 💥 Agilent	11:06:13 Oct 9,	2013			RT	
Northwest EM	1C, Inc					
Ref 31.25 dE	⊰m	#Atten 10 c	IB			
#Peak						
Log						
31.2						
dB						
#LaAv						
W1 S2						
S3 VS						
£ (f):						
f>50k						
Center 914.6	688 MHz					Span 0 Hz
Res BW 20 kl	Hz		#VBW 30 kH	z	Sweep	4 s (8192 pts)

	GFSK, 11	5.2 kbps, Mid Cha	annel, 914.6880	MHz 50 Hopping (Channels	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result
12.492	N/A	5	5	312.3	400	Pass



		GFSK, 11	5.2 kbps, Mid Cha	nnel, 914.688	0 MHz 80 Hoppin	g Channels		
P	ulse Width	Number of	Average No.	Scale	On Time (ms) Limit	Dee	
	(ms) 12.492	N/A	N/A	N/A	During 20 S	(ms) N/A	N/	A
siz .		F•44 0=+ 0	0010		1	рт		
12450 A	glient 11.1	5.44 UCT 9,	2013			R I	a hillan 1	10.40
Northwe	est EML, I SE JPm	nc	#0+++= 10 d	в			∆ MKr1	12.49 ms
Ker SI #Peak	.25 000		#Htten 10 a					0.00 UD
Ina	[[[]]]			
5	\vdash				•			
dB7								
Offst								
31.2								
aБ								
#LaAv								
~ E 311 V								
M1 S2								
S3 VS								
£ (f):								
Flun								
Lenter	914.688 Lagg Lu-	MHŻ				S	10	pan 0 Hz
Kes BW	1 300 KHZ			#VBM 30 K⊦	IZ	Змеер 26	.12 ms (2	000 pts)_

		0 = 017 17								
Di	1 \ A /2 -1(1)	GFSK, 11	5.2 kbps, Mid Cha	annel, 914.688	30 MHz 80	Hopping C	hannels			
Pu	lise width	Number of	Average No.	Scale	On Tir	ne (ms)	Limit		Desult	
	(ms)	Puises	of Puises	Factor	Durin	ig 20 S	(ms)	-	Result	
	N/A	5	N/A	N/A	N	I/A	N/A		N/A	
🔆 🔆 Ag	jilent 11:11	7:31 Oct 9,	2013				RT			
Northwe	st EMC, I	nc								
Ref 31.	25 dBm		#Atten 10 d	B						
#Peak ∏										
Log										*
2							_			
dB7										
Offst										
31.2										
dB										
#LaAv										
"Lgriv										
ui sol										
20 IN										
00 00										
c (f)·								<u> </u>		
£/50L										
I JUL										
		^								
Center	914.688 N	1Hz							Spa	an 0 Hz
Res BW	8.2 kHz			#VBW 30 k	Hz		Sweep	6.4	s (819	2 pts)



GFS	K, 115.2 kbps, Mid Cha	annel, 914.6880	MHz 80 Hopping	Channels	
Pulse Width Number	of Average No.	Scale	On Time (ms)	Limit	
(ms) Pulse	s of Pulses	Factor	During 20 S	(ms)	Result
N/A 5	N/A	N/A	N/A	N/A	N/A
🔆 🗰 Agilent 11:17:45 0c	t 9,2013			RT	
Northwest EMC, Inc		_			
Ref 31.25 dBm	#Atten 10 d	B			
#Peak					
2				_	
dB/					
Offst					
31.2					
dB					
#LaAv					
~L311V					
W1 S2		l .			
S3 VS					
£(f):					
t<50k					
Contor 014 CSS MU					
Center 314.000 MHZ				~ ~	Span @ HZ

Р	ulse Width	Number of	Average No.	Scale	On Time (ms)	Limit			
	(ms)	Pulses	of Pulses	Factor	During 20	วร่	(ms)		Result	
	N/A	5	N/A	N/A	N/A		N/A		N/A	
* A	gilent 11:1	.8:00 Oct 9,	2013				RΤ			
Northw	est EMC, I	lnc								
Ref 31	.25 dBm		#Atten 10 c	IB						
#Peak										
Log										
2										
aB/										
31.2										
dB										
						1		1		
#LgAv										
W1 S2	┣━━━━┿			┼ <mark>───┼</mark>						
53 VS										
c (f)·										
£-(1). f<50k										
1 (000										
Center	914.688	MHz							Snan	0 Hz
Res Bl	√ 8.2 kHz			#VBW 30 kH	z		Sween	6.4 s	(8192	nts)



		GFSK, 11	5.2 kbps, Mid Cha	annel, 914.6880	MHz 80 Hopping	Channels	
	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result
	N/A	5	N/A	N/A	N/A	N/A	N/A
*	Agilent 11:1	8:14 Oct 9,	2013			RT	
Nor	thwest EMC, 1	lnc					
Ref	31.25 dBm		#Atten 10 d	В			
#Pe	ak						
Log							
2							
dB7	′						
011	St						
31. dB	-						
dD							
	o						
#Lg							
1.11	0						
22 N1	<u>u</u> e			+ +			
55	•						
£ (f	y. H						
د را ارج	ak I						
1 \ 3				+ + +			
Cen	iter 914.688	MHZ					Span 0 Hz
Res	BM 8.2 kHz			#∆RM 30 KH	Z	Sweep	6.4 s (8192 pts)

	GFSK, 115.2 kbps, Mid Channel, 914.6880 MHz 80 Hopping Channels									
Pulse Wi	dth Number	of Average No	. Scale	On Time (ms)	Limit					
(ms)	Pulses	s of Pulses	Factor	During 20 S	(ms)	Result				
12.492	N/A	5	3.125	195.2	400	Pass				



		GFSK, 115	.2 kbps, Mid Chan	nel, 914.6880	MHz 112 Hoppin	g Channels		
P	ulse Width	Number of	Average No.	Scale Eactor	On Time (ms)	Limit	Pac	114
	12.492	N/A	N/A	N/A	N/A	N/A	N/A	
Siz A	ailant 11·2	5·17 Oct 9	2013			РТ	•	
Northw	ast EMC I	D.17 OCC 0,	2013			K I	▲ Mbr1	1249 m
Ref 31	25 dBm	ne	#Atten 10 dF	3				0.80 dB
#Peak			written 10 di					0.00 GD
Log								
5	•			<				
dB7								
011St 31-2								
dB								
#LgAv	\vdash							
M1 \$2								
S3 VS								
£ (f):								
FTun								
_								
Lenter	- 914.688 E 200 LU-	MHŻ		UDU 20 LU	_	Susan 20	12 ma (2)	pan V Hz 200 pt-t
Res Br	N DUU KHZ		#	VDW SU KH	۷		.12 ms (2)	ooo pts)

					MULE 440 Llawsin	Ob a rest a la		
	GFSK, 115.2 kbp Pulse Width Number of Ave		Average No	Scale		Limit		
	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result	
]	N/A	5	N/A	N/A	N/A	N/A	N/A]
*	Agilent 11:2	26:08 Oct 9,	2013			RT		
Nort	hwest EMC, I	lnc						
Ref	31.25 dBm		#Atten 10 dE	3				
#Pea	ak 🔤							
Log								*
2								
dR\								
0ffs 31.2	t							
dB								
#Lgf	λv							
W1	\$2							
\$3	VS							
£(†)	: al.							
1<54	ак							
		^						
Cent	ter 914.688	MHZ				0	5pan k) HZ
Kes	BM 8.2 KHZ			VBM 30 KH	Z	Эмеер Х	.96 S (8192 p	ots/_



	GFSK, 115.2	2 kbps, Mid Char	nnel, 914.6880	MHz 112 Hopping	Channels	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result
IN/A	5	N/A	N/A	IN/A	IN/A	IN/A
🔆 🔆 Agilent 11:2	26:25 Oct 9,2	2013			RT	
Northwest EMC, 1	lnc					
Ref 31.25 dBm		#Atten 10 dl	B			
#Peak						
Log						
Offet						
31.2						
dB						
J						
#LgAv					_	
55 VS						
f (f)						
f<50k						
Center 914.688	MHz					Span 0 Hzî
Res BW 8.2 kHz		+	ŧVBW 30 kH:	z	Sweep 8	.96 s (8192 pts)

		CESK 115	2 kbps Mid Chan	nol 014 6990		ning Chr	annolo		
	Pulse Width	Number of	Average No.	Scale	On Time (r	ns)	Limit		
	(ms)	Pulses	of Pulses	Factor	During 20	S	(ms)	Res	ult
	N/A	5	N/A	N/A	N/A		N/A	N//	Ą
*	Agilent 11:2	6:42 Oct 9,	2013			F	₹Т		
Nort	hwest EMC, I	Inc							
Ref	31.25 dBm		#Atten 10 dB	3					
#Pea	ık 📃 🗌								
Log									
2									
dB7									
Uffs:	t								
dB									
	1	1						1	
#LaA	iv 📃								
W1 3	\$2								
\$3	VS								
£ (f)									
F<50	Jk								
Cent	er 914.688:	MHz						S	pan 0 Hz
Res	BW 8.2 kHz		#	VBW 30 kH	lz		Sweep 8	.96 s (8	192 pts)



	GFSK, 115	5.2 kbps, Mid Cha	nnel, 914.6880	MHz 112 Hopping	Channels	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	Booult
N/A	5	N/A	N/A	N/A	N/A	N/A
Ne Bailant 11-	26.E0 0at 0	2012			РТ	1 · I
Northugot EMC	20.33 OCT 3, Ive	2013			КТ	
NULTHWEST EMC, Dof 31-25 dBm	Inc	#O++on 10 c	IR			
#Peak						
Log						
2						
dB/						
Offst						
31.2 dB						
#LgAv						
W1 S2			<u> </u>			
S3 VS						
e /(1).						
ε(τ). f<50k						
Center 914.688	MHz					Span 0 Hz
Res BW 8.2 kHz			#VBW 30 kH:	7	Sween 8.	96 s (8192 nts)

	GFSK, 11	5.2 kbps, Mid Cha	nnel, 914.6880 N	Hz 112 Hopping	Channels	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result
12.492	N/A	5	2.23	139.3	400	Pass



	GFSK, 15	3.6 kbps, Mid Char	nel, 914.6880 l	MHz 50 Hopping	Channels	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	Peoult
12.622	N/A	N/A	N/A	N/A	N/A	N/A
Siz Automa 11-	22.27 0.4 0	2012	-		рт	
Masthugat EMC	.52.57 UCC 3, Jac	2013			K I	. Mbr1 10.00 .
NULTIWEST EMC, Dat 21 25 dBm	Inc	#0++op 10 dE	>			ע 12.02 מער 12.02 מ ג 207 או
#Peak			, ^			0.27 ui
Log			Ĭ			
5 5						
dB/ 1 <mark>R</mark>						
Offst 🔮						
31.2 dB						
#LgAv						
M1 S2						
S3 VS						
ETun						
Center 914.688	MHz					Span 0 H
Res BW 300 kHz	2	#	VBW 30 kHz		Sweep 26.	12 ms (2000 pts

		0 = 014 4 =						
	B 1 147 141	GFSK, 153	3.6 kbps, Mid Chan	nel, 914.6880	MHz 50 Hopping (Channels		
	Puise width	Number of	Average No.	Scale	On Time (ms)	Limit	Descult	
	(ms)	Fuises			During 20 S	(ms)	N/A	
			10/7	11/73	N/A	- -	19/73	
業	Agilent 11:3	3:16 Oct 9,	2013			RT		
Nort	thwest EMC, I	lnc						
Ref	31.25 dBm		#Atten 10 dB					
#Pea	ak 🕅 🗌							
Log								
5								
dB/	, <mark>,</mark>							
Offs	st					_		
31.2								
dB								
#L at	<u>م</u> ب ا							
#⊏9i								
111	e2							
C2								
00	v.5							
C (1)	∖. ┝┝─────					_		
I -(T)								
1<21	өк							
		~						
Cen	ter 914.688	MHz					Snan Ø	Hz
Res	BW 82 kHz		#	JRU 30 PH	7	Sweer	$4 \le (8192 \text{ m})$	 (a
1163	DH VIC NIZ			NDM DO NH	-		$r \rightarrow 3$ (or $\sigma_{\rm c}$ h	



	GFSK, 15	3.6 kbps, Mid Cha	annel, 914.688	0 MHz 50 Hoppin	g Channels	
Pulse Width	Number of	Average No.	Scale	On Time (ms) Limit	
(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result
N/A	5	N/A	N/A	N/A	N/A	N/A
🔆 🔆 Agilent 11:3	33:28 Oct 9,	2013			RT	
Northwest EMC, 1	lnc					
Ref 31.25 dBm		#Atten 10 d	B			
#Peak						
				1		
Offst						
31.2						
dB						
#LgAv						
un oo						
55 VS						
f (f):						
f<50k						
Center 914 688	MHz					Span Ø Hz
Res BW 8.2 kHz			₩VBW 30 kH	2	Swee	n 4 s (8192 nts)

				and 044,000		Le maine a O	h a sa a a la			
Bulae W	Gi Gidaba Numaba	SK, 153.6 K	ops, wid Cha	nnei, 914.688		hopping C	nanneis			
Pulse W	natn Numb	eror A	Verage No.	Scale	On Thr	ie (ms)	LIMIT	Bee		
		ies (Factor N/A	During	y 20 3		Kes N/		
IN/A	5		N/A	IN/A	IN/	A	IN/A	IN//	A	
🔆 🔆 Agilent	11:33:40 0	lot 9, 201	13				RT			
Northwest E	MC, Inc									
Ref 31.25 d	Bm	#A	ltten 10 d	B						
#Peak										1
loa										1
5										1
				h		b		1		1
										1
										1
31.2				l di la						1
ав <mark>,</mark>										1
										1
		⊥								1
										1
#LaAv										1
23										1
L1 S2								- I		1
e2 11e		+-								1
55 VS										1
										1
£(†):										1
f<50k										1
										1
										1
										4
										1
										1
Center 914.	688 MHz							S	pan 0 Hz	Ĩ
Res BW 8.2	kHz			#VBW 30 k⊦	lz		Swee	p4s(8	192 pts)	1



		GFSK, 15	3.6 kbps. Mid Cha	annel, 914,688	0 MHz 50 Hopping	Channels		
	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit		
	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result	_
	N/A	5	N/A	N/A	N/A	N/A	N/A	
*	Agilent 11:3	3:53 Oct 9,	2013			RT		
Nor	thwest EMC, I	lnc						
Ref	31.25 dBm		#Atten 10 d	IB				
#Pe	ak 🔤							
Log								
5		1		.	L.		L	
dB/	'.							
Uff: 31 - 1	st							
dB	<u>د</u>				le l			
#La	Av							
-9								
W1	S2							
\$3	VS							
£ (f):							
f<5	0k							
Cen	iter 914.688	MHz					Span 0	Hz
Res	80 8.2 kHz			#VBW 30 k	Hz	Swee	ep 4 s (8192 p	its)

	GFSK, 153.6 kbps, Mid Channel, 914.6880 MHz 50 Hopping Channels									
	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit				
_	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result			
	12.622	N/A	5	5	315.55	400	Pass			



	GFSK, 15	3.6 kbps, Mid Chan	inel, 914.6880	MHz 80 Hopping	Channels	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	Decult
(ms) 12.622	N/A	N/A	N/A	N/A	(ms) N/A	N/A
	40-04 0 - 0	0010			D T	1
Agilent 11:	:43:31 Uct 9,	2013			K I	MI 4 40.00
Northwest EML,	Inc					▲ MKrI 12.62 m
HPook		#Htten IV dB	5 			9.13 dB
	· · · · · · · · · · · · · · · · · · ·	·····	·····	Ŷ		
ς –						
dBZ						
Offst 1R						
31.2						
dB						
#LgHv						
M1 00						
00 00						
£ (f):						
FTun						
Center 91 <u>4.688</u>	MHz					Span <u>0Hz</u>
Res BW 300 kHz	7	#	VBW 30 kH	z	Sweep 26.	12 ms (2000 pts)

		GFSK, 15	3.6 kbps. Mid Chan	nel. 914.6880	MHz 80 Hopping (Channels		
	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit		
г	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result	1
	N/A	5	N/A	N/A	N/A	N/A	N/A	
*	Agilent 11:4	14:07 Oct 9,	2013			RT		
Nort	hwest EMC, D	Inc						
Refi	31.25 dBm		#Atten 10 dB	3				
#Pea	ik 🔤							
LOG								
∠ dB∠								
0ffst	t							
31.2	-							
dB						_		
#LgH	1V							
ม1 🔹	\$2							
\$3	vs							
£ (f):	:							
f<50	ik 📔							
		~						
Cent	er 914.688	MHz					Span Ø	Hz
Res	BW 8.2 kHz		#	VBW 30 kH:	2	_ Sweep 6	i.4 s (8192 p	ts)_



Γ

Pulse Width Number of Pulses Average No. of Pulses Scale Factor On Time (ms) During 20 S Limit (ms) Result N/A 5 N/A N/A N/A N/A N/A N/A # Agilent 11:44:21 Oct 9, 2013 R T Northwest EMC, Inc Ref 31.25 dBm #Atten 10 dB # Image: Control of the	
Image Parage Parage </td <td>Pulse Width</td>	Pulse Width
* Agilent 11:44:21 Oct 9, 2013 R T Northwest EMC, Inc *Atten 10 dB *Peak *Atten 10 dB Log	(ms) N/A
Agriculture Art of the set of the se	Nic A
Northwest EML, Inc Ref 31.25 dBm #Atten 10 dB #Peak	Agilent 11.4
Ref S1.25 dBm #Htten 10 dB #Peak	Northwest EML, Def 21 25 JBm
Log 2 dB/ Offst 31.2 dB *LgAv W1 \$2 \$3 V\$ £(f): f<50k 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	#Peak
2 dB/ Offst 31.2 dB +LgAv H1 S2 S3 VS £(f): f<50k I I I I I I I I I I I I I I I I I I I	Ing
dB/ 0ffst 31.2 dB	2
Offst 31.2 dB	dB/
31.2	Offst
db	31.2
#LgAv Image: Solution of the second of t	
#LgAv	
*LgAv	
H1 S2	#LaAv
W1 S2 S3 VS S3 VS S3 VS £(f): f<50k	- L 3/11
S3 VS £(f): f<50k	W1 S2
£(f): f<50k	S3 VS
£(+): f<50k	
	£(†):
	t<50k
Contain 014 CSS MU	Canton 014 000
Center 914.000 MHZ Span 0 HZ	Center 314.688 Poc BU 8-2 kU-

				and 044.000		le a a la a Ob				_
	Pulse Width	GFSK, 153.t	Average No	nnei, 914.688 Scalo	00 IVIHZ 80 H	opping Cr	lanneis			
	(ms)	Pulses	of Pulses	Factor	During	n 20 S	(ms)		Result	
Г	N/A	5	N/A	N/A	N/	/A	N/A		N/A	
*	Agilent 11:4	4:35 Oct 9,2	013				RT			
Nort	hwest EMC, I	nc								
Ref	31.25 dBm		#Atten 10 d	В						
#Pea	ik 🔽 👘									
Log										
2										
dB/										
Offsi	t +									
31.2										
dB										
#LgH	IV			+						
114										
LM CO	52 Hel									
33	vo									
c (f)	. +									
£<50	•									
1/36										
~	01.4.000									
Cent	er 914.688	MHZ					~	~ 1	Span 0	ΗZ
Kes	BW 8.2 KHz			≇∆RM 30 kl	HZ		Sweep	6.4 s	(8192 pt	(S)



	GFSK, 153.6 kbps, Mid Channel, 914.6880 MHz 80 Hopping Channels						
	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result
	N/A	5	N/A	N/A	N/A	N/A	N/A
*	Agilent 11:4	4:49 Oct 9,	2013			RT	
Nort	thwest EMC, 1	lnc					
Ref	31.25 dBm		#Atten 10 c	IB			
#Pea	ак						
LOG				ļ			
	,						
0ffe	;+			ļ			
31.2	$\frac{1}{2}$						
dB				+			
				<u> </u>			
#LgH	HV	<mark>_</mark>		+-			
111	0						
S3	<u>v</u> e						
	•						
£ (f)):						
f<50	0k						
Cen	ter 914.688	MHz					Span 0 H
Res.	BW 8.2 kHz			#VBW 30 kH	z	Sweep	6.4 s (8192 pts

GFSK, 153.6 kbps, Mid Channel, 914.6880 MHz 80 Hopping Channels									
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit				
(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result			
12.622	N/A	5	3.125	197.2	400	Pass			


		GFSK, 153	8.6 kbps, Mid Cha	nnel, 914.6880 N	1Hz 112 Hopping	Channels		
Ρι	ulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	_	
	(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Resu	llt
	12.022	N/A	IN/A	N/A	IN/A	N/A	IN/A	
🔆 🔆 🔆 🕂	gilent 11:4	8:51 Oct 9,	2013			RT		
Northwe	∍st EMC, I	nc					▲ Mkr1	12.62 ms
Ref 31.	.25 dBm		#Atten 10 d	В				5.10 dB
#Peak [
Log				+				
5								
dB/								
Offst								
31.2								
αD								
#LgHV								
M1 00								
MI 32								
JJ VJ								
£ (£):								
FTun								
i i dii								
Control	014 000	MI I						0 H-
Center Dec BU	314.000 I	MAZ				S	12 mg (20	
Kes BW	300 KHZ	_		#VBW 30 KHZ		_Эмеер 26	.12 ms (20	pts)

		GESK 153	8 6 kbps Mid Char	nel 914 6880	MHz 112 Hopping	Channels		
	Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit		
_	(ms)	Pulses	Ises of Pulses		During 20 S	(ms)	Result	
	N/A	5	N/A N/A		N/A	N/A	N/A	
ж.	Agilent 11:5	0:21 Oct 9,	2013			RT		
Nort	hwest EMC, I	Inc						
Ref	31.25 dBm		#Atten 10 dl	3				
#Pea	ak 🔤							
Log								
~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~								
0.ffs	•							
31.2								
dB								
		<mark> </mark>						
#LgH	1v	H						
111	e2							
23 MT								
00	•							
£ (f)	:							
f<50	ðk 🛛							
		^						
Cent	ter 914.688	MHz					Span	0 Hz
Res	BW 8.2 kHz		+	VBW 30 kH:	2	Sweep 8	.96 s (8192	pts)



		GFSK, 15	3.6 kbps, Mid Cha	nnel, 914.6880	MHz 112 Hoppi	ing Channels		
	Pulse Width	Number of	Average No.	Scale	On Time (m	s) Limit		
	(ms)	Pulses	of Pulses	Factor	During 20 S	S (ms)	Result	
	N/A	5	N/A	N/A	N/A	N/A	N/A	
*	Agilent 11:5	50:39 Oct 9,	,2013			RT		
Nort	hwest EMC, 1	Inc	_	_				
Ret	31.25 dBm		#Atten 10 d	В				1
#Pea Log	ак							
2								
dB7								
Offs	+							1
31.2	2							
dB								1
		<u> </u>		⊢				
#Lgf	-γv							1
111	~							
6.3 M T	32 US	<mark> </mark>		\vdash				1
	•							
£ (f)	:							i
f<50	0k							
								i
Cen	ter 914.688	MHz					Span 0 Hz	
Res	BW 8.2 kHz			#VBW 30 k⊦	Iz	Sweep 8.	.96 s (8192 pts)	8

		GESK 153	6 khos Mid Chan	nel 914 6880	MHz 112 Hopp	ing Channels		
	Pulse Width	Number of	Average No.	Scale	On Time (m	s) Limit		
_	(ms)	Pulses	of Pulses	Factor	During 20	S (ms)	Re	esult
	N/A	5	N/A	N/A	N/A	N/A	1	N/A
*	Agilent 11:5	51:01 Oct 9,	2013			RT		
Nort	hwest EMC, J	lnc	II	_				
Ket "Doo	31.25 dBm		#Htten 10 dt	3				
#Pea	ak							
209								
∠ dB7								
0ffs								
31.2								
dB								
#Lgf	λv							
W1	S2							
\$3	vs							
e /0	. —							
r (T) f/50	ас							
1/36	ок							
_	01.4.000	MU_						<u></u>
Cent	DU 0 0 UU-	MHZ		UDU DA LI		e	- 0 00 - /	ວpan ២ H (2100 ຫມ
Kes	BW 8.2 KHZ		#	VBM 30 KH	1Z	Swee) 0.96 S (.8192 pts



	GFSK, 15	3.6 kbps, Mid Cha	nnel, 914.6880	MHz 112 Hopping	Channels	
Pulse Wid	h Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result
N/A	5	IN/A	IN/A	IN/A	IN/A	IN/A
🔆 🔆 Agilent 1	1:51:20 Oct 9,	2013			RT	
Northwest EMC	C, Inc					
Ref 31.25 dBr	n	#Atten 10 c	IB			
#Peak						
Log						
2						
dB						
#LaAv						
-3.11						
W1 S2						
S3 VS						
£ (f):						
f<50k						
Center 914.68	8 MHz					Span 0 Hz
Res BW 8.2 kH	z		#VBW 30 kH	Z	Sweep 8.	.96 s (8192 pts)

	GFSK, 153	3.6 kbps, Mid Cha	nnel, 914.6880 N	MHz 112 Hopping	Channels	
Pulse Width	Number of	Average No.	Scale	On Time (ms)	Limit	
(ms)	Pulses	of Pulses	Factor	During 20 S	(ms)	Result
12.622	N/A	5	2.23	140.74	400	Pass

Calculation Only

No Screen Capture Required

EMC

Band Edge Compliance-Hopping Mode

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
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Attenuator, 'Precision N'	S.M. Electronics	SA18N-06/SM4032	REE	12/11/2012	12
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	36
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to its normal pseudorandom hopping sequence. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet. The measurements were taken per ANSI C63.10.2009 section 7.7.9.

Span = wide enough to capture the peak level of the emission operating on the channel closest to theband edge, as well as any modulation products which fall outside of the authorized band of operation

RBW ≥ 1 % of spectrum analyzer display span VBW ≥ RBW Sweep = auto Detector function = peak

Trace = max hold

The spectrum was scanned below the lower band edge and above the higher band edge.



	d Edge Compliance- Hoppir	ng Mode		XMit 2013.08.15 PsaTx 2013.07.11
EUT: FGRM		Work Order:	FREW0011	
Serial Number: 956-8447		Date:	10/10/13	
Customer: FreeWave Technologies, Inc.		Temperature:	22.1°C	
Attendees: None		Humidity:	40%	
Project: None		Barometric Pres.:	1015.9	
Tested by: Brandon Hobbs	Power: 12 VDC	Job Site:	EV06	
	Test Metriod			
FGC 15.247:2013	ANSI C63. 10.2009			
COMMENTS				
DEVIATIONS FROM TEST STANDARD None Configuration # 1 Signature	J. Jar			
CESK		Value	Limit	Result
115.2 kbps				
Low Channel, 902.2464 MHz 50 Hopping Channel	ls	-43.84 dBc	≤ -20 dBc	Pass
Low Channel, 902.2464 MHz 80 Hopping Channel	els	-44.14 dBc	≤ -20 dBc	Pass
Low Channel, 902.2464 MHz 112 Hopping Chann	nels	-44.7 dBc	≤ -20 dBc	Pass
High Channel, 927.8208 MHz 50 Hopping Channel	els	-27.55 dBc	≤ -20 dBc	Pass
High Channel, 927.8208 MHz 80 Hopping Channel	els	-26.73 dBc	≤ -20 dBc	Pass
High Channel, 927.8208 MHz 112 Hopping Chan	nels	-26.9 dBc	≤ -20 dBc	Pass
153.6 kbps				
Low Channel, 902.2464 MHz 50 Hopping Channel	els	-48.3 dBc	≤ -20 dBc	Pass
Low Channel, 902.2464 MHz 80 Hopping Channel	els	-47.8 dBc	≤ -20 dBc	Pass
Low Channel, 902.2464 MHz 112 Hopping Chann	nels	-48.22 dBc	≤ -20 dBc	Pass
High Channel, 927.8208 MHz 50 Hopping Channel	els	-49.04 dBc	≤ -20 dBc	Pass
High Channel, 927.8208 MHz 80 Hopping Channel	els	-31.40 dBc	≤ -20 dBc	Pass
High Channel, 927.8208 MHz 112 Hopping Chan	nels	-29.75 dBc	≤ -20 dBc	Pass





XMit 2013.08.15































EMC

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, 900 MHz Band

No Hop, 115 kbps No Hop, 154 kbps

Channels Tested, 900 MHz Band

No Hop, Low Channel, 902.25 MHz No Hop, Mid Channel, 916.07 MHz No Hop, High Channel, 927.82 MHz

POWER SETTINGS INVESTIGATED

12 VDC

CONFIGURATIONS INVESTIGATED

FREW0013 - 2

FREQUENCY RANGE INVESTIGATED Start Frequency 30 MHz

Stop Frequency 12400 MHz

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
HP Filter	Micro-Tronics	HPM50111	HHI	1/18/2013	24 mo
HP Filter	Micro-Tronics	HPM50114	HFN	1/18/2013	36 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	1/18/2013	12 mo
Notch Filter	K&L Microwave	3TNF-500/1000-N/N	HHO	8/28/2013	12 mo
LP Filter	Micro-Tronics	LPM50003	LFE	1/18/2013	24 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	12/14/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	12/14/2012	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	12/13/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAB	12/13/2012	12 mo
NC01 Cables	N/A	Standard Gain Horn Cable	NC3	12/14/2012	12 mo
NC01 Cables	N/A	3115 Horn Cable	NC2	12/13/2012	12 mo
NC01 Cables	N/A	Bilog Cables	NC1	12/13/2012	12 mo
Antenna, Horn	EMCO	3160-08	AHO	NCR	0 mo
Antenna, Horn	EMCO	3160-07	AHP	NCR	0 mo
Antenna, Horn	EMCO	3115	AHM	6/19/2012	24 mo
Antenna, Biconilog	EMCO	3142	AXJ	5/16/2012	36 mo
Spectrum Analyzer	Agilent	E4440A	AAW	2/21/2013	24 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

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. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

The power level used while under test for the 900 MHz band was set at the maximum allowable by the test software. All average measurements above 1 GHz were performed using a RMS Average Detector unless otherwise noted. Particular average measurements were made using an average detector employing a 10 Hz VBW, as per FCC KDB 913591, which are noted in the comments section as 10 Hz Avg. The EUT was transmitting at its maximum allowable duty cycle.



Spurious Radiated Emissions



						MHz				PK	◆ AV	• QP	
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
5413.440	44.7	9.0	1.0	330.0	3.0	0.0	Horz	AV	0.0	53.7	54.0	-0.3	Low Ch, EUT Flat, 115 kbps, 10Hz Avg
5413.465	43.5	9.0	1.1	224.0	3.0	0.0	Vert	AV	0.0	52.5	54.0	-1.5	Low Ch, EUT Flat, 154 kbps, 10Hz Avg
5413.495	42.9	9.0	1.1	288.0	3.0	0.0	Vert	AV	0.0	51.9	54.0	-2.1	Low Ch, EUT Vert, 154 kbps, 10Hz Avg
5413.510	42.0	9.0	1.0	86.0	3.0	0.0	Horz	AV	0.0	51.0	54.0	-3.0	Low Ch, EUT Vert, 154 kbps, 10Hz Avg
5413.450	41.9	9.0	1.4	327.0	3.0	0.0	Horz	AV	0.0	50.9	54.0	-3.1	Low Ch, EUT Flat, 154 kbps, 10Hz Avg
5413.540	41.4	9.0	1.1	343.0	3.0	0.0	Horz	AV	0.0	50.4	54.0	-3.6	Low Ch, EUT Horz, 154 kbps, 10Hz Avg
5413.510	41.3	9.0	1.3	338.0	3.0	0.0	Vert	AV	0.0	50.3	54.0	-3.7	Low Ch, EUT Horz, 154 kbps, 10Hz Avg
5413.455	37.4	9.0	1.1	224.0	3.0	0.0	Vert	AV	0.0	46.4	54.0	-7.6	Low Ch, EUT Flat, 115 kbps, 10Hz Avg
5413.205	52.2	9.0	1.0	330.0	3.0	0.0	Horz	PK	0.0	61.2	74.0	-12.8	Low Ch, EUT Flat, 115 kbps
5413.205	51.7	9.0	1.1	343.0	3.0	0.0	Horz	PK	0.0	60.7	74.0	-13.3	Low Ch, EUT Horz, 154 kbps
5413.080	51.2	9.0	1.1	224.0	3.0	0.0	Vert	PK	0.0	60.2	74.0	-13.8	Low Ch, EUT Flat, 115 kbps
5413.325	50.2	9.0	1.1	224.0	3.0	0.0	Vert	PK	0.0	59.2	74.0	-14.8	Low Ch, EUT Flat, 154 kbps
5413.795	50.1	9.0	1.1	288.0	3.0	0.0	Vert	PK	0.0	59.1	74.0	-14.9	Low Ch, EUT Vert, 154 kbps
5413.290	48.8	9.0	1.0	86.0	3.0	0.0	Horz	PK	0.0	57.8	74.0	-16.2	Low Ch, EUT Vert, 154 kbps
5413.385	48.7	9.0	1.4	327.0	3.0	0.0	Horz	PK	0.0	57.7	74.0	-16.3	Low Ch, EUT Flat, 154 kbps
5413.805	48.3	9.0	1.3	338.0	3.0	0.0	Vert	PK	0.0	57.3	74.0	-16.7	Low Ch, EUT Horz, 154 kbps



Spurious Radiated Emissions



						MHz				PK	 AV 	• QP	
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4511.230	46.6	6.0	1.2	223.0	3.0	0.0	Vert	AV	0.0	52.6	54.0	-1.4	Low Ch, EUT Flat, 115 kbps, 10Hz Avg
4511.320	46.3	6.0	1.2	222.0	3.0	0.0	Vert	AV	0.0	52.3	54.0	-1.7	Low Ch, EUT Flat, 154 kbps, 10Hz Avg
4511.275	44.8	6.0	1.8	299.0	3.0	0.0	Horz	AV	0.0	50.8	54.0	-3.2	Low Ch, EUT Flat, 115 kbps, 10Hz Avg
3609.060	47.1	2.4	1.0	194.0	3.0	0.0	Vert	AV	0.0	49.5	54.0	-4.5	Low Ch, EUT Flat, 115 kbps
3609.070	47.0	2.4	1.0	193.0	3.0	0.0	Vert	AV	0.0	49.4	54.0	-4.6	Low Ch, EUT Flat, 154 kbps
2706.820	30.0	-1.0	1.0	45.0	3.0	20.0	Vert	AV	0.0	49.0	54.0	-5.0	Low Ch, EUT Flat, 115 kbps
3609.100	46.4	2.4	2.0	14.0	3.0	0.0	Horz	AV	0.0	48.8	54.0	-5.2	Low Ch, EUT Flat, 115 kbps
2706.835	29.4	-1.0	3.3	71.0	3.0	20.0	Horz	AV	0.0	48.4	54.0	-5.6	Low Ch, EUT Flat, 115 kbps
4511.330	41.0	6.0	1.4	299.0	3.0	0.0	Horz	AV	0.0	47.0	54.0	-7.0	Low Ch, EUT Flat, 154 kbps, 10Hz Avg
3609.065	44.1	2.4	1.5	203.0	3.0	0.0	Horz	AV	0.0	46.5	54.0	-7.5	Low Ch, EUT Flat, 154 kbps
74.957	36.8	-8.2	1.4	200.0	3.0	0.0	Vert	QP	0.0	28.6	40.0	-11.4	Low Ch, EUT Flat, 115 kbps
8120.520	28.5	13.6	1.0	226.0	3.0	0.0	Vert	AV	0.0	42.1	54.0	-11.9	Low Ch, EUT Flat, 115 kbps
8120.140	28.3	13.6	1.0	1.0	3.0	0.0	Horz	AV	0.0	41.9	54.0	-12.1	Low Ch, EUT Flat, 115 kbps
9022.765	47.2	-5.8	1.0	284.0	3.0	0.0	Horz	AV	0.0	41.4	54.0	-12.6	Low Ch, EUT Flat, 115 kbps
132.714	38.2	-7.6	1.0	336.0	3.0	0.0	Vert	QP	0.0	30.6	43.5	-12.9	Low Ch, EUT Flat, 115 kbps
9022.865	46.7	-5.8	1.1	338.0	3.0	0.0	Vert	AV	0.0	40.9	54.0	-13.1	Low Ch, EUT Flat, 115 kbps
2706.235	40.9	-1.0	3.3	71.0	3.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	Low Ch, EUT Flat, 115 kbps
2705.540	40.1	-1.0	1.0	45.0	3.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	Low Ch, EUT Flat, 115 kbps
4511.390	52.8	6.0	1.2	222.0	3.0	0.0	Vert	PK	0.0	58.8	74.0	-15.2	Low Ch, EUT Flat, 154 kbps
4510.990	52.6	6.0	1.2	223.0	3.0	0.0	Vert	PK	0.0	58.6	74.0	-15.4	Low Ch, EUT Flat, 115 kbps
4511.215	51.6	6.0	1.4	299.0	3.0	0.0	Horz	PK	0.0	57.6	74.0	-16.4	Low Ch, EUT Flat, 154 kbps
4511.160	51.4	6.0	1.8	299.0	3.0	0.0	Horz	PK	0.0	57.4	74.0	-16.6	Low Ch, EUT Flat, 115 kbps
8119.810	39.2	13.6	1.0	226.0	3.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	Low Ch, EUT Flat, 115 kbps
8118.990	39.0	13.6	1.0	1.0	3.0	0.0	Horz	PK	0.0	52.6	74.0	-21.4	Low Ch, EUT Flat, 115 kbps
3608.960	49.8	2.4	1.0	193.0	3.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	Low Ch, EUT Flat, 154 kbps
3608.735	49.8	2.4	1.0	194.0	3.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	Low Ch, EUT Flat, 115 kbps
3608.710	49.6	2.4	2.0	14.0	3.0	0.0	Horz	PK	0.0	52.0	74.0	-22.0	Low Ch, EUT Flat, 115 kbps
3608.760	47.9	2.4	1.5	203.0	3.0	0.0	Horz	PK	0.0	50.3	74.0	-23.7	Low Ch, EUT Flat, 154 kbps
975.954	14.6	12.6	1.4	200.0	3.0	0.0	Vert	QP	0.0	27.2	54.0	-26.8	Low Ch, EUT Flat, 115 kbps
9023.645	52.6	-5.7	1.1	338.0	3.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Low Ch, EUT Flat, 115 kbps
9022.930	52.5	-5.8	1.0	284.0	3.0	0.0	Horz	PK	0.0	46.7	74.0	-27.3	Low Ch, EUT Flat, 115 kbps



Spurious Radiated Emissions



1(D		100			1000			10000			100000	
						MHz				PK	♦ AV	• QP	
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4580.380	44.8	6.6	1.4	225.0	3.0	0.0	Vert	AV	0.0	51.4	54.0	-2.6	Mid Ch, EUT Flat, 154 kbps, 10Hz Avg
4580.385	44.7	6.6	1.4	298.0	3.0	0.0	Horz	AV	0.0	51.3	54.0	-2.7	Mid Ch, EUT Flat, 115 kbps, 10Hz Avg
2748.185	32.1	-0.9	1.0	74.0	3.0	20.0	Horz	AV	0.0	51.2	54.0	-2.8	Mid Ch, EUT Flat, 115 kbps
2748.185	32.0	-0.9	1.0	198.0	3.0	20.0	Vert	AV	0.0	51.1	54.0	-2.9	Mid Ch, EUT Flat, 115 kbps
4580.400	44.5	6.6	1.0	76.0	3.0	0.0	Vert	AV	0.0	51.1	54.0	-2.9	Mid Ch, EUT Flat, 115 kbps
4580.390	44.2	6.6	1.3	294.0	3.0	0.0	Horz	AV	0.0	50.8	54.0	-3.2	Mid Ch, EUT Flat, 154 kbps, 10Hz Avg
3664.350	43.4	2.9	1.0	74.0	3.0	0.0	Vert	AV	0.0	46.3	54.0	-7.7	Mid Ch, EUT Flat, 115 kbps
3664.365	43.1	2.9	1.0	323.0	3.0	0.0	Horz	AV	0.0	46.0	54.0	-8.0	Mid Ch, EUT Flat, 115 kbps
76.187	37.1	-8.3	1.0	191.0	3.0	0.0	Vert	QP	0.0	28.8	40.0	-11.2	Mid Ch, EUT Flat, 115 kbps
960.358	29.9	12.4	1.5	208.0	3.0	0.0	Vert	QP	0.0	42.3	54.0	-11.7	Mid Ch, EUT Flat, 115 kbps
7328.825	29.3	12.3	1.2	116.0	3.0	0.0	Vert	AV	0.0	41.6	54.0	-12.4	Mid Ch, EUT Flat, 115 kbps
7328.708	28.7	12.3	1.0	6.0	3.0	0.0	Horz	AV	0.0	41.0	54.0	-13.0	Mid Ch, EUT Flat, 115 Kbps
2747.030	41.7	-0.9	1.0	108.0	3.0	20.0	Nort	PK	0.0	60.6	74.0	-13.2	Mid Ch, EUT Flat, 115 kbps
2749.025	41.0	-0.9	1.0	196.0	3.0	20.0	Ven	PK	0.0	40.6	74.0	-13.3	Mid Ch, EUT Flat, 115 kbps
9101.100	45.5	-4.9	1.0	221.0	3.0	0.0	Horz		0.0	40.0	54.0	-13.4	Mid Ch. EUT Flat, 115 kbps
0244.903	40.7	-0.8	1.1	321.0	3.0	0.0	Vert		0.0	38.9	54.0	-14.1	Mid Ch, EUT Flat, 115 kbps
4580 650	50.9	-4.5	1.0	298.0	3.0	0.0	Horz	PK	0.0	57.5	74.0	-16.5	Mid Ch, EUT Flat, 115 kbps
4580 110	50.9	6.6	1.4	225.0	3.0	0.0	Vert	PK	0.0	57.5	74.0	-16.5	Mid Ch, EUT Flat, 154 kbps
8244.925	43.8	-6.8	1.0	0.0	3.0	0.0	Vert	AV	0.0	37.0	54.0	-17.0	Mid Ch. EUT Flat, 115 kbps
4580.645	50.4	6.6	1.3	294.0	3.0	0.0	Horz	PK	0.0	57.0	74.0	-17.0	Mid Ch. EUT Flat, 154 kbps
4580.740	47.5	6.6	1.0	76.0	3.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	Mid Ch. EUT Flat, 115 kbps
7328,542	40.0	12.3	1.0	6.0	3.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	Mid Ch. EUT Flat, 115 kbps
7331.175	39.7	12.3	1.2	116.0	3.0	0.0	Vert	PK	0.0	52.0	74.0	-22.0	Mid Ch. EUT Flat, 115 kbps
3664.205	47.3	2.9	1.0	323.0	3.0	0.0	Horz	PK	0.0	50.2	74.0	-23.8	Mid Ch, EUT Flat, 115 kbps
3663.905	46.8	2.9	1.0	74.0	3.0	0.0	Vert	PK	0.0	49.7	74.0	-24.3	Mid Ch, EUT Flat, 115 kbps
9159.942	51.3	-4.9	1.0	308.0	3.0	0.0	Horz	PK	0.0	46.4	74.0	-27.6	Mid Ch, EUT Flat, 115 kbps
9160.925	50.1	-4.9	1.0	331.0	3.0	0.0	Vert	PK	0.0	45.2	74.0	-28.8	Mid Ch, EUT Flat, 115 kbps
8244.042	51.8	-6.8	1.1	321.0	3.0	0.0	Horz	PK	0.0	45.0	74.0	-29.0	Mid Ch, EUT Flat, 115 kbps
8244.667	50.2	-6.8	1.0	0.0	3.0	0.0	Vert	PK	0.0	43.4	74.0	-30.6	Mid Ch, EUT Flat, 115 kbps



Spurious Radiated Emissions



	-												
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4639.230	46.7	7.0	1.3	293.0	3.0	0.0	Horz	AV	0.0	53.7	54.0	-0.3	High Ch, EUT Flat, 115 kbps
4639.220	46.2	7.0	1.3	292.0	3.0	0.0	Horz	AV	0.0	53.2	54.0	-0.8	High Ch, EUT Flat, 154 kbps
4639.205	45.6	7.0	1.3	354.0	3.0	0.0	Vert	AV	0.0	52.6	54.0	-1.4	High Ch, EUT Flat, 115 kbps
4639.230	45.0	7.0	1.4	224.0	3.0	0.0	Vert	AV	0.0	52.0	54.0	-2.0	High Ch, EUT Flat, 154 kbps
2783.480	32.7	-0.9	1.0	198.0	3.0	20.0	Vert	AV	0.0	51.8	54.0	-2.2	High Ch, EUT Flat, 115 kbps
2783.435	29.8	-0.9	1.0	223.0	3.0	20.0	Horz	AV	0.0	48.9	54.0	-5.1	High Ch, EUT Flat, 115 kbps
3711.285	43.9	3.4	1.0	350.0	3.0	0.0	Horz	AV	0.0	47.3	54.0	-6.7	High Ch, EUT Flat, 115 kbps
3711.260	43.8	3.4	1.0	68.0	3.0	0.0	Vert	AV	0.0	47.2	54.0	-6.8	High Ch, EUT Flat, 115 kbps
76.182	37.4	-8.3	1.6	197.0	3.0	0.0	Vert	QP	0.0	29.1	40.0	-10.9	High Ch, EUT Flat, 115 kbps
7422.908	29.7	12.8	1.0	249.0	3.0	0.0	Vert	AV	0.0	42.5	54.0	-11.5	High Ch, EUT Flat, 115 kbps
972.105	29.6	12.5	1.5	211.0	3.0	0.0	Vert	QP	0.0	42.1	54.0	-11.9	High Ch, EUT Flat, 115 kbps
2783.540	41.6	-0.9	1.0	198.0	3.0	20.0	Vert	PK	0.0	60.7	74.0	-13.3	High Ch, EUT Flat, 115 kbps
7420.367	27.8	12.8	1.0	152.0	3.0	0.0	Horz	AV	0.0	40.6	54.0	-13.4	High Ch, EUT Flat, 115 kbps
8350.600	47.3	-6.7	1.0	317.0	3.0	0.0	Horz	AV	0.0	40.6	54.0	-13.4	High Ch, EUT Flat, 115 kbps
136.402	36.6	-7.4	1.0	341.0	3.0	0.0	Vert	QP	0.0	29.2	43.5	-14.3	High Ch, EUT Flat, 115 kbps
2782.090	40.3	-0.9	1.0	223.0	3.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	High Ch, EUT Flat, 115 kbps
8350.675	44.7	-6.7	1.0	28.0	3.0	0.0	Vert	AV	0.0	38.0	54.0	-16.0	High Ch, EUT Flat, 115 kbps
4639.605	49.5	7.0	1.4	224.0	3.0	0.0	Vert	PK	0.0	56.5	74.0	-17.5	High Ch, EUT Flat, 154 kbps
4638.895	49.4	7.0	1.3	293.0	3.0	0.0	Horz	PK	0.0	56.4	74.0	-17.6	High Ch, EUT Flat, 115 kbps
4639.380	49.2	7.0	1.3	354.0	3.0	0.0	Vert	PK	0.0	56.2	74.0	-17.8	High Ch, EUT Flat, 115 kbps
4639.495	48.8	7.0	1.3	292.0	3.0	0.0	Horz	PK	0.0	55.8	74.0	-18.2	High Ch, EUT Flat, 154 kbps
7423.158	39.8	12.8	1.0	249.0	3.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	High Ch, EUT Flat, 115 kbps
7422.550	39.4	12.8	1.0	152.0	3.0	0.0	Horz	PK	0.0	52.2	74.0	-21.8	High Ch, EUT Flat, 115 kbps
3711.120	48.2	3.4	1.0	350.0	3.0	0.0	Horz	PK	0.0	51.6	74.0	-22.4	High Ch, EUT Flat, 115 kbps
3711.290	47.7	3.4	1.0	68.0	3.0	0.0	Vert	PK	0.0	51.1	74.0	-22.9	High Ch, EUT Flat, 115 kbps
8350.708	52.4	-6.7	1.0	317.0	3.0	0.0	Horz	PK	0.0	45.7	74.0	-28.3	High Ch, EUT Flat, 115 kbps
8350.117	51.0	-6.7	1.0	28.0	3.0	0.0	Vert	PK	0.0	44.3	74.0	-29.7	High Ch, EUT Flat, 115 kbps



TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50 Ω .

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwarz	ESCI	ARE	05/30/2013	12 mo
NC05 Cables	N/A	Conducted / NF Probe Cable	NC4	12/14/2012	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HHF	02/01/2012	24 mo
LISN	Solar	9252-50-R-24-BNC	LIM	01/16/2013	12 mo

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.94 dB	-2.94 dB

CONFIGURATIONS INVESTIGATED

FREW0013-3

MODES INVESTIGATED

Transmitting High Channel, 927.8 MHz, 115 kbps Transmitting Low Channel, 902.25 MHz, 115 kbps Transmitting Mid Channel, 916.1 MHz, 115 kbps



EUT:	FGRM	Work Order:	FREW0013
Serial Number:	956-8447	Date:	10/15/2013
Customer:	FreeWave Technologies, Inc.	Temperature:	23°C
Attendees:	Dean Busch	Relative Humidity:	35%
Customer Project:	None	Bar. Pressure:	1028 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	FREW0013-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

-	_							
Run #:	5	Line:	High Line	Ext. Attenuation (dB):	20			
COMMENT	ſS							
Output power	Output power level at 10, Full Power.							
EUT OPER	ATING MODES							
Transmitting I	ow Channel, 902.25	6 MHz, 115	kbps					
DEVIATIO	NS FROM TEST	STANDA	RD					
NI								

None

100

90

80

70

60

50

40

30

20

10 0

0.1

dBuV

Quasi Peak Data - vs - Quasi Peak Limit

1.0

10.0

MHz







RESULTS - Run #5

Quasi Peak Data - vs - Quasi Peak Limit								
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)			
6.144	20.8	20.6	41.4	60.0	-18.6			
8.600	16.5	20.7	37.2	60.0	-22.8			
7.374	16.2	20.6	36.8	60.0	-23.2			
5.530	15.0	20.6	35.6	60.0	-24.4			
0.154	20.2	20.3	40.5	65.8	-25.3			
0.190	13.5	20.4	33.9	64.0	-30.2			

Average Data - vs - Average Limit									
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)				
6.144	18.7	20.6	39.3	50.0	-10.7				
8.600	14.4	20.7	35.1	50.0	-14.9				
7.374	14.0	20.6	34.6	50.0	-15.4				
5.530	12.7	20.6	33.3	50.0	-16.7				
0.190	2.1	20.4	22.5	54.0	-31.6				
0.154	3.7	20.3	24.0	55.8	-31.8				

CONCLUSION

Tested By



EUT:	FGRM	Work Order:	FREW0013
Serial Number:	956-8447	Date:	10/15/2013
Customer:	FreeWave Technologies, Inc.	Temperature:	23°C
Attendees:	Dean Busch	Relative Humidity:	35%
Customer Project:	None	Bar. Pressure:	1028 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	FREW0013-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

Run #·	6	l ine [.]	Neutral	Ext Attenuation (dB):	20				
$\operatorname{Run}\pi$.	0	Line.	Neutrai	Ext. Attendation (db).	20				
COMMENT	ſS								
Output power	Output power level at 10, Full Power.								
EUT OPER	EUT OPERATING MODES								
Transmitting I	ow Channel, 902.25	5 MHz, 115	kbps						
DEVIATIO	NS FROM TEST	STANDA	ARD						

None

100

90

80

70

60

50

40

30

20

10

0

0.1

dBuV

Quasi Peak Data - vs - Quasi Peak Limit

1.0

10.0

MHz







RESULTS - Run #6

NLOOLI.								
Q	Quasi Peak Data - vs - Quasi Peak Limit							
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)			
6.144	21.3	20.6	41.9	60.0	-18.1			
8.600	17.1	20.7	37.8	60.0	-22.2			
7.374	16.8	20.6	37.4	60.0	-22.6			
9.832	16.3	20.7	37.0	60.0	-23.0			
12.286	13.1	20.9	34.0	60.0	-26.0			
0.158	16.6	20.3	36.9	65.6	-28.7			

Average Data - vs - Average Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
6.144	19.2	20.6	39.8	50.0	-10.2	
8.600	14.9	20.7	35.6	50.0	-14.4	
7.374	14.6	20.6	35.2	50.0	-14.8	
9.832	14.1	20.7	34.8	50.0	-15.2	
12.286	11.2	20.9	32.1	50.0	-17.9	
0.158	3.2	20.3	23.5	55.6	-32.1	

CONCLUSION

Tested By



EUT:	FGRM	Work Order:	FREW0013
Serial Number:	956-8447	Date:	10/15/2013
Customer:	FreeWave Technologies, Inc.	Temperature:	23°C
Attendees:	Dean Busch	Relative Humidity:	35%
Customer Project:	None	Bar. Pressure:	1028 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	FREW0013-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

-	-					
Run #:	7	Line:	High Line	Ext. Attenuation (dB):	20	
COMMENT	ſS					
Output power	level at 10, Full Pow	/er.				
EUT OPERATING MODES						
Transmitting I	Transmitting Mid Channel, 916.1 MHz, 115 kbps					
DEVIATIONS FROM TEST STANDARD						
N 1						

None

100

90

80

70

60

50

40

30

20

10 0

0.1

dBuV

Quasi Peak Data - vs - Quasi Peak Limit

1.0

10.0

MHz

Average Data - vs - Average Limit





RESULTS - Run #7

Quasi Peak Data - vs - Quasi Peak Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
6.144	21.7	20.6	42.3	60.0	-17.7	
8.600	17.6	20.7	38.3	60.0	-21.7	
7.374	17.4	20.6	38.0	60.0	-22.0	
9.832	16.8	20.7	37.5	60.0	-22.5	
12.286	13.9	20.9	34.8	60.0	-25.2	
0.154	20.2	20.3	40.5	65.8	-25.3	

Average Data - vs - Average Limit					
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
6.144	19.7	20.6	40.3	50.0	-9.7
8.600	15.5	20.7	36.2	50.0	-13.8
7.374	15.2	20.6	35.8	50.0	-14.2
9.832	14.7	20.7	35.4	50.0	-14.6
12.286	12.0	20.9	32.9	50.0	-17.1
0.154	3.6	20.3	23.9	55.8	-31.9

CONCLUSION

Tested By



EUT:	FGRM	Work Order:	FREW0013
Serial Number:	956-8447	Date:	10/15/2013
Customer:	FreeWave Technologies, Inc.	Temperature:	23°C
Attendees:	Dean Busch	Relative Humidity:	35%
Customer Project:	None	Bar. Pressure:	1028 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	FREW0013-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

_	-						
Run #:	8	Line:	Neutral	Ext. Attenuation (dB):	20		
COMMENTS							
Output power	level at 10, Full Pov	/er.					
EUT OPERATING MODES							
Transmitting I	Transmitting Mid Channel, 916.1 MHz, 115 kbps						
DEVIATIONS FROM TEST STANDARD							

None

100

90

80

70

60

50

40

30

20

10 0

0.1

dBuV

Quasi Peak Data - vs - Quasi Peak Limit

1.0

10.0

MHz







RESULTS - Run #8

NEGOLI								
Qı	Quasi Peak Data - vs - Quasi Peak Limit							
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)			
6.144	21.7	20.6	42.3	60.0	-17.7			
8.600	17.7	20.7	38.4	60.0	-21.6			
9.830	17.6	20.7	38.3	60.0	-21.7			
7.374	17.5	20.6	38.1	60.0	-21.9			
12.286	14.1	20.9	35.0	60.0	-25.0			
0.158	16.5	20.3	36.8	65.6	-28.8			

Average Data - vs - Average Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
6.144	19.7	20.6	40.3	50.0	-9.7	
8.600	15.6	20.7	36.3	50.0	-13.7	
9.830	15.5	20.7	36.2	50.0	-13.8	
7.374	15.3	20.6	35.9	50.0	-14.1	
12.286	12.2	20.9	33.1	50.0	-16.9	
0.158	3.2	20.3	23.5	55.6	-32.1	

CONCLUSION

Tested By



EUT:	FGRM	Work Order:	FREW0013
Serial Number:	956-8447	Date:	10/15/2013
Customer:	FreeWave Technologies, Inc.	Temperature:	23°C
Attendees:	Dean Busch	Relative Humidity:	35%
Customer Project:	None	Bar. Pressure:	1028 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	FREW0013-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

-	-					
Run #:	9	Line:	High Line	Ext. Attenuation (dB):	20	
COMMEN	ſS					
Output power	level at 10, Full Pow	/er.				
EUT OPER	ATING MODES					
Transmitting High Channel, 927.8 MHz, 115 kbps						
DEVIATIONS FROM TEST STANDARD						

None

100

90

80

70

60

50

40

30

20

10 0

0.1

dBuV

Quasi Peak Data - vs - Quasi Peak Limit

1.0

10.0

MHz







RESULTS - Run #9

Quasi Peak Data - vs - Quasi Peak Limit							
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)		
6.144	22.1	20.6	42.7	60.0	-17.3		
8.600	18.0	20.7	38.7	60.0	-21.3		
7.374	18.0	20.6	38.6	60.0	-21.4		
9.830	17.8	20.7	38.5	60.0	-21.5		
0.154	20.4	20.3	40.7	65.8	-25.1		
11.060	12.6	20.8	33.4	60.0	-26.6		

Average Data - vs - Average Limit					
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
6.144	20.1	20.6	40.7	50.0	-9.3
8.600	15.9	20.7	36.6	50.0	-13.4
7.374	15.8	20.6	36.4	50.0	-13.6
9.830	15.6	20.7	36.3	50.0	-13.7
11.060	10.2	20.8	31.0	50.0	-19.0
0.154	3.6	20.3	23.9	55.8	-31.9

CONCLUSION

Tested By



EUT:	FGRM	Work Order:	FREW0013
Serial Number:	956-8447	Date:	10/15/2013
Customer:	FreeWave Technologies, Inc.	Temperature:	23°C
Attendees:	Dean Busch	Relative Humidity:	35%
Customer Project:	None	Bar. Pressure:	1028 mb
Tested By:	Richard Mellroth	Job Site:	NC05
Power:	110VAC/60Hz	Configuration:	FREW0013-3

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2013	ANSI C63.10:2009

TEST PARAMETERS

Run #:	10	Line:	Neutral	Ext. Attenuation (dB):	20	
COMMENT	ſS					
Output power	level at 10, Full Pow	/er.				
EUT OPERATING MODES						
Transmitting High Channel, 927.8 MHz, 115 kbps						
DEVIATIONS FROM TEST STANDARD						

None

100

90

80

70

60

50

40

30

20

10 0

0.1

dBuV

Quasi Peak Data - vs - Quasi Peak Limit

1.0

10.0

MHz







RESULTS - Run #10

Quasi Peak Data - vs - Quasi Peak Limit						
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)	
6.144	22.1	20.6	42.7	60.0	-17.3	
8.600	18.1	20.7	38.8	60.0	-21.2	
7.374	18.1	20.6	38.7	60.0	-21.3	
9.830	17.9	20.7	38.6	60.0	-21.4	
12.286	13.6	20.9	34.5	60.0	-25.5	
0.158	16.5	20.3	36.8	65.6	-28.8	

Average Data - vs - Average Limit					
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
6.144	20.1	20.6	40.7	50.0	-9.3
8.600	16.0	20.7	36.7	50.0	-13.3
7.374	16.0	20.6	36.6	50.0	-13.4
9.830	15.8	20.7	36.5	50.0	-13.5
12.286	11.6	20.9	32.5	50.0	-17.5
0.158	3.2	20.3	23.5	55.6	-32.1

CONCLUSION

Tested By